

1982

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Citation of this paper:

Liebowitz, Stanley J.. "The Betamax Case: An Economic Approach." Centre for the Economic Analysis of Property Rights Working Papers, 82-06. London, ON: Department of Economics, University of Western Ontario (1982).

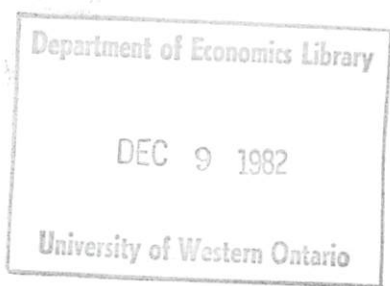
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WORKING PAPER 82-06

THE BETAMAX CASE: AN ECONOMIC APPROACH

S. J. Liebowitz

Support for this research was received from The Centre for Economic Analysis of Property Rights, The University of Western Ontario, London, Ontario.



Major funding for the Centre for Economic Analysis of Property Rights has been provided by the Academic Development Fund, The University of Western Ontario. Additional support has come from The Bureau of Policy Coordination, Consumer and Corporate Affairs. The views expressed by individuals associated with the Centre do not reflect official views of the Centre, The Bureau of Policy Coordination, or The University of Western Ontario.

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The 'Betamax' case, as *Universal Studios Inc. v. Sony Corporation of America* has come to be known,¹ has elicited much interest because of the visibility of the participants, the high stakes involved and the likelihood that the resolution of the case will have an impact on millions of Americans who own video tape recorders (VTR's). While much has been written about the case by legal academics and newspaper reporters, the rationales and implications of this case have been generally neglected by economists. The purpose of this paper is to attempt to remedy this situation.

The first section contains a summary of some facts of the case. The second section contains a discussion of the broadcasting market and some of its unusual characteristics which influence the economic analysis of the case. The next section proceeds to an economic analysis of fair-use, the legal concept at the heart of this and several other recent copyright controversies. The alleged and possibly real harm to copyright owners caused by VTR's is discussed in the fourth section with the focus of the analysis being the possible alterations in the value and size of broadcasters' audiences which might be caused by VTR's. The fifth section discusses the impact of several proposed remedies. The conclusions of the paper are presented in section 6.

1. Some Facts of the Case

Videotape recorders (known as VTR's or VCR's) make a physical reproduction of television signals on videotape, allowing the viewing of these signals (now on tape) to occur at the convenience of the VTR owner. Besides recording broadcast signals, VTR's can be used in conjunction with

¹The district court decision is cited as 480 F. Supp. 429 (1979), the appeals court decision is cited as 1981 Copyright Law Decisions, para. 25, 308.

cameras, other VTR's or videodisk players to record "home" movies or to make a copy of someone else's tape or videodisk. VTR's can also be used to play back videotapes recorded on other machines. Since most VTR's have their own tuners, viewers can usually tape one show while watching another. There is little doubt, however, that at the present time VTR's are primarily used to record television broadcasts, and discussion of the case has focussed on this particular activity.²

In the particular case at hand (the "Betamax" case), Universal Studios Inc. and Walt Disney Productions Inc. were the plaintiffs who accused the defendants of infringing their copyrights, either directly, vicariously or contributively. The defendants included the Sony Corporation (the manufacturer of the Betamax), Sony's American distributor (Sony Corporation of America), several retailers who sold the Betamax (Carter Hawley Hale Stores, Inc.; Henry's Camera Corporation; Associated Dry Goods Corporation; Federated Department Stores, Inc.), Sony's Advertising Agency (Doyle Dane Bernbach, Inc.) and an individual who used the Betamax in his home to record a broadcast of the plaintiffs' copyrighted works (William Griffiths).

To date, there have been two rulings on this case; the first by a district court and the second by a circuit court of appeals. The original ruling by the lower court in 1979, found for the defendants. Most important among its findings was that home recording was fair-use (to be defined below), meaning that for practical purposes home recording was not an infringement of copyright. It also ruled that even if home recordings had not been found to be fair-use, the corporate defendants would not have been liable for copyright infringement caused by the owners of VTR's. The appeals court (in 1981) overturned this lower court ruling. It determined that

²In fact, the district court explicitly stated that its finding held only for advertising based television, and not pay television.

home recording was not fair-use and was therefore a copyright infringement. It also concluded that manufacturers and sellers of VTR's were guilty of contributory infringement since they knew that VTR's would be used to record copyrighted materials. The higher court left the decision of appropriate relief to the lower court which has not yet made a pronouncement on the matter. The supreme court, however, has agreed to rule on this case in 1983.

Analysis of the economic issues of this case will reveal inconsistencies and unclear reasoning in the decisions of both courts. Central to these decisions is an understanding of the market for broadcasting, which is the concern of the next section.

2. The Peculiar Market for Television Broadcasting

It is well known that the broadcast industry sells to advertisers contacts with the viewing audience. Since advertisers are willing to pay for these contacts one must conclude that television is valuable as an advertising medium. It is equally obvious (based on expenditures for televisions, T.V. guides, etc.) that viewers value television programming, even though they do not have to pay for it. Television can therefore be thought of as embodying two joint products; an advertising medium for producers and a consumption good for viewers. Since a market only exists for one of these products, the producers of television programming will be unaware of any positive valuation placed on programs by viewers,³ and will underproduce (relative to some 'efficient' amount)

³It is possible, and even likely, that audience valuation and advertiser valuation of particular shows will be highly correlated. Even so, such a correlation is likely to be imperfect (as we are constantly told by cultural elitists) and quite irrelevant to the externality problem. Even with a perfect correlation, the total value society places on any television program will be greater than the value that advertisers alone can make effective to television producers, leading therefore to the externality.

television programs for this reason. The analysis and implications are identical to that of any positive externality.

Figure 1 will help to illustrate these points. The horizontal axis measures units of television programming in hours. Viewers value this programming as a consumption good, and the values they place on successive units can be represented by the demand curve D_V . Additional programming units beyond the quantity Q_1 are of zero value as a consumption good, indicating viewer satiation with television viewing beyond this quantity. D_V is a function of, among other things, the amount of advertising included in the programming. The value of programming to advertisers on the other hand, is a function of the audience contacts that they can make by advertising during these broadcast hours. Obviously, since there are no viewers of television programs beyond Q_1 , advertisers could not find any value in broadcast units beyond Q_1 . In Figure 1, D_A represents the value that advertisers place on audience contacts associated with a given number of broadcast hours. D_A will depend on factors such as the number of advertisements per minute, the size of the audience and the underlying demand for advertising contacts. The vertical sum of D_V and D_A represents the social value of individual programming hours. The marginal (and average) cost of producing broadcasting hours is represented by the horizontal line MC. Since the value represented by D_V is not appropriated under the present institutional arrangements, D_A is the only demand which producers of television programming will respond to. A competitive equilibrium will occur at an output of Q_2 , the intersection of MC and D_A . The "efficient"⁴ output, however, is Q_3 , where the sum of

⁴Efficient if it were costless to make the demand D_V effective in some manner.

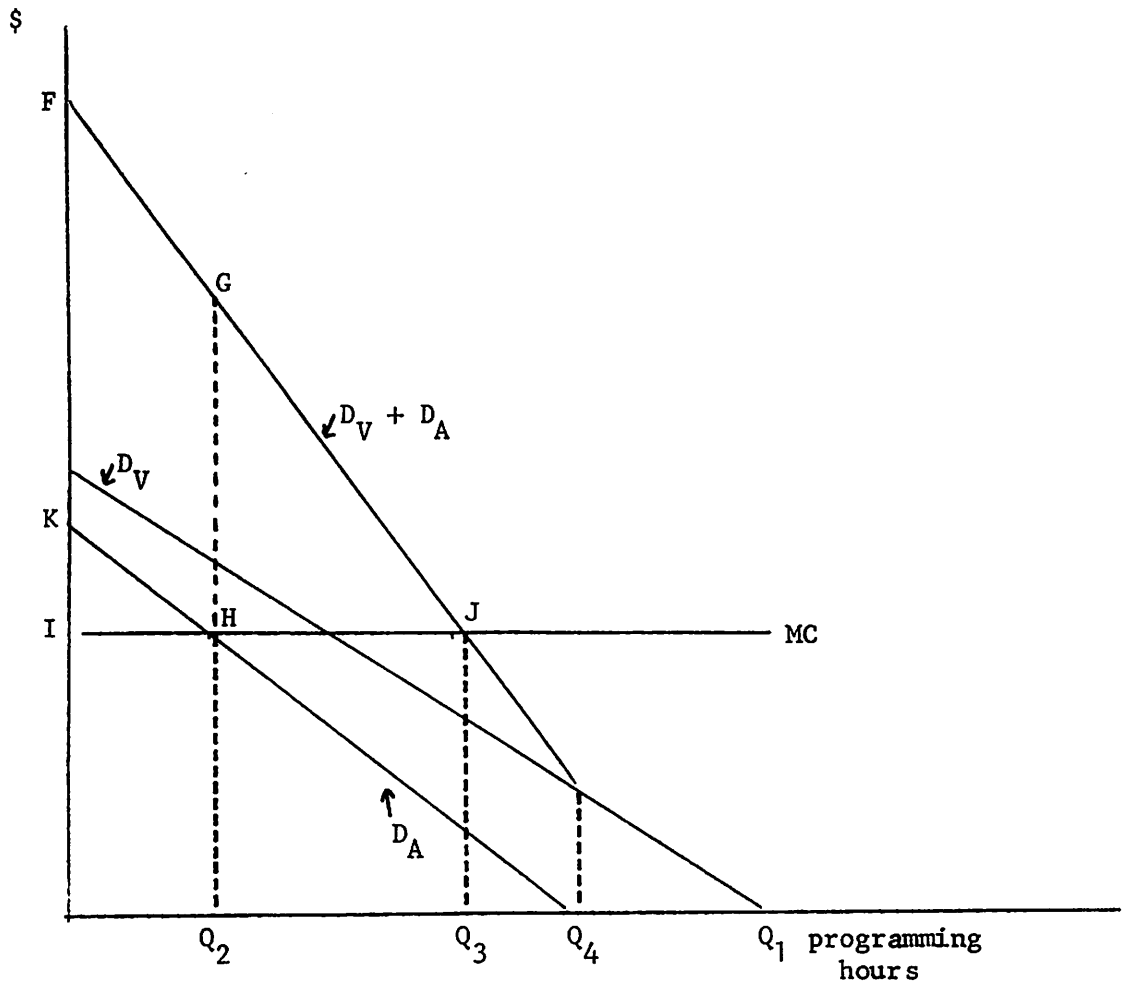


FIGURE 1

D_V and D_A intersects the marginal cost of additional programming.⁵ Therefore, the externality acts to reduce the output of programming hours (unless MC intersects $D_V + D_A$ to the right of Q_4).

Externalities are the classic 'market failure' whereby the market does not produce the efficient amount of some particular commodity. One could argue, then, that some method of internalizing this externality might be beneficial. In principle, a remedy would be to subsidize television producers by an amount which equals the value of marginal units of television programming on the part of the viewing public so that the effective demand facing program producers would be $D_V + D_A$. Allocating such a subsidy efficiently requires a great deal of costly information as well as requiring political action which may not be popular. An alternative remedy would be to try to alter the nature of the television market in such a way that broadcasters would be enabled to collect revenues from viewers by charging them for the privilege of viewing, and excluding those who did not pay.⁶ Technology has progressed to the point that such exclusion is feasible,

⁵In Figure 1, D_V and D_A represent only one of many possible pairs of these demands. Since D_V and D_A both depend on various factors controlled by broadcasters, such as the type of programming, number of advertisements, etc., the vertical sum of D_V and D_A will vary with broadcaster policy. The 'efficient' combination of these factors is that which provides the greatest area for FJI. Because broadcasters only receive value for D_A , however, they will provide these factors in a way which tends to maximize IKH. This particular loss of efficiency is not discussed in the text.

⁶Since television is essentially a 'public good', meaning that one person's consumption does not reduce anyone else's consumption, there are other unusual welfare considerations which could be brought into the analysis. This Pandora's Box will not be opened here, however.

as demonstrated by the various pay-TV networks now in existence.⁷ Since this externality has not been generally recognized, however, society has not been concerned with its amelioration.⁸

The lack of concern over this externality poses something of a dilemma when considering the impacts of videotaping. Should the change in the valuation placed on television programs by viewers brought about by videotaping be considered a relevant factor by the courts? That is to say, if videotaping increases the valuation of programs by viewers (an upward shift in the D_V curve in Figure 1) the extent (damage) of the television externality grows. The courts could attempt to award revenues (damages), in some fashion, to creators of television programs in the hope of ameliorating the increase in the size of the externality, but does it make sense to restrict increases in an externality while, at the same time, not attempting to deal with the larger fundamental cause of the externality? I shall assume in what follows that this externality is best ameliorated through institutions other than copyright and that VTR's impact on this externality need not be considered by the court.

⁷The analysis here indicates that the most efficient form of television and the one likely to emerge, would be pay-television with advertisements. Any restrictions prohibiting either pay-TV companies from selling advertising or advertisement-based television from charging a fee for viewing would not be in the best interests of society. One would expect the market to develop in a manner very similar to newspapers and magazine which are generally priced at a non-zero level and which also usually carry advertisements. There are, of course, exceptions to this rule which would indicate that in those cases the sum of D_V and D_A intersects MC to the right of Q_4 .

⁸As pay-TV becomes the accepted form of broadcasting this externality will disappear. Since some of the conclusions of this paper are based on the assumption that the impact of VTR's on this externality should not be addressed as a separate issue from the externality as a whole, the conclusions will be stronger when pay-TV predominates.

Our attention is thus restricted to the impact of VTR's on D_A . There are several ways in which VTR's can alter the advertising revenues of broadcasters. First, assume that all television viewers used VTR's to eliminate all commercial messages from the taped programs, and thus all advertising contacts as well. Commercial television would no longer exist even though the value of the potential advertising contacts which television would generate if viewers saw the advertisements would be greater than the cost of these programs. The demand represented by D_A could not be effectuated through the marketplace because of VTR's and society would be worse off by the amount of FGHI in Figure 1 although advertisers would lose KIH.

A second way in which VTR's might alter broadcast revenues which is sharply distinguishable from the first would be if television owners stopped watching (or taping) over-the-air broadcasts and instead bought prerecorded tapes of movies or concerts. In this example VTR's work to enhance the value of alternative entertainment mediums while decreasing the value of commercials on broadcast television. Such a shift in consumer behavior indicates that D_A has diminished and that advertisers would probably now more highly value commercials inserted in prerecorded tapes. The market for television programs would be working efficiently even if no shows were produced, since shows would no longer be produced only if the value of the shows was less than the cost. Therefore, the proper concern of a court interested in promoting economic efficiency is with VTR impacts of the first type, but not of the second. Before proceeding with an examination of these impacts in Section 4, however, the economic role of fair-use will be analyzed.

3. Fair-Use: The Central Legal Concept

Much of the discussion of the Betamax case by legal academics centers on whether home videotaping should or should not be considered fair-use. Prior to the 1976 revisions to the copyright act, the concept of fair-use was a vague judicial doctrine under American Law. Although the 1976 statute codified this doctrine, its lack of precision was left basically intact. The 1976 statute (S 107) states:

The fair use of a copyrighted work, including such use by reproduction in copies or phonorecords...for purposes such as criticism, comment, news reporting, teaching (including multiple copies for classroom use), scholarship, or research, is not an infringement of copyright. In determining whether the use made of a work in any particular case is a fair use the factors to be considered shall include -

- (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; and
- (4) the effect of the use upon the potential market for or value of the copyrighted work.

Those who argue that home videotaping is not fair-use emphasize that:⁹ (1) the videotaped work is almost always copied in its entirety; (2) the purpose of the taping is non-productive, i.e., entertainment as opposed to scholarship; (3) videotaping would cause economic harm to the plaintiffs since advertising revenues would decrease and/or videodisk or rerun markets would be harmed. Those who argue that videotaping is not an infringement¹⁰ tend to stress that: (1) the use is non-commercial in nature

⁹ See for example, *Universal City Studios, Inc. v Sony Corp.*: "'Fair Use' Looks Different on Videotape," 66 Va. L. Rev., 1005-1027 (1980).

¹⁰ See for example, Edward Kallal, Jr., "Betamax and Infringement of Television Copyright," Duke Law Journal, p. 1181 (1977).

and (2) the economic impact of individual videotaping instances are negligible (leading to a de minimis exception to infringement). As is proper in legal analysis, these discussions are based on an interpretation of the law, or its congressional intent, and not on what an economically rational ruling would be. However, economic analysis makes clear a coherent rationale for fair-use and allows a delineation of the characteristics of home videotaping which are consistent or contrary to the purposes served by fair-use.

In economic terms, the fair-use concept is easily accommodated as a judicial attempt to perform a rudimentary cost/benefit analysis for any infringing activity. The creation of property rights over intellectual works through copyrights (or patents) serves the function of providing increased incentives for the creation of intellectual works. The monopoly inherent in such rights, however, obviously limits the use (consumption) of any already created work. Balancing the benefits of increased production of intellectual properties caused by the granting of this monopoly power with the societal costs of diminished consumption of particular intellectual properties is the economic goal of an efficient copyright law. The fair-use doctrine was a method whereby the courts could circumvent the rigid rules of copyright law when the benefits of increased consumption appeared to outweigh any harm from reduced production.

This is clearly seen by envisioning the operation of the fair-use doctrine prior to the recent technological advances in copying (i.e., audio or videotaping or xeroxing). When copying was primarily done by hand, a laborious process for works of any length, allowing the individual making the copy to avoid copyright payment probably would cause little or no harm to the author of the copyrighted work while benefitting the

individual making the copies. This can be better understood if the net impact of this copying is disaggregated into three components--a substitution effect, an exposure effect and secondary use effect. The substitution effect is meant to capture the copyright holder's loss of revenue if the individual making a copy uses that copy as a substitute for purchase of a new item. Although the substitution effect works to decrease the revenues of copyright holders, it only does so if those making the copy replace the purchase of an original with the copy. However, the cost in time and effort when copying by hand are so high relative to the purchase price of most copyrighted materials that it seems unlikely that many individuals would prefer to copy the entire work instead of buying the original. On the other hand, if one were only interested in a small portion of the work, it is unlikely that one would have purchased the entire work had the option of copying not been available. The exposure effect reflects the increase in future sales which might occur when the copy of the original is seen by people who might otherwise have not had contact with the intellectual property. For example, if excerpts from a book are reproduced in a literary criticism, sales of the book might increase if certain individuals reading the criticism find these passages appealing. The secondary-use effect corresponds to the indirect impact of copying on the price of the particular copyrighted item which was copied. If, for example, the original work is located in a library, the library might pay a higher price for the original because it knows that when copies are made, the work's value to the patrons of the library is increased. Or an individual who purchases an original work might place a higher value on it because he knows his friends will wish to make copies. An analogy to the secondary-use effect is the impact that

allowing resale of used cars has on the value consumers place on new cars.¹¹ Since the substitution effect would probably reduce revenues by only a small amount and the exposure and secondary-use effect both work to enhance the revenues of the copyright holders, the net effect of many forms of non-commercial hand copying is to likely benefit copyright holders. Therefore the transactions costs brought about by rigid adherence to the copyright ban against copying might actually harm copyright holders if they dissuade enough people from making copies.

It now becomes quite clear why the guidelines for fair-use make economic sense for the hand copying of copyrighted materials. Those making the copies clearly benefit by not having to pay a copyright fee or incurring the transactions costs associated with negotiating or paying a copyright fee. The cost to the copyright holders is probably very small and might even be negative.

Although hand copying might have had a relatively benign impact on copyright, modern technology has greatly reduced the costs associated with copying and may have changed the relative size of these effects. These lower costs have increased the copying of copyrighted materials which in turn has caused concern among authors that the readily perceived substitution effect would become very large and seriously jeopardize their revenues. While this concern may be justified, only an empirical investigation can determine the actual impact of copying on copyright holders.

Not surprisingly, the present fair-use statute calls for examination of empirical magnitudes which appear relevant to a cost/benefit calculation. Each of the four factors is related in some way either to the social benefit of

¹¹For a demonstration that a secondary market can, in general, have either positive or negative effects on the firm producing the primary commodity, see S. Liebowitz "Durability, Market Structure and New-Used Goods Models," American Economic Review, September 1982. For a more detailed application to photocopying, see S. Liebowitz, "The Impact of Reprography on the Copyright System". Copyright revision studies, Consumer and Corporate Affairs, Canada (1981).

allowing copying or to the harm to the copyright owners from such activity. However, there is some redundancy and imprecision in these four factors.

The first two factors, the purpose and the character of the use, and the nature of the copyrighted material, have been interrelated in their interpretation by the courts. There is evidence that the courts generally consider scientific (educational) work to be of greater value than entertainment.¹² This position makes little economic sense for two reasons: (1) scientific work does not have inherently greater economic value than entertainment; and (2) by freeing the copying of scientific work from copyright payments, the production of scientific work, which the court apparently considers so invaluable, may in fact diminish for the same reason the courts believe that commercial works might diminish. There is little reason for the character of the work, per se, to be considered in determining whether the copying constitutes fair-use. All that should be taken into account is the gain to society from increased access to copyrighted material versus the harm to society from the diminished production of copyrighted materials if copyright payments are in fact reduced.

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See, for example, Williams and Wilkens Co. v. United States, 487 F.2d 1345 (1973) aff'd by an equally divided court, 420 U.S. 376 (1975). In this case a government medical library made photocopies of copyrighted medical journals. The lower court ruling, upheld by the Supreme Court, was that this practice constituted fair-use, in part because of the nature of the material at hand. The Supreme Court majority opinion stated: "We are convinced that medicine and medical research will be injured by holding these practices to be an infringement...we should not...place such a risk of harm upon science and medicine."

See also Va. L. Rev., 1019, supra Note 1. A similar view was given in the appeals court ruling of the Betamax case which stated:

"We do not mean to suggest the increased access to such Disney products as 'Chip and Dale Mixed Nuts' is not a benefit to society. We only mean to say that the consequences attendant upon reduced consumer control of access do not in any way correspond to the deleterious consequences of reduced access identified...in Williams and Wilkens." (16,748)

The first factor (nature of the use) is sometimes confined to the distinction between commercial and non-profit use (as emphasized by the lower court in 'Betamax'). This distinction, per se, is also without particular merit. Although commercial use is much more likely to decrease the revenues of the copyright holders than private use since it tends to occur on a greater scale and is less likely to be captured in the secondary-use effect, such an implication is redundant with the fourth factor (economic harm to copyright holder). And for any given amount of harm to the copyright owners, there is no reason to prefer the harm to be brought about by non-profit institutions or individuals than by profit-making ones.

The third factor, the proportion of the copyrighted work copied, is also redundant with the fourth factor. When small portions of the work are copied, they are not likely to be good substitutes for the complete work and the substitution effect should be small, implying little economic harm to copyright holders. Therefore, the proportion of the work copies should only enter the court's decision equation through its impact on the copyright holder's revenues.

The fourth factor, the economic impact of copying on the copyright holder, is of obvious importance given the discussion so far. In fact, it provides part of the information which the courts would need in order to produce an economically sound decision.¹³ The other part of the information which the courts would need would be the extent of benefit to the users of copyrighted materials from the additional copying which would be brought about by a decision of non-infringement. The harm to copyright

¹³ The impact of copying on the copyright holder is not the cost to society brought about by the copying. The cost is the loss in production of copyrighted materials caused by the decreased payments to copyright holders. Some transformation of the harm to copyright holders to the lost value of copyrighted materials needs to be made before a true cost/benefit analysis can be performed.

owners should be examined first, however, since if it is zero it may provide a sufficient basis on which to make economically sound judgements.

This view of fair-use essentially boils down to examining the fourth factor, the impact on copyright revenues. Such an examination was also central to an economic analysis of videotaping, as discussed in Section 2. Section 4 will discuss the economic factors relevant to such an examination as well as provide some rough estimates of the magnitudes involved.

4. The Economic Impacts of Home Videotaping

A. Anticipated Harm to Copyright Owners

The discussion in each of the last two sections indicated that the most important task for the courts to determine would be the likely impact of home videotaping on the revenues to owners of the copyrighted works. Although the courts ruled only on an individual case of infringement, the economic significance of such rulings comes from and should be based on the total impact of all home video-recording on copyright holders as a group and not the impact of an individual instance of videotaping on an individual copyright owner. This point has generally been appreciated by both the courts and legal academics.¹⁴

¹⁴The lower court reviewed the likelihood that, in general, video-taping would harm copyright owners. The arguments were based on factors such as the impact of video-taping on advertising revenues. However, the court did not feel completely comfortable with such an analysis as demonstrated in the following statement from the judgment: "Because this prediction of harm is based on so many assumptions and on a system of marketing which is rapidly changing, this court is hesitant to identify 'probable' effects of home-use copying." 452.

The appeals court judgment was more comfortable with such an analysis: "That such competition [copyright holders competing with copies of their work] is necessary supports appellants' allegations of harm; at the least, it makes clear that the 'infringing' activity tends to prejudice the potential sale of appellants' work." (16,752)

Both courts cite Nimmer's analysis of these issues in which he claimed that the relevant question of harm could only be answered by examining the total impact of all such copying on the potential markets of the copyright holder. See M. Nimmer, "Photocopying and Record Piracy: OF Dred Scott and Alice in Wonderland" 22 U.C.L.A. L. Rev. 1054.

How then to best go about calculating the impact of videotaping on copyright owners? To perform this task properly requires some understanding of the broadcasting industry; in particular one needs to appreciate that the payment to copyright holders is based on the advertising revenues generated by their programs which, in turn, are related to the size and demographic characteristics of the audience.

Unfortunately, determining the impact of videotaping on advertising revenues is not a simple task. The plaintiffs predicted that harm would occur from each of four possible uses of VTR's: (1) Recording material off-the-air but never viewing; (2) Recording a program not being viewed but viewing it later (time-shifting); (3) Recording the program, saving the tape and viewing the program several times (librarying); (4) Avoiding commercials while pausing during recording or fast-forwarding while playing back. The lower court considered each of these effects in turn and it is useful to examine its analysis.

The lower court decided that the first factor did not injure copyright holders. This seems an entirely reasonable finding since an individual not owning a VTR could not have watched the show at any other time anyway (unless it was broadcast again). Certainly, such a use of VTR's seems incapable of reducing advertising revenues below what they would otherwise have been.

The court also ruled that time-shifting was unlikely to harm copyright holders. This also seems to be the correct conclusion. The value of a particular viewer to an advertiser should not depend on what time of day the viewer watches the program. Although this time-sharing has occasionally been referred to as fragmentation it should not be confused with the more general "fragmentation" effect brought about by cable

television whereby viewers tend to watch broadcasts originating from more distant geographic areas. In the cable example, advertisers do not value distant viewers as much as they value local viewers because distant viewers are less likely to purchase items from advertisers located in the city of program origination.¹⁵ However, if the viewing of the program is delayed long enough by VTR use, it could happen that advertising revenues would fall. For example, if a person first watches a 1980 television program in 1982, the old advertisements will have lost much of their value since the 1980 products are likely to have changed considerably by 1982, making the advertising message obsolete. The court's definition of time-sharing seems to imply short delays, however, and long delays such as this are probably best analyzed under the "librarying" factor anyway.

The district court did not consider librarying to be detrimental to the copyright holders. Here, the court's reasoning is somewhat suspect. The first point made by the court was that not much librarying was likely to occur, since videotapes are expensive, costing approximately \$20 each. This point may be correct, but it is an empirically testable proposition. In addition, the court also stated that librarying would not harm copyright holders because viewers would see the advertisements each viewing and they should be no less

¹⁵ A recent study by F. Fisher, J. McGowan and D. Evans might appear to contain a contrary finding. See "The Audience-Revenue Relationship for Local Television Stations," Bell Journal of Economics, Fall 1980. They concluded that "Policy decisions which concern audience diversion must take this [differences in values of audience by time of day] into account by examining the temporal as well as the spatial aspects of such diversion." p. 707. This conclusion was based on the finding (not original to this article--for a similar finding see R. Park, "Potential Impact of Cable Growth on Television Broadcasting," Rand Report R-587-FF, October 1970, p. 40) that a prime-time viewer was worth more to advertisers than a nonprime-time viewer. However, such a result is almost certainly due to the differences in audience characteristics at various times of day and/or differences in programming attractiveness (for evidence that programming attractiveness influences the value of viewers to an advertiser see S. Liebowitz, "The Impacts of Cable Retransmission on Television Broadcasters," Canadian Journal of Economics, August 1982). Therefore, for a given viewer of a given program, altering the time of day in which he views the program should not alter his value to advertisers.

valuable to advertisers than if they were to view reruns. This reasoning is fallacious, because of the obsolescence of the advertising messages over long periods of time. As a practical matter, however, librarying would not seem likely to have a major deleterious effect on copyright holders since it would not occur to any large extent and any obsolescence of advertisements which occurred (which is not exogenous to this phenomenon) would likely be less than complete.

The fourth, and most serious impact to be examined by the courts is the avoidance of commercials made possible by the VTR. Avoidance can occur in two ways: the viewer can delete the commercials upon the initial viewing using a pause switch; or the viewer can fast-forward through the commercials when viewing a previously recorded tape. The lower court seems surprisingly sanguine about this potential problem. If VTR owners do avoid commercials to any significant extent there would be little doubt that such a practice, ceteris paribus, would be detrimental to copyright owners and perhaps justify the taking of some remedial action such as a finding of infringement. Unfortunately, this ceteris paribus assumption neglects the probability that the price of a unit of advertising, properly defined, will not remain constant when the number of units of advertising changes. This point is important enough that a more detailed analysis should prove valuable.

B. Advertising Revenue and Advertising Contacts

Television broadcasters generate revenues by selling time slots to advertisers. These advertisers can be thought of as buying the opportunity to make advertising contacts with a given number of viewers. The desire of advertisers to purchase these contacts can be represented by a downward sloping demand curve in the market for these purchases. While the actual slope of the

demand for television advertising contacts can only be discovered through empirical methods, there can be virtually no doubt that the curve does slope down. Also, since there do not seem to be many close substitutes for television advertising, the demand curve for advertising contacts might slope steeply down.

The slope of the demand curve for advertising contacts is very important for all discussions of audience size and advertising revenue, as the following reasoning will demonstrate. If ownership of VTR's would reduce the total number of advertising contacts (since the number of advertisements and stations is fixed by regulation and tradition and is therefore exogenous to VTR use) this decrease in the number of contacts would raise the market price of an advertising contact. Whether total revenue to advertisers goes up or down would depend on the elasticity of demand for advertising contacts. If the elasticity were less than 1 (a possibility in a competitive market), a decrease in quantity of advertising contacts would increase the total revenue to advertisers! If the elasticity were greater than 1 but less than infinite, total revenue would fall, but by a smaller percentage than the decrease in audience contacts. Only if the elasticity were infinite (a horizontal demand) would the decrease in advertising revenue be as large as the decrease in advertising contacts.¹⁶

¹⁶ Although this discussion may appear extremely rudimentary, this simple but subtle point does not appear to have been fully appreciated in past analyses. In particular there is a tendency to equate audience contacts (size) with revenues. This is perhaps best brought into relief by examining the literature which examines cable television's impact on advertising revenues. These papers (some of which are discussed in footnote 14) estimate across individual stations the relationship between audience size and advertising revenue. They then infer, incorrectly, that overall changes in audience sizes (or other audience characteristics) will have a direct impact on advertising revenues, implicitly assuming that the price of an advertising contact does not change.

It is now clear that a determination of the impact of VTR's on advertising revenue requires a knowledge of two factors: (1) the change in the number of advertising contacts brought about by VTR use; and (2) the elasticity of demand for these advertising contacts. There is little that is known about the second factor but some approximation of the first factor is possible and is now undertaken.

C. The Change in the Number of Advertising Contacts Brought About by VTR's

The defendants and plaintiffs provided surveys of VTR usage which helped the lower court reach its decision. Unfortunately, the discussion of these surveys is very imprecise and does not allow for many concrete conclusions.

The defendants' survey indicated that VTR owners fast-forwarded through 25% of commercials, and that the pause button was used to eliminate commercials 8% of the time.¹⁷ What the discussion of the surveys doesn't provide is information on the number of hours of television programming recorded per week. If, for example, everyone owned a VTR and the average VTR owner used the VTR for 10% of his viewing, and if 25% of commercials were deleted, the number of advertising contacts would diminish by only 2.5%.

It is possible, however, to make some very rough predictions regarding the eventual use of VTR's. The average television household watches about 7 hours of television per day.¹⁸ Almost half of this viewing occurs during

¹⁷ These surveys are likely to be unreliable because the population of users at the time of the survey is likely to be very different from the eventual population of VTR users. The first people to buy VTRs are likely to be those who place the greatest value on owning a VTR, perhaps because either time shifting or commercial editing is of great importance. Therefore, the population of initial owners is likely to include disproportionately high percentages of wealthy individuals, those who particularly detest commercials or those who have jobs that cause them to miss their favorite shows. Thus the amount of taping and the amount of commercials deleted are likely to be higher in a survey conducted when the VTR industry is immature than when the use of VTR's is more widespread.

¹⁸ Source: TV Basics, Television Bureau of Advertising, New York, 1982.

the prime-time period of 7:00-11:00 p.m. and a majority of television revenues are generated during this prime-time period. It is simple to demonstrate that the average household, which presumably prefers prime-time programs, could not engage in a great deal of videotaping of prime-time programs unless it owned more than one VTR. Assume, for example, that a household has taped 3 hours of prime-time programming from Monday's programs and that there are 3 hours of prime-time programming which members of the household would like to watch on Tuesday. They will not be able to simultaneously record Tuesday's programs and also watch the tapes of Monday's programs since one VTR cannot both record and playback at the same time. In fact, if members of the average household enjoy watching the same amount of prime-time television shows every night, they will be virtually unable to use the VTR at all unless it increases their television viewing above what it would have been had they not owned a VTR. If, on the other hand, the members of the household enjoy shows broadcast on Monday, Wednesday and Friday, but not Tuesday, Thursday or Saturday, they could record shows on M, W, F and watch them on T, Th, S.

It is possible to make some estimates of the behavior of a household whose members watch an average amount of television. Assume members of the average household would like to watch 4 hours (the maximum for prime-time) of television programs on M, W, F and 2 hours on T, Th, F. Using the VTR they could view TV the national average of 3 hours per night by taping 1 hour of programming on M, W, F and playing back the tapes on T, Th, S. This would imply that 17% of the prime-time shows would be videotaped.

A more extreme estimate of VTR use could be derived by assuming that members of the average household enjoy 4 hours of prime-time shows per week night, but only one hour on Saturday and none on Sunday. This allows one hour of taping on weekdays and five hours of playback on weekends, with 24% of viewing based on videotapes. It is difficult to imagine a scenario under which a typical household could use their VTR more intensively than this so that this 24% figure becomes something of an upper bound.¹⁹

Table I gives various possible decreases in the percentage of audience contacts for advertisers based on different assumptions about the percentage of the viewing public which owns VTR's and about their use of VTR's to replace over-the-air viewing. It is assumed in these calculations that VTR owners delete 33% of commercials. In row 1 it is assumed that 10% of the households own VTR's, and the resulting decrease in advertising contacts is only 1.65% even when it is assumed that half of television viewing is derived from VTR use by households which own VTR's. The lower right-hand corner gives the most extreme reduction in advertising contact (16.5%) based on 100% VTR ownership and 50% VTR viewing.

¹⁹There is one possibility which might raise VTR use yet further. If viewers taped shows while watching a different show during the first run season and viewed the tapes for the first time during the rerun season, VTR use might climb as high as 50%. It does appear, contrary to these assumptions, that people often watch the same shows in rerun that they watch during the first run.

TABLE I

% Decrease in Advertising Contacts (Assuming 33%
Deletion of Commercials)

% of Households Owning VTR's	% of VTR Viewing by Those Owning VTR's			
	10	17	25	50
10	0.33	0.56	.83	1.65
25	0.83	1.41	2.08	4.15
50	1.65	2.81	4.13	8.25
75	2.48	4.22	6.20	12.40
100	3.30	5.61	8.25	16.50

The decreases in advertising contacts represented in Table I are, of course, larger than any revenue decrease which might be brought about by them. Without knowing the elasticity of demand for advertising contacts, it is not possible to determine the associated revenue changes which would follow from these changes in advertising contacts.

D. Alternative Impacts of VTR's on Advertising Revenues

The impact of VTR's on copyright owners may be quite different than those predicted by the plaintiffs. If VTR's increased the total amount of television viewing, for example, total advertising contacts might increase and the revenue to copyright holders might increase as well. Indeed, VTR's provide conditions under which one might expect to find that the individual viewer will choose to watch more television than he otherwise would since each hour of television viewing is now of higher perceived quality. However, the relationship between quality of a product and quantity consumed does not always conform to this simplistic view. For example, it is well known that increasing the amount of chocolate in candy bars, holding the price of bars constant, will have an ambiguous impact on the consumption of candy bars (but an unambiguous impact on chocolate consumption), depending on the price elasticity of demand for chocolate. Similarly, VTR's increase the value of television services in any hour period, but the number of hours of television viewing 'consumed' will depend on the viewers' elasticity of demand for television services. Thus the expected impact of VTR's on time spent viewing television is ambiguous.

Unfortunately, there exist only a few shreds of empirical evidence on this issue. The plaintiffs stated that "viewing time is relatively inelastic". The viewing survey of the defendants, according to the district judge, did

"not show any negative effect of Betamax ownership on television viewing". However, given the potential biases of any current survey data,²⁰ and the lack of economic sophistication demonstrated by the statements of both the plaintiffs and defendants, there is little to recommend these views. Instead, an examination of the few studies which attempted to measure the impact of program diversity (or quality) on viewing habits will be undertaken.

The impact of a wider choice of programming on viewing habits has been examined by researchers interested in predicting the impact of cable on viewing habits (and the wider choice of signals it allows) or the value of additional networks. An FCC staff study in 1970 concluded that additional television signals did not appear to increase viewing at all.²¹ A different study indicated that a second network station increased viewing by 30% but that adding a third only increased viewing by 7%²² implying that since most viewers presently have access to three networks and often several independent stations, their viewing time would presumably not change very much as VTR's increased their choices. Two studies of more recent vintage which examine this impact with somewhat greater precision come to similar conclusions. Park's 1979 study attempted to estimate the impact on viewing from the extra signals carried

²⁰See footnote 19 supra.

²¹Federal Communications Commission. "The Economics of the TV-CATV Interface." Research Branch, Broadcast Bureau, 1970, pp. 11-15.

²²See Roger Noll, Merton Peck and John McGowan. Economic Aspects of Television Regulation, the Brookings Institution, Washington, D.C., 1973, p. 52.

on cable, holding factors such as reception quality constant.²³ He concluded "there is no indication in these data that more signals lead to more viewing: the coefficient of NSTA [number of stations] is small, negative (wrong sign), and insignificant." My own study²⁴ came to a similar conclusion, with the number of stations having a negative, though insignificant, impact on viewing in most instances. Thus, based on these studies it seems unlikely that VTR's would increase the total amount of television viewing.

There is yet another way, however, in which VTR's might alter advertising revenues. Even if the additional choice brought about by VTR's does not increase the amount of time individuals spend watching television, it certainly will increase viewer satisfaction and the intensity with which people watch television. It will also allow advertisers to pinpoint their advertisements more precisely to specific groups since these groups will be able to self-select themselves into better defined groups based on the greater choice of available programming. The confluence of these effects (termed the 'segmentation' effect) tends to increase quality adjusted advertising contacts for any given size audience. My study, which attempted to measure this impact, found that the additional segmentation brought about by additional stations carried on cable television tended to increase quality adjusted advertising contacts by 5-10%.

The net impact of VTR's on advertising contacts through the segmentation and viewing habits effects is unknown but other indirect evidence has indicated that it is likely to be quite small. The negative impacts of advertising deletion caused by VTR's are also likely to be small (although additional evidence would be helpful on this point). It seems fair to conclude that evidence

²³Rolla Park, "Audience Diversion Due to Cable Television: A Statistical Analysis of New Data," Rand Report R-2403-FFC, April 1979, p. 22.

²⁴See Liebowitz, footnote 14 supra.

presently available indicates that the total impact of VTR's on the audience-revenue mechanism is, therefore, likely to be quite small.

E. Legal and Economic Assessment of Videotaping

The preceding analysis indicates that VTR's are not likely to have a large negative impact on the revenues of broadcasters. This in turn implies that copyright holders are likely to receive payment for their work which would be similar to payment they would have received had VTR's not been in use. The logic of the fair-use concept would seem to imply that VTR use should be considered an exception to copyright infringement since no diminution of creative activity is likely to follow from VTR use and users would clearly benefit.

The fair-use concept, however, is only an imperfect proxy for a cost/benefit analysis. The economic arguments are considerably more complex. VTR use obviously increases the consumer satisfaction associated with television viewing and probably increases the value of the marginal hour of viewing such that D_V shifts to the right in Figure 1. As I have already explained, economic efficiency would require that the quantity (or quality) of programming should increase to reflect this additional value but such is not the case in an advertising only based broadcast system. It was also noted, however, that any attempt to compensate for movements of D_V would be a piecemeal approach to the problem since the very existence of D_V is not accounted for in the market. A full solution to this problem would appear more desirable than the small partial adjustment which would compensate for the impacts of VTR's on D_V .

If this line of reasoning is accepted, the court need only concern itself with the ability of the market to capture the marginal values represented by D_A . The underlying demand for (quality adjusted) advertising contacts

by advertisers should not be altered by VTR's. Nor should contacts with users of VTR's be of much different value than contacts with over-the-air viewers (although the segmentation effect implies that they should be worth slightly more). If people did not delete ads, the empirical implications of VTR's on viewing habits and segmentation would probably lead to a slight increase in the number of quality adjusted contacts. On the other hand, massive commercial avoidance would cause the number of contacts to decrease. What would be the implications for efficiency if VTR's decreased the number of advertising contacts? Although the revenue generated by these contacts might go up or down, the contacts themselves are not being provided as efficiently as they were before the advent of VTR's. This is true because the total value of television contacts falls, since the quantity of contacts falls, yet the cost of producing the television programs providing these contacts remained unchanged. This loss of efficiency in the advertising medium is not a copyright problem, however, since it does not directly influence copyright holders. It is the change in revenues which affects copyright.

To sum up, VTR's may weaken or strengthen copyright protection, but the total impact is likely to be small (less than 10%). The fair-use exception would seem to be a legitimate defense to infringement because the revenues to copyright holders are not likely to fall significantly. VTR's probably exacerbate the inefficiency due to the externality caused by non-payment by viewers of television but this externality is not primarily caused by VTR's. Finally, VTR's make television a less efficient medium of advertising, but this is not a copyright concern.

5. Some Proposed "Remedies"

If the supreme court upholds the appeals court decision, the remedy which shall be imposed is not yet known. Commentators on this case have often proposed a tax on videotape machines (or tapes), to be disbursed by a copyright tribunal, as a preferred remedy.²⁵ The appeals court specifically went out of its way not to rule out statutory damages (\$250 minimum per infringement),²⁶ or injunctive relief. The economic impacts of each of these three forms of remedy will now be examined.

The effects of an injunction are rather straightforward. An injunction would ban VTR's from being sold, thus keeping any likely impact of VTR's mere potentialities. Copyright holders would be made better off only if VTR's would have reduced television advertising revenues, which we have seen is quite uncertain. The television externality is in no way addressed. Potential buyers and sellers of VTR's suffer a loss in value which could be measured as the sum of consumers' and producers' surplus in the VTR market. The loss in the VTR market would seem likely to dwarf any possible loss of advertising revenues to broadcasters.²⁷ This particular remedy is extremely blunt and would almost certainly reduce the welfare of society.

If the court decides that statutory damages are appropriate, the total amount of damages which might be awarded are uncertain since the number of infringements which the courts would consider relevant cannot be predicted.

²⁵ See Carey Ramos, "The Betamax Case: Accommodating Public Access and Economic Incentive in Copyright Law," Stanford Law Review, January 1979, 243-263.

²⁶ See 17 U.S.C. app. S 504(C) (1976); 17 U.S.C. S 101(6) (1976).

²⁷ It has already been demonstrated that advertising revenues are likely to fall by only a very small amount. On the other hand, all VTR revenues would disappear. Since VTR expenditures per household are probably roughly equivalent to household advertising revenues (\$150/year) the surplus created in the VTR market would only have to be an equivalently small portion of VTR revenues for the statement in the text to be true.

It might, for example, consider each television household owning a VTR as engaging in a single act of infringement; it might consider each use of the machine as a separate act of infringement; or it might find the simultaneous use of the machine by all users a single act of infringement. We also don't know against which party the damages would be brought. Once these questions have been assessed, the court would then have to determine the amount of damages and it is not clear how the court would perform this calculation. It might attempt to measure the impact of videotaping on advertising revenues, but based on the analysis in Section 4 of this paper, it should be clear that such a measurement would be extremely difficult. Or the courts might apply the \$250 statutory minimum damages per infringement although courts have been reluctant to do this when it appears to result in a very large 'windfall' gain to the copyright holders.²⁸

The major proposed remedy seems to be either a tax on VTR's or on videotapes. Both taxes are very similar since both raise the marginal cost of VTR use and both taxes will be paid in part by videotape machine (and tape) sellers and videotape machine buyers. The major difference between these taxes is that the burden of the videotape tax would be borne differently by different VTR users, based on their use of tapes, while the burden of the VTR tax would be independent of how the machine is used.

These taxes will likely cause many inefficiencies. VTR owners who don't delete advertisements would pay the same tax as people who do. Light users of machines will pay the same taxes as heavy users if the tax is placed on machines. Heavy users who keep recording and erasing the same few tapes will pay less than less heavy users who purchase a new tape for every recording, when the tax is placed on videotapes. In addition,

²⁸ See the discussion on page 261, and footnotes 80 and 81 in Ramos, footnote 23 supra.

by increasing the costs of videotaping, the tax will reduce the purchase and use of VTR's, which could cause a significant deadweight loss.

It is also unclear that the revenues generated will promote the creation of new programs in an efficient manner. The behavior of the copyright royalty tribunal, which would probably disburse these revenues in a manner similar to that it used to disburse royalty payments to copyright holders by cable television, has been extremely arbitrary.²⁹ There seems little reason to believe that the copyright tribunal would dispense the VTR tax revenues with any greater efficiency than it has cable revenues.

While it is quite unclear that any remedies are necessary, I would like to propose one which I believe is much more precise than those just discussed. Since the deletion of advertising is the primary cause of videotaping's influence on revenues to copyright holders, it would seem wise to focus any tax on this activity directly. I believe that a tax on remote-control fast-forward (and possibly pause) devices would come close to playing this role. Only by using one of these controls can one avoid commercials (with the pause control one can avoid commercials on future playbacks). The costs of getting up and manually adjusting a VTR whenever a commercial comes on seems high enough to deter advertisement deletion for those VTR owners who don't have remote control; and for those persons who absolutely detest advertisements, other forms of avoidance such as talking, reading, or leaving the room probably already dominate their activity, making them worth little to advertisers. With the tax in this form, people who didn't care about deleting commercials could avoid the tax, as would be

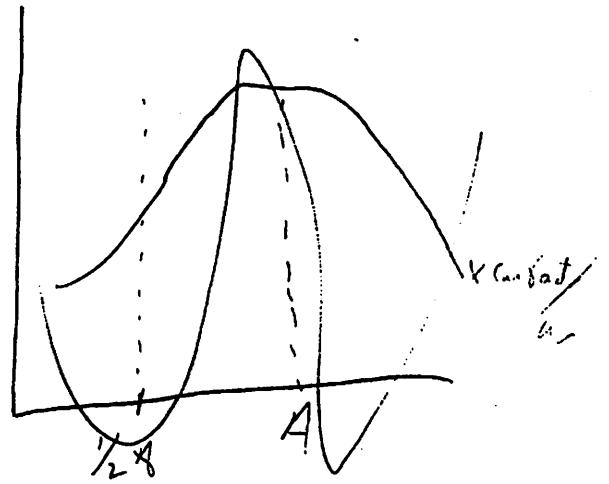
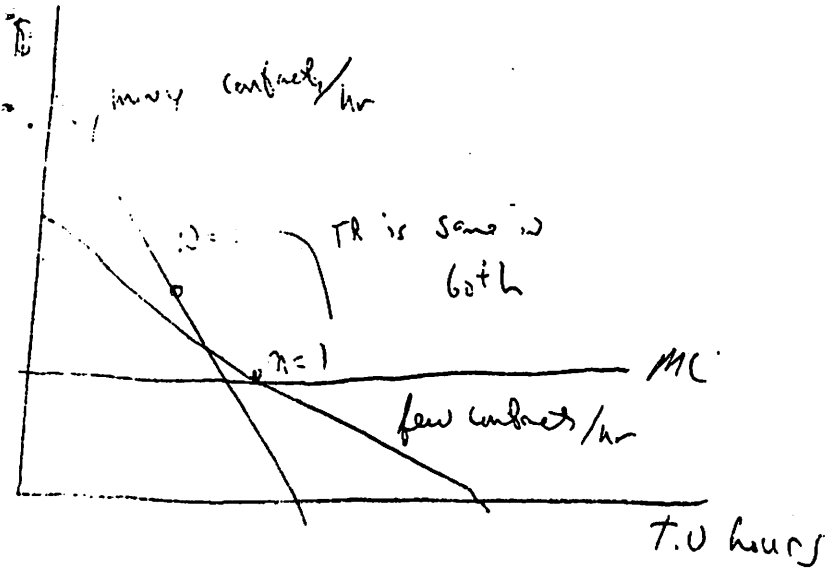
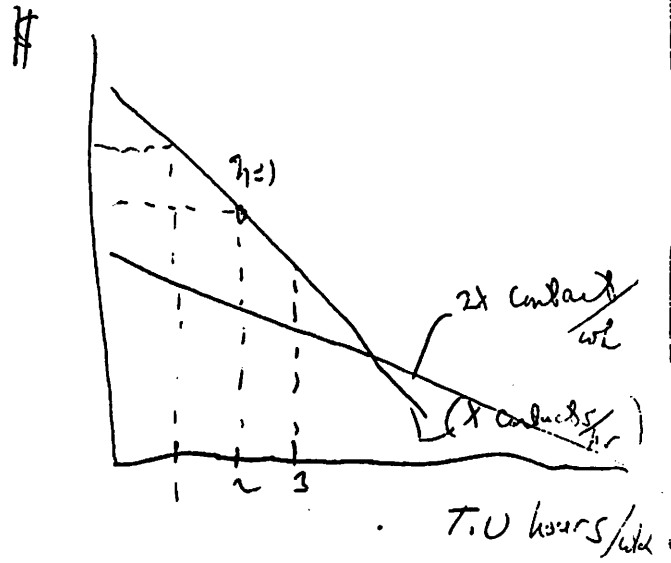
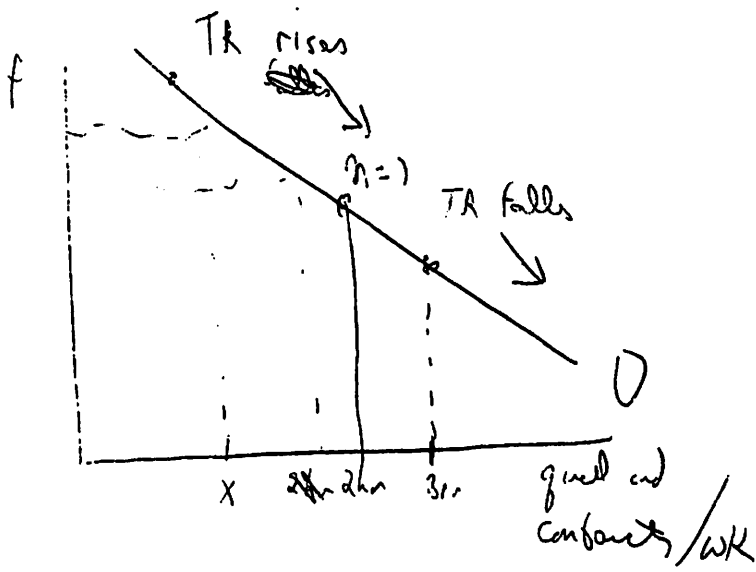
²⁹The cable revenues have been held up in litigation for several years. The proposed allocation of funds appears to bear little correspondence to those shows which generate the most revenues. See Philip Shenon, "Cable TV's Benefactor Comes Under Fire," New York Times, August 9, 1981, col. 1. Also "Nonnetwork Firms Win Royalty Ruling on Cable-TV Shows," Wall Street Journal, July 30, 1980, p. 14, col. 1.

efficient, while those who wanted to delete commercials would almost certainly pay the tax. The extra precision of this tax would cause a much smaller loss in efficiency than the blunter alternatives.

6. Conclusions

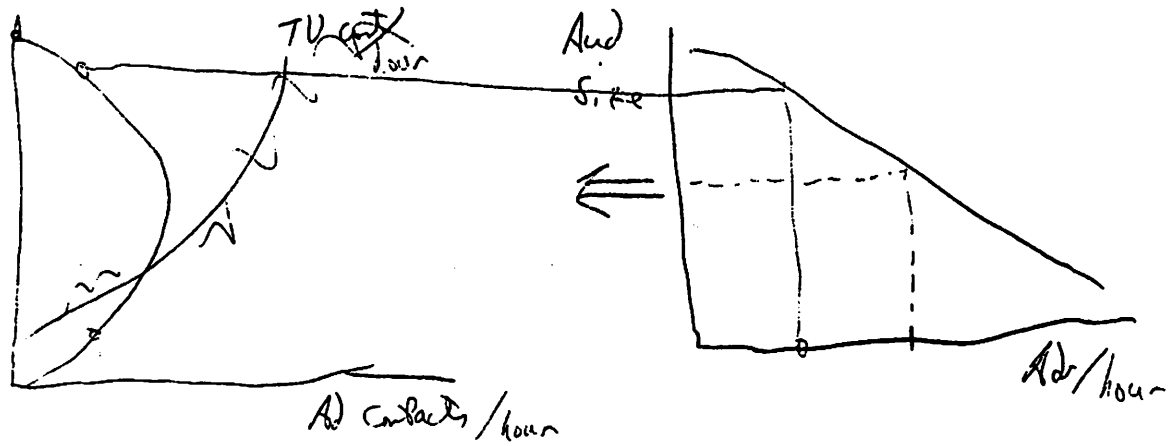
I have endeavored in this paper to examine the economic logic of various aspects of the Betamax case. The primary conclusion to be drawn is that VTR use does not have a simple or well-known impact on copyright holders. It may either decrease or increase their revenues. The courts have not seemed to be at all aware of this possibility. In addition, the total size of this impact, regardless of its sign is not likely to be very large. It is difficult to believe that the courts would not treat this case very differently if made aware of these facts.

I have also attempted to provide an economic rationale for fair-use and to demonstrate that it would probably make sense to consider private VTR use as fair-use. Finally, I have demonstrated that many of the proposed solutions create inefficiencies of their own which may greatly outweigh any possible benefit.



T.O. hours, Audience Size, Ads per hour

Aud
Site



5

