

## Chapter 9: Copyright and the Internet

For economic incentives to work appropriately, property rights must protect the rights of capital assets....At present...severe economic damage [is being done] to the property rights of owners of copyrights in sound recordings and musical compositions...under present and emerging conditions, the industry simply has no out...Unless something meaningful is done to respond to the...problem, the industry itself is at risk.

Alan Greenspan<sup>85</sup>

### Introduction

As the storage and transmission of artistic creations becomes primarily digital, the primary form of property right, i.e., copyright, would seem to face unprecedented enforcement challenges. The recent focus of attention has been the digitization of audio, the circumvention of copyright in the trading of these files, and in particular the Napster case. Yet the digitization of any artistic creation, whether audio, video, or the written word threatens, or appears to threaten, current copyright regimes, as Napster successors such as Bearshare, Limewire, AudioGalaxy, and Morpheus make clear.

It is unclear whether copyright, which itself is the child of technology, can continue to provide ample incentives for artistic creation. Will authors be able to appropriate more or less of the value than they have in the past? How does digital storage change the balance between authorized and unauthorized use? What pricing schemes are likely to arise? What legal rules strike the best balance between consumptive efficiency and productive efficiency? That is, how do we maximize use and creation at the same time?

For perspective, we should remember that copying technologies have been in existence for several generations. Doom and gloom scenarios have been raised before and often nothing untoward has happened to copyright owners even when they were not given extra protection from copying technologies. Videocassette recorders are one example. Audio taping, to which the above Alan Greenspan quote refers, was another.

This paper argues that the greatest threat to copyright owners has always come from organized, large-scale unauthorized copying. The digitizing of works and the ubiquity of the Internet has the potential to increasingly organize what otherwise would be unorganized, making pirating cheaper,

---

<sup>85</sup> From his testimony in 1983 on the Home Recording Act . Hearings before the Subcommittee on Patents, Copyrights and Trademarks, October 25, 1983.

easier, and more widespread than ever before. This is what makes the current copying crisis more significant, and should cause a serious examination of the issues even if the copyright owners have cried “wolf” often in the past, as history shows that they have.

Current technologies, whether server-mediated peer-to-peer systems, such as Napster, or direct peer-to-peer based systems based on Gnutella, appear capable of destroying the value of copyright, for reasons explained below (although the recording industry failed to present evidence of such an impact in the Napster case). Nevertheless, it is possible that copyright owners can weather this new form of piracy in either of two ways.

First, it is possible that copyright harms can be ameliorated through the mechanism of “indirect appropriability”<sup>86</sup> if several changes are put in place regarding how these systems are used. However, it is more likely that an organized system such as Napster could have been converted into a more copyright friendly system than would be the case for pure peer-to-peer systems that appear to be replacing Napster. Thus the recent attempts by the record industry to shut Napster down may backfire by moving users to the more difficult to control peer-to-peer systems and harm the chances for appropriation of value on Napster or similar systems.

Second, the possibility of automated or digital rights management can solve the problem as well by making it much more difficult for copies to be made in the first place. The specter of self-enforcing copyright has caused alarm among groups of scholars and users who argue that it would give too much power to copyright owners and damage the carefully constructed balance between production and use. This paper suggests that there is little economic support for this concern. A review of the basic economics involved is worthwhile.

## **The Economic Impacts of Copying**

The issue at the heart of copyright, indeed all intellectual property law, is the degree to which the copyright owner can appropriate the value produced by the consumption, or appreciation, of his work by others. This focus leaves aside the moral rights to that value that are so important under Napoleonic legal systems, but is in keeping with the practical purpose of intellectual property laws in countries such as the US.

---

<sup>86</sup> Indirect appropriability, to be defined in more detail below, was first propounded in Stan J. Liebowitz “Copying And Indirect Appropriability: Photocopying Of Journals,” *Journal Of Political Economy*, October, 1985, pp. 945-957.). It is basically the idea that under certain conditions, copyright owners can collect for the unauthorized copying by charging higher prices for originals.

The correct level of appropriation is at the center of many disputes, both current and historical. How much appropriation is the right amount?<sup>87</sup> Is it possible to have too much appropriation? What impact do technologies have on appropriation?

Economists have tended to be concerned with the tradeoff between consumption efficiency (maximizing the amount consumers get of any produced intellectual product) and production efficiency (preserving incentives to create these products). On the one hand, if there was no ability to appropriate revenues, the creators of intellectual properties would be expected to produce too few intellectual products, probably far fewer than would be optimal.<sup>88</sup> On the other hand, by providing some degree of control over the use of these products to copyright owners by restricting others' ability to make copies, consumption of these products is decreased from "ideal" levels. This restriction in use is sometimes carelessly referred to as a loss due to the "monopoly" of the copyright owner. As Edmund Kitch correctly points out, providing property rights does not confer economic monopoly—which would imply that consumers have only a small number of alternative products that are not very good substitutes.<sup>89</sup> In reality, the "monopoly" conferred by copyright is no greater than the monopoly that each worker has on his or her efforts, or that each firm has on products bearing its name. Still, monopoly power or not, the ideal number of reproductions of a public good—a public good being defined as a good that does not get used up when consumed, what is called non-rivalrous consumption—would require a quantity of reproductions above the level that copyright owners would find in

---

<sup>87</sup> One school of thought at the extremity of these debates is populated by those who believe that no copyright is required at all for an efficient functioning market for artistic and creative goods. The members of this group believe either that being first in the market provides sufficient appropriability that no additional legal protection is required, or, that sufficient incentive to produce these products exists with other forms of remuneration, perhaps of a nonpecuniary nature, such that legal rules restricting the control of these products to their creators is unnecessary. The former school of thought is represented by Arnold Plant "The Economic Aspects of Copyright in Books." *Economica*, (May 1934): 167-95, and R. Hurt, and R. Schuchman, "The Economic Rationale of Copyright.," *American Economic Review*, May 1966. The latter school of thought is represented by organizations such as the Free Software Foundation (at <http://www.gnu.org/fsf/fsf.html>).

<sup>88</sup> In truth, there is virtually no empirical evidence on the extent to which copyright owners require remuneration to create their artistic works. However, the claim that production requires, to at least some extent, remuneration of the producers, is fully consistent with the usual market principles adduced from numerous other instances. Adam Smith's famous quote about how production doesn't come from the "benevolence" of butchers, bakers, or candlestick makers, but instead derives from their self interested behavior, certainly has a plethora of empirical evidence to support it.

<sup>89</sup> See Edmund W. Kitch, "Elementary and Persistent Errors in the Economic Analysis of Intellectual Property" 53 *Vanderbilt Law Review*, page 1727 November, 2000

their best interest to produce, and thus too few reproductions would be created.<sup>90</sup>

Even if a technology were to increase the revenues of copyright owners, say by increasing the pool of users, the relative level of appropriability might still be diminished. In terms of a simple analogy, if a pie were increased in size, even a smaller share might lead to a piece that is of larger absolute value. In this case, the copyright owner would still suffer harm compared to an instance where appropriability was kept constant (unless it were impossible to increase the size of the pie without also decreasing the share going to the copyright holder).<sup>91</sup> This distinction is relevant to discussion of the impact of technologies on the financial remuneration achieved by copyright holders.

### **Direct Economic Effects of Copying Technology**

The pirating of copyright materials would normally be thought to be harmful to the interests of copyright owners.<sup>92</sup> This is because piracy is often expected to prevent the copyright owner from appropriating any of the value created by his work to the users engaged in piracy. The mechanism by which unauthorized copying may harm the owners of intellectual products is straightforward enough that no detailed explanation seems necessary. Potential consumers no longer are compelled to purchase the product from the copyright owner when the option of using unauthorized copies is available

---

<sup>90</sup> There are actually two definitions of public goods in the economics literature. The first defines them as goods with non-rivalrous consumption, as in the text. The other, more prevalent definition, is due to Paul Samuelson. It has an additional component to the non-rivalrous consumption assumption. The additional component is the inability to exclude individuals from consuming the good, as would be the case for national defense or any good without defined property rights. I believe this latter definition to be far less useful since it conflates two independent ideas that need not have anything to do with one another. Any good for which non-excludability is a property will not be efficiently produced in a market. And non-excludability usually has more to do with the laws and technology, than with the good itself.

<sup>91</sup> This might seem to complicate the policy issues, but it actually simplifies them. If a technology decreased appropriability but increased payments to copyright holders, then it would both provide greater incentives to create the copyrighted material and also provide greater value to consumers who get to keep the non-appropriated value. Removing this technology would decrease value regarding both the number of titles and value received for each produced title, and couldn't be economically beneficial.

<sup>92</sup> For a review of the economic impacts copying see Richard Watt, *Copyright and Economic Theory: Friends or Foes?* Edward Elgar: Cheltenham, 2000. This is the most thorough review of this material that we have found. My only quibble is that he attributes some of the modeling that was originated in Liebowitz *The Impact Of Reprography On The Copyright System*, Copyright Revision Studies, Bureau Of Corporate Affairs, Ottawa, 1981 to Stanley Besen and Sheila Kirby, (1989) "Private Copying, Appropriability, and Optimal Copying Royalties," *Journal of Law and Economics*" 32, 1989, pp. 255-280.) The Liebowitz article is available at

[http://papers.ssrn.com/sol3/papers.cfm?cfid=565423&cftoken=13632430&abstract\\_id=250082](http://papers.ssrn.com/sol3/papers.cfm?cfid=565423&cftoken=13632430&abstract_id=250082))

to them. Defections from the legitimate market are normally expected to reduce the revenues that can be earned in the market.

In some instances, however, the piracy impacts will be negligible on the copyright holder's ability to appropriate. One obvious instance is the case where the individual engaging in pirating would not have purchased an original even if pirating were not an option.<sup>93</sup> In this case, the prevention of piracy would provide no pecuniary reward for the copyright owner and would only diminish the gratification of the individual engaged in piracy.

A different situation in which copying might be helpful, or at least not harmful to copyright owners, is when piracy has what in previous work I have termed an "exposure effect"—a form of advertising or sampling that might ultimately lead to larger sales of legitimate versions.<sup>94</sup> Users of pirated versions might find themselves wanting, say in the case of software, the manuals and technical support that would only be available to authorized users. Or, as claimed in the Napster defense, copies might just be used to sample songs, allowing a better selection of CDs to be purchased. The Napster defenders erroneously claimed that sampling necessarily benefits copyright owners, which it need not, although it does clearly benefit users.

A more recent claim is that copying may benefit copyright holders when network effects are strong.<sup>95</sup> Network effects exist when the value the consumers place on a good is a function of the number of individuals who use the good, with the archetypical case being the fax machine.<sup>96</sup> An example of network effects for products prone to piracy, might be a word processor that becomes more valuable to a user the more other individuals are using that word processor. With more users, it might become easier to exchange files with one another. In such an instance, it is conceivable that the extra value that paying customers receive from the larger user base that is enhanced by users of pirated versions might outweigh any lost revenues from being unable to prevent piracy. If the prevention of copying would result in few former pirates paying full price, the prevention of unauthorized copying might prove

---

<sup>93</sup> One neglected point here is the price that is proffered to the pirate that would lead to his decision to forgo the product as opposed to making a legitimate purchase. There is presumably some price above zero at which the pirate would make a purchase when confronted with this choice. The ability to price discriminate or not is crucial here and generally important in judging the impact of copying.

<sup>94</sup> See the Liebowitz article referenced in note 92.

<sup>95</sup> See Lisa N. Takeyama, "The Welfare Implications of Unauthorized Reproduction of Intellectual Property in the Presence of Demand Network Externalities," *Journal of Industrial Economics*, 42, 1994, pp. 155-166; K. R. Conner and R. P. Rumelt, "Software Piracy-An Analysis Of Protection Strategies," *Management Science* 37 (2): Feb. 1991, pp. 125-139.; Oz Shy and Jacques-Francois Thisse, "A Strategic Approach to Software Protection," *Journal of Economics and Management Strategy*, 8, 1999, pp. 163-190.

<sup>96</sup> See, for example, Stan J. Liebowitz and Stephen E. Margolis "Network Effects and Externalities" entry in *The New Palgrave's Dictionary of Economics and the Law*, Macmillan, 1998, Vol. 2, pp. 671-675.

financially harmful to the interests of the copyright owner. Of course, if all or enough of the pirates were to become purchasers of authorized versions when pirating was no longer possible, then the prevention of piracy would still be remunerative for the copyright owner even in the presence of network effects.

Even though piracy, in a world characterized by either exposure effects or network effects might work to actually enhance the revenues of the copyright owner, it should be noted that appropriability is not necessarily enhanced. Both network and exposure effects increase the amount of the value received by consumers, allowing the copyright owner to generate more revenues with constant or even somewhat reduced levels of appropriability. In our pie analogy, the size of the piece might be increasing even if the piece's share of the whole were decreasing, as long as if the pie itself was growing rapidly enough. So even if pirating were beneficial to copyright owners, that wouldn't mean that appropriability was not decreasing.

Of course, these are the exceptions to the more general rule that allowing potential consumers to pirate copies of a work is likely to reduce the revenues available to the copyright owner.

### **Indirect Economic Effects of Copying Technology**

Sometimes copyright owners are able to collect revenue from unauthorized copiers by charging higher prices for the originals from which the unauthorized copies are made, a result known as "indirect appropriability".<sup>97</sup> The basic premise is simple: if the copyright owner knows which originals will be used to make copies, a higher price can be charged for them, allowing the copyright holder to capture part, all, or more of the revenue than might have been appropriated through ordinary sales if unauthorized copying could be prevented.

This can be made clear with a simple example. Assume that each and every purchaser of a compact disc makes a single audiocassette copy to play in their automobile. Assume further that this copying, although illegal, is unstoppable. What would be the impact on the copyright holders who, in addition to selling compact discs had also planned to sell pre-recorded tapes?

Since each original CD will have a copy made from it, and since it is reasonable to infer that the consumers of originals place some value on the ability to make a copy, each consumer's willingness to pay for the original CD is higher than it would otherwise be. The copyright owner can capture some

---

<sup>97</sup> Coined in Stan J. Liebowitz "Copying And Indirect Appropriability: Photocopying Of Journals," *Journal Of Political Economy*, October 1985, pp. 945-957.

of this additional value by charging a higher price for the CD.<sup>98</sup> This is the basic idea behind indirect appropriability. The logic here is the same as would be true for any durable good that can be resold into another market. If automobiles could not be resold, for example, the price that consumers would be willing to pay for new autos would undoubtedly fall.

Whether the copyright owner is better off or worse off depends on the particular circumstances. Assume, for example, that each purchaser of a CD would be willing to pay \$9 and also be willing to pay \$4 for a tape to listen to in their automobile. It might be that if home taping is disallowed then the seller of pre-recorded tapes can then just charge a price of \$4 and capture this group's value. This may be more or less profitable for the copyright owner, depending, among other factors, on the relative cost between individuals and firms of making and delivering copies. If it is much less expensive to make pre-reordered cassettes commercially than to have them made at home, one-at-a-time, then it would be inefficient to have personal copying replace commercial production and the copyright owner will not be able to collect as much from the consumer (who deducts the cost of the blank cassette and time from his willingness to pay). Note, however, that costs include shipping, inventorying, and delivery to the consumer, not just manufacturing, so that the cost advantages of pre-recorded tapes are at least questionable.

Another would arise if there is a sub-group of music listeners that purchases pre-recorded tapes for the home instead of purchasing CDs. If the price that had been established for this group was also, say, \$9, then the seller of prerecorded tapes is in something of a bind in terms of capturing revenues. If the price is lowered to \$4 to capture the value from those who would otherwise purchase CDs and make tapes for their automobiles, the seller loses \$5 of the \$9 from those who would purchase prerecorded tapes for home-listening. In this case indirect appropriability would allow the seller to capture the \$4 from CD purchasers by raising the price of CDs to \$13 and still collect the full \$9 from those who buy pre-recorded tapes for the home. Of course, many other possibilities can be imagined, but the result that allowing unfettered copying *may* improve the revenue position of the copyright owner, is nonetheless feasible.

Note that indirect appropriability implies that the purchasers of CDs in the previous example actually pay copyright owners, albeit indirectly. Fair use, a defense to copyright infringement that allows copying in certain cases (discussed in more detail below), might protect the copiers from legal liability, but it does not prevent the 'fair-users' from indirectly paying the copyright owners.

---

<sup>98</sup> Unless, that is, the extra value that the marginal purchaser of originals receives is zero. This would seem unlikely, however.

There is at least one documented instance where the impacts of indirect appropriability are strong and where unauthorized copying appears to have benefited copyright owners—that is the case of photocopying discussed below.

Of course, just because indirect appropriability *might* be capable of securing profits doesn't mean that it will succeed in any particular case. An important factor that influences the likelihood that indirect appropriability might work is the variability in the number of copies made of each original. Note that in the CD automobile-cassette example, each CD was used to make 1 tape, therefore no variability existed in the number of copies per original. If each CD had been used to make 2 cassette copies that would not have changed the story since there still would not have been variability. But if some CDs were used to make no copies and others were used to make 1000 copies, then indirect appropriability becomes difficult or impossible.

In the photocopying case discussed below, there was variability in the number of copies made from originals since libraries make many photocopies from each original whereas personal subscribers made few. Because the seller could distinguish between the two groups, however, and charge difference prices, indirect appropriability was able to work. But the greater the variability in the number of copies made from each original, the more difficult the task becomes of identifying which originals are used to make how many copies and charge appropriate prices that match the number of copies made. In many cases it will be impossible to charge different prices to different users for identical originals, since one can not usually identify the purchaser's copying intent when the original is purchased.

Therefore, in an atmosphere of rampant copying variability, the seller will generally find it impossible to identify which originals should have the higher price and successfully charge higher prices for them. That is why instances of illicit organized copying, where a single original might be used by a copier to make thousands of copies, are so much more dangerous to copyright holders than unorganized copying where individuals make one or two copies for themselves.

Note also that when copying occurs, the least variation is achieved when *copying is ubiquitous and similar*. Thus if some copying is difficult to stop it might be profitable for copyright owners to encourage everyone to engage in the same degree of copying. This has interesting implications for Napster and other digital distribution techniques as I discuss below.

There is one other form of indirect appropriation that I should mention before closing this section. In some instances the legislature may decide to

allow copyright owners to collect revenue in a manner other than charging for use. So, for example, a tax could be imposed on blank audiotapes or recorders.<sup>99</sup> But this would not directly charge users for the right to copy, since audio tapes can be used to tape works for which copyright clearance was given or for taping non-copyrighted works. Instead, people buying digital audio tapes pay an additional amount that goes to the copyright owners, but is only indirectly related to copying. We can refer to this as *explicit* indirect appropriability as opposed to the *implicit* indirect appropriability described earlier. On the other hand, an organization such as the Copyright Clearance Center, which levies fees based on their monitoring of photocopying in libraries, tries to directly appropriate revenues for the copyright owners—the payment is supposed to be a function of how much and what is copied.

## **Lessons From the Past: The Economic Impact of “New Technologies” On Copyright Owners.**

Each new copying technology might appear to require fresh analysis, as each generation argues that the new technologies created during its watch require total upheavals of the status quo, whether it be the advent of sound recordings, television, photocopiers, or in the most recent instance, the Internet. But history tells us that when it comes to copyright, the more things change, the more they remain the same. Copyright law generally can and has worked, with legal and institutional modifications appearing to balance costs and benefits to both users and producers as technologies have changed. The trick, or course, is in getting it right.

### **Photocopying**

The ability to photocopy all books and magazines with ease might have been thought to jeopardize the livelihood of authors and publishers. After all, anyone could take a copyrighted work and make copies on the photocopier. Yet the photocopier proved a boon to those whose works were most frequently copied.<sup>100</sup>

This came about for two reasons. First, publishers were able to appropriate a portion of this additional value, thanks to indirect appropriability, the charging of higher prices for originals. Second, the convenience of being able to make copies was so great that the nature of scholarship changed among the academic communities that used so much of

---

<sup>99</sup> These payments would normally go to an organization or collective representing copyright owners.

<sup>100</sup> The claims in this section are documented in Liebowitz, (1981).

the copyrighted materials that were copied, and the market for journals grew relative to the market for books.

The mechanism underlying this growth in journals was indirect appropriability.<sup>101</sup> Publishers were able to identify those locations where photocopying occurred—libraries and other similar institutions—and which materials were most frequently photocopied—academic journals. Publishers then began charging much higher price for library subscriptions relative to personal subscriptions, often two, three or four times as much. The price differentials that are practically ubiquitous now among publishers of academic journals did not exist prior to the photocopier.

Further, prior to the advent of the photocopier, researchers needed to either have a personal subscription to a journal, or to take notes in a library. Books tended to be on single topics, as opposed to journals which contained articles on varying topics which would have different levels of attraction to different scholars. Books were a key form of scholarship and were deemed of great use. Photocopying changed this relationship. The inconvenience and cost of photocopying entire books were prohibitively high so that they were rarely copied. Articles in journals, on the other hand, were well suited to the photocopier and became the major target of copying activities. Photocopying articles was fast and cheap. Subscriptions were no longer necessary except for those individuals who valued a large percentage of articles in a journal. Having a photocopy of an article was such an improvement over handwritten notes taken in the library, in terms of convenience and accuracy, that articles and journals became a far more important means of transmitting information than had previously been the case. Books, the other side of this coin, were significantly diminished in importance.<sup>102</sup>

The price discrimination that was engendered by the advent of the photocopier may or may not have increased overall appropriability. The evidence does not allow sufficient precision to know the answer to this question. Clearly, however, photocopying did not harm copyright owners of photocopied materials, as made clear by the growth in the number of academic journals and the financial health of the publishers. The claims to

---

101 It is also true that the Copyright Clearance Center (CCC) came into existence to allow copiers to make direct payments to copyright holders. But the improvement in the economic well-being of journal publishers occurred quite independent of the CCC, since the CCC was not organized until well after the market for journals had experienced enormous growth.

<sup>102</sup> This is documented in Liebowitz, note 92 above. Book expenditures were more than three times that of periodicals from the 1940s until the 1960s when the ratio began to fall dramatically and fell to about 1:1 in the early 1980s. In 1996, expenditures on serials outpaced that of books and bound periodicals by 8:5. See table 11 in “The Status of Academic Libraries in the United States” U.S Department of Education; Office of Educational Research and Improvement; NCES 2001-301; May 2001.

the contrary by journal publishers, and there were may, were an example of crying wolf.

### **Videocassete Recording: The Betamax Case**

The Betamax case played a central role in the Napster defense.<sup>103</sup> The Supreme Court ruling allowed individuals to make private recordings of television shows off the air on their videocassette recorders (VCRs). The Betamax case (so called because at the time the case was brought, VHS had not yet begun its obliteration of the Beta video format) represented another instance where copying was unlikely to harm copyright owners.<sup>104</sup>

Almost all television viewing in the early 1980s was of advertising-supported over-the-air broadcasts, particularly those of the big three networks—ABC, CBS, and NBC. The original Betamax had only a one-hour recording time. The major use for VCRs was expected to be the “timeshifting” programs for more convenient viewing. Although VCR controls made it possible for viewers to fast-forward through commercials, close attention had to be paid to avoid fast-forwarding through the programming.<sup>105</sup> Thus, time shifting was unlikely to significantly lower the revenues that would be derived by television broadcasters.<sup>106</sup> The Court concluded that time-shifting was unlikely to harm copyright owners.

Although not part of the court’s reasoning, it was also fairly clear that the amount of time shifting would be small. For one thing, a single VCR could either make a recording, or else play one back, but it could not do both. Combine this with the fact that the average household viewed six or seven hours of TV a day, including virtually complete viewing during prime time programming, and very quickly a constraint on behavior takes hold. If a family was going to watch three hours of prime time television on Monday,

---

<sup>103</sup> Universal Studios Inc. v. Sony Corporation of America, 1984. The original district court ruling was in 1979.

<sup>104</sup> This material is based on Stan J. Liebowitz, “The Economics of Unauthorized Copying of Advertising Based Television Broadcasts,” 1986, unpublished manuscript to be available on SSRN soon.

<sup>105</sup> It was also the case that remote controls at the time were tethered by wires to the VCR, thus making their use not very convenient.

<sup>106</sup> Defendants in the Napster and MP3.com cases argued that their products “space-shifted” music from a CD to a computer, a putative analogy to the time-shifting that occurred in the Betamax case. A problem with this analogy is that without indirect appropriability, space shifting would decrease revenues to copyright owners, a result not analogous to that of time shifting since the latter retained exposure to commercials. A more important defect with this analogy in the case of Napster, is the fact that what Napster does is not actually space-shifting. Since Napster users do not download their own files into their computer, but instead download files from others, it is better described as user-shifting than space shifting. User shifting could, in other circumstances, be considered a euphemism for “theft” except that the theft is from the copyright owner in the form of a lost potential sale, rather than the user who provides the original to be copied.

say, they could not also watch a tape. If they watched a tape of the previous night's programming, they could not record the programming that was on while they watched the tape (unless they had a second VCR, which was quite rare at that time). Therefore, when it came to taping broadcast television, it was apparent that not that much taping was going to occur.

Of course, in hindsight we know that VCRs are primarily used to play back prerecorded tapes. Ridiculing the difficulty of setting up VCR's to tape programs unattended has become a staple of second rate comedians, and time shifting has not played the damaging role that copyright owners expected it to play. Nor is there much evidence that individuals have been excessively copying prerecorded tapes, although it is the case that many prerecorded tapes do have a fairly primitive anti-backup technology build in.

The difficulty of avoiding commercials, combined with the fact that the amount of time-shifting had to be small, made it apparent that videorecording was not going to harm copyright owners substantially. Fortunately, the Courts managed to get it right, although it can be viewed as a split decision.<sup>107</sup> Several years later, Hollywood learned that by lowering the price of prerecorded movies from \$100 to \$20, they could sell a ton of them, so that now Hollywood's sale of videotaped movies generates more revenue than theatrical showings.<sup>108</sup> Hollywood's claim of impending doom was another instance of crying wolf.

### **Audio Taping**

Even without a high profile case such as Betamax, audio taping was an issue in the early 1980s as illustrated by the Alan Greenspan quote earlier in the chapter. The basic mechanism of how indirect appropriability might work with respect to audio tapes was illustrated above. Note that if unauthorized copying were prohibited, copyright holders might actually be worse off. In a world with no copying, record producers might find that consumers would be unwilling to pay as much for CDs, lowering revenues and profits. (It is not clear how many, if any, of the former copiers would purchase legal copies).<sup>109</sup>

---

<sup>107</sup> The District Court ruled in favor of users (Sony), the Appeals Court ruled in favor of copyright owners, and the Supreme Court sided with the District Court, but by a narrow 5-4 vote.

<sup>108</sup> According to the US Statistical Abstract, table 909, theatrical movie revenues were \$32 per person per year in 1998 whereas revenues from prerecorded movies was \$92.

<sup>109</sup> Silva and Ramello argue that unauthorized home taping helped producers largely by allowing low-valuation consumers to become music listeners and that these users later became the high valuation listeners that record producers wanted. Francesco Silva and Giovanni B. Ramello, "Sound Recording Market: the Ambiguous Case of Copyright and Piracy" 9 *Industrial and Corporate Change*, 2000, pp. 415-442.

When discussing the impacts of copying I noted that variability in the number of copies made was crucial for allowing indirect appropriability to work. It is most likely the case that instances of home audio taping were common and similar enough to one another that no great harm was likely to be done to copyright owners. Despite dire predictions, the recording industry went on its merry way, merely substituting CDs for vinyl recordings as time progressed.<sup>110</sup> Inaction on the part of Congress and the presumption that most of the copying that was going on was unstoppable and legitimate exercises of fair use was almost certainly the correct decision.

Congress, in response to the dire warnings from the recording industry, considered legislation, but it wasn't until a decade later that the Audio Home Recording Act of 1992 was passed, and it was largely concerned with digital recording. That act, which was considered a compromise between creators and users, allows personal copying, but requires that recording devices include systems to prevent 'serial copying,' i.e., making second generation copies, or copies of a copy. Additionally, the law has provisions to require producers of these recording devices and recording mediums pay a tariff for each unit produced or imported. Ironically, the original target of this law, digital audio tapes (DAT), never achieved any serious market penetration. The devices that have achieved much greater penetration, CD writers on computers, are not considered recording devices and do not have these copy protection devices and the producers have not been paying duties. The entire mp3 phenomenon would have bypassed these controls on copying anyway since the format of the music on a CD is altered in a way that was not predicted when CD writers were first contemplated.

### **Digitized Networked Copying: Lessons From the Napster Case**

The entertainment industry has often exaggerated the damage to itself that each new copying technology would bring—from cassette tapes and videorecorders, to MP3s and Napster. Crying wolf too many times, however, shouldn't by itself negate claims that a new technology will harm copyright owners. Napster and its descendants (as well as movie and electronic book copying technologies) appear to be instances where real harm is a possibility.

The Napster program, created by then-teenager Shawn Fanning, provided users the ability to search for songs encoded in near-CD-quality mp3 format and identify other computer owners willing and able to transfer those songs. Programs that allow one computer user to interact and exchange

---

<sup>110</sup> The recent paper by Hui *et. al.*, (2001) attempts to estimate the harm brought about by the pirating of CDs. They report a rather large negative impact. Although they believe they are including the impact of indirect appropriability, they do not since they measure the impact in terms of quantity sold per capita. Indirect appropriability is consistent with a decrease in the quantity sold—in fact, we would expect that the quantity sold would be diminished. See Kai Lung Hui, I. P. L. Png, and Yan Cui "Piracy and the Legitimate Demand for Recorded Music" working paper, March 2001.

files other computers that are not full-time servers create a sort of network that is known as peer-to-peer, and Napster was a peer-to-peer based program, albeit with a central server to allow users to find one another. Napster grew at an explosive pace and soon had millions of users.<sup>111</sup> As Napster grew in popularity, so did potential investors, interested in the brand name and the millions of eyeballs reached by the Napster program and its website.

Some Napster supporters claim that the online sharing of songs is a latter-day Betamax scenario. They argue that Napster users actually purchase more CDs because Napster allows listeners to sample music with which they might otherwise be unfamiliar. Given the fact that files downloaded from Napster are, or at least soon will be, very good substitutes for the original, and since they can be “burned” onto CDs and copied to increasingly popular mp3 players, it seems likely that these files will substitute for the actual purchase of authorized CDs. Until most downloaders of mp3 files can transfer them onto CDs so that they can be used on the primary stereo system, however, mp3 files are unlikely to greatly damage CD sales. Thus empirical testing at this early stage in the development of the mp3 market is likely to find much smaller negative impacts than are likely to occur later. Further, although some sampling undoubtedly occurs, the direction of its impact is unclear as shown below, and it seems intuitively unlikely that it could reverse the negative impacts on copyright holders that would be expected from the substitution of computer files for purchased CDs.

Unlike the audiocassette example mentioned above, Napster-style copying is unlikely to allow record companies to indirectly capture the value of the copies being made from legal originals since some originals will have dozens or hundreds of copies made (and others none). Nor does it seem likely that the amount of copying will be small—there are no time constraints or confusing instructions preventing widespread copying. Finally, copies are likely to serve as substitutes for the purchase of originals in this case. The people making the copies are the very group that was expected to purchase originals (that is why it is not surprising that surveys indicate that Napster users are among the heaviest purchasers of CDs).

### **The Impact of Peer-to-Peer Networks On Revenues – The Theory**

Napster appeared to be a clear threat to the revenues of copyright owners of recorded music. The number of individuals using Napster, at its

---

<sup>111</sup> In February of 2001 2.8 billion files were downloaded, the peak number in its history. By April, after Napster was ordered to stop allowing copyrighted music to be transferred, the number had fallen to 1.6 billion. See Reuters newswire “Napster downloads drop 36 percent” May 2, 2001.

peak, had reached approximately 70 million.<sup>112</sup> Many of these users were concentrated in the groups of users most responsible for the purchase of recorded music—teenagers and young adults. The record companies were rational to fear Napster. The market is to some extent political, and if enough users decided that they want to trade music files for free, they could get Congress to legislate their desires into law. That can help to explain the urgency demonstrated by the courts and the copyright owners.

But it is not a *prima facie* conclusion that file sharing over the Internet hurts the revenues of copyright owners, nor even that it decreases appropriability. As discussed above, copying need not have the detrimental impact that is so often wrongly attributed to it. As is almost always the case, however, theory by itself can not really tell us what impact peer-to-peer networks such as Napster would have on copyright owners. But it certainly can provide a good deal of guidance about the likely outcome.

There are two possible means by which Napster-style copying may nonetheless not harm revenues of copyright holders—indirect appropriability and exposure effects.

#### Indirect Appropriability

First we have the possibility of indirect appropriability. Remember how peer-to-peer networks function—files on individuals' computers become part of the database sharable among all those logged on to it. One can construct a scenario whereby each individual buys half the quantity of CDs that they would normally buy and downloads the other half from the network (assuming individuals continue listen to the same number of songs). This may not be totally unreasonable since many individuals would need to have duplicate CDs, or at least duplicate files, for if it were otherwise, everyone trying to download a song from a single original CD stored on one machine would run up against limited bandwidth from that individual's machine. Even though the number of copies grows exponentially, since copies can be made of copies, it is still more time consuming starting from a very small than from a very large number of originals. With very few sales of original CDs, it would be more difficult for a very large number of users to successfully download the song during the period of its peak popularity.<sup>113</sup>

At any rate, one could imagine record companies selling half the number of CDs as they would have sold without this form of copying. The question is whether they could charge approximately twice the price (setting aside for

---

<sup>112</sup> This estimate was reported in "Napster could face shutdown" AP newswire, April 10, 2001.

<sup>113</sup> With enough time this bandwidth limitation could be overcome, but the nature of the music business is that a small number of songs are in extremely high demand for a short period of time. As long as tastes gravitate around the same small number of songs at any one time, the argument in the text is valid.

arguments sake that part of the “rationale” given for downloading is the high cost of today’s CDs), allowing them to appropriate roughly the same value as before. This could be the case if Napster enforced a rule stating that the number of files downloaded had to match the number of files uploaded. In such a case having a heavily demanded file early would be valuable for those wishing to generate credits with which to later download files, thus users would be willing to pay a higher price to purchase the original CDs early in the process when it would be difficult to get a downloaded copy to make available to others. Further, if it were possible to change the code in recordings (or as the 1992 Home Recording Act envisioned) such that copies could only be made from an original, but not from a copy of an original, then users of the system would be *required* to purchase CDs if they wanted to download songs. If the system were “balanced” sufficiently, one can imagine indirect appropriability working to keep both revenues and appropriability intact.

But of course, Napster in its original format had no such rule that to download required equal uploads. Users did not have to earn credits in order to download files. Under the actual procedures followed by Napster, which did not require any quid for the quo, it seems highly unlikely that Napster users who purchased legitimate copies would have been willing to pay a higher price to allow unnamed and unknown users to download their files on Napster.

Finally, some (such as professor Lawrence Lessig, the author of ‘Code’) have argued that an explicit indirect means of appropriability could be put in place, as in the case of taxing digital audio tapes.<sup>114</sup> Lessig has used the example of cable retransmission of broadcast signals. Similar analogies can be made to broadcasters’ use of music, either radio or television. The choices in the case of Napster, however, seem far less workable.

In the former instances, the users of the copyrighted material (e.g., broadcasters) pay some portion of their revenues to copyright owners, be it mechanical rights or performance rights.<sup>115</sup> Such indirect payments work because these uses are *additional* or *incremental* uses and they do not remove the revenues copyright owners receive in the original markets. Thus, this new source of revenue would be a net gain to the copyright owner, an instance of making the pie bigger and also increasing the size of the piece going to the copyright owner, whether or not the share goes up.

---

<sup>114</sup> See Lawrence Lessig “Just Compensation” *The Industry Standard*, April 18, 2001.

<sup>115</sup> When music is put onto a record or CD, the creator of the music receives a small payment for each copy known as a mechanical royalty. Similarly, composers receive a percentage of television, radio, cable or concert revenues as compensation from broadcasters for the use of their music, known as a performing rights payment.

In the case of Napster and other peer-to-peer systems, however, this method of copyright payment will not function in the same way. Using music from peer-to-peer systems is likely in many cases to substitute for the purchase of a CD.<sup>116</sup> For this reason, it is not just a case of Napster creating additional value without payment, rather it is one of Napster reducing payments. If Napster had been allowed to continue in its original guise, it is unlikely that the revenues it generated, say from advertising, would have been as large as the losses it imposed in the CD market, and thus even a tax of 100% would not have made copyright owners whole, to say nothing of giving them a piece of a new market.<sup>117</sup> So, this method of payment would not have been a useful antidote for the damage done to copyright owners by the rampant copying engendered by Napster.

Alternatively, a tax could be devised on the activity of making copies. Using digitized music on one's computer requires the computer, a hard drive, a sound card and possibly rewriteable CDs and drives. Unlike audio cassettes, however, the vast majority of computer usage is not for the purpose of copying copyright material, largely ruling out the logic for taxing computers, or hard drives, or sound cards. That leaves the rewriteable CD and blank recordable CDs. If these drives are used primarily for recording copyrighted material, they already should have to pay a small tariff under current law.<sup>118</sup> It is possible that these devices are used for sufficient noninfringing uses that they might not properly be classified as infringing. So there might not be an appropriate target on which to place a tax.

#### Exposure Effects

Then, of course, there is the possibility that peer-to-peer systems might help copyright owners by making it easier for users to sample songs. If Napster were merely used to "try out" a song or an album, as might be done alternatively in a record store or by listening to the radio, then Napster use would be a complement to a CD purchase, not a substitute. In fact, Napster's experts in its court hearings have made this claim, the evidence for which will be examined in more detail in the next section. Of course, the difference

---

<sup>116</sup> Although the current evidence is unclear as reported below in the section on Napster's impact on revenues.

<sup>117</sup> It was never clear what Napster's business plan was when it was merely allowing the free transfer of files, but one possibility was the sale of advertising.

<sup>118</sup> The Audio Home Recording Act of 1992 provides that importers, manufacturers, or distributors of any digital audio recording device or digital audio recording media must file quarterly statements and pay royalties on each recorder or piece of media distributed in the United States. The royalty is 2 percent of the manufacturer's selling price for recorders and 3 percent of the manufacturer's selling price for recordable media. See Starrett, Robert A. Starrett, "Copying Music to CD: The Right, the Wrong, and the Law," *EMedia Professional*, February 1998. at [http://www.cdpage.com/Audio\\_Compact\\_Disc/rightwrong.html](http://www.cdpage.com/Audio_Compact_Disc/rightwrong.html).

between listening to a song in a store or on the radio and listening to the song using Napster is that in the latter case an actual physical representation of the song is in the possession of the user whereas in the former cases only the memory of the tune remains in his possession.

Even if it were the case that Napster were used merely for sampling, its impact on the sellers of CDs market need not be the benevolent one espoused by its supporters. The usual assumption is that if Napster merely helps people decide which CDs to purchase, that it cannot be harmful and would most likely be beneficial to the copyright owner. Since Napster would only provide information to consumers, this activity must benefit society and copyright owners. Consumers, after all, would be better able to select songs that provide the greatest enjoyment for the time and money. It seems natural that they should then be willing to pay more for the CDs they purchase.

As appealing as this story is, however, it is not correct and can be quite misleading.<sup>119</sup> Better information about the music contained in a CD does allow each CD that a consumer purchases to have greater value, or quality, than if the information were not available. On the other hand, the fact that the consumer is better able to satiate his desire for music with the CDs that he purchases implies that the number of CDs purchased quite possibly would fall.

With better sampling, CDs purchased provide greater utility because they better fit the desires of consumers, therefore consumers have a higher willingness to pay.<sup>120</sup> But, assuming that CDs all basically meet the same need for music consumption, the CDs purchased provide greater value and do a better job of satiating the desires of the consumers. So consumers may discover that they do not need to purchase as many CDs since their thirst for music can be quenched with a smaller number of CDs.<sup>121</sup> Depending on supply conditions, it can be shown that the total quantity of CDs, their price, and the total revenue in the market may go either up or down.<sup>122</sup>

---

<sup>119</sup> A typical view is espoused in the expert reports put forward by Napster in its defense. One of those reports, by Robert Hall, states on page 2: "the exchanges of music facilitated by Napster stimulate the demand for the plaintiffs' CDs by allowing consumers to sample CDs and develop interest in CDs that they subsequently purchase." The reports from Napster's experts can be found at: <http://napster.com/pressroom/legal.html>. Several, but not all, of the RIAA's reports can be found here: [http://riaa.com/napster\\_legal.cfm](http://riaa.com/napster_legal.cfm).

<sup>120</sup> In essence, the ability of consumers to better select CDs will rotate the market demand curve for CDs clockwise.

<sup>121</sup> Another way of looking at this is to imagine that some CDs that are now purchased are "mistakes" due to insufficient information. With the additional information provided by the Napster experience, fewer of these mistakes are made and fewer CDs are purchased.

<sup>122</sup> By analogy, it is as if CDs were chocolate bars (or light bulbs). These bars are bought in order to eat the chocolate. If each bar were to contain more chocolate (or each bulb were to last twice as long), holding the price of a bar constant, the number of bars sold could go up or down depending on the elasticity

## The Impact of Napster on Revenues – The Evidence

The evidence put forward in the hearings on the preliminary injunction consisted of a set of expert reports, by economists, marketers, and others, that were mainly focused on two issues.<sup>123</sup> First, whether or not Napster was likely to increase or decrease sales of CDs in the market. Second, whether or not Napster's existence as then configured would sully the market for the *selling* of music online. Unfortunately, the evidence from these reports provides very little in the way of useful guidance on these issues.

These expert reports were conducted for the purposes of the hearing on the preliminary injunction to stop Napster from transmitting copyrighted materials and not for a complete trial.<sup>124</sup> Therefore, it is to be expected that these reports might not have the level of sophistication and completeness that might come about in a full case. Nevertheless, the hearing on the injunction had very high visibility and several of the experts were quite well known. Additionally, most of these reports (or their authors) were challenged according to court rules on the qualifications of experts (Daubert rules). The lower court's rulings on these challenges was illuminating for the hostility they showed toward the Napster experts, a hostility that was later supported by the court's nonsensical and later overruled 'zero-tolerance' ruling toward any trivial illegal copying occurring on Napster.<sup>125</sup>

A majority of the reports was concerned with whether or not Napster was decreasing the sale of CDs. As already explained, one might expect its impact to be quite small at due to the difficulty of migrating Napster downloads to the home stereo. In an attempt to demonstrate harm, the

---

of demand for the underlying product of interest, chocolate. If the elasticity of demand for chocolate were greater than one, the now lower effective price of chocolate would lead to an increase in total revenue spent on chocolate and with the price of bars constant the number of bars sold would increase. [this relationship between elasticity and revenue can be found in any introductory microeconomics text.] But if the demand for chocolate were inelastic, the number of bars sold would decrease. Although it could be argued that the demand for any particular CD is elastic, since otherwise the seller would find it profitable to raise its price, it need not be the case that overall demand for CDs is elastic. CD prices are not set individually (see Silva and Ramello in footnote 109) and CDs often would seem to be close enough substitutes for one another as to classified in the same market.

<sup>123</sup> There were several other reports that were difficult to classify. Lawrence Lessig submitted a report that the Court rejected out of hand stating: "The Lessig Report merely offers a combination of legal opinion and editorial comment on Internet policy. Therefore, this court grants plaintiffs' motion to exclude it."

<sup>124</sup> The preliminary injunction preventing Napster from allowing users to download copyrighted files is in place, and although there were skirmishes, Napster was effectively shut down in the form that it previously existed. Napster is now planning to return as a legitimate subscription service.

<sup>125</sup> The court told Napster to end the dissemination of copyright materials. Napster did this by blocking access to known copyrighted songs, which required many different variations for each title since users tried to evade being blocked by putting up alternative titles that still indicated what the song was. When Napster was only 99% effective in this endeavor, the judge threatened to shut them down.

plaintiffs had as their centerpiece two reports—one that examined the pattern of CD sales in stores near college campuses (the Fine Report) and the other a survey of college students asking them about their views on Napster and its impact on some of their musical habits (the Jay Report).<sup>126</sup> The defense had its own survey of Napster users (the Fader report) and several critiques of the Fine report.

In principle, a statistical analysis of how actual CD sales were impacted by the popularity of Napster would seem to be much preferable to surveys. For one thing, surveys are self-reported and most Napster users were likely aware that Napster was in legal difficulty. For this reason, survey respondents would find it in their self-interest to minimize any evidence that Napster actually decreased their purchases of CDs. It is somewhat like asking death row convicts whether the death penalty is a deterrent to murder. Further, even if respondents were to tell the truth, it is unclear they would actually know what impact Napster had had on their behavior. Respondents very well might not know with any precision how much they spend on CDs per month. Unless they track their expenses very carefully, their impressions of the impact of Napster on their behavior may very well be incorrect. They may in fact buy some CDs because of the songs they downloaded from Napster and this may color their impressions even if they purchase fewer CDs overall.

Statistical analysis of actual sales is really the only way to determine what Napster's impact was. Unfortunately, the statistical analysis of CD sales reported in the Fine report provides ambiguous answers. The Fine report examines sales at CD retailers near college campuses and compares the sales trends in those stores to those of other CD retailers.<sup>127</sup> The theory is that students at college campuses are heavy users of the Internet and Napster, more so than would be the case for consumers of the typical record store. Therefore, any differences in the behavior of sales between the two groups of stores should be due to Napster. Although Fader, one of the Napster experts, criticizes the focus on college students, this focus is a very practical way of isolating the overall impact of Napster, even if imperfectly.

---

<sup>126</sup> These reports are so named in the "Memorandum And Order Re Admissibility Of Expert Reports" issued by the trial judge. Plaintiffs also had a declaration by Charles Robbins, a store owner claiming that Napster had largely destroyed his business, but this report was thoroughly discredited by the Fader report (mentioned below) who pointed out that the store had changed locations and switched from selling new CDs to selling used records and CDs during the period that its sales declined.

<sup>127</sup> Actually, Fine has three groups of brick-and-mortar retailers near college campuses. The overall group, a set of retailers near the 40 most heavily wired college campuses, and a set of retailers near college campuses that have banned Napster. Napster's expert Hall makes much of the fact that this latter group of retailers shows the same decrease in sales as the others, claiming that for this group sales should improve if Napster were having a negative impact on sales. Such a claim is unwarranted since we do not know the how long Napster had been banned at these campuses and how successful the ban was.

Despite claims to the contrary, it seems unlikely that the behavior of Napster users who are not college students (many of whom are high school students) is so different as to counteract the measured impact of college students.

This particular design, although not bad in general, has some serious problems with its implementation. One major problem with the Fine study, as both Fader and Hall point out at length, is that it neglects to control for the impact that online purchases of CDs, as opposed to downloads of songs, might have had on brick-and-mortar record stores near college campuses. Internet merchants such as Amazon and CDNOW increased their CD sales during the period of Napster's growth. Since Internet access is a requirement for both using Napster and ordering online, it is possible that college students have merely switched their patronage from brick-and-mortar retail outlets to online retailers.<sup>128</sup>

Napster experts claim the Fine Report is fatally flawed by this oversight. In principle, however, it could be corrected if data were available for online retailers and the two groups of brick-and-mortar retailers on, say, a monthly basis, along with the number of songs being downloaded on Napster.<sup>129</sup> Instead, however, the Fine study presents data that is very coarse; once-a-year quarterly data from the first quarter of 1997 to the first quarter of 2000. Given Napster's brief existence (it became publicly available in August of 1999) the data that is supposed to reveal Napster's influence amounts to but a single before and after snapshot of the impact of Napster.

What does the Fine study find? Mr. Fine focuses on the fact that from the first quarter of 1999 to the first quarter of 2000, a 12-month period during which Napster came into existence at about the midpoint, sales at brick-and-mortar CD stores near colleges fell by 2-3 percent but rose at other brick-and-mortar CD stores by approximately seven percent. From this Fine concludes that Napster has led to a decrease in sales of CDs. Fine's conclusions are undermined, however, by his data for earlier years. From 1998 to 1999, a year preceding Napster's existence, sales near colleges fell by about five percent while rising elsewhere by approximately 3%. Since year-to-year changes at brick-and-mortar CD retailers near colleges were doing much more poorly than other brick-and-mortar CD retailers prior to Napster's introduction, the fact that they continued to do relatively poorly after Napster's introduction can hardly be taken as evidence that Napster is responsible for the difference.

---

<sup>128</sup> It is unfortunate that online CD retailers probably had not achieved an equilibrium market position prior to Napster since comparing the sales of online retailers to brick-and-mortar retailers would have provided what probably would have been a better test of Napster's impact, with online sales changes being the proxy for Napster's impact.

<sup>129</sup> Fine reports that online sales figures were first collected in the first quarter of 1999.

The data, in fact, are more consistent with the theory that online sales are replacing brick-and-mortar sales than with the claim that Napster is hurting sales.<sup>130</sup> The fact that Napster could at most have influenced these figures for about six months, a period during which it would have had the smallest number of users, makes this data less useful than data based on later time periods. It is unfortunate that Mr. Fine chose only four time periods to examine, but it is fortunate, although not for his client, that he provides more than two years' worth of data.

Napster's experts preferred to focus on the continued robust growth of CD sales overall, after even after Napster's birth. Certainly, this growth, the seven percent figure at brick and mortar stores reported above, is inconsistent with the idea of "irreparable" harm claimed in the preliminary injunction. But it hardly demonstrates that Napster has a benign impact on CD sales since there might well be other factors at work and the increase in CD sales might have been even larger without Napster's impact.

A major impediment to measuring Napster's long-term impact during this period is that mp3 files, the format of music files used on Napster, were not initially the good substitutes for CDs that they are becoming over time. Mp3 files could largely only be listened to only on computers and could not be played on the home audio system (unless the computer was hooked up to the home system). That may help explain why a negative impact on sales was not apparent. As mp3 use has increased, however, more and more audio components have been converted to play mp3 files. Also, most users were downloading files over slow telephone modems so the impact was probably not as large as it would have been had higher bandwidth connections been more readily available.<sup>131</sup> As more computer users adopt CD writing hardware, mp3 files are being converted back into CD formats that are playable through normal audio systems. It is likely that as MP3 files became better substitutes for CDs, and were played on primary audio systems, that the true negative impact of Napster would have been felt.

The other category of report presented in the Napster case is based on surveys. As noted, the results from surveys should be regarded with great

---

<sup>130</sup> The court also was aware of these problems: "The Court finds some aspects of the Fine Report troubling—especially the fact that it shows a decline in retail sales prior to the launching of Napster. This limitation, combined with Fine's decision not to track Internet music sales, reduces the study's probative value."

<sup>131</sup> Nevertheless, at its peak Napster downloads were estimated to be in the vicinity of 2.8 billion files per month, which would roughly be the equivalent of 250 million CDs per month. I suspect that these data include many failed downloads. According to the Fine report, US national sales ran approximately 60 million CDs per month. So even with the slow bandwidths, the potential impact seems like it could have been large. See "Music downloads soar" Reuters September 6, 2001 available at: <http://news.cnet.com/news/0-1005-200-7080479.html>.

skepticism. The Recording Industry Association of America presented the survey of college students by Deborah Jay that attempted to infer whether Napster increased or decreased the purchase of CDs based on answers given to questions that do not directly address the point. Jay concluded that 41 percent of Napster's subscribers used it in ways that displaced the purchase of CDs. But the fact that Jay does not ask this question directly of her subjects makes her conclusions suspect. Further, her categorization of answers as enhancing or decreasing CD sales is questionable and seems to favor a negative finding about Napster's impacts. On the other hand, the bias from respondents trying to support Napster might work in the other direction.

As an example of these problems, consider her classification of responses to an open-ended question asking respondents why they use Napster. Two of the categories of answers, "buy fewer CDs" and "make my own CDs," are classified as indicating a substitution of Napster files for CD sales. The first answer obviously fits this characterization. The second, however, is not at all clear. If someone wished to sample music for later purchase, and created a CD to sample the music on their stereo system, Jay would classify that answer as indicating that the respondent uses Napster to decrease CD purchases. The fact that Jay doesn't provide separate numbers for each of these two answers makes it impossible to determine whether this is a potentially serious problem or not. Further complicating this issue is the fact that 22 percent of respondents say they either buy fewer CDs or make their own CDs, whereas 8.4 percent say they purchase more CDs.<sup>132</sup> This classification seems capricious. Why not just tell us how many say they purchase fewer CDs instead of lumping them in with those who make their own CDs?

Peter Fader, the expert for Napster, criticized Jay for using only college students and also for her interpretation of open ended questions. Although I do not believe his criticism on the use of college students is valid, the concern with Jay's interpretation of open-ended questions seems quite legitimate.

Fader conducted his own survey for Napster that tries to answer the same question. He concludes that Napster decreases CD sales for 8.1 percent of the respondents but increases sales for 28.3 percent of the respondents, virtually the opposite of the conclusion reached by Jay. Fader, however, was harshly criticized by the court, which questioned his credentials and the degree to which he participated in the conduct of the study bearing his

---

<sup>132</sup> Jay includes "getting free music" and "getting music that one wants" as other answers that reveal substitution of sales. Although this might be true, it is not clearly so, and this interpretation problem could have been avoided if more direct questions were asked.

name.<sup>133</sup> It appears that he did not supervise the execution of the study as closely as he might have. Nevertheless, the harshness of the court's criticism of Fader contrasts with its generally benign view of the problems in the Jay report.

There were other reports, particularly those by economists David Teece on behalf of record companies, and Robert Hall on behalf of Napster. Teece's report is unavailable due to its frequent use of confidential information. Teece appears to have examined the impact of Napster on the current CD market as well as nascent or planned online sales of music by copyright owners. He concluded that damage to copyright owners is clear. Hall, on the other hand, concluded that Napster was beneficial to the sale of CDs because, in his view, it largely allows users to sample music before purchase.<sup>134</sup> Once again, the Court was much harsher in its discussion of the Napster expert Hall than in its discussion of Teece.<sup>135</sup> Without seeing Teece's report, however, it is hard to gauge the validity of the court's relative rankings.<sup>136</sup>

All in all, my reading of the reports in the case indicates that the record industry, the plaintiffs in the case, failed to make as persuasive a case for harm as the defense did for the lack of harm. I say this even though I believe Napster was dangerous to the industry. The judge's readings of the reports seem, to me, to have been biased against Napster even though I think her decision was in the end correct even if not supported by the evidence at hand. Although the courtroom decision was a victory for the record industry, it isn't clear to me that record industry's strategy was a wise one.

---

<sup>133</sup> The Court states: "He considers himself an expert on consumer surveys... However, he admitted in his deposition that he has never before prepared a consumer survey for litigation and he is unfamiliar with the standards set forth by federal courts for the reliability of such surveys." Lack of familiarity with legal standards hardly disqualifies someone as an authority on surveys in general. The Court continues: "In short, his claim to have designed and overseen the Greenfield survey appears exaggerated, and the generality of his report renders it of dubious reliability and value."

<sup>134</sup> Hall assumes that any music sampling by Napster users benefits the CD market, an assumption that we demonstrated to be incorrect in the above subsection on exposure effects.

<sup>135</sup> The court stated: "Hall relied too heavily on outside studies that favored defendant without performing any analysis of the Jay Report... these shortcomings are not grave enough to warrant exclusion of his expert opinion. Insofar as the Hall Report assumes the requested injunction would put defendant out of business, it tends to corroborate plaintiffs' argument that Napster has no legitimate non-infringing uses... they [the plaintiffs] would be wise not to object too strenuously to admission of the Hall Report."

<sup>136</sup> One potentially questionable point, according to Hall, is Teece's use of the concept of path dependence to argue that consumers will be locked-in to Napster and will not then purchase music online from the copyright owners. Hall notes that Teece cites the QWERTY keyboard as an example of such lock-in. There are two problems here. First, the keyboard story has no evidence to support it. Second, it is hard to imagine what the coordination problem might be that would have to underlay a case of lock-in since network effects are not sufficient for there to be for lock-in without some form of coordination failure. See Stan J. Liebowitz, Stan J and Stephen E. Margolis "The Fable of the Keys" *Journal of Law and Economics*, April 1990, Pp. 1-26. (This article also cited by Hall.)

## Pure Peer-to-Peer Technologies: The Devil You Don't Know

Napster, of course, is not the only game in town. A new generation of programs plays by a somewhat different set of rules. These are programs based on the Gnutella protocols or some variation, programs such as BearShare, Aimster, Limewire, Morpheus (FastTrack) and others. The important difference between these programs and Napster is that these systems are more decentralized—there are often no central servers keeping track of the downloads and uploads.<sup>137</sup>

Obviously, songs downloaded using these programs are likely to have the same type of direct impacts on revenues as does Napster. One question is whether they could be as popular as Napster. Current evidence, if it is to be believed, indicates that they already are more heavily used than Napster was at its peak.<sup>138</sup>

This poses an extremely serious problem for copyright enforcement. Because there is no centralized location, firm, individual, or server that can be monitored and controlled by legal authorities, copyright enforcement is going to be very messy at best, and unenforceable at worst.<sup>139</sup> There is a provision in the Digital Millennium Copyright Act (DMCA) that requires Internet Service Providers to block access when notified that users are serving up copyright material using the ISPs facilities. The MPAA (Motion Picture Association of America) has brought action asking ISPs to 'crack down' on users providing movies on pure peer-to-peer based systems when the MPAA was able to monitor those systems and determine the Internet Protocol (IP) addresses of those allowing movies to be copied. This is not likely to be a successful long-term tactic since users have a choice of ISPs. Further, it would seem to require static IP addresses and it would be possible for many users to move to systems that use dynamic IP addresses on high speed lines, such as Earthlink's DSL service. Also, the vast majority of users still use slow dial-up access, and these have dynamically based IP addresses.

It is almost unimaginable to expect authorities to try to monitor each computer user and to prosecute teenagers for downloading music although authorities may choose to make examples out of a handful of people. Yet, that

---

<sup>137</sup> This distinction is somewhat artificial. Napster is also a peer-to-peer system, albeit one with a central server. And the pure peer-to-peer based systems can have some specialized hardware—LimeWire, for example, has a special router that is supposed to improve performance.

<sup>138</sup> This claim is made that the four largest Napster replacements, FastTrack, Audiogalaxy, iMesh and Gnutella, were responsible for 3.05 billion downloaded files although not all of these were songs. The data comes from Webnoize, a company that tracks Internet usage as reported by Reuters as discussed in endnote 131.

<sup>139</sup> See Lee Gomes "Recording Industry Targets Gnutella Amid Signs Napster Usage Is Falling" *Wall Street Journal*, May 4, 2001, p. B6.

is exactly the specter that faces the copyright owners, who do seem willing to undertake it. They might do well to consider, however, the public relations fiasco that ASCAP created when it decided to enforce copyright against summer camps, including the Girl Scouts who believed they were no longer allowed to sing copyrighted songs around the campfire.<sup>140</sup> The blizzard of negative publicity engendered by that action required ASCAP to backpedal at full speed. Teenagers trading copyrighted songs may not engender the same degree of empathy as young girls singing around the campfire, but lots of parents have such teenagers and I think it will be difficult to make examples out of them without alienating the public.

If enforcement does prove more difficult, how does the possibility of indirectly appropriating revenues stack up for these pure peer-to-peer systems? At first blush, one might think that these pure peer-to-peer systems are rather like the more traditional exchanges of music or CDs that occurs between friends, since there is no central server. But that is not the case. These peer-to-peer networks search out other computers running the relevant software and seem capable of finding an enormous number of such computers, far more than any circle of personal friends. On the other hand, there is some indication that users downloading but not uploading files will not be completely tolerated since several of these programs have 'anti-freeloading' tools (ironic, isn't it?) to prevent users who are not sharing large numbers of files from being able to download files.<sup>141</sup>

If an "anti-freeloading" rule became prevalent it is possible that the type of balance discussed earlier might arise, such that the value of new and popular CDs to users who need to upload songs to "qualify" would increase and some level of indirect appropriability might be possible. Nevertheless, it seems unlikely that numerous decentralized systems could provide sufficient constraints to reduce "freeloading" and thereby facilitate indirect appropriability on behalf of copyright holders, as would a centralized system like Napster if Napster so chose.<sup>142</sup> Thus it might have been somewhat

---

<sup>140</sup> For one of the more subdued articles on this issue see: "Okay, Six Choruses of 'Kumbaya'-- That'll Be \$1.50" by Marcus Errico, Eonline Aug 24, 1996 at: <http://www.eonline.com/News/Items/0,1,109,00.html> For ASCAP's version of this public relations fiasco see ASCAP's memo "ASCAP Clarifies Position on Music in Girl Scout Camps" August 26, 1996 at: <http://www.ascap.com/press/ascap-082696.html>.

<sup>141</sup> For example, LimeWire has an "Anti-Freeloader Feature": In the FAQ (frequently asked questions) file for Limewire we find: "Q: Will the number of files I share affect my LimeWire experience? A: It could. If you're not sharing enough files, users with certain connection preferences won't let you connect to them for downloading. For this reason, we recommend all LimeWire users share generously with one another."

<sup>142</sup> If Napster were to have a no-freeload rule, one might think that competition between Napster and a decentralized system would favor a decentralized system since freeloaders would flock there and most everyone would want to be a freeloader. But such is not necessarily the case. The system with a no-freeload rule would have more heavily-demanded files available for downloading relative to the number of

shortsighted of the copyright owners to have brought aggressive action against Napster, a relatively easy target, when they might then wind up with a much more vibrant decentralized system that will prove far harder to stop or from which to wrangle indirect revenues. Napster should have been much easier for copyright holders to deal with. Although the RIAA appears to be making peace with Napster, Napster's users have largely gone on the more decentralized systems. The RIAA has won the battle against Napster, but it may soon find it is losing the war against decentralized copying.

## Automated Rights Management

The panacea tantalizingly held out to copyright owners is automated rights management (ARM). ARM refers to technologies that promise to prevent unauthorized copies of copyrighted materials from being made. Control mechanisms to prevent unauthorized copying can be buried deep within the digital code of the music. In principle, such technology could restrict copying, or even just playing the music, unless there was a payment using, say, a credit card.

Of course, forms of copy protection have been with us for some time, in computer software, videotapes, digital audio tapes, scrambled cable TV signals, and so forth. All have proven susceptible to being cracked by some pirate, somewhere. Even the new technologies are prone to being cracked.<sup>143</sup> Critics of ARM assign far too much power to this technology. The reason that pirated versions of software, music, and videos have not dominated usage is as much due to the law abiding nature of users as it is to the difficulty of copying. The fact that digital copies of music are technically better than analog copies is a trivial difference to most listeners not using an extremely high-end audio system.<sup>144</sup>

Protection doesn't have to be perfect to do the job. In order to be successful it merely has to limit the number of pirated copies that actually

---

downloaders and therefore should prove more attractive to users, particularly users with files to upload. What economists refer to as a separating equilibrium might come to exist, with Napster having the newer and still popular songs whereas the pure peer-to-peer networks would have older songs.

<sup>143</sup> For example, to test the effectiveness of watermarks, a technology that in principle allows the tracking of the origin of a copy, the Secure Digital Music Initiative (SDMI) last year sponsored a hacking challenge, offering \$10,000 to anyone who could successfully remove the watermarks while meeting certain audio-quality standards. That challenge was met and a minor brouhaha took place over whether the codebreakers (a group from Princeton) were to be allowed to publish their techniques, which they eventually did. See "SDMI hack draws legal threats," Lisa M. Bowman, *ZDNet News*, April 23, 2001 found here: <http://www.zdnet.com/zdnn/stories/news/0,4586,5081595,00.html>. The report of the hackers can be found at: <http://www.theregister.co.uk/extra/sdmi-attack.htm>.

<sup>144</sup> Of course, digital copies can be used to make another generation of digital copies that remain the same quality, whereas analog copies of copies deteriorate in quality for each additional generation.

are used to replace sales. Nevertheless, this modern anti-copying technology has been treated by some commentators as a potential abridgement of freedom as well as an economically and legally unsound tilting of the historical balance that exists between users and creators in favor of the creator. I now turn to the fulcrum of this balance, known as fair use.

Fair use is a defense against claims of copyright infringement. There are four factors that are considered in determining whether a use is fair; and if a use is deemed fair, no copyright payment is required.<sup>145</sup> Certain activities are listed as exemplars of fair use, such as criticism, comment, news reporting, teaching, scholarship, or research. There is a debate currently raging about what the impact of ARM will be on fair use, and what the consequences will be for society if fair use is largely eliminated.

For scholars and policy analysts, this newest change in technology has led to an outpouring of commentary and analysis, with two very distinct schools of thought emerging. On the one hand, the Digital Millennium Copyright Act was created, egged on in large part by sympathetic academics, in response to these perceived dangers to copyright owners hoping to forestall or prevent the demise of artistic compensation. On the other hand, scholars such as Pamela Samuelson suggest that these dangers are dramatically overstated and that the attempt to strengthen protection has been overdone.<sup>146</sup> Following in this vein, Lawrence Lessig has suggested that the digitizing of artistic works coded with ARM systems will lead to a far higher level of appropriability than has historically been the case and that technology may have shifted the balance of economic power too far in favor of copyright owners if the government doesn't step in to limit it.<sup>147</sup> Tom Bell, on the other hand, has argued that systems based on ARM, what he calls "fared-use," are logically and legally sound.<sup>148</sup>

---

<sup>145</sup> The four factors are: 1) the purpose and character of the use, including whether such use is of a commercial nature or is for nonprofit educational purposes; 2) the nature of the copyrighted work; 3) the amount and substantiality of the portion used in relation to the copyrighted work as a whole; 4) the effect of the use upon the potential market for or value of the copyrighted work.

<sup>146</sup> See Pamela Samuelson "The Copyright Grab" *Wired*, January 1996. Found here: [http://www.wired.com/wired/archive/4.01/white.paper\\_pr.html](http://www.wired.com/wired/archive/4.01/white.paper_pr.html)

<sup>147</sup> Lessig states: "Code displaces the balance in copyright law and doctrines such as fair use." Found on page 135, Lawrence Lessig, *Code and other laws of Cyberspace*, Basic Books, 1999.

<sup>148</sup> Bell points out that fair-use imposes costs of its own, both copying costs (photocopiers, time, and so forth) and also imposes uncertainty on users since it is often unclear whether individual acts are fair use or not. He also moves a bit in the direction of the efficiency of perfect price discrimination that I put forth when he suggests that many instances of worthwhile copying would be missed because getting permission was too costly, but that ARM reduces these transactions potentially increasing the number of such uses. See Tom W. Bell, "Fair Use Vs. Fared Use: The Impact of Automated Rights Management on Copyright's Fair Use Doctrine" 76 *North Carolina Law Review* 557, 1998, pages 558-618. Available at <http://www.tomwbell.com/writings/FullFared.html>.

In order for ARM to achieve the type of power its critics are so concerned with, ‘cracking’ would need to be close to zero and analog versions of the material would need to be poor substitutes for the original. The latter requirement would seem to be false, making many of the claims of the anti-ARM camp seem unreasonable. Even if ARM made it impossible to cut and paste electronically from one document to the next, one can always just type in the material that one wished to copy into another document.

History tells us that the former requirement cannot be achieved through technical sophistication itself. Instead, the powers of the state have to be brought into play, and the DMCA does just that. The DMCA has some draconian provisions to prevent copying, in particular a provision that makes it illegal not just to make copies, but making it illegal to circumvent, or create tools that allow the circumvention of copyright protection technologies. To violate these provision of the DMCA it is not necessary to even make copies of the copyrighted materials. These aspects of the DMCA have created concerns of free speech and civil liberties that seem fully warranted, but that I will not address since they are not essentially economic issues.

Can ARM shift the balance too far toward copyright owners? Since Lessig couches his argument against ARM in terms of economics, it is fair to analyze this claim in economic terms.<sup>149</sup> However, the concern that ARM will somehow cause economic inefficiency—defined as a reduction in the amount of intellectual property produced and used—is based on two largely false premises.

a. ARM Will Not Harm “Fair” Use or Any Use

First, the specter of ARM that most seems to haunt its critics is the version in which ARM charges users for each and every use, no matter how small. This would appear to eliminate fair use in its role as a mechanism for allowing copying in those instances where the transaction costs of collecting payment are greater than the payment itself, a view of fair use most often associated with Wendy Gordon. She has argued that fair use provides a mechanism whereby copying may occur when the transactions costs of getting permission might have been too great to allow even worthwhile copying to occur, an argument similar to viewing fair use as a form of

---

<sup>149</sup> “Economists have long understood that granting property rights over information is dangerous (to say the least). This is not because of leftist leanings among economists. It is because economists are pragmatists, and their objective in granting any property right is simply to facilitate production, but there is no way to know, in principle, whether increasing or decreasing the rights granted under intellectual property law will lead to an increase in the production of an intellectual property.” Page 134.

cost/benefit analysis that I put forward in my 1981 study.<sup>150</sup> The critics of ARM correctly note that in general, strengthening copyright, and its concomitant reduction in consumption of the copyrighted good (since consumption of unauthorized copies is no longer allowed), might decrease the value to consumers by more than the value of any increased production that might be brought about by the stronger copyright. Fair use, they claim, is a mechanism that needs to be retained to keep the balance from tipping too far (i.e., inefficiently) in this direction.

What the critics of ARM fail to notice in this instance is that the type of complete ARM that they so fear, in fact particularly this type, does not reduce the consumption of copyrighted goods. By charging for each minor instance of use, each paragraph read, say, or each page printed, consumers can be charged amounts that are closely related to their usage of the copyright product. That is because this extreme form of ARM becomes virtually an instance of what economists call 'perfect price discrimination', charging each user a price highly related to his willingness to pay.<sup>151</sup> There would no longer be 'missed opportunities' whereby copying would not occur because the transaction costs of getting permission were too high relative to the value.

This is in contrast to the normal textbook representation of a market that has but a single price charged to all consumers for identical units of a product. Although a textbook monopolist charges a higher price than is found in a competitive market, it is still but a single price. In this monopoly market a smaller quantity is therefore sold and consumed and it is the decrease in quantity consumed that is the harm engendered by monopoly, what economists refer to as economic inefficiency.<sup>152</sup> When a seller is able to charge several different prices, high prices for users willing to pay high prices and low prices for others (such as business versus regular airline tickets), it is known as price discrimination. Because low prices can be charged to consumers who would not have purchased the item at the high monopoly price, price discrimination will generally increase the total output sold. The more successfully and completely that a seller can match prices to the maximum prices consumers are willing to pay, the closer the total output will be to the competitive level.

Unlike simple monopoly, which restricts output from optimal levels, perfect price discriminators do not restrict output at all. Therefore, they are

---

<sup>150</sup> Wendy Gordon, "Fair Use as Market Failure: A Structural and Economic Analysis of the Betamax Case and Its Predecessors," 82 *Columbia Law Review*, 1600-1657.

<sup>151</sup> I assume that the more one uses of a product, the greater the willingness to pay.

<sup>152</sup> The harm from the reduced output is traditionally referred to as a deadweight or welfare loss in economics textbooks.

every bit as efficient as a competitive market, a perfectly standard result that can be found in any textbook.

ARM is not perfect price discrimination. ARM does not charge each consumer an amount exactly equal to his maximum willingness to pay. That ideal can never be achieved. Nevertheless, by tying the usage closely to the payment, ARM will move a good way toward perfect price discrimination. Much of the difference in willingness to pay is a function of how much, how frequently, and how often an item is going to be used. In those instances where there is only a small use of the copyrighted material, ARM can charge a very low price and usage (copying) will not be deterred. Consequently, fair use no longer has an important role to play as cost/benefit analysis.

Admittedly, some of the differences in valuation of the copyrighted good is due to income or taste differences, which ARM doesn't address. The aspect of ARM that most concerns its critics, however, is its ability to charge for each small transaction and to keep copies from being made if payments are not forthcoming.

This, of course, is a purely economic argument and it turns on the concept of efficiency. Perfect price discriminators, while efficient, remove the 'surplus' received by consumers. In laymen's terms, the seller sucks up all the difference between the value the consumer puts on the product and its cost of production (what is known as surplus), and turns it into profits. Critics of ARM might argue that this is 'unfair' to users. But such an argument is not one based on economic efficiency, and is not the one that is made by the critics of ARM.

So the harm that ARM critics envision, the reduction in use, fair or otherwise, of a copyrighted good, is not in fact an outcome that is to be expected.

### *ARM Will Not Reduce Production of New Works*

ARM critics, after incorrectly asserting that ARM will reduce consumption of copyrighted materials, then argue that there will be no countervailing benefit, which would usually be the additional production of copyrighted materials brought forth by the additional revenues. This notion that additional revenues will not bring forth additional output arises from an influential paper by Landes and Posner.<sup>153</sup> Prior to their paper it had

---

<sup>153</sup> Landes W. M, Posner R. A. "An Economic-Analysis of Copyright Law," *Journal of Legal Studies* 18 (2): 325-363 June 1989. One might argue that earlier, Plant (1934) also thought that lengthening copyright would not increase production since Plant argued that copyright wasn't even necessary. This is, we believe, a misreading of his work. A correct reading discovers that Plant doesn't argue that production is unaffected

previously been taken as a given that increasing copyright increased appropriability and thus incentives to produce. Stronger or longer copyright protection led to more payments to creators leading to more creative works produced. It seemed clear enough.

But Landes and Posner broaden that basic model by assuming that new works often are derived, at least in part, from old works, so that making the copying of old works more expensive lessens the number of new works that can build upon the old works as inputs.

In spite of the originality of this claim, there are several reasons to believe that the traditional expectation that increasing copyright protection increases the body of copyrighted works still holds in our world. The Landes/Posner article was examining fundamental questions about copyright, such as whether ideas should be copyrighted, and many of their results make the most sense in a legal setting very different than the actual one. For example, if someone could claim ownership over the phrase “good morning,” asking for payment each and every time it was used, one can imagine the costs being large with no concomitant benefits. Similar problems might arise if someone could copyright ideas, such as the idea of two young people falling in love even though their families disliked one another, and try to prevent others from using that idea.

Actual copyright law, however, limits its protection to the ‘expression’ of ideas, and individuals are allowed to create a particular expression even if it was already created by someone else and even if it were already copyrighted, as long as was not copied from someone else’s work.<sup>154</sup> Thus, the major hindrance that copyright on old works causes to creators of new works would be when the creators of new works wish to copy direct passages from older works. This is only legitimately done with attribution, however, and such writings tend to be in the nature of reviews or academic works. In these cases, there is little reason to believe that an accommodation would not be made between the creator of the original and the creator of a work that uses part of the original. If the derivative work is hostile to the original then an agreement might not be reached. But it is unusual to have more than a

---

by income, although he does point out that this is true for some authors, so much as the profits from being first (prior to 1934, when copying was still slow and costly) were great enough that the balance between production and consumption would be skewed inefficiently toward producers if there were any copyright protection beyond the time advantage of being first.

<sup>154</sup> Unlike patent law, the first to copyright does not prevent others from creating the same expression of an idea as long as the later expressions were independently created. So, if you can prove that a sonnet you wrote, that happens to be identical to one written by Shakespeare, was created entirely on your own, it will not be a copyright infringement. In patent law, even if later inventors were entirely independent in creating their invention, if it turns out to be similar to the first patent it will not be allowed to stand as an independent patent.

paragraph or two directly quoted at a time, and this can be done the old fashioned analog way if necessary. Then we are back in the realm of old fashioned fair use, even if now it serves a somewhat different purpose.<sup>155</sup>

Critics of ARM probably imagine that it could extend the life of copyright indefinitely. In reality, all ARM schemes can be broken, just as all copy protection on software could be broken during the last two decades. Traditional copyright enforcement, and the desire of users to remain within the law should limit the distribution of these 'cracked' items while the term of copyright is still in force. Once copyright is over, however, then everyone can in good conscience distribute cracked items and thus ARM will not lead to perennial copyright protection (and of course, they can be 'cracked' the old analog way). This might be one reason to oppose the DMCA's provisions that attempt to prevent all circumvention of protection schemes.

It is fair to conclude, therefore, that increased appropriability brought about by ARM will enhance the production of new copyrighted works. If ARM allows a very strong degree of price discrimination, then there would be very little loss from the possibility of users being disenfranchised from purchase by the extra appropriability given to copyright owners. ARM, even if it eliminated fair use (and Bell claims that it wouldn't) would be economically efficient.<sup>156</sup> Of course, one could always argue that ARM would make authors too rich and readers too poor. Or perhaps that it might lead to some form of censorship.<sup>157</sup> But these are not arguments based on economic efficiency, nor do they seem reasonable.

### *Public Goods, ARM, and other Alternatives*

Copyrighted items, whether intellectual products that are embodied in a CD or a stream of bits over the Internet, are public goods, which, as defined above, means they don't get used up when consumed. Efficient consumption of public goods requires that any consumer with a value for the item that is above the cost of producing its physical embodiment (which might be close to zero) be allowed to consume it, since allowing such consumption deprives no other consumer of possible consumption.

---

<sup>155</sup> It can be claimed that the ARM might impose a contract on the user that no copies of any sort are to be made as a condition of sale. But any book, even with no digital technology at all, could come shrink wrapped with a contract that says to only open it if you promise not to make copies. That is the nature of many software contracts. So this problem really has little to do with ARM.

<sup>156</sup> See page 591 of Bell where he talks about the legal impacts of ARM on cutting and pasting.

<sup>157</sup> It has been suggested by Netanel (Neil Weinstock Netanel "Copyright and a Democratic Civil Society" 106 Yale Law Journal 283-386, 1996, that fair use is valuable to society, even if perfect metering reduced transactions costs to zero, because in his view the purpose of copyright is to promote a democratic society and not to maximize economic efficiency. He believes that fair use protects negative follow-up works, e.g., parodies, that he suggests could be eliminated by the original copyright owner with strong enough copyright protection. This, to me, confuses censorship with the proper working of markets.

This is the tradeoff that is known to exist in the creation and distribution of public goods. Efficient consumption often requires a price close to zero whereas efficient production requires that producers receive sufficient payment to compensate them for the act of creating titles, whether writing a book or producing a movie, which is a large fixed cost. Traditional market mechanisms are not expected to be able to produce the theoretically ideal quantity of titles. Too few titles are likely to be produced and too little consumption of any single title is likely to occur, compared to the theoretical ideal.

Ironically, the sole market mechanism that can theoretically produce the ideal level of public goods is perfect price discrimination. That is because the perfect price discriminator, by charging each consumer the amount that consumer is willing to pay, but no more, deters no consumer from consuming. The ideal consumption level for any title is thus a consequence of perfect discrimination. Further, since the producers receive all or most of the surplus, all titles with values greater than the cost of production are likely to be produced, leading to the optimal number of titles produced.

That is the direction in which ARM promises to take us. So even if critics of ARM were to refocus their arguments to one based on the equity or inequity of having producers taking so much and consumers so little of the surplus created by the consumption of copyrighted goods, they would then be arguing against economic efficiency, which would be a turnabout of one hundred and eighty degrees.

Although ARM is one solution, and may prove central to the issue of copying, there are other potential solutions that might incorporate some of ARM's anti-copying characteristics although not the payment mechanisms that are normally associated with ARM.

Some copyright markets, for example television and radio broadcasts, use a device known as a 'blanket license.' A blanket license allows the purchaser of the license to use any amount of the copyrighted material contained in the repertoire covered by the license for a single fee that does not depend on the usage of the repertoire. Historically, the best-known instances of a blanket licenses have been sold by performing rights organizations such as ASCAP and BMI.

These blanket licenses are sold to television and radio stations with the price of the license a function of the revenues earned by the broadcaster. Blanket licenses have some very useful economic characteristics. First, since the cost of using another copyrighted item in the repertoire is zero, consumers who purchase the license use the optimal amount of these public goods. From an economic efficiency vantage, this is much better than selling

the individual items in the repertoire one at a time (unless the seller were a perfect price discriminator). The blanket license provides copyright owners with revenues to help pay for the fixed costs of creation, although the revenues may not be as perfectly related to willingness to pay as would be the case for a perfect price discriminator.

It is possible that some users may not purchase the blanket license, so there may be an inefficiency on the consumption side anyway, although in the case of television and radio, all stations have purchased such licenses and the artificial restriction on the number of stations by regulators tends to ensure that the blanket license fee doesn't reduce the number of stations. Also, since the price itself is related to willingness to pay (i.e., approaches perfect price discrimination) the system would appear to have excellent efficiency characteristics given that the products are public goods. There is no reason that a record company could not just as easily employ a similar device in selling music to individual consumers, what we might call a blanket subscription.

Sellers of music, among them the new Napster, are publicly discussing subscription systems whereby users are charged some monthly fee for access to some amount of music. A monthly subscription fee would be like a blanket license as long as it allows unrestricted usage of the material covered by the license and doesn't limit the number of downloads each month.

It doesn't appear that this is the initial route that is going to be taken by the record companies. News reports indicate that monthly subscription fees are going to apply to only a fixed number of downloads per month.<sup>158</sup> These reports also indicate that record companies envision a pricing structure of at least \$10 a month for a limited number of downloads. The downloaded songs, according to initial plans, will not be playable on any devices other than PCs, and will be limited in terms of how many times they can be played or

---

<sup>158</sup> The two leading services that have been announced, MusicNet (supported by Warner, Bertelsmann, EMI) and Pressplay (supported by Sony and Vivendi) have suggested some form of monthly subscription fee. The suggestions, however, are for a fixed amount of downloads. Reports Newsbytes: "[A]cting MusicNet CEO Rob Glaser said the lower end of a hypothetical tiered pricing plan might include a \$9.95 per month plan allowing customers to temporarily download 30 songs and stream 30 titles." That same article reports on a survey on teenage users indicating they would be willing to pay slightly under \$3 per month for unlimited downloads. See "Plug.In: Music Services May Struggle With Napster-Era Teens" Brian Krebs, Newsbytes July 26, 2001 at <http://www.newsbytes.com/news/01/168370.html>. A more recent article discusses the problems with selling music online, particularly since these sites intend to stream music which brings in performing rights as well as other rights. See "Label Deal to Unclog Music Logjam" Jim Hu and John Borland, Sept. 17, 2001, Cnet News available at: <http://www.msnbc.com/news/630261.asp?0na=22184D02>.

copied.<sup>159</sup> It is hard to imagine these services being successful unless the price for these downloaded items is far lower than currently suggested

One might argue that it would be foolish for the record companies to allow unlimited access to their repertoire since consumers would seem to have an incentive to download everything they want all at once and then stop paying. This concern, however, ignores the fact that the vast majority of sales are of new music and that it is the new additions to the repertoire that consumers now purchase and these additions would provide continued incentive to subscribe to a monthly service. Additionally, the repertoire could be divided into chunks based on time periods, alphabet, genre, and so forth and yet unlimited downloads could be allowed for each one, preserving the efficiency component that would be lost with restrictions on the number of items made available.

The original pricing plans, although not official, appear foolish to me, but perhaps the record industry knows something I don't. On the other hand, it is possible that they will follow the lead of the movie industry which overpriced prerecorded tapes because they thought that video rental stores were the primary market. Only when it was discovered that individual movie viewers actually desired to purchase videotapes did the price come down to levels that made it affordable for individuals. It isn't really a question of whether the sellers will get the price right, but instead the question is when.

Further complicating the issue is the fact that web sales compete with brick-and-mortar sales. The brick-and-mortar retail outlets that sell CDs will pressure record companies to keep online prices at a high enough level so as not to discourage retail sales. This would be in spite of the fact that web sales do not incur the costs of packaging, shipping, distribution, or physically producing the CD. Large retail chains have significant leverage on CD sales by their placement of CDs and the availability of CDs at these stores. To the extent that a large fraction of sales is done through brick-and-mortar retailers, web prices may remain artificially high and this may help explain the seeming unreasonableness of the current planned prices.

## **Conclusion**

The impact of pirating has often been misunderstood and copyright owners have frequently claimed harm when little or none was occurring. This

---

<sup>159</sup> An news story just before going to press discusses the problems with selling music online, particularly since these sites intend to stream music as well as sell it, which brings in performing rights as well as other rights. See "Label Deal to Unclog Music Logjam" Jim Hu and John Borland, Sept. 17, 2001, c/net News available at: <http://www.msnbc.com/news/630261.asp?Ona=22184D02>.

was true for many copying technologies. Nevertheless, record companies and copyright owners are right to fear Internet based copying of digitized products. It is a potentially serious threat to their well-being. Still, the arguments against Napster and its relatives remain basically theoretical. As strong as they appear to be, it is somewhat premature to say we know what will happen one way or another, since there is as yet no compelling empirical support. The evidence that has been put forward to this point doesn't clearly point to even the direction of the impact, to say nothing of the magnitude.

Even if Napster had been as serious a threat to record companies and copyright holders revenues as implied by theory, it is not the most formidable threat facing copyright owners. Pure peer-to-peer pirating would seem to be far more dangerous because Napster could have been tamed by changing its rules, but peer-to-peer networks cannot. By crippling Napster, copyright holders may have strengthened a far more fearsome foe, diminishing their chances to appropriate revenues from activities that they might not be able to stop.

In the not too distant future, ARM technology should allow copyright owners to reduce large scale unauthorized copying. These ARM tools should greatly reduce any harm to copyright owners brought about by unauthorized copying. At that point, Web sites and technologies that allow unauthorized copies should be of far less importance as long as the ARM technology proves difficult enough to break.

Many scholars and commentators fear that ARM is dangerous because its practical elimination of fair use would seem to upset the delicate balance between creators and users. These fears are largely unfounded, at least in terms of economic efficiency. Because price discrimination is enhanced, there is every reason to believe that efficiency is enhanced as well. These critics of ARM imagine ARM providing more power to authors than ARM will in reality be able to deliver.

The Internet, as has been the case for many other technologies, should prove a boon to record companies and copyright owners, once they learn how to use it effectively. As was true in the videocassette example, record companies will need to experiment to find the appropriate pricing levels for their own products. It is possible that some startup with a better business plan will replace the incumbents, but this is largely irrelevant to the balance between creators and users. Internet distribution should largely destroy brick-and-mortar record stores, and when it does, the old distribution methodology will seem as primitive as horses and buggies seem today.