

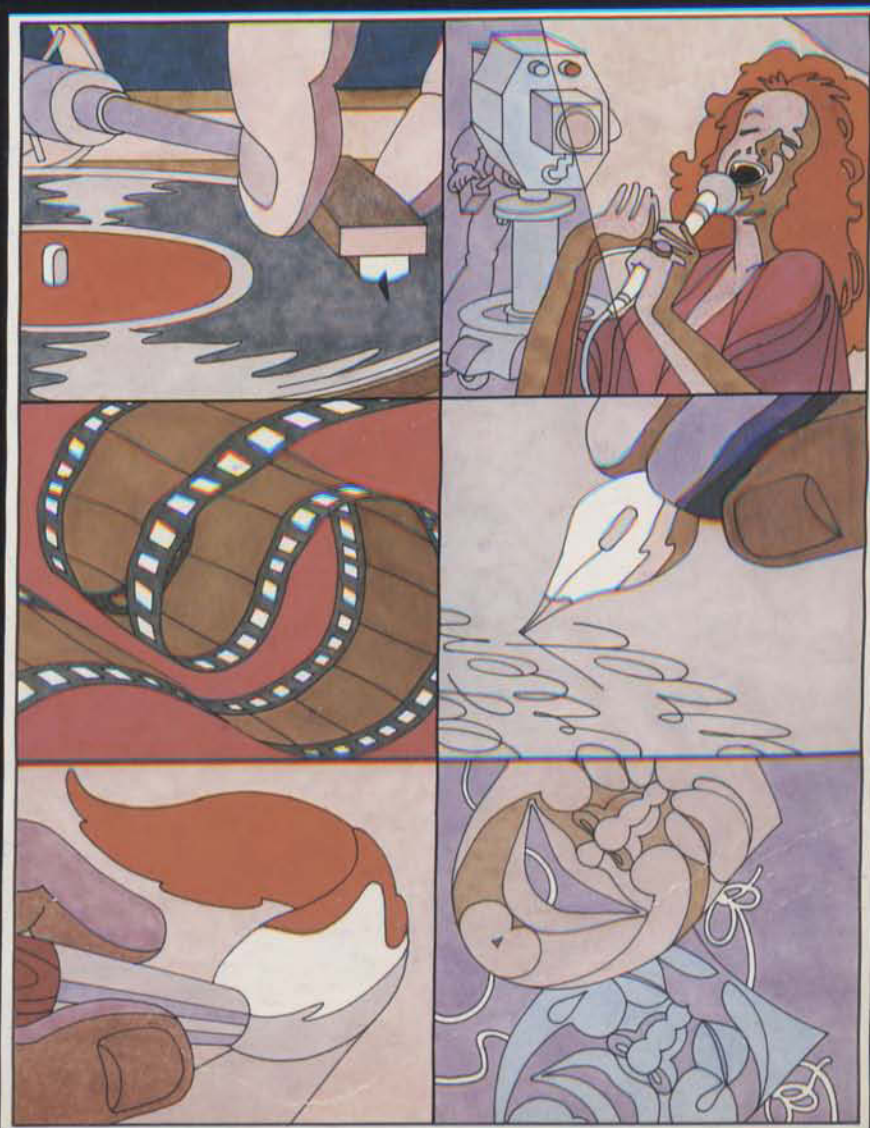


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# Copyright Obligations for Cable Television: Pros and Cons

S.J. Liebowitz



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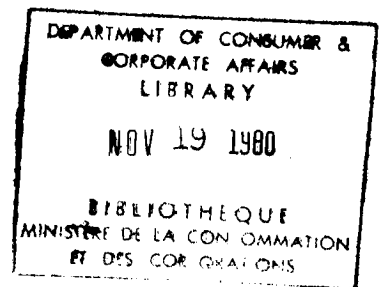
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COPYRIGHT OBLIGATIONS FOR  
CABLE TELEVISION: PROS AND CONS

S.J. Liebowitz  
University of Western Ontario



Copyright Revision Studies  
Research and International Affairs Branch  
Bureau of Corporate Affairs

This is one of a series of studies prepared for the Research and International Affairs Branch, Bureau of Corporate Affairs, CCAC. The analysis and conclusions of these studies are those of the authors themselves and do not necessarily reflect the views of the Department.

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## FOREWORD

This series of studies concerning aspects of copyright law was initiated to provide a better understanding of some important problems and issues involved in the revision of the Canadian Copyright Act. The present Act is now more than fifty years old. The wide breadth of legal, economic and technological developments since the Act was proclaimed underlie the significance of the revision process. The creation and dissemination of information is becoming an increasingly important resource of our society. In addition, the copyright community, including authors, publishers, the film and video industries, broadcasters, the recording industry, educators, librarians and users, contributes hundreds of millions of dollars to the economy. For this reason the Research and International Affairs Branch of the Bureau of Corporate Affairs felt it necessary to undertake in-depth economic and legal research into the cultural, economic and legal implications of the most important of the copyright issues.

With respect to the appropriateness of the economic studies of this series, the following passage from the 1971 study of the Economic Council of Canada entitled Report on Intellectual and Industrial Property is perhaps the most perceptive and eloquent:

It is sometimes implied that where cultural goals are important, economic analysis, with its base associations of the market place, should take a back seat. But this involves a serious misconception of the proper and useful role of economic analysis. It may well be true that in the final analysis, economics is much more concerned with means than with ends, and that the really fundamental "achievement goals" of a society are largely, if not wholly, non-economic in nature. It is also true, however, that, in practice, means can have an enormous influence on ends, whether for good or ill, and that as a result the systematic analysis of economic

means is indispensable both in the specification of social goals and the planning of how to achieve them. In the case of cultural goals, among others, economic analysis can be of great help in bringing about a clearer identification of the goals in the first place, and then in planning for their attainment by the shortest, least costly and most perseverance inducing route.

It is particularly important that the relevance of cultural goals in a policy-planning situation should not be used as a smoke screen behind which material interests and conflicts between private and social interests are allowed to shelter unexamined. In an increasingly service-oriented and knowledge-based society, cultural matters in the broadest sense are to a growing extent what economic life is all about. They must not fail to be studied in their economic as well as their other aspects. (pp. 139-140)

It is within this spirit that the economic studies completed for the Branch have been commissioned and carried out.

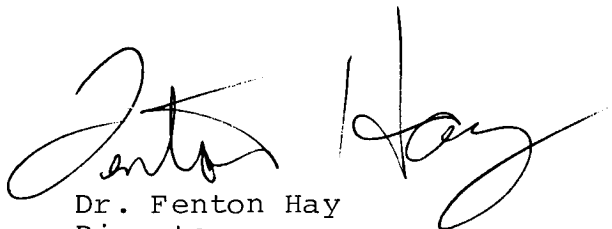
In addition to internal studies, the Branch has contracted with research academics from the Canadian university community who have a special interest in copyright. The external funding of research provides the Branch with new insights and perceptions from some of the most highly skilled academics in Canada with respect to the many complex issues inherent in the revision of the Copyright Act. Additionally, it serves to foster an interest and involvement in these important policy issues amongst others within the academic community. Such involvement and input can only lead to a better understanding and a consequent improvement in the copyright policy formation process.

This study by Professor S. J. Liebowitz of the Department of Economics, University of Western Ontario, is concerned with analyzing the economic justification for requiring operators of cable television systems to pay copyright royalties for the programs which they distribute to subscribers. This issue is typical of the

copyright concerns raised with the advent of new technological methods for the dissemination of material protected by copyright. The author, through his use of rigorous economic and statistical analysis, has succeeded in making a significant contribution to the existing knowledge of the impact of cable systems on the broadcasting industry in Canada. This report should thus prove of interest to members of both the public and private sectors who are concerned about copyright or the impact of technology on our information-based economy.

Subsequent to completion of the main report, additional data in the form of a 1979 Bureau of Broadcast Measurement special survey became available to the author. These data enabled Professor Liebowitz to specify his statistical models with even greater precision. The additional work, contained in the Appendix to the study, confirms the validity of the conclusions of the main report and provides additional explanation concerning certain contentious points in the model.

It should be noted that the results and recommendations contained in this study are those of the author and do not necessarily imply acceptance of same by the Department of Consumer and Corporate Affairs. We believe that this approach is optimal for the purpose of encouraging the researchers to employ the widest scope in both the creation and presentation of their views.

A handwritten signature in black ink, appearing to read 'Fenton Hay', is written over the typed name.

Dr. Fenton Hay  
Director  
Research & International Affairs  
Branch



## Executive Summary

This paper examines the economic justification of imposing copyright payment on CATV (also known as Cable) operators for their retransmission of over-the-air broadcasts. The analysis is conducted on both a theoretical and empirical level. Our major finding is that CATV increases advertising revenues and that imposition of copyright payments on Cable appears unjustified.

In the theoretical section we examine the rationale behind various copyright proposals put forth by Keyes and Brunet, the Economic Council of Canada, and other interested parties. The key assumption implicit in each proposal is the belief that CATV reduces advertising revenues of over-the-air broadcasters and thus copyright payments made by said broadcasters. In each case the motive behind the copyright proposal is to re-establish the copyright payments back to a level which would occur without the existence of CATV.

These proposals differ in the approach taken to re-establish these revenues. In each case, the group in the population which is required to pay the amount necessary to keep these copyright payments from being reduced by CATV is different from the group which would have paid without the existence of CATV. In the text we suggest alternatives which, when compared to these proposals, are most likely to have copyright payments being made by the same segment of the population which would generate these payments without the interference of CATV.

In the paper we also present a short discussion of the advantages and disadvantages of the system used to generate copyright payments prior to including CATV in the generation of these payments. In other words, we discuss the merits of the present system of supporting television programming with advertising revenues. No policy conclusions are made with respect to this subject.

The second half of this paper is concerned with estimation of the impact of CATV on over-the-air broadcasting revenues. There are several ways in which CATV influences revenues of broadcasters.

CATV is known to cause "market fragmentation". In other words viewers in a given locality who might have access to one station, say station X, prior to the introduction of CATV will have, after the introduction of CATV, many more stations which they may watch. Station X's share of the local audience will drop because people on Cable will watch some of the distant stations brought in by Cable. The loss of viewers to station X is the gain to distant stations. On the other hand, viewers in distant localities will be able to watch station X on their Cable and this will tend to increase station X's audience. Even if station X's total audience remains the same, the average distance from transmitter to viewer has increased. This is market fragmentation.

This fragmentation is thought to reduce advertising revenues because advertisers in a given locality might not value viewers in a distant locality as much as they value local viewers. This is due to the fact that distant viewers are less likely to patronize local establishments since these viewers would have to travel a long way to reach them. The existence of national or regional advertisers with outlets in many localities mitigates the impact of market fragmentation since these advertisers are likely to place similar values on viewers in all localities.

We measure the potential impact of fragmentation by determining the relative values of local and distant viewers to advertisers. Our statistical techniques allow us to determine the average advertising rate per person for distant viewers and for local viewers. We find that in general, local viewers are worth twice as much as distant viewers to advertisers. Our confidence in these results is not extremely high due to several factors. First, these results are barely statistically significant; in other words, they are likely to occur by chance one out of twenty times. Second, when we compare the value of local versus distant viewers for local advertisers, the local viewers are worth no more than the distant viewers, contrary to expectations. Third, our data collection regarding local and distant viewers is not very precise and the chances for mistakes are high.

We then estimate the greatest possible decrease in advertising revenues given our previous results. Twenty-six percent of television viewers in Canada are located outside of the broadcaster's local area. We assume that there

would be no distant viewers without the existence of CATV (a very unlikely assumption). The reduction in advertising revenues if distant viewers are half the worth of local viewers to advertisers would be 13 per cent. This is most likely an overstatement of the impact of market fragmentation.

CATV will likely have positive effects on advertising revenues which may or may not counteract the impact of market fragmentation. Since CATV increases the choice of programs available to viewers and since they are willing to pay for CATV, it must be the case that Cable makes television a more attractive entertainment medium. If viewers' valuation of television increases because of Cable we would expect that they either watch more television or watch television more intensely or some combination of these two behavioral changes.

We measure the change in viewing habits brought about by Cable in several ways. First we investigate the relationship between changes in viewing habits and changes in Cable penetration (the percentage of homes in a locality which subscribe to Cable). We expect that those areas which experience large increases in Cable penetration will also experience large increases in television viewing due to the greater diversity of programs available with Cable. This is not the case, however. We find no relationship whatsoever between these variables.

In a second test of the same hypothesis we examine the relationship between the level of Cable penetration in an area and the amount of time people spend watching television. Once again, no relationship is found, contrary to our expectations.

Since viewers obviously value CATV, we must conclude that if they don't watch more television then they must get greater value from the programs that they watch. With the greater diversity of programs brought about by Cable we would expect that viewers would be more likely to find a program which more closely matches up with their tastes in any given time slot. This is the final hypothesis which we test.

Viewers paying close attention to their televisions are more likely to be receptive to television commercials than those viewers who are paying less attention. If one

is not following the plot of the program, it seems unlikely that one could be aware of the content of an advertising message. Therefore, we would expect advertisements to be more effective with attentive viewers and advertisers to value these advertising time slots more highly. Thus Cable, to the extent that it increases viewing intensity, should increase advertising revenues.

The empirical implementation of this hypothesis requires comparison of television advertising rates and the percentage of viewers on Cable for different stations. The latter variable is not directly available. Fortunately, we are able to find a proxy for this variable which is available. This proxy, known as the Herfindahl index, is normally a measure of market concentration. It is related to Cable penetration because people on Cable tune to a greater variety of stations and thus the concentration of leading stations in the market is lower than for areas with less Cable usage.

The relationship between the Herfindahl index and advertising rates (after taking account of the influences of many other variables) is quite strong (statistically significant). High Herfindahl indices (which imply low Cable penetration) are negatively related to advertising rates. This, of course, means a positive relationship between advertising rates and Cable penetration. We estimate that Cable is responsible for a 19.6 per cent increase in advertising revenues. This result includes any influence of the local/distant audience relationship. This finding of the beneficial impact of Cable on advertising revenues is the key result of this paper. It is contrary to the assumptions made by those who have focused only on market fragmentation and proposed the imposition of copyright payments on CATV because of this focus.

Additional evidence is gathered in support of this last finding. Examination of advertising revenues over time does not indicate a negative impact of Cable. Interprovincial differences in advertising rates are shown to be positively related to Cable penetration. We thus have several pieces of evidence supporting our conclusion that CATV increases advertising revenues. The policy implication of this result is that there is no justification for imposition of copyright payment on Cable systems.

The final section of this study is contained in the Appendix. This section is a more precise evaluation of the previously discussed impacts of cable on broadcasters using a data set not available at the time of the original study. Some new and interesting results are generated but the basic conclusions from the original results are unaltered.

This last section also attempts to examine the impact of cable on the viewing of American broadcasts by Canadians. There is evidence that cable does increase the viewing of American stations relative to Canadian stations. This shift towards American stations is detrimental to Canadian broadcasters. However, the positive effects of cable on Canadian broadcasters more than offset this negative impact. The conclusion that Canadian broadcasters are benefitted by cable is more appropriate to broadcast policy than copyright policy but its importance deemed its inclusion necessary.

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## INTRODUCTION

The purpose of this study is to investigate the economic impact of proposals to have Cable television pay copyright fees for their retransmission of television signals of over-the-air broadcasters. Cable companies usually own a large antenna (headends) or sometimes microwave relay systems with which they receive television broadcasts and they retransmit these broadcasts through trunk lines (cables) which carry signals to individual households. They charge a monthly fee for this service and usually an initial installation fee as well. Cable companies are also known as Community Antenna Television (CATV).

Households pay for this service because they are able to receive more and higher quality broadcasting signals than was previously the case. Cable companies usually carry some of their own programming which might be weather and news headlines, stock market tickers or local broadcasting. While these latter endeavors might have a positive effect on the value of CATV to subscribers, it is most likely negligible since viewers do not seem to watch this programming to any non-negligible degree.

Cable companies in Canada are not free to import any broadcast which they wish. The Canadian Radio-Television and Telecommunications Commission (CRTC) has imposed rules specifying a priority system of stations which the Cable companies are required to obey. Cable companies must carry all local stations (with preference given to CBC and educational stations) before importing any distant stations. There are also rules regulating the order in which distant signals can be imported, with the CBC and educational stations again receiving preferential treatment.

Our analysis occurs within this institutional framework. Our work can be separated into two major parts. First we examine theoretical aspects of proposed legislation regarding retransmission of broadcasts. The strengths and weaknesses of our present system of supporting broadcasting through advertising revenues is examined. An analysis of various copyright proposals suggested by Keyes and Brunet, the Economic Council of Canada, and other interested parties is undertaken within the above framework. We shall see that the rationales behind these proposals are very similar and are based on untested empirical assumptions. We then examine the potential impact of Cable on broadcasting revenues.

The second half of this paper is empirical in nature and is an attempt to estimate the magnitude of some of the effects discussed in the first half. First the data

are described. Then we measure several relationships which underly the basic relationship between CATV, broadcasting revenues and copyright payments. The results do not support the rationales behind proposals to have CATV operators make copyright payments for the retransmission of broadcasts.



## PART I

### THEORETICAL ASPECTS OF COPYRIGHT PROPOSALS

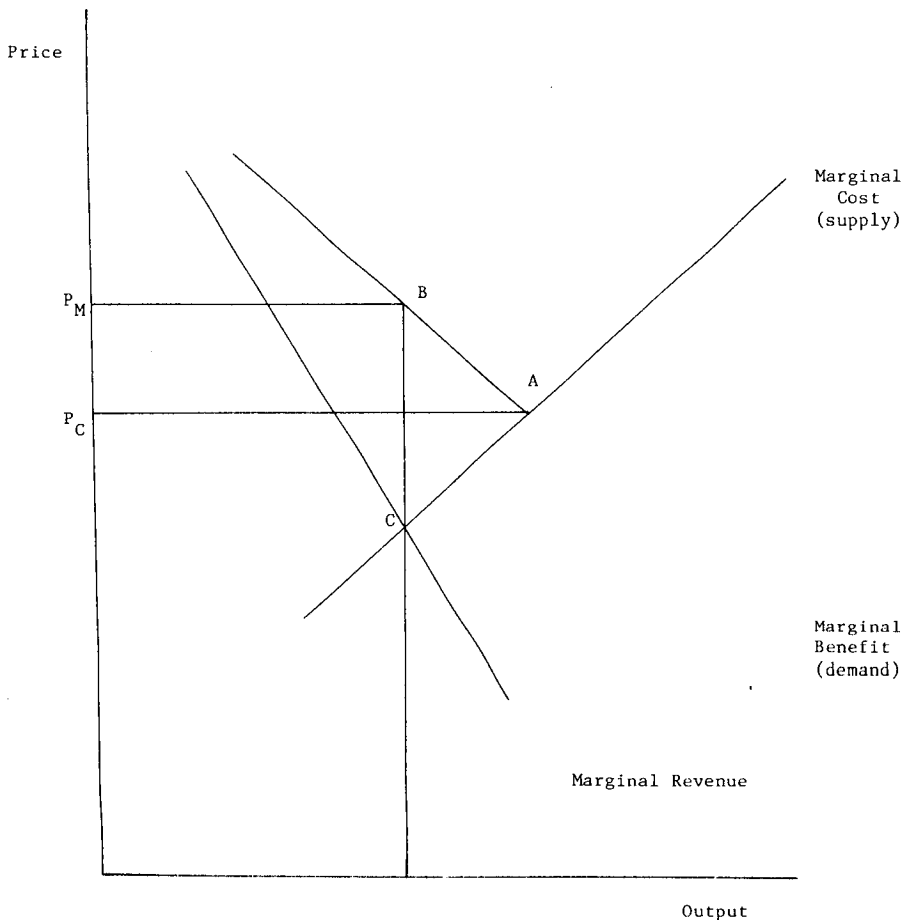
#### PAYMENT BY ADVERTISING

Our primary focus in this paper is to determine the impacts of various copyright proposals on the major parties involved. One of our concerns is the impact of these proposals on the well being of the public. In order to make this latter assessment, we will use some traditional techniques found in economic welfare theory. We shall assume that the public is benefitted when a proposal increases efficiency and thus total wealth of the public. This public impact is divorced from any particular impact on various members of the public, some of whom may be worse off even though the public as a whole is better off. The concept of Pareto optimality is implicit in this technique. Pareto optimality is a state where no one can be made better off without making someone else worse off. This can only occur when goods are efficiently produced.

The efficient production of a good requires that it be produced if the total benefit is greater than the total cost and that it be produced up to the point where an additional unit imposes greater costs than the benefit created (point A in Figure 1). In the case of copyrights we wish to reward copyright holders to the extent that all works whose value exceeds the cost of production are produced. Giving a monopoly to a copyright holder is an attempt to allow him to extract as much of the value of the good as possible from the public.

Once the good has been produced, a monopolistic copyright holder will cause losses to society by refusing to reproduce the items in the most efficient quantities. The profit maximizing price (point B in Figure 1) causes an output less than that at which the production costs just equal the value of an additional unit. The loss to society is equal to triangle ABC. The dilemma of copyrights is that removal of

Figure 1



this inefficiency is likely to reduce the production of copyrighted works since the benefit perceived by the potential copyright holder has been diminished. Thus we have either an inefficient creation of copyrighted works or an inefficient distribution of these works once they are created.<sup>1</sup>

---

1. This topic is well known in the literature. For more detail, see Chapter 3 of the Economic Council of Canada's Report, Chapter 2 in Keyes and Brunet or Chapter 16 in Scherer.

The market for television broadcasts is unique in many respects. Television broadcasting has many of the attributes usually found in public goods. Public goods are defined as those goods where one person's consumption does not diminish anyone else's consumption. For this reason, they are dissimilar in many respects to normal goods and are analyzed in a somewhat different manner.

The efficient provision of public goods is not easily achieved. If potential users can be excluded from consuming the good, a price mechanism can be effective in collecting revenue. With perfect information, a multiple part pricing mechanism (perfect discriminatory pricing) could collect revenues equal to the total value of the item in question with no potential users being excluded. This is an optimal solution in an optimal world but the assumption of perfect knowledge is patently false.

Demsetz has shown that exclusion of potential customers may be efficient in a world with transactions costs. He has also demonstrated the feasibility of producing public goods privately. The present system of provision of TV shows is primarily private. There are several major problems with the financing of TV shows with the present institutional arrangements.

Television revenues are now derived from advertising revenues. This method is inferior to the normal price mechanism in responding to viewer wants. This problem stems from two main factors. (1) Viewers can't express the intensity of their desire to watch particular shows and (2) the advertiser's customers may not contain the total audience. Conversely, people who pay for a show may not value it at all.

The first point arises because of the information available on audiences. The television rating services basically measure only whether a particular household or person watched a particular show. The degree to which a person values the show is unknown. With a price mechanism, the value of a show to a person is revealed in the price he is willing to pay for it.<sup>2</sup>

---

2. In fact, we shall later see that advertisers are in fact aware of the intensity of viewership. This is not necessarily true between shows but between various geographic areas they appear to be aware of distinctions.

The second difficulty has to do with the fact that certain members of the audience may value the TV show very highly and yet no advertiser may particularly feel it efficacious to appeal to the viewers who may not react, say, to advertising messages. If a particular show appeals to many members of the audience who are not influenced by advertising the mismatch of audience and advertisers may lead to a lack of advertising revenue on the part of the broadcasters and eventual removal of the show from the air.

A further problem with the present system has to do with the fact that many beneficiaries of advertising (those who watch shows supported by advertising) do not pay for the advertising (by buying the advertised item which is priced to cover advertising expense) whereas many of those who pay do not receive the benefits. However, no one is excluded from the present system. With pay TV some viewers who do not value the program sufficiently to pay the price will be excluded from watching. Since there is no extra cost to society in letting these persons watch, it is thought to be more efficient not to exclude anyone. This is one of the few advantages of the present system.

Since the value of a show to society may be quite different from what advertisers pay for it, creators of a show might not feel properly rewarded.<sup>3</sup> However, if advertisers pay too little the supply of shows will not equal the demand and the price will rise. This is known as a disequilibrium situation.

It should be remembered that there are many goods whose value to society is not fully reflected in the price or revenues generated by the good. The diamond/water paradox is a well-known example of this. Water is clearly of more value than diamonds and yet water commands a lower price. This is due to the greater scarcity of diamonds relative to water. The scarcity of a good is a prime determinant of the price.

All in all it seems fair to say that the present system of television payment through advertising is quite inefficient. A system of pay TV could in principle alleviate

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3. This likelihood is mitigated by the fact that substitutes such as movies exist and if a show is much more valuable than advertisers are willing to pay, it will most likely find one of these other outlets to be more attractive.

many of the problems. This alternative is not one to which we shall devote much time. Further discussions will measure the deviations from the present systems caused by copyright proposals. We shall not be questioning the efficiency of payment by advertising again. We assume that the present system is working fine prior to the introduction of CATV television.

#### ANALYSIS OF VARIOUS PAYMENT SCHEMES

In order to analyze proposals put forward by Keyes and Brunet, the Economic Council and others we must have an understanding of their intent. Copyrights are given by the government in order to reward individuals for their creative efforts. By giving these individuals a monopoly on their work the government has allowed these people to reap the maximum reward for their efforts. Assuming that this is a wise policy, we will concern ourselves with the preservation of these rewards and the impact of CATV on these rewards.

The compensation that copyright holders of television programs receive is determined to a large extent by the advertising revenues generated by the program (see the section "Transmission of Advertising Revenues" below).

It is argued by proponents of copyright legislation such as Keyes and Brunet that CATV will reduce these advertising revenues and copyright payments. The payment systems discussed in this section are all attempts to prevent CATV from reducing advertising revenues.

It is thought that CATV will reduce advertising revenues because of "market fragmentation". Market fragmentation (discussed more fully in Part II of this paper) occurs when viewers stop watching local shows and start watching shows which originate from distant areas when Cable makes these distant shows available. The advertisers in these distant areas are thought to value these local viewers less highly than local advertisers, leading to a net reduction in advertising revenues. Under this scenario the increased advertising to the distant station is more than offset by the decrease in advertising to the local station.

Some copyright proposals take this argument into account and propose that Cable companies only pay copyright fees to the extent that they are responsible for fragmenting the audience. These proposals (signal coverage and the Economic Council solution) specify conditions under which payments will or will not be made. Other proposals (compulsory

licensing, joint payment, strict copyright) are basically concerned with developing a workable system of payments and do not differentiate between instances where Cable decreases advertising revenues and those when it does not. All proposals take for granted the supposition that Cable does reduce advertising revenues. Testing this supposition is our task in the second half of this paper. In the following analyses we shall assume that Cable does decrease advertising revenues.

### Signal Coverage

This proposal attempts to impose copyright payments on Cable companies only to the extent that they decrease advertising revenues. Under this proposal the increases in "distant" audiences due to Cable are measured and copyright fees are a function of the increase in distant audience.

As defined by Keyes and Brunet:

Under this system, where a cable service duplicates the signal coverage of a local broadcast, no payment would be made; where the cable system extends the audience reached by the signal of the broadcast, provision for payment would be made only to the extent of the increase. The theory is that broadcasters pay royalties, through negotiations prior to broadcast, on the basis of broadcast revenue to be derived from the "normal" reception market area. (p. 141)

The payment referred to in the above paragraph would be determined by the copyright tribunal. Deletion of advertising would be considered tantamount to extension of the audience (even to a local audience) and royalties would be charged to Cable companies.

The comments regarding rediffusion of local broadcasts are easily understood. As long as CATV rediffuses the local programming intact in all forms, customers of CATV merely benefit from superior reception. Local advertisers should value any additional local Cable viewers as equivalent to local non-cable viewers. It is reasonable to expect that advertisers will compete more aggressively for time slots in the programming and that the advertising rates (price) and revenues will be bid up. Under most reasonable conditions (which we shall detail below) we would expect the higher

advertising revenues earned by the stations to be passed on (in part) to the creators of television programming.

The provision whereby payment would be made for that part of the audience which was newly reached due to CATV makes sense when the newly reached audience is less valuable to advertisers because they are far away. It should be made clear, however, that the definition of extended audience includes only that part of the audience which lies outside the natural broadcasting sphere of the television station. Increases in audience brought about through increased viewership within the broadcasting sphere (e.g., due to better reception on Cable) should not be considered an extension of the audience since no station is losing these local viewers.

In fact we have come to the major problem with signal coverage as defined by Keyes and Brunet. The purpose of signal coverage is to eliminate any negative influence of CATV on advertising revenues. When local viewers from the audience of a local station switch to a distant station local advertising revenues fall.<sup>4</sup> Signal coverage does not measure the loss of viewers to local stations but instead it measures the gain to distant stations. The two will only be equivalent if there is no change in viewership at all when CATV is introduced. Signal coverage would make more sense if it measured the gain to distant stations which came from local stations instead of just the gain to distant stations.

The extension of the audience into more distant regions will reduce the revenues to television stations and producers of programs if the distant (extended) audience is worth less to advertisers than the local audience. In order to prevent CATV from reducing revenues to copyright holders, it would be necessary to charge a copyright fee (to the offending Cable company) equal to the difference between the valuation of the extended audience to advertisers in the city of program origination and the valuation of this audience to the advertisers of the local stations which lost them. The empirical work in Part II will enable us to determine the different valuations placed on local and distant stations.

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4. Part II is concerned with measuring these effects.

If CATV deleted advertising messages the connection between audience and payment for viewing would be completely severed.<sup>5</sup> In this case the audience watching the CATV would be classified entirely as an "extended audience". Advertisers will not value these viewers at all and broadcasters and program producers will lose much more revenue than would be the case with simple extension of the audience and the accompanying fragmentation of the market. In this case payment by the Cable companies should be equated to the total value of the CATV audience to advertisers before these people were given the option of watching CATV.

An interesting situation would arise if the Cable companies are allowed to delete the original advertising. Under signal coverage they are to be charge an amount equal to the lost advertising revenues caused by CATV. Cable companies must somehow generate enough revenue to make these payments. If Cable companies were previously earning only normal profits they would be forced to conduct business in a somewhat different manner if they wished to keep solvent. If they delete all advertising they can either raise CATV rates if viewers prefer to avoid advertisements or sell the slots on their own. The alternative chosen will tend to depend on whether viewers value the lack of advertising to a greater or lesser extent than advertisers value the time.<sup>6</sup> If Cable companies are forced to pay for a reduction in advertising revenues they should be allowed to sell advertising themselves if it increases total revenues. In this way those who value the advertising time the most will get it. To disallow this possibility reduces society's welfare.

#### Joint Payment

This is a rather vague proposal to require copyright owners and broadcasters to take account of the impact

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5. Under present regulations this behavior is not allowed. It is also the case that Cable companies are not allowed to sell their own advertising although we will analyze this possibility. The government also regulates the monthly fees charged by Cable companies.
  6. We use the term "tend" in the last sentence because the value of a product is not equal to the revenue it generates and sometimes that good which generates the greatest revenue does not yield the greatest value.



of CATV while negotiating the broadcasters' copyright payments. According to Keyes and Brunet:

Another solution would be to require copyright owners and broadcasters, when negotiating for authorization to broadcast, to take into account the possibility of a broadcast being rediffused by cable systems. It is possible to envisage a provision in the copyright law requiring that any broadcasting fee negotiated between copyright owners and broadcasters reflect the larger audience reached by rediffusion of the broadcast signal. In turn, cable systems could be required, under the Broadcasting Act to reimburse the broadcaster for the additional cost of paying for the cable audience. (p. 142)

This proposal seems unmanageable and unnecessary. If the rediffusion of CATV increases the audience, we would expect advertisers to be willing to bid up the price of advertising slots. If the new audience is not worth anything to advertisers, broadcasters would not be willing to pay a larger amount to copyright holders. The value of the additional audience should be reflected in the price established between the broadcasters and advertiser without any special provision for CATV.

Forcing the broadcasters to pay more and reimbursing them by taxing the CATV operators could lead to some economically inefficient and bizarre situations. For example, assume that the broadcaster negotiates the rates with the copyright holder. If he can pass any additional payment off to the CATV operator he will have no incentive to bargain for a low price. This will lead to the CATV operator being squeezed for as much as he can give by the copyright owner. There are forces at work to prevent this situation from occurring. The CATV operator can pay the broadcaster to bargain more effectively in the CATV operators' interest. Of course the copyright holder can also pay the broadcaster to bargain ineffectively (from the CATV perspective). The fact that the broadcaster and copyright holder jointly are in a position to squeeze any profits from the CATV operator makes it likely that the CATV operator will be pushed to the limit.

A profit-maximizing union of the copyright owner and broadcaster has two possible strategies. The first is to remove all profits (economic profits exclude the normal return to an investment) from the CATV operator. In this case the CATV operator will stay in business and the increase

in wealth to the two partners will be equal to the present value (discounted value) of the future stream of payments into the indefinite future. On the other hand, the partners can maximize the CATV's short-run payments by reducing his revenues to the point where he is just covering his average variable costs. In the case of CATV, where there are long-lived fixed costs (e.g., the trunk lines and major antennas carrying the signals), this may have the effect of extracting considerably more revenue than the first instance even though it will not last indefinitely. When it comes time for the CATV operator to replace his fixed capital, he will shut down and go out of business. The fact that this may not happen for a long time makes it likely that this will be the optimizing strategy for the broadcaster/copyright holder team. If the Cable company was not earning any economic profit to begin with, we can be sure that the latter strategy would be the one picked by the negotiating partners.<sup>7</sup>

It is not always the case that broadcasters will maximize their profits, as a group, by removing all profits from CATV. Broadcasters, as a group, may benefit by driving out some CATVs and collecting higher prices from the remaining CATVs if the reduction in CATV companies increases the price which can be charged by CATV companies. This does not seem realistic, however, as CATV companies do not generally compete for the same audience and removing some CATVs will not influence the price which others can charge.<sup>8</sup>

It is not in society's best interest (as far as its total wealth) to allow the broadcasters and copyright holders to drive the CATVs out of business. In the case where CATV profits were driven to zero, we merely had a redistribution of wealth from CATV operators to broadcasters and copyright holders and there are very few positive welfare implications which we can make. The presence of

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7. The CATV operator is not able to fully pass on these additional costs because the demand for his product is not perfectly inelastic. As his price is forced up, fewer people will use the CATV and this will reduce his profits. If this were not the case he could raise his price and profits to infinitely high levels at his discretion.
  8. We must also remember that CATV subscriber rates are regulated and can not be raised at will. In addition, if broadcasters collude the government may use anti-combines legislation against them.

economic profits in the CATV industry could be indicative either of monopoly power or a disequilibrium situation. If it were indicative of monopoly power, we would wish to increase the competition between CATV operators so that a more optimal amount of CATV services would be produced.<sup>9</sup> Transferring the profits would have no particular deleterious effects. However, if the profits were indicative of disequilibrium, where profits act as a spur to new productivity, the transfer would have a detrimental effect and should be avoided if possible.

Instead of assuming that broadcasters negotiate with copyright holders, a more realistic scenario might be to have the government determine, through a formula, the increase in price which the copyright holder could charge and which the CATV must pay. It is unlikely that there would be any benefit in having the broadcaster act as a middleman in this instance. Such a system is obviously not one of "joint payment" and belongs under the rubric of either compulsory licensing or strict copyright payment.

#### Compulsory Licensing and Strict Copyright Liability<sup>10</sup>

The system of compulsory licensing is one where users of copyrighted material pay for its use without negotiating with copyright holders directly. Instead, a tribunal determines the appropriate fees for the use of a work and anyone wishing to use the work may, as long as he pays the license fee. The fee may be paid into a general fund and not directly to the copyright holder.

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9. Government regulation is another possible solution although a difficult one to manage properly.
  10. Compulsory licensing is a particular type of copyright payment system. Full copyright liability implies that copyright owners negotiate the prices for use of the copyrighted materials with each user. Compulsory licensing, as explained in this section, eliminates the need for these negotiations and thus is analyzed along with full copyright liability.

The 1976 General Revision of the Copyright Act in the United States imposed compulsory licensing of copyrighted television programs with respect to use by CATV television systems. The CATV systems are required to pay a specified percentage of revenues to the Register of Copyrights and these proceeds are distributed to copyright holders in some unspecified manner. It seems reasonable to assume that compulsory licensing for Canadian CATV operations would have many features similar to the U.S. law.

Compulsory licensing has several advantages and disadvantages in comparison with granting a private right to exclude to the holders of copyright. The right to exclude, implied by strict liability, means that a Cable system cannot retransmit a particular program without the permission of the copyright holder.

The major advantage of compulsory licensing is the reduction in transactions costs brought about through the elimination of the bargaining process between copyright holders and those wishing to use the copyrighted work. The cost of these transactions is unknown and estimates by those studying the problem vary. From Johnson:

Not only would fees paid to copyright owners constitute an added cost to CATV operations, but CATV operators assert that the sheer mechanics of the clearance process would be formidable, ... . Clearance on a continuous basis for several channels allegedly would require massive paperwork--a potentially serious burden. (p. 17)

On the other hand:

If full liability for retransmission had been imposed, then contracts and institutions would have developed to facilitate negotiations. Independent stations do manage successfully to complete negotiations for programs for their broadcast day ... . The use of selling and purchasing agents...could exploit the economies of scale to...reduce negotiation costs. (Besen, Manning and Mitchell, p. 29)

Regardless of the magnitude of these costs, their elimination is clearly a good thing. What then are the disadvantages of compulsory licensing?

A fundamental weakness is that the licence fee need bear no resemblance to the market value of the program. If license fees are inflexible, some shows which have license fees below market valuation which the public would wish to have broadcast and carried on CATV won't be; in other cases when the value of the show to CATV viewers is greater than the license fee, the copyright owner will not be able to capture the difference.<sup>11</sup>

For example, assume that the value of the retransmission was such that consumers would be willing to pay an amount much greater than the licensing fee and other costs. If the amount broadcasters are willing to pay plus the license fees are below the costs of production the program will not be broadcast or rediffused and both copyright holders and the viewing public will be worse off than if a copyright fee more than the license fee could be agreed upon.<sup>12</sup>

On the other hand, assume the value of the retransmission was greater than the license fee. The copyright owner has no chance of getting a higher price because he has lost the right to exclude. Under a system of strict copyright liability, the copyright owner would have a chance to gain some of the additional revenue by threatening to exclude the CATV system. This would benefit the artistic community. This would be a case of increasing the financial incentives for creative work without decreasing the distribution of the copyrighted good.

This leads to our next point. Copyright liability allows for the setting of various prices for retransmission. Compulsory licensing only allows for a fixed price (or set of

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11. Besen, Manning and Mitchell, p. 28.

12. Besen, Manning and Mitchell, p. 28. This merely says that imposing a fixed price hurts both producers and consumers. If automobile prices were set at \$4000 producers of Cadillacs would stop production and many Chevette customers would no longer wish to buy the former car of their choice.

prices). Compulsory licensing will reduce retransmissions if the license fee is increased, say, in the desire to increase rewards to artistic effort (assuming the license fee is below the monopoly level). Strict liability allows price discrimination to achieve the same ends (increased revenues) without reducing retransmissions.

There are other problems with compulsory licensing. The mechanism which will determine the license fees will not likely be as flexible as market negotiations, because the royalty tribunal will not have the same incentives as the market participants. It is also possible that a license fee will be set which will bear little relationship to the market value.

An example of this can be found in the present Canadian copyright law. A compulsory license was given to sound recordings under the terms of the 1921 Copyright Act. At that time a license fee was established which remained in effect for more than 57 years even though prices and conditions in the recording industry have changed radically over the last half century. We even find the royalty being negotiated in some cases.<sup>13</sup>

Another more important objection has to do with the distribution of the license fees. The reduced transactions costs brought about by using compulsory licensing are due to the fact that the relative value of individual programs is not negotiated. When license fees are distributed it is unlikely that the split will reflect the appropriate market value of the shows. The creators of popular shows would most likely wish to get a larger share of the pie than average. Compulsory licensing proposals don't seem to address this question.

This distribution problem is not absent in other uses of compulsory licensing. For example, with respect to sound recordings, the license fee is paid directly to copyright holders under Canadian law. (Why CATV payments under the U.S. compulsory licensing law for CATV are not sent directly to copyright holders is a puzzling question.) Under Section 19 (6) the law states that if there is more than one copyright holder on the side of a record, they will share the payment equally. This arbitrary distribution is likely to make some copyright owners distraught, but not to

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13. Keyes and Brunet, p. 101.

the same degree as television program copyright owners. This is due partly to an informational difference between these two cases.

Copyright holders on songs don't usually know to what extent their song was responsible for the sales of a record. When an artist picks songs for a record he usually picks a combination of songs that will do well together. In addition, records tend to be sold based on the performance of a song as well as the song itself and few copyright holders could demonstrate that their song was responsible for the success of a record. Television copyright owners have more information on which to form an opinion. The rediffusion of a show does not alter the content. Several rating services give information on the popularity of various television programs. From these ratings the copyright owners can judge whether their show is more likely than other shows to induce people to purchase a CATV service. The range of popularity of various shows is probably greater than that of songs on a record (of which there are usually less than five on a side) and thus there is more likely to be resentment by copyright holders of popular shows over an equal distribution of license fees for television copyright holders.

It is quite apparent that compulsory licensing has both advantages and disadvantages. If it were found that the transactions cost savings were in fact of a small magnitude, a system of strict copyright liability would be preferable as far as rewarding creators of shows most highly valued by consumers. It would also lead to more rediffusion and greater royalty payments. Whether greater royalty payments are beneficial to society is another question altogether, which we shall answer in Part II.

### Economic Council Solution

The Economic Council has proposed that CATV not pay royalties for rediffusion of unaltered television signals with advertising. When advertisements are deleted, or for programming with no advertisements, it recommends that the CATV systems be liable for copyright payments, though the form of these payments is left unspecified.

The Economic Council was aware that advertising revenues reflect audience size and implicitly assumed that the market fragmentation caused by CATV would not greatly alter advertising revenues. They felt that this result was

likely because those advertisers who value fragmented audiences the most (national advertisers) can replace local advertisers if the audience becomes fragmented. This position is reasonable but in fact may or may not be empirically true.

The argument for royalty payments when advertising is deleted is sound. With no advertising messages in the rediffused program, advertising revenues would be lower than would be the case without CATV. Broadcasters and copyright holders would both be hurt by a policy of commercial deletion. If the Cable company replaced the advertisements with its own advertisements, its revenues would increase. The Cable company would, in this case, be free riding and this is not an efficient situation.

For rediffusion of non-commercial television the arguments are somewhat different and the Economic Council is not correct. The Economic Council says: "... where the cost of the wireless broadcast was not carried by advertising the cable company might be required to provide appropriate recompense to copyright owners..." (p. 176) Non-commercial TV which is paid for out of voluntary contributions need not be compensated for royalty loss since its royalties were non-existent to begin with. All viewers have the choice of being free riders and there is no reason why CATV viewers should not be allowed to free ride also. The production of these shows may not be efficient but it is the nature of non-profit institutions that the level of output they produce bears little relationship to market solutions.

An exception to this might be a case of local programming which is sponsored by a local government. In this case the local viewers do pay for the show when they pay taxes, and if we aggregate people into communities we could say that other communities shouldn't get a free ride at this community's expense.

The Economic Council solution begs the question as to the appropriate form of copyright payment in those cases where copyright payment is mandated. Our other sections cover this question.

The solution proposed by the Economic Council makes an assumption which is the opposite of that made by the proponents of signal coverage. The Economic Council assumes that the value of new audiences to advertisers is negligibly different from the value advertisers place on the old audience. Signal coverage makes sense under the



assumption that the new audience has a zero value to advertisers. The truth probably lies between those extremes and we will test this proposition in Part II.

### The Keyes and Brunet Solution

Keyes and Brunet recommend a "rediffusion right" in broadcasts. This solution is a contrivance to avoid copyright payments to non-nationals while increasing such payments to Canadians. This potential avoidance is made possible by the international copyright conventions to which Canada subscribes.<sup>14</sup> Copyrights for programs are covered under these conventions, so that Canada must treat nationals and non-nationals alike. Broadcasts are not covered by the copyright conventions to which Canada subscribes, so it might be possible, in theory, to grant domestic broadcasters rediffusion rights without doing the same for foreign broadcasters. Keyes and Brunet are quite forward in stating their objective:

It is submitted, however, that it is possible to arrive at a solution that respects Canada's international commitments and abides by the principles of copyright law, yet does not increase the present imbalance of international copyright payments. (p. 142)

These payments are to be paid in a manner analogous to compulsory licensing. Keyes and Brunet envision the payments of Cable companies being made to a central body which distributes the proceeds among the broadcasters. Keyes and Brunet propose that this tribunal assure that some of the proceeds go to the (Canadian) program suppliers.

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14. Whether or not Canada can avoid these payments is a contentious question. Barry Torno, in a paper prepared for the Federal Government Interdepartmental Copyright Committee, has cast doubt on this possibility. Brunet, in a paper for Rogers Cable Television, also recently rejected this as a viable plan.

Keyes and Brunet assume that CATV reduces revenues to program suppliers (and broadcasters). They do not detail the extent of this loss nor the appropriate amount of royalties to be paid by CATV operators. Their main concern seems to be focussed on increasing domestic program suppliers' revenues without violating international copyright laws. The major economic issue involved is not a primary consideration to them. In addition, Keyes and Brunet propose that Canadian broadcasters only receive royalties for the Canadian content of their broadcasts. This will increase the value of Canadian shows to broadcasters and will reduce the value of these shows to CATV operators. The CATV operator could avoid copyright payments if he refrained from retransmitting Canadian shows. Under present CRTC regulations which do not allow unauthorized signal curtailment this is not a viable option.<sup>15</sup>

Since they appear to favour a compulsory license type of solution, this would appear to be the appropriate framework in which to judge the economic impact of their proposals. It is different from our previous analysis of this payment type only because the beneficiaries are the broadcasters and not the program suppliers. This will have the effect of reducing payments to program suppliers to some level below the amount of copyright payment by CATV operators. This will be the case because broadcasters will need to be compensated for the cost of their involvement in the system and because the broadcaster is unlikely to pass on the entire increase in revenue to program suppliers. The degree to which the additional revenues are passed on is dependent on how the disbursements of the copyright tribunal are made.

If the payments are divided equally among broadcasters, an individual broadcaster would have no increased incentive to purchase more popular programs and the copyright disbursement would not increase his demand for programs nor the price he pays for them. He would tend to keep this payment and not have it influence his decisions since it is equivalent to a lump sum payment (or tax). Only if his disbursement is a function of his behavior will he change his behavior. For example, if payments were a function of audience size (on Cable) we would expect competition among the broadcasters in an attempt to increase their audience and this will increase their demand for programs and much of the copyright payment would be passed on to program suppliers. Thus Keyes' and

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15. See 1976 Cable Television Regulations, p. 8.

Brunet's proposal to force broadcasters to pay program suppliers might not be farfetched although how it would be implemented is uncertain.

### Other Forms of Payments

Central to all the previous proposals was the belief that program creators (the artistic community) were underpaid for their services. The particular cause of underpayment was thought to be the introduction of CATV. Implicit was the belief that it was at least necessary to bring the payment level back to that which would exist under the system of advertising without CATV. All of the proposals above are capable of achieving this result although with varying impacts on other segments of the economy. We know that a sufficiently high royalty will either succeed in raising the necessary revenue or drive CATV operators out of business. If the latter possibility comes about the payment level will be equivalent to the original since there will be no CATV to change revenue patterns.

All of these proposals have attempted to charge the Cable companies (and thus the viewers) for use of the programs. This result is seemingly more in line with traditional efficient allocations than is the case with over-the-air broadcasting. As mentioned in an earlier section, the viewers of over-the-air television do not pay for their use of the programs except in their role as product consumers. The burden is then spread around in a manner which is randomly related to use (except to the extent that the advertising greatly affects consumption habits).

We thus find ourselves in somewhat puzzling circumstances. The over-the-air television market does not charge only consumers of programs. Other segments of the community help pay program suppliers. Under the various copyright proposals discussed previously, the users of CATV are charged for their viewing of a show. Thus over-the-air viewers are treated in a manner dissimilar to CATV viewers. There is a way to bring back the status quo, if we so desired.

CATV viewers would be treated the same as over-the-air viewers if the government were to raise the requisite royalties (previously to be paid by CATV) by taxing television advertisers. The tax could be a function of the amount of television advertising. If this were done

advertisers, and thus the customers of the advertised products, would pay for the program as they would without CATV. The only difference (aside from the costs of administering the taxes) would be that the advertisements would be less attractive than they were prior to Cable and the advertisers might switch to other advertising mediums. All television viewers would be treated the same under this proposal (none pay directly for the programs) even though as a general principle we would want viewers, and not the public, to pay for the programs.

A second way to equate these two types of viewers is to go to a system such as that used in many other countries whereby owners of televisions are taxed a flat amount when they purchase the television, with the proceeds being used to finance television programs and broadcasts. The disadvantage of such a system is that the government must then disburse these revenues among television broadcasters and/or networks. Conceivably, however, the money could be doled out to stations or networks based on the number of viewers reported by the various measuring institutions such as Neilson or the Bureau of Broadcast Measurement (BBM). In this latter case the programming would most likely be similar to that which now exists with advertising, with the viewers of television footing the bill instead of the consumers of advertised products.

Another form of payment would be a direct government subsidy to copyright owners. The payments would then be shouldered by taxpayers. In addition, we do not know how the government will decide the amount of royalties to give or the manner in which it is to be dispersed. This system suffers from the flaw of not having the group that pays being correlated to the group that benefits (viewers of television). It also suffers from the additional flaw of not allowing citizens to avoid these payments. (Under payment by advertising citizens can patronize brands which don't advertise if they wish to avoid paying for television broadcasts.) We might say that from a welfare perspective this system contains the worst of all worlds except that the collection of revenues is not very costly.

The major advantage of direct government subsidy is that all of it goes to Canadians. This is opposed to non-discriminatory copyright payments which will go primarily to foreigners. Of course, a tax on televisions could also be disbursed entirely among Canadians and this would still appear to be a much superior solution.

## TRANSMISSION OF ADVERTISING REVENUES

In the previous sections we have been concerned with the impact of CATV on the advertising revenues of broadcasters. Much of the discussion regarding copyright legislation has been concerned with protecting the revenues of the creative community. For example, Keyes and Brunet state:

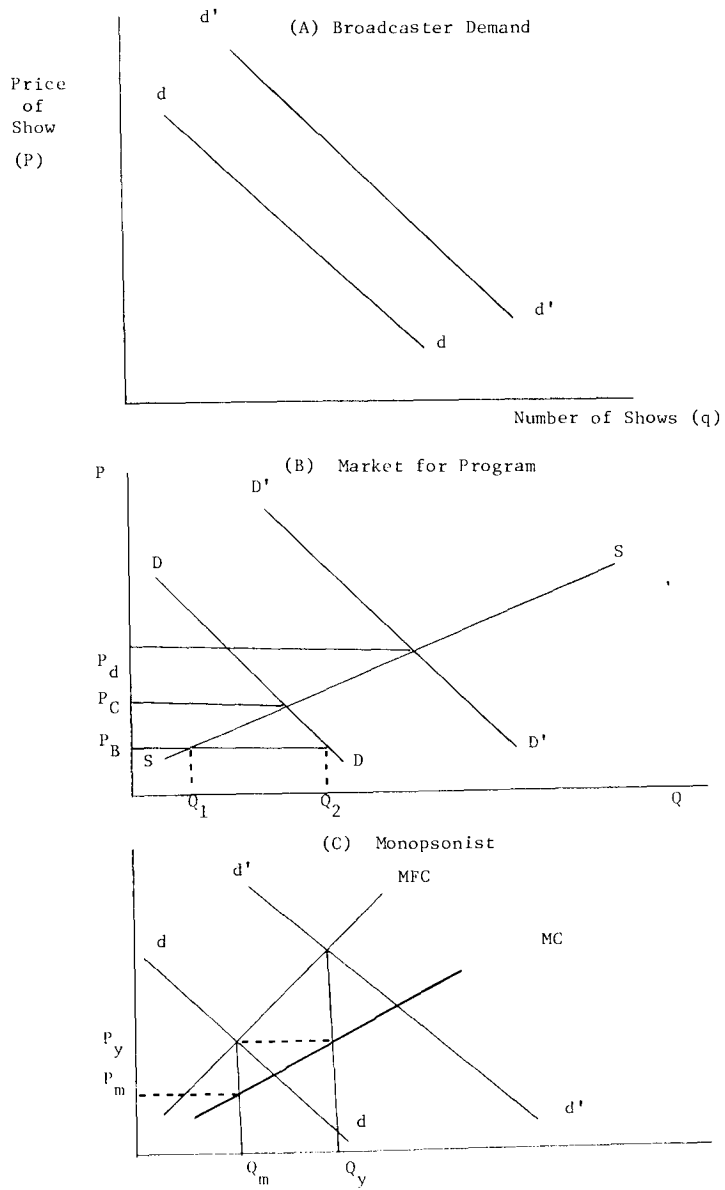
It is submitted, however, that there is no reason why a broadcaster should act as bargaining agent on behalf of copyright owners. Furthermore, even if a broadcaster did obtain a better price from a sponsor, on the grounds of increased coverage, there would be no guarantee that such increase in revenue would be passed on to copyright owners. (p. 139)

Because of the evident confusion regarding this point, it seems worthwhile to discuss the interactions of the broadcasters and the copyright holders in more detail.

Broadcasters have a derived demand for television shows. By derived demand we mean that these shows are used as a means to an end--that end being the creation of profits for the broadcasters. Broadcasters base their value of a show on its ability to attract large viewing audiences and raise advertising revenues. We can represent the markets for programs in Figure 2. Panel A shows the demand (dd) for programs for an individual broadcaster. He would be willing to pay a high price for the first few shows because he can show these during prime time and earn a great deal of advertising revenue. Additional shows are worth less to him because he must show these during increasingly unpopular time periods and will not generate as much advertising revenue. If advertisers suddenly valued viewers more highly than was previously the case (e.g., if viewers became wealthier) broadcasters would find the value of each show to be increased and the entire demand curve would shift up to d'd'. The demand curve shows the maximum price that broadcasters would be willing to pay--not the price they would like to pay (he would like to pay nothing)

By adding the demand for all broadcasters together we get the market demand DD. There is also a supply of programs--i.e., the number of programs that producers will create at any given price. The higher the

Figure 2



price, the greater the number of shows which are produced. We represent this with curve SS in panel B. In a competitive market  $P_C$  will be the price paid by broadcasters for shows. At a price below  $P_C$  (which the broadcasters prefer) the number of shows produced will be less than the quantity demanded. This is illustrated by price  $P_B$  because the quantity demanded ( $Q_2$ ) is much larger than the quantity supplied ( $Q_1$ ). The only way that broadcasters can induce the creation of more shows is by bidding up the price.

If Cable increases advertising revenues, demand will shift to  $D'D'$ . At the old price  $P_C$ , the quantity demanded is greater than the quantity supplied and the price will be bid up to  $P_d$ .

Critics of this analysis contend that abstract models of competitive markets are not appropriate in this case. They claim that broadcasters may act in a non-competitive way so that an increase in demand does not lead to an increase in price. We shall examine the behavior of a non-competitive market below and shall then have a few words to say about its realism.

The most non-competitive market would be one where there was only one buyer of programs. He would not need to compete with any other broadcasters in purchasing programs, so that there will be no external pressures forcing up the price of shows. This situation is known as monopsony. A monopsonistic broadcaster would wish to purchase programs until the cost of an additional program became greater than the increase in advertising revenues generated by this program. Unlike a competitive firm, when a monopsonist buys an additional show at a higher price (because the supply curve slopes upward) he must take account of the influence of the higher price on the other shows which he buys. Since the price of all shows will rise (assuming there is no price discrimination) the increased cost of buying an additional show is greater than the mere price of the additional show. This cost that the monopsonist faces is known as the marginal factor cost and is represented in panel C of Figure 2 by MFC. A monopsonist will buy a quantity  $Q_m$  and pay a price  $P_m$ . This is a lower price and a smaller quantity than will be bought in a competitive market.

More germane to our discussion, however, is the impact of higher advertising revenues on the prices paid for programs. When demand shifts to  $d'd'$  because of higher advertising revenues, the monopsonist will pay a

price of  $P_y$  for a quantity  $Q_y$ . This result is the same as that found in the competitive market: higher prices and greater quantities sold.

The only instance when the price would not increase is if the supply curve of shows were horizontal. In this case we would still find that the total revenue paid for the shows would increase, since the quantity of shows would increase. From this theory we can conclude that broadcasters will pass some of the increased advertising revenues on to the producers of shows when advertising revenues increase, and we have not specified any particular degree of benevolence to these broadcasters.

This analysis has been simplified somewhat because we have assumed a single level of quality. Broadcasters will most likely wish to increase the quality (as perceived by viewers) of their programs in order to attract a larger audience. In a more rigorous fashion we can assert that both the quality and quantity of programs are inputs in the production of broadcasts. An increase in advertising rates (the price of the output) will increase the marginal revenue product of both of these factors and this will increase both the price of the factor and the quantity being hired.

#### COPYRIGHT AND THE BALANCE OF PAYMENTS

If CATV reduces advertising revenues it also reduces payments to copyright holders. This holds for Canadian and non-Canadian copyright holders (and creators of shows) alike. In most instances forcing CATV to pay royalties to copyright holders will increase the amount of money flowing abroad in royalty payments. This will move the balance of payments in a negative direction.

In fact it seems safe to say that at least 50 per cent of the added copyright payments will go out of the country. Canadian content rules limit the amounts of non-Canadian programming which can be shown over a given period of time.<sup>16</sup> Between the hours of

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16. 1977 Television Broadcasting Regulations, p. 7, published by CRTC.



6:00 a.m. and midnight at least 60 per cent of the programming must be of Canadian content. In the period from 6:00 p.m. to midnight at least 50 per cent of the programming must be of Canadian content for private stations but the 60 per cent rule still holds for CBC stations. These appear to be binding constraints in that stations seem to use the smallest amount of Canadian programming possible. Foreign programs account for more than 50 per cent of advertising revenues and if CATV copyright payments are based on the value of the programming these payments would go primarily to foreigners. In addition, CATV increases the number of American stations available to the Canadian audience and if copyright payments are made for these programs as well it would seem safe to say that only a small fraction of copyright payments would go to Canadian copyright holders.

The flow of copyright payments out of the country is not necessarily a bad thing. It is possible that these payments will increase the quality of the shows made abroad. If this were the case and if Canadians valued this increase in quality more than the additional copyright cost, then the welfare of Canadians would be improved despite the flow of money leaving the country.

There is a tendency to feel that Canada can get something for nothing by restricting copyright payments abroad. That this is not always true was explained in the last paragraph, but it is probably close to the truth with present day realities. The Canadian market is only ten per cent of the U.S. market and increased copyright payments by Canadians for American programs probably have little influence over the quality of these shows. If Canada could reduce its copyright payments to zero (say by eliminating all Canadian broadcasters) it could free ride entirely on the American coattails. Canadians could still watch television thanks to CATV. Such a system is probably unacceptable to many Canadians, however.



## PART II

### EMPIRICAL TEST OF IMPACT OF CABLE

#### THE IMPACT OF CATV ON TV REVENUES

As we have seen, the institutional arrangements whereby television derives its revenues through advertising lead to some grave market distortions.

It is not the purpose of this study to analyze this particular source of distortion in detail. We are concerned with the specific impact of various proposals dealing with CATV payments for rediffusion. Our purpose is to determine: (1) the impact of CATV on the revenues of broadcasters and artists; and (2) the impact of various payment schemes on these two groups as well as society at large. The simplifying assumption throughout this analysis is that the market is working well prior to the introduction of CATV rediffusion.

The copyright payments for TV programs are handled in a manner whereby the creator of the program sells some rights regarding the program to a middleman (in this case usually a TV network) who then broadcasts the show to the ultimate consumers of the show, who do not directly pay for the show. Advertisers pay for the show. Thus under the present system the ultimate users of the show (the audience) never reveal their preferences for the show in a marketplace.

Under these circumstances it seems rather strained for Keyes and Brunet to question a passage from the Economic Council's report regarding copyright payment for CATV. From Keyes and Brunet:

The Council felt that the presence of advertising was the prime determinant of whether payment should be made to the copyright owner, but it is difficult to reconcile this position with the Council's previous guidelines that "compensation should be in proportion to use and each user should pay his fair share". To say that payment should be governed by use on the one hand and by advertising on the other appears contradictory. (p. 139)

Keyes and Brunet do not mention that advertising is the method of payment even without the existence of CATV. If they wish to argue for a system of pay TV then they might be on firm footing but once one accepts advertising as an appropriate method of payment for TV there is no inconsistency in trying to use advertising as the prime method for CATV as well. This is especially true when CATV viewers influence the over-the-air broadcasters and change their revenues.

If CATV viewers add nothing to the revenues of over-the-air broadcasters, then a good case could be made that the people watching CATV should pay a copyright fee on the program they watch, in a manner analogous to pay TV.<sup>1</sup> If this were to happen we would find ourselves with two very different systems of television viewing existing side by side. The condition most likely leading to this situation would be where advertising messages were blocked out on CATV so that people watching CATV would have no value to broadcasters at all.

The use of CATV introduces a second middleman into the transmission mechanism between producers and the audience. If CATV does not alter the relationship between market size and advertising revenues, program producers should not be adversely affected. In fact, since CATV tends to increase total audience size we would expect that advertising revenue would go up in this instance and producers would receive more money for their copyrights.

It is reasonable to expect that CATV will influence the transmission mechanism between audience size and advertising revenues. This result seems likely for several reasons.

Firstly, CATV tends to fragment television audiences. This means that the geographical homogeneity of an audience is greatly reduced with the introduction of CATV. In an area served by CATV, many viewers will watch programs originating from outside the normal television viewing area so that in a given area viewers watch a greater diversity of stations and the audiences

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1. Whether this payment is made directly by CATV customers or indirectly through higher user fees for CATV is essentially irrelevant to the discussion.

for stations carried on the CATV are dispersed over a much larger area.

This fragmentation may change the audience size/revenue relationship in several ways. Firstly, the average distance from the television transmitter to the audience increases when CATV is introduced because people watch stations that they couldn't receive over the air. This will change the value of a given-size audience if advertisers care about the distance of the viewer from the program origin. If the advertising is local in nature we would expect distant viewers to be less valuable to advertisers than local viewers. The net effect would be for CATV to reduce the advertising revenue generated by any given size audience.

A second way CATV may influence the audience size/revenue relation has to do with the empirical assertion that CATV tends to strengthen large stations and weaken small stations.<sup>2</sup> This is due to the fact that the signals of large audience TV stations are usually put on CATV and their higher quality programming tends to pull away viewers from small stations with lower quality programming. It has been suggested in the literature that advertisers might not value additional viewers as highly when the advertisement is already reaching a large audience. This hypothesis has been tested and confirmed by Park. The rationale for this type of behavior seems extremely weak.

Why should advertisers value marginal viewers at a diminishing rate? It seems reasonable to assume that any additional viewer will have the same likelihood as prior viewers of being influenced by the advertisement and should therefore be equally regarded by the advertiser. If, on the other hand, advertisements are more effective when a smaller percentage of the population is aware of them, say because the information can easily be spread by word of mouth, the results obtained by Park would make more sense. This particular form of advertising effectiveness seems rather contrived and not a form of reasoning in which to place much faith. It is also interesting to note that under this scheme, CATV should have the impact of increasing advertising revenues because it tends to fragment the audience so as to increase the effectiveness of any word-of-mouth advertising.

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2. This assertion has been made by Park, among others.

There are other potential explanations of the diminishing marginal viewer revenue (DMVR) effect which are less difficult to believe. Television stations with large audiences are usually found in large metropolitan areas where there are also more competing stations than in less populated localities. The paucity of competition in these small localities may lead to the exercise of monopoly power by the local television stations. This would result in above normal advertising rates and revenues in low population centers.

A second explanation of the DMVR effect has to do with locational factors. Large markets are likely to have a large percentage of the population living far away from the location of the broadcast and/or the location of particular advertisers. If the percentage of people living far away is higher in high population areas, then the DMVR effect may in fact merely be the local/distant distinction in disguise.

CATV may influence advertising revenues by directly changing the size of the audience. Larger audiences will lead to greater advertising revenues, ceteris paribus. We might expect larger audiences for two reasons. Firstly, CATV improves the reception of television signals by eliminating many forms of interference due to antenna directionality, etc. Secondly, CATV increases the choice of programs available to most viewers. Both effects work in such a way as to make television viewing a more attractive activity than would be the case without CATV.

One of the purposes of this study will be to test these various propositions regarding the changes in advertising revenues brought about by CATV.

### The Data

In order to estimate the important relationships, it was necessary to construct a data set which would give us information on the audience size of television stations, income of viewers, the number of viewers outside of non-CATV viewing area, possibilities of collusion among television broadcasters in a given area and advertising rates for various broadcasters. The purpose of each variable will be described in the following section. The construction of proxies for these variables and a discussion of their strengths and weaknesses follows.

(a) Audience Size: This information was taken from the Reach book published by the Bureau of Broadcast Measurement (BBM). This book gives the number of people reached and the number of hours watched in a week for each television station. It also gives these same variables for each BBM area (similar to Census Districts). The audience values for the station are broken down into each BBM area in which it has a non-negligible audience. For each BBM area the audience is broken down into the stations which people in that area watch.

There are two audience figures available in these data. One is known as the audience reach, the other is total viewing man-hours per week. Audience reach is a measure of the number of individuals who tune to a given station for the majority of any 15-minute period during the week. This measure is insensitive to the variations in viewing intensity beyond the first 15-minute period. Someone who watches a station for 30 hours a week is given equal weight to someone who watches for a mere 15 minutes. For this reason it is to be expected that reach is not very indicative of the true audience size of a station.

The second measure of audience is total viewing man-hours. This variable is constructed by adding up the number of hours each viewer watches of a given station. This measure is also imperfect since the show which is seen the longest in a 15-minute period has all 15 minutes assigned to it. This variable appears to be considerably more accurate than reach since people who watch stations for longer than 15-minute intervals will have their total hours weighted in favor of those shows which they in fact watch the most.

Both of these variables are constructed by the BBM, which sends blank diaries to individuals who then fill them out. The diaries break the viewing week into 15-minute periods and viewers put down the program which was watched the most during that period. When a diary is sent to a child the parents are supposed to fill it in for the child. The results of the survey are tabulated by BBM and each category of individual (adult, man, women, etc.) has its observations weighted by its percentage of the population in a given area to arrive at the final figures which are estimates for the entire population.

It is not clear that our variable need be overly accurate. Since we wish to explain advertising rates, we merely need to determine which variables advertisers look for when they decide to purchase advertising time. If they are content with audience reach or total hours as a measure of audience size, then further refinement of these variables on our part may prove counter-productive.

(b) Income of Viewers: This information comes from Taxation Statistics for 1975. This publication gives income figures for census districts. These census districts were matched up with BBM areas and the average per capita income calculated over all viewers of a station was determined. This required weighting the income figures for every census district in which there resided viewers of a particular station by the total hours variable for that station in the particular locality.

This weighting scheme is somewhat imperfect to the extent that total hours is an imperfect variable. Also, these income figures are not deflated by geographic price indices, which may lead to some further distortions of the results.

(c) Distance of Viewers from Broadcast: This variable was taken from the BBM figures for stations. Since total viewing hours were broken down by area, it was possible to assign the viewers of each area to the categories of local or distant. In fact, the areas were assigned as A contour, B contour and C contour. A contour is defined as that area around the broadcast station which has satisfactory reception 90 per cent of the time for 70 per cent of televisions. B contour is defined as the area where reception occurs 90 per cent of the time for 50 per cent of televisions. C contour is defined as anything worse than B contour. The contours for each station come from Television Factbook Stations.

In cases where a BBM area was in more than one contour, an attempt was made to look at the major population centers within each area and determine which contour seemed most appropriate.

In some instances problems were encountered because the areas used by BBM overlapped and certain populations were included in both (e.g., core cities and the district containing them were often given as separate BBM areas). In these instances attempts were made to



disentangle those various populations.

In our empirical work the A and B contours were added together. This allowed us to distinguish those viewers who probably require CATV for reception of a station (C contour) from those viewers who don't (A and B contours).

(d) Herfindahl Index: The Herfindahl index is defined as the sum of squared market shares, where market share for a firm is the percentage of the market output which that firm supplies. In the present instance the Herfindahl index for each BBM area was calculated by taking the percentage of the total viewing hours for the market (BBM area) generated by an individual station, squaring this value and then summing over all stations seen in that BBM area. This was done for all stations as well as for only Canadian stations. The Herfindahl index is a measure of market concentration. If there are many broadcasters in a market the share of each one will most likely be low and the Herfindahl index will be low. This will not be true if one firm dominates the others. A high index is usually taken to mean monopoly power exists in the market and collusion is possible. In our work the Herfindahl index will be shown to be negatively related to Cable penetration in an area.

With the Herfindahl index calculated for each market, we were able to construct a summary measure of market collusion for each television station. This was done by constructing a weighted average of the Herfindahl indices based upon all the areas into which a television station's signals (whether over-the-air or CATV) reach. The weights are the total viewing hours for that station in each BBM area. We thus have an "average" Herfindahl index for each television station. This value is not based on any specific market but is indicative of whether the station operates in markets which are concentrated.

(e) Advertising Rates: This information comes in two forms and from several sources. Advertising rates can be either national or retail with the retail rates being somewhat less than national rates. Retail rates are given only to local advertisers and are sold by individual stations. National rates are sold to any advertiser by either the individual station or the network it is affiliated with. Retail rates don't guarantee that the commercial message will actually be shown. If the

station manages to sell an additional commercial at a national rate the local (retail) commercial may be bumped.

In addition, advertising rates vary depending on what time of day or day of week the particular message will be shown. Prime time (weekday nights) usually commands the most expensive advertising rates. The CRTC allows a maximum of 12 minutes of advertising per hour.

Television stations display their rates on circulated "rate cards". National rates are listed in publications such as Canadian Advertising Rates and Data. Local rates must be taken directly off station rate cards. These rate cards were obtained by solicitation through the mail.

Comparing rates was not always easy because various stations use different time classifications. One station might have its higher rates from 7:00-10:00 p.m. while another might have them from 8:30-10:00 p.m. This made comparison of rates somewhat difficult. It was decided to take the average rate for the hours of 7:00-11:00 p.m. weighted by the frequency of each rate in that time period.

One difficulty with the rate data is that not all time slots are sold. It is not clear what it means if station A has higher rates than station B, if station A does not sell as many of its slots as station B.

Also, various quantity discounts are given by stations to qualified advertisers. These discounts vary from station to station and are difficult to incorporate in the data.

It is possible to make an estimate of the extent to which these practices reduce advertising rates from the list prices. We have taken three stations and calculated their potential advertising revenues if all their time slots in a week were sold at the list 30-second advertising rate. Two of the stations were large (CBLT in Toronto and CFTM in Montreal) and the third station was small (CBCT in Charlottetown). We then divided this largest potential revenue by the number of viewing man-hours per week for the station. This gave us the value of a viewing man-hour. The results were 3.5 cents, 4.7 cents and 4.5 cents for CBLT, CBCT and CFTM respectively. We then divided the total television advertising for 1978

What was "actual" revenue for each?

(approximately \$400 million) by the total Canadian viewing man-hours per year and got a result of .87 cents per hour. It is quite obvious that revenues are much lower than their maximum potential. Other factors reducing the calculated station revenues are the selling of local advertising time and the fact that 30-second slots are often more expensive than 60-second slots. Loose.

We will continue to assume that the list rates are indicative of the supply/demand conditions for the individual stations. Advertising rates give us somewhat more flexibility than revenues and are more easily available. Our regression results will indicate that this assumption is reasonable.

(f) Population: Geographic Distributions. This variable was calculated in a manner similar to the Herfindahl indices and income figures. The population for each market which had viewers of a particular station was found and these values were weight-averaged for all markets receiving the station's signal where the weights were the total viewing hours in the market.

This variable is supposed to measure the number of people in each market. To the extent that census areas are not markets this variable will fail in its purpose.

(g) CBC Dummy Variable: Many of the stations in our sample are owned by the Canadian Broadcasting Corporation. To determine the possible impact of this ownership we have included a dummy variable which takes on the value of one if the station is affiliated with the CBC and a value of zero otherwise.

(h) French Dummy Variable: Most of the stations in Quebec and several in other provinces have French programming. To determine if advertisers view these audiences differently than English speaking audiences (or conversely that these stations behave differently) we have included a dummy variable which takes on the value of one if programming is in French and zero otherwise.



## Determination of Advertising Rates

The major empirical goal of our study is to determine the impact of CATV on the advertising revenues of over-the-air broadcasters. This can be broken up into two major effects: (1) the negative impact due to market fragmentation; and (2) the positive impact due to the influence of CATV on the viewing habits of the population. The latter effect will be investigated in the next section and we shall now turn our attention to the former.

Much of the discussion regarding various copyright proposals has depended crucially on the impact of market fragmentation. Market fragmentation is brought about by CATV because on CATV viewers in any one locality will have a wider choice of alternative programs and some viewers will elect to watch programs originating from distant areas which would not be accessible without CATV. Each broadcaster whose programs are carried on CATV finds his audience spread out over all geographical areas which are served by CATVs carrying his station. The average distance between broadcaster and viewer is increased by CATV.

This has a potentially deleterious effect on advertising revenues, to the extent that advertisers place less value on viewers in localities other than that immediately surrounding the broadcaster. We would expect local advertisers to place less worth on viewers in distant localities since it is unlikely that these viewers will patronize an establishment which is far away. The further away these viewers the less valuable we would expect them to be to a local advertiser.

We would not expect national advertisers to be affected as strongly. Viewers far away from transmissions are as likely to be valuable as viewers close to transmissions. To the extent that fragmentation helps or hinders the transactions involved in coordinating advertising purchases, we might expect advertising revenues to increase or decrease respectively.

In order to test these hypotheses we have constructed a data set in which the audience for each station is broken down into various categories based on location from the transmitter. For each station we have determined the number of man-viewing hours per week in the A plus B contour and the C contour.

There are several problems in the construction of these data. Several stations (especially in the Maritimes) have over-the-air retransmission of their signals at other localities. We have always included just the contours of the major signal in constructing our data set. In addition, the audience was partitioned according to BBM regional classifications. These regions were often entire census divisions which were sometimes as large as the B contour of the stations. The B contour often cut several of the regions and partitioning the viewers required some guesswork. For these reasons our contours do not inspire as much confidence as we might have hoped.

With the audience partitioned in this manner, it is possible for us to determine the value of both of these groups to advertisers. We wish to explain advertising rates (both national and local) as a function of the audience size in each of the categories. These categories should measure the likelihood of using CATV, as well as distance from the transmitter (relative to its strength and height). This is because viewers in the C contour are not likely to receive a signal of sufficient strength over the air to provide reasonable reception. The only way they are able to view the station is over CATV.

In addition to audience size, we shall expect audience income to influence advertising rates. This is for one of two possible reasons. If most viewers are wealthy they probably spend more money on products and are more valuable to advertisers. In addition, some areas have higher costs of living than others. To the extent that income differences are illusionary (due to cost-of-living differences), we would expect different costs of living to be reflected in different advertising rates.

We have also included several other variables in the data set. The Herfindahl index measures the ease of collusion in a market. A market dominated by a small number of firms will register a high value (close to one) for the Herfindahl index whereas markets with many small firms will have a low value for the Herfindahl index (mean zero).

Dummy variables for those stations which either broadcast in French or are owned by the CBC have also been calculated. Dummy variables have values of one if the criterion is satisfied and values of zero if it is not.

The coefficients on these variables measure the difference in advertising rates between those stations which fulfil the criterion and those which don't, when the impact of the other variables has also been taken account of.

The average population of the BBM areas which a station broadcasts into have also been calculated. If advertisers value viewers in heavily populated areas differently than they value viewers in sparsely populated areas this variable will pick up the difference.

Another consideration prompted by previous studies concerned the linearity of the relationship between audience size and advertising rates. Fisher found the relationship to be linear while Park found it to be non-linear. The result is of possible significance because Cable is thought to increase the audience of large stations relative to that of small stations. If revenues increase at a decreasing rate when audience size increases (the result found by Park) a shift to large stations would decrease the total advertising revenues of over-the-air broadcasters.

In order to examine the linearity of our relationship, we sometimes ran a quadratic form of the audience variable and we sometimes ran it in logged form. Further examination of this point will appear in our discussion of the empirical estimates.

We ran a regression of the form

$$R = \beta_0 + \beta_1 A + \beta_2 C + \beta_3 I + \beta_4 H + \beta_5 P + \beta_6 \text{CBC} + \beta_7 F + \mu$$

where R is advertising rates during prime time,  $\beta_0$  is a constant terms, A and C refer to man-hours of viewing per week in contours AB and C respectively, I refers to average viewer income, H refers to Herfindahl index, P stands for population, CBC and F are dummy variables for CBC affiliation and French programming respectively and  $\mu$  is an error term. The value of the coefficients  $\beta_1$  and  $\beta_2$  indicate the average worth to an advertiser (or station) of a viewer in either of our two categories.

These regressions were run with both national and local advertising rates. Past studies on U.S. data (see Park [1979]) have not distinguished between these advertising rates in this manner. Previous studies, on

U.S. data, also have not had as much market fragmentation to measure for two reasons: (1) there is a much larger percentage of homes on CATV in Canada than in the U.S. because U.S. regulations have been very restrictive about letting CATV into the 100 largest markets; and (2) our study uses more recent data and CATV penetration increased rapidly since the late 1960s, the period upon which Park's data were based.

There are several predictions we can make regarding these coefficients:

- (1)  $\beta_1$  will be larger than  $\beta_2$ ; both will be positive.
- (2)  $\beta_3$  will be positive.
- (3)  $\beta_4$  will be positive.
- (4)  $\beta_5$ ,  $\beta_6$  and  $\beta_7$  can be of any sign.

Also, we would expect the difference between  $\beta_1$  and  $\beta_2$  to be more pronounced for local advertising rates than for national advertising rates since local advertisers should value distant viewers to a lesser degree than national advertisers.

### Regression Results

Various combinations of our independent variables were used in regressions which attempted to explain advertising rates. The results can be found in Table 1. Some general comments can be made before we discuss the particulars:

- (1) The audience size is always positive and significant.<sup>3</sup>
- (2) Income is always positive and generally significant.
- (3) The Herfindahl index is always negative and usually quite significant.

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3. Statistical significance means that as statisticians, we can be confident that our coefficient has at least a 95% probability of representing the actual sign of the underlying variable.

TABLE 1

REGRESSIONS WITH ADVERTISING RATE AS DEPENDENT VARIABLE

	A	C	AC	log A	log C	log AC	AC <sup>2</sup>	INC	CBC	HERF	POP	FR	R <sup>2</sup>
(1)	.035* (93.5)	.014** (4.3)						.026** (5.4)	-52* (8.0)	-253* (9.9)	-.86 E-5 (.3)	-32 (2.2)	.900 .887
(2)	.013** (4.1)	.036* (10.6)						.022 (.9)	-42 (1.7)	-183 (1.2)	.3 E-4 (1.5)	52 (1.5)	.865 .825
(3)	.025* (23.6)	.029* (10.8)						.013 (.4)	-58** (4.8)	-245 (3.2)	.4 E-5 (.1)	-2 (0)	.925 .903
(4)			.028* (216)					.024** (4.3)	-55* (8.3)	-264* (10.3)	.5 E-5 (.1)	-26 (1.3)	.891 .880
(5)			.035* (109)				-.3 E-6 (6.0)	.026** (5.4)	-56.6* (9.5)	-214* (6.9)	.2 E-4 (1.2)	-20.1 (.9)	.902 .889
(6)	.040* (91)	.021* (8.7)					-.3 E-6 (5.1)	.028** (6.5)	-54* (9.1)	-209* (6.9)	.5 E-5 (.1)	-27 (1.6)	.908 .895
(7)	.010 (1.9)	.032* (6.7)					.13 E-6 (.5)	.014 (.4)	-35 (1.4)	-212 (1.6)	.2 E-4 (.4)	43 (1.1)	.865 .823
(8)						116* (80.1)		.029 (3.1)	-83* (9.7)	-138 (1.4)	.8 E-4* (16.2)	23 (.6)	.784 .762
(9)				118* (51.2)	1.52 (0)			.031 (3.3)	-82.9* (9.0)	-138 (1.3)	.7 E-4* (12.3)	19.9 (.4)	.774 .746

\* significant at 99% level

\*\* significant at 95% level

F statistics in Parenthesis

bottom R<sup>2</sup> is the corrected R<sup>2</sup>.

Advertising rates and viewing man-hours are for September 1978.

Advertising rates are national except for rows 2 and 7.

67 national rates, 32 local rates.



- (4) The CBC dummy variable is always negative and quite significant.
- (5) Our French dummy variable and population variables are not significantly different from zero.
- (6) Our specifications seem capable of explaining about 90 per cent of the variance of the dependent variable, a result in line with those of past studies and one which should give us confidence in our work.

The first matter we wish to investigate concerns the relative value of local and distant viewers. Looking at row one we can see that the value of the A coefficient (.035) is two-and-a-half times that of the C coefficient (.014). Using regressions 1 and 4 we are able to determine the significance of this difference. The calculations are shown in Table 2. We can see here that the difference is significant at the 95 per cent level but not at the 99 per cent level. Also included in the table are calculations for equation 6, which has a slightly different specification of these variables. In this instance the difference in coefficients is not significant at the 95 per cent level although it is "close". As we will see below, it can be argued that equation 6 is a superior specification of the relationship than equation 1.

If we were to end our examination at this point we would conclude that local viewers are worth more than distant viewers but that the relationship is rather weak. However, further examination will lead us to question the robustness of these results even more. In particular, we wish to see how viewers are regarded by local advertisers.

Equations 2 and 7 will help us in this endeavor. The variables are identical to those of equations 1 and 6 but our source consists only of those stations for which we have local data. We expected the difference between these coefficients to be greater in equations 2 and 7 but to our surprise and consternation we find this not to be the case at all. Instead we find that distant viewers are worth more than local viewers. (The difference in coefficients is not even close to being statistically significant, however.) This is surely a suspicious result. To determine the extent to which it was determined by sample selection (since there are fewer stations which have local

TABLE 2

TESTING FOR DIFFERENCE OF COEFFICIENTS ON A AND C

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In equation 1

$$R^2 \text{ of equation 1} = .89978$$

$$R^2 \text{ of equation 4} = .89120$$

$$F = (.89978 - .89120) / (1 - .89978) \times 57 = 4.87$$

In equation 6

$$R^2 \text{ of equation 6} = .908$$

$$R^2 \text{ of equation 5} = .902$$

$$F = (.908 - .902) / (1 - .908) \times 57 = 3.72$$

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95% significance implies an F of 4.0

99% significance implies an F of 7.1

data, 32 vs. 67 for national rates) we regressed the same variables on national rates for those stations which had local rates. Regression 3 of Table 1 gives these results.

In this case we find that the distant audience is still worth more although to a lesser degree than in the previous instance. Thus, sample selection plays a large part in causing these results. In addition, all CBC-owned stations have local rates and they have a larger impact on the results of this sample. As we shall see later, there is reason to believe that CBC stations fail to price their advertising rates in a competitive manner, thus distorting natural market effects. When we tried running these regressions for the non-CBC sample, however, there was no appreciable difference, indicating that the CBC stations were not responsible for the greater value of distant viewers.

The overall results from our regressions are ambiguous. It seems fair to say that local audiences are probably worth somewhat more than distant audiences but that the available evidence for this assertion is quite weak.

In the U.S. study by Park (1970), similar results were obtained. He found local audiences to be worth 50 per cent more than distant audiences but only borderline statistical significance was found. For the subsample of independent stations no significant result was found and he did not report these results.

One other factor influencing the relative value of local and distant audiences is a CRTC regulation requiring Cable companies, if asked, to delete distant broadcasts and replace them with local signals when the two broadcasts have at least 95 per cent of the program material in common. The impact of this regulation is to replace distant signals with local signals when two stations on CATV are carrying the same television program. Many viewers who report their television habits to data collecting organizations are likely to indicate that they were watching the distant signal when in fact they were receiving the local broadcast including the commercials. This is because viewers tend to identify stations by their position on the television turning knob. This will bias the reported data such that the local audience will appear to be more responsive to advertisements and therefore give a larger coefficient on advertising rates since local audiences are in fact larger than the reported data.

The conclusion that local viewers are worth more than distant viewers, though theoretically appealing, is quite tenuous. Even if we accept these results we would need to quantify the impact of Cable on local/distant relationships before we could determine the reduction in rates caused by CATV.

Our next concern involves the linearity of the advertising/audience relationship. If the relationship were curved so that increasing audience size increased advertising revenues at a decreasing rate, we would find that a shift in audience from small-audience stations to large-audience stations would decrease the total revenue of all broadcasters grouped together. This was exactly the effect reported by Park. He ran his regression in a quadratic form (i.e., he included audience and audience squared as independent explanatory variables) and found the quadratic term to be significantly negative.

Regressions 5 and 6 in Table 1 are an attempt to investigate this result with our data. Our quadratic term is negative and significant in both regressions, indicating that a non-linearity as described above does in fact exist.

There are some theoretical problems with a quadratic specification of the audience/revenue relationship. A negative quadratic term implies that at some point advertising rates will fall when audience size increases, and this seems to be an unlikely result. We calculated the point at which this would occur based on our coefficients and found that our audience size was nowhere in the range of this downturn of the relationship.

In an attempt to circumvent the theoretical difficulties of a quadratic form, we attempted to fit the data to several other non-linear relationships. Regressions 8 and 9 were run with the audience measured in natural logs. As can easily be seen, the fit of the regression (as shown by R-squared) is much lower for this specification. Similar results were obtained in estimating a hyperbolic function (not shown). These specifications are superior in that, unlike the quadratic, they do not turn down at some audience size.

We ran several other tests on the linearity of this relationship. An inspection of the residuals (predicted value of the dependent variable minus the

measured value) ranked by advertising rates did not show any clear-cut curvature. A test of curvature was performed whereby the stations were ranked by advertising rates and broken up into seven (and four) groups. The increased explanatory power of the regression when the slope of the coefficient of audience size was allowed to vary between groups was measured and found to be insignificant.

We conclude that the evidence favouring a curved relationship is weak. There is no denying the fact that a quadratic form gives a better fit, but this may be due to a few outlying observations. General tests of curvature give negative results.

A curved relationship is also difficult to explain on an economic level. If advertisers are merely interested in reaching a given population one would think that any random member of that population would be worth the same as any other (other personal characteristics being unknown). If advertising is transmitted by word of mouth (after television viewing) it is possible to construct an explanation whereby the first viewers are worth more than the last. This seems rather farfetched, however.

The explanation may be in the cost of advertising. It may well be that the average cost per viewer reached is lower for large stations than for stations with small audiences. If large stations tend to compete only with each other<sup>4</sup> we would find that they would have lower advertising rates per viewer.

The impact of the Herfindahl index is the next important matter to be taken up. We included this variable to pick up any monopoly power that might exist on the part of broadcasters in some localities. Any such power would be reflected in a positive coefficient for this variable. The significant negative sign is very surprising and difficult to explain. This result

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4. If all stations competed against each other, regardless of size, then the price per viewer would be the same for all and large stations with lower costs would merely earn higher profits.

is quite robust and holds up under almost all specifications.<sup>5</sup> This is true for Herfindahl indices based on all television broadcasters received in an area, as well as an index based on only Canadian stations.

There is obviously some effect other than market power which is being picked up. Our examination of the influence of CATV on viewing habits will reveal just what this effect is. It will be a result central to the conclusions of this study.

The final result of interest in these regressions concerns the coefficients on the CBC dummy variable. The consistently significant negative sign on this variable indicates that when the impact of the other variables is taken account of, CBC stations consistently charge advertising rates below the level that would be charged by non-CBC stations with the same audience size and characteristics. This can be interpreted to mean that CBC stations are not charging profit-maximizing advertising rates since the private stations are certainly trying to maximize advertising revenues.

This result is not without precedence in the literature. In 1963, O. J. Firestone wrote:

... the CBC could about double its commercial revenues without significantly increasing the time devoted to commercial messages provided the Corporation wished to pursue appropriate policies concerning the pricing and the marketing of commercial time it has at its disposal.

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5. Except in equations 7, 8 and 9. In 7 the lack of significance is probably due to multicollinearity. The following results, based on local advertising rates, will demonstrate this fact

$$\begin{array}{llll} \text{LRT} = & .018\text{A} & + & .035\text{C} & - & 272\text{Herf} & + & \text{K} & & \text{R}^2 = .842 \\ & (19.8) & & (12.2) & & (5.09) & & & & \text{R}^2 = .827 \end{array}$$

In equation 8 and 9 the misspecification of the audience variable is most likely responsible.

The data show...that the CBC's cost per thousand in prime-time was on the whole about one-third below those charged by private broadcasters in comparable time periods. (p. 294)

His estimation techniques were considerably less precise than our own but our conclusions are similar to his. We find that CBC stations tend to charge about \$55 less than the competitive advertising rate for a 30-second spot. With an average advertising (national) rate of \$228, this works out to a reduction of 25 per cent.

It should be remembered that not all advertising spots are sold and that total revenue depends on the percentage of spots sold as well as the going price. We cannot directly measure the percentage of spots sold for each broadcaster but we can gain some institutional insights. The CRTC allows broadcasters up to 12 minutes per hour for advertisements. The CBC only allows its stations 10 minutes of advertising per hour. Thus we might expect that CBC stations would sell a higher percentage of their ads and also that their rates would be higher since they supply fewer commercial messages. Fewer commercial messages make the programming more attractive and reduce the opportunities for advertisers to reach the audience of this station. The smaller the supply of advertising time the higher the rates should be, since many stations will not be in perfectly competitive markets and will in fact have downward sloping demand for their advertisements.

This result is really not surprising. The CBC is not a profit-maximizing corporation and it would be unusual for it to maximize profits since it exists in a different environment than private stations. The managers of private businesses are usually motivated by different objectives than those of public enterprises.

This brings us to the foremost question of this section -- to what extent does Cable, by fragmenting the audience, reduce advertising revenues? We can estimate the largest possible loss by making several assumptions. First, we assume that all viewers in the C contour are on Cable and would not be receiving the station without Cable (we exclude the possibility of over-the-air retransmission or consumer purchases of

large antennas). Next we assume that local viewers are worth twice as much as distant viewers. This is the most extreme assumption we can make given our regression results.

Twenty-six per cent of the viewing audience (measured in viewing hours) is located in the C contour. Since these viewers are worth only half of what they would be worth if they were local viewers, the total impact would be to reduce advertising revenues by 13 per cent. This is probably an overstatement of the true impact of fragmentation since our assumptions were rather severe.

#### THE EFFECT OF CATV ON VIEWING HABITS

CATV television increases the choice of programming available to viewers. Since CATV allows a viewer to watch all stations which he is likely to receive without CATV, we can predict that CATV will unambiguously increase the viewer's pleasure derived from watching television. This increase in pleasure is likely to lead to an increase in the amount of time spent watching television under most circumstances.

There are certain conditions under which an increase in viewer pleasure will not lead to an increase in television viewing. One constraint placed on television viewing is that of time. There are a maximum number of hours that one can watch television during any given period of time. If a viewer already is watching television for the maximum number of hours possible, an increase in programming attractiveness could not lead to an increase in viewing although it may lead to an increase in the intensity with which the viewer concentrates on a show.

It is also possible that television viewing is an inferior good with respect to pleasure (income). Inferior goods possess the attributes of reduced consumption being related to increases in wealth (income). If a taste for television viewing can be saturated or if television viewing pleasure is complementary with other activities, we might find that superior programming leads



to less viewing by the public.<sup>6</sup>

We attempted to measure the impact of CATV on viewing habits. One primary test consisted of comparing the change in viewing habits with the change in CATV usage in localities for which it was possible to get appropriate data. Two data sources were used. The first was created by looking up all CATV systems operating in Canada in 1969 and 1978, apportioning the subscribers of these systems into the appropriate BBM region and using BBM data to calculate viewing habits for each of these regions. The results are found in Table 3, row 1. The dependent variable is the change in viewing hours per week. The coefficient of change in CATV penetration is insignificant and of the wrong sign. A dummy variable for each province was included to take account of geographic differences.

Row 2 of Table 3 shows the results for a different sample of data. These data consist of a sample of major metropolitan areas which have CATV penetration rates compiled by the BBM. It was thought that their data collection methods might be superior to ours. Once again, however, we find that the coefficient of CATV change is not significant and is of the wrong sign.

In row 3 we ran a regression which is no longer in the form of first differences. In this case we are regressing the level of CATV penetration in 1975 on the average viewing hours for 1975. Our sample consists of the 24 major metropolitan areas as in row 2. As in our other regressions, CATV penetration does not significantly affect the dependent variable. In fact, according to our results, an increase in CATV use from 0 to 100 per cent of the population would increase TV viewing by only 8 1/2 minutes.

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6. By complementary we mean that other activities become more attractive when television becomes more attractive, e.g., if television becomes exhilarating to watch it might cause individuals to partake of other activities to calm themselves. The increased sexual content of recent shows comes quickly to mind.

TABLE 3

REGRESSION OF CHANGE IN VIEWING HOURS ON  
CATV PENETRATION CHANGE

	Constant	CABLECH	Ontario	Quebec	Alberta	R <sup>2</sup>	N
(1)	-.012	-.029	2.8	1.6	1.2	.27	44
		(.8)	(8.9)	(2.7)	(1.0)	.19	4
(2)	3.73	-4.9				.16	24
		(3.9)				.12	

Regression of Viewing Hours on CATV Penetration

		CATV		
(3)	23.9	.0014	0	24
		(.003)	-.04	

Change in viewing hours taken from 1969 and 1978 Reach book  
by B.B.M.

Cable penetration change in row 1 comes from Television  
Factbook - Services, for 1969 and 1978.

Cable information in regressions 2 and 3 come from B.B.M.  
Household enumeration, 1971 and 1975.

From these results we are forced to conclude that CATV does not significantly affect the number of hours that people spend watching television. This result, although puzzling at first blush, is consistent with other results of investigations of this kind.<sup>7</sup>

Additional verification of our results come from a special BBM analysis. Viewing habits of those with CATV were contrasted with those of people without Cable. For men it was found that CATV viewers watched an average of 21 hours and 41 minutes of television per week and those men without CATV watched for 21 hours and 1 minute. For women it was a different story. With CATV they watched for a total of 24 hours and 27 minutes. Without CATV they watched for 25 hours and 25 minutes -- almost an hour more. We thus conclude that CATV does not increase the amount of time people spend watching television.

It is important to emphasize that we cannot conclude from these results that CATV does not increase the value of an audience to an advertiser by changing viewing habits. What we have found is that CATV doesn't increase the amount of time that people spend watching television. Time spent in watching television can also be spent in other activities such as talking or reading. If CATV increases the intensity of television viewing, advertisers will find that television will be a more effective medium per viewer reached than it was prior to CATV. This should lead to an increase in advertising rates even though the total volume of viewing hours remains the same. This proposition, however, is somewhat more difficult to test.

We now come back to the results of the previous sections. In particular, we are ready to explain the negative signs on the Herfindahl indices in our regressions on advertising rates. At that time we mentioned that market power would be reflected in higher advertising rates and that the negative sign was contrary to that hypothesis. The reason that our Herfindahl index was so strongly negative is because it was picking up the

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7. See Park (1970), pp. 21-23. CATV viewers in the United States watch more television than non-CATV viewers but there is a self-selection process at work so that people who watch more television are those most likely to value and subscribe to CATV.

influence of another variable -- the CATV penetration rate!

To understand this, one merely needs to realize that CATV reduces the market share of each local station and that the Herfindahl index will be reduced accordingly.<sup>8</sup> Since CATV viewers value the additional programming (they demonstrate this fact by their willingness to pay for the service), we would expect higher advertising revenues. We have demonstrated that CATV does not increase the amount of time that people keep the television turned on. Thus the higher rates due to CATV will not be picked up by the audience variable. Instead it will be picked up by the Herfindahl index, which is in essence a proxy for CATV penetration.

To demonstrate this last point we ran a regression with the Herfindahl (Herf) index as the dependent variable. Our explanatory variables were CATV penetration (CAB), population (POP) and the number of local stations (STA). Our sample consisted of 18 localities with published CATV penetration rates. Our results are given in the following equation:

$$\begin{array}{rccccccc} \text{Herf} = & -.004 & \text{CAB} & - & .00005 & \text{POP} & + & .01 & \text{STA} & R^2 = .496 \\ & (12.97) & & & (1.2) & & & & (.2) & N = 18 \end{array}$$

F Statistics are in parenthesis.

The only variable which is statistically significant is the CATV penetration rate. The coefficient tells us that for every 10-point increase in penetration rate a locality has a decrease in its Herfindahl index of .04.

This result, in conjunction with some results found in previous sections, allows us to make some estimates of the beneficial impact of CATV on advertising rates. The coefficient of the Herfindahl index in our regressions on advertising rates were clustered around -.225. The CATV penetration rate in Canada is now at 50 per cent. From the above regression, we would expect

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8. Unless CATV brings in a station which becomes so popular that it dominates the market to a greater extent than any of the local stations did before the introduction of CATV.

that a CATV level of 50 per cent would decrease the Herfindahl indices by .20. A decrease in the Herfindahl index of this magnitude should lead to an increase in advertising rates of \$45 per 30-second commercial. With a mean advertising rate of \$230, we can estimate that CATV has led to an increase in advertising revenues of 19.6 per cent. Any market power (which would give the Herfindahl index a positive sign) would tend to bias this estimate downward.

Another technological change in the television industry in recent years is the increase of color televisions. This increase has paralleled the increased use of CATV. We attempted to determine if the confluence of these two changes might cause an overstatement of the impact of CATV.

A simple Pearson correlation coefficient between these two variables was calculated for 55 metropolitan areas in 1975. A value of .019 was found to be the very insignificant result. We thus conclude that CATV and color penetration rates are not related and that our results concerning CATV rates should be unaffected by the change in color usage.

From Table 1 we can see that the local/distant distinction does not have much of an impact on the coefficient of the Herfindahl index. From the table of correlation coefficients we find that the Herfindahl index has a correlation ratio of -.03 with the ratio of local to distant viewers. These results imply that the local/distant values are not particularly indicative of CATV use and that the positive influence of CATV greatly outweighs any negative influence.

There are other facts to be presented which support this proposition. The first is the real growth of television advertising in the face of CATV growth. In 1972 television accounted for 44 per cent of total national advertising expenditures. In 1977 the percentage had increased to 52 per cent. At the same time CATV<sup>9</sup> households increased from 30 per cent to 50 per cent. The only reason television would increase relative to other national media is if television became a more effective medium relative to the others in this period.

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9. TV Basics, Facts, 1978/79.

If CATV had a detrimental impact on advertising effectiveness, we would not expect to find this result.

This implies that television is increasing either its viewership or its advertising effectiveness. The percentage of homes with television has not changed appreciably over the period, since virtually all households owned a television in this period. The amount of time spent watching television has increased somewhat over the period 1969-78 but this is not true in recent years. From March 1976 to March 1978 average daily viewing time decreased from 5 hours 59 minutes to 5 hours 33 minutes. Television continued to increase its share of the market in this period, however. From 1969 to 1978, for a random sample of metropolitan areas the average viewing time increased by 15 minutes a day. Thus it appears we cannot attribute the increase in advertising revenues to an increase in viewership. This implies that advertising effectiveness has increased over this period.

In addition we present Table 4, which relates advertising rate per viewing hour to CATV penetration rate by province.<sup>10</sup> Visual inspection reveals that provinces with high penetration rates also have high advertising rates per viewing hour. The correlation coefficient is .77 which is significant at the 95 per cent level. The results are only suggestive since we have only seven observations and many other factors which influence advertising rates are not taken into account.

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10. The observant reader may wonder why CATV penetration rates were not directly included in the regression on advertising rates (Table 1) instead of using the Herfindahl index as a proxy. The answer has to do with the fact that CATV penetration rates exist for areas and advertising rates exist for stations. Penetration rates could only be calculated for about 40 areas whereas Herfindahl indices were calculated for over 300. Many stations which broadcast into areas with no penetration rate data would have to be excluded from the regressions and we would have had a very small sample with which to work.

TABLE 4

CABLE PENETRATION AND ADVERTISING RATES

	NRT/V.H.	CATV Pen.	Observations
British Columbia	.0558	75	6
Alberta	.0582	59	9
Ontario	.0422	58	15
Manitoba	.0426	45	5
Quebec	.0309	40	15
Atlantic	.0240	22	8
Saskatchewan	.0397	12	7

$$r_{XY} = .766$$

$$Z \text{ transform} = 1.01$$

$$Z \text{ statistic} = 2.02$$

Column 1 is the average advertising rate per viewing hour for each province. Nova Scotia, New Brunswick, Newfoundland and Prince Edward Island are combined into Atlantic.

## CONCLUSIONS

Our basic conclusion is rather simple: CATV does not decrease advertising revenues. This result is based on several diverse pieces of information. It is contrary to the expectations held by most researchers in the field. It invalidates the arguments for most copyright proposals put forth in this area. New justifications are needed if logic is going to imply a need for copyright payments by CATV.

It is understandable that copyright payment by CATV has recently become an issue in North America. Canadian broadcasting revenues in 1977 amounted to nearly \$350 million. For CATV the figure was \$232 million. CATV revenue growth was outpacing that of broadcasters. Thus CATV became an obvious target for copyright payment. In addition, CATV appears to earn a high rate of return on investment.

CATV should not be a target for copyright payment just because it is a growing business. Rational economic arguments should be the center of a discussion regarding copyright payments. If it is thought that CATV is overly profitable, there are other remedies (especially since CATV rates are regulated by the government). We are not saying that no economic justification for CATV copyright payments exists. We are saying that no arguments extolling the virtues of CATV copyright payments have been made which have not relied on the assumption that CATV reduces broadcasting revenues. Our work suggests that these proposals be discarded.



## APPENDIX

### INTRODUCTION

The study to which this Appendix is attached was completed in March 1979. In the study, I attempted to measure the various ways in which Cable influences broadcasters' advertising revenue, but lack of data limited to some extent the variables which could be included in the analysis. Many of these variables are now available in a special audience survey from the Bureau of Broadcast Measurement (BBM) published in fall 1979 and based on data collected in the fall of 1978. This new information makes it possible to investigate in detail each of the variables by which Cable impacts on broadcast revenue.

In this Appendix, I have reworked the analysis presented in the original study to see if the new data would change any of the results. While some of the results presented here are significantly different to those in the study, the basic conclusion is unaltered.

This Appendix also addresses an interesting question more in the realm of broadcast than copyright policy. Are Canadian broadcasters better off because of Cable? The study, being concerned with copyright policy, was concerned with whether Cable increased or decreased advertising rates for a given-size audience. Total audience for Canadian broadcasters might decrease (even while total Canadian viewing increases) because Cable might increase the viewing of American stations by Canadians. The final section of this Appendix considers this effect, revealing that although Cable does increase Canadian viewing of American stations, this increase is not large enough to offset the positive effects of Cable on Canadian stations.

There is one important change in terminology in this Appendix. The Herfindahl index (the sum of squared market shares) is no longer considered a proxy for Cable penetration, as it is in the original study. It is now merely one of several effects caused by Cable. In particular, it measures both the ability of advertisers to pinpoint viewers according to taste and the likelihood that viewers watch television more intensely when they have a greater choice of programs. The Herfindahl index is positively related to the degree of inequality of market shares and negatively related to the number of broadcasters. A new term, audience segmentation,

is more likely to convey this meaning. We define audience segmentation (AS) as the negative Herfindahl index. AS is large when there are many equal-size stations and small when there are few unequal-size stations.

## IMPACT OF CABLE ON TV ADVERTISING RATES

In the first report I identified four ways in which Cable influences revenues of broadcasters: (a) market fragmentation, (b) broadcast size variation, (c) total audience size, and (d) Cable's impact on audience segmentation. These four effects are again examined here in Table A-1 in light of the new data. Table A-1 below is a restructuring of the information presented in Table 1 of the report (p. 42). Some of the discussion is redundant with the first report.

### Market Fragmentation

Assume that viewers in a given locality have access to only one station, station X, prior to the introduction of Cable. After the introduction of Cable, station X's share of the local audience will drop because local Cable viewers will be able to watch distant stations. On the other hand, Cable viewers in distant localities will be able to watch station X, which tends to increase station X's audience. Even if station X's total audience remains the same, the average distance from transmitter to viewer has increased. This is known as market fragmentation. Market fragmentation is thought to reduce advertising rates because of the local-distant effect, discussed on pages 43 and 45 of the first report.

The regressions of Table A-1 indicate that local viewers are worth more than distant viewers. Acceptance of regression 5 as the best specification implies that local viewers are worth 185 per cent of distant viewers.

With this as the appropriate point estimate, it is possible to estimate the loss to broadcasters brought about by a switch in viewership from local to distant stations. It is necessary to discover the actual increase in distant audience brought about by Cable. The data reveal that twenty-six per cent of viewing man-hours occurred outside the B contour. If market fragmentation had been responsible for all viewing outside the B contour, Cable would have reduced advertising rates by  $14\% = (26\% \times \frac{1}{1.85})$ .

TABLE A-1

HEDONIC PRICE REGRESSION OF 30-SECOND PRIME TIME, NATIONAL, SPOT ADVERTISING RATES

	K	A	C	(A+C)	log(A+C)	(A+C) <sup>2</sup>	INC	CBC	AS	POP	FR	R <sup>2</sup>	N
1)	44 (.7)	.035* (9.67)	.014** (2.07)				.026** (2.32)	-52* (2.83)	253* (3.15)	-.9E <sup>-5</sup> (.6)	-32 (1.5)	.900	65
2)	58 (.9)			.028* (14.7)			.024** (2.07)	-55* (2.88)	264* (3.21)	.5E <sup>-5</sup> (.1)	-26 (1.3)	.891	65
3)	7 (.1)			.034* (10.44)		-.28E-06* (2.45)	.026* (2.33)	-56* (3.08)	215* (2.63)	.2E-4 (1.1)	-20 (.95)	.902	65
4)	-832* (5.91)				116* (8.95)		.029** (1.76)	-83* (3.11)	135 (1.18)	.8E-4* (4.02)	23 (.74)	.78	65
5)	.066 (0)	.040* (9.54)	.021* (2.95)			-.30E-6** (2.26)	.028* (2.55)	-54* (3.02)	209* (2.63)	.5E-5 (.3)	-27 (1.3)	.908	65

K: Constant term

A: weekly local viewing man hours

C: weekly distant viewing man hours

Inc: average income of viewers

CBC: 1 if CBC owned station

AS: viewer intensity due to audience segmentation

Pop: average population of viewers home areas

Fr: 1 if French programming

\*\* significant at 95% level

\* significant at 99% level

t - statistics in parenthesis

Income and population data from 1976; Advertising rates, viewing man hours, viewer intensity, CBC and French dummies are for 1978.

In fact, however, Cable need not be responsible for all viewing outside the B contour. Some people buy large antennas, allowing them to receive distant stations. Over-the-air retransmission of stations allows people living in remote areas to receive some over-the-air broadcasts.

To test the impact of Cable on the amount of distant viewing, I estimated a regression with the ratio of distant to total viewers as the dependent variable. Independent variables included Cable penetration and a measure of audience segmentation due to local television broadcasters. The more diverse the local programming the less likely are viewers to switch to distant stations. As a measure of local broadcast segmentation I constructed an audience segmentation variable ( $-\sum S_i^2$ ) for local broadcasters ( $\sum S_i$  was set equal to 1 even if local broadcasters did not capture the entire local audience). The results are presented in Table A-2. Regression 3 was run in first differences.

TABLE A-2

DEPENDENT VARIABLE: PERCENTAGE OF VIEWERS OUTSIDE B CONTOUR

(1)	Constant	Cable Pen.	AS of Local Stations	R <sup>2</sup>	N
1969	-.043 (.7)	.00565* (3.77) 31	-.211 (1.69) -.57	.75	17
(2)					
1978	-.038 (.4)	.00549* (3.47) 64	-.119 (.7) -.35	.54	17

DEPENDENT VARIABLE: CHANGE IN % OF VIEWERS OUTSIDE B CONTOUR

(3)	Constant	$\Delta$ Cable Pen.	$\Delta$ AS		
1969-78	-.005 (0)	.0038* (2.83)	.070 (.6)	.49	17

Cable Pen.: % of homes in area using Cable  
AS of local stations:  $-\sum S_i^2$  where

$$S_i = \frac{\bar{\text{Audi}}}{\sum \text{Audi}} \quad \text{for each local station } i$$

Variables with a bar over them are mean values  
Data based on 17 metropolitan areas with published  
Cable penetration rates.

These regressions indicate that most distant viewers use Cable. The first two regressions, evaluated at their means, indicate that Cable explains 69 and 91 per cent, respectively, of the value of the distant viewer ratio. Assuming that causality runs from Cable to distant viewing, these two regressions imply that Cable by itself increased the percentage of distant viewers by 18 points and 24 points respectively. Regression 3 indicates that a Cable penetration of 50 points would have increased the percentage of distant viewers by 19 points.<sup>1</sup>

The three-point estimates are very close and I have taken the average of the three as the overall point estimate. The average value is .20 which is quite close to the total percentage of distant viewers (26%). The estimated decrease in advertising rates due to market fragmentation now becomes 11 per cent  $[\text{.20} \times 1/1.85]$  compared to a maximum possible loss of 14 per cent.

#### Broadcast Size Variation

Park [1970] has asserted that Cable will increase the size of large stations and decrease the size of small stations. Models of audience diversion (summarized in Park, 1979) have been used to imply that such an effect would indeed be brought about by Cable.

This effect would alter average advertising prices for broadcasters as a whole, given that the relationship between advertising rates and audience size is nonlinear. The maximum possible impact on advertising rates due to nonequality of audience size can easily be estimated. The negative quadratic term  $(A+C)^2$  in Table A-1 implies that as the variation of audience size among broadcasters increases, the average

- 
1. In regression 3, I evaluate the coefficient of change in Cable penetration with the assumption that the change in audience segmentation is zero since there is no reason to believe that a change in Cable penetration will influence the shares of local broadcasters relative to each other. Equations 1 and 2 evaluate the coefficient of audience segmentation at its mean since this exogenous variable is at a more realistic level when evaluated at its mean.

advertising rate will diminish since the value of marginal viewing hours to large broadcasters is less than the value of marginal viewing hours to small broadcasters. The most severe impact that Cable could have on advertising rates due to audience variation would occur if Cable were completely responsible for all dispersion of viewing audience sizes among broadcasters.

Such an assumption is clearly unreasonable since it is obvious that broadcasters had different-size audiences prior to the introduction of Cable. I compute this maximum possible effect merely to demonstrate the small impact of audience variation on advertising rates. In making this estimate, I use the coefficients of regression 3 in Table A-1 in the following formula:<sup>2</sup>

$$(1) \quad \% \Delta \text{AdRt} = \frac{1}{65} \sum_{i=1}^{65} \text{AdRt}_i \left[ \sum_{i=1}^{65} [.034(\text{MVH}_i - \overline{\text{MVH}}) - .28E - 6(\text{MVH}_i^2 - \overline{\text{MVH}^2})] \right]$$

where  $\% \Delta \text{AdRt}$  is the percentage change in aggregate advertising rate due to dispersion of audience size;  $\text{AdRt}_i$  is the  $i$ th station's 30-second advertising rate and  $\text{MVH}$  is the man-viewing hours of the  $i$ th station. Bars represent average values.

This calculation was performed for 65 broadcasters for 1978 and advertising rates were found to be only 11.6 per cent less than would have been the case had all broadcasters been of equal size.

It is difficult to believe that Cable is responsible for much of the current audience-size dispersion. A simple attempt can be made to measure the impact of Cable on relative audience sizes over time by comparing the dispersion of broadcast audiences as the incidence of Cable use increases. Table A-3 portrays this attempt.

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2. Regression 3 has been used even though it is slightly inferior to regression 5 because with this regression it is not necessary to allocate individuals into A and C contours when we equalize station size.

TABLE A-3

(1) Year*	(2) National Cable Penetration	(3) $\sigma$	(4) $\sigma/\bar{X}$	(5) N
1973	32	829000	1.28	76
1976	42	910000	1.29	87
1978	50	935000	1.32	87

$\sigma$  = Standard deviation of audience size in weekly man-hours

$\bar{X}$  = average audience size per week

N = number of observations

\*These years were used because of readily available data.

In this period of time (1973-1978, picked because of easily accessible data), Cable increased by 56 per cent and yet the variance of audience sizes hardly changed at all. The standard deviation increased by only 3 per cent.<sup>3</sup> Observation of the underlying data clearly reveals that the variation in the size of the city of broadcast origination is largely responsible for the variation of audience size. The largest stations originate in Toronto and Montreal (which together contain 25 per cent of Canada's population) and it is clear that these would be the largest stations with or without Cable.

- 
3. The coefficient of variation is the more appropriate measure of audience dispersion. Observations of the provincial standard deviations and means of audience size clearly showed that large average audiences were associated with large variances of audience sizes. This is to be expected since an increase in population will increase both the average audience size and the variance if the market shares of stations remain the same. Introduction of new stations might mitigate this impact but has not in our data. Coefficients of variation standardize variability by the means and thus allow us to examine audience variability cleansed of this audience-size effect.

Since it is clear that the variation in audience size is primarily a function of population variance, measurement of the relationship between Cable and audience variation needs to take account of this effect. Towards this end we disaggregated our national data into seven provincial categories.<sup>4</sup>

Coefficients of variation of audience size were calculated for each province, along with Cable penetration and coefficients of variation of population among cities of broadcast origination. With only seven observations we can make limited empirical enquiries but we were able to run the following regression:

$$(A) \quad ACV = 47.3 - .17CP + .44PCV \quad R^2 = .76 \quad N = 7$$

(3.4)      (.4)      (2.80)

where ACV is the audience-size coefficient of variation, CP is the Cable penetration rate and PCV is the population coefficient of variation (all data 1978). An increase in Cable penetration from 0 to 50 per cent would decrease ACV by 10 per cent of its mean value, quite the opposite of past assertions. This would lead to an increase in advertising rates of 1 per cent. We will consider this to be our best point estimate. Running this regression in the form of first differences further confirmed this result.

While it seems reasonable to conclude that Cable does not increase the audience of large stations at the expense of small stations, such a strong statement need not be made in order to demonstrate that the impact of the non-linearity is almost negligible. Using columns 2 and 4 of Table A-3 we determine the largest positive estimate of the impact of Cable on audience variance. An increase of 18 points in Cable penetration led to an increase of 3 per cent in the audience coefficient of variation. Extrapolating to a 50 per cent Cable change gives an increase of 8 per cent in audience variation. Since the total "loss" due to audience variation is 12 per cent (calculated with formula one) the net impact of Cable in this instance is to reduce revenues by less than

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4. The four Eastern provinces (Prince Edward Island, Newfoundland, New Brunswick and Nova Scotia) are combined into one Atlantic grouping.



1 per cent  $[\cdot 08 \times 12\%]$ . However, it should be kept in mind that with the regression estimates Cable has been found to increase advertising rates through the audience-size variation impact.

### Total Audience Size

The next task involves estimating the impact of Cable television on the audience size.<sup>5</sup> There is a prima facie case which can be made regarding the expected impact of Cable on audience size. Since people who pay for Cable reveal through their payment that it increases their viewing satisfaction it might be thought that they must watch more television. This argument is faulty.

The only variable cost involved in watching television is usually the time cost involved. When Cable increases viewer utility (i.e., viewer satisfaction), it lowers the implicit price of television services (defining television services as the entertainment received from a minute of television viewing) since less viewing time is needed to achieve a given level of utility. This increases the quantity of television services demanded by an individual. This increased quantity of television services can be brought about through either a decrease or increase in television viewing since a minute of television viewing now gives more services than was the case prior to Cable. Thus the impact of Cable on the quantity of television viewing is theoretically ambiguous.<sup>6</sup>

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5. Audience size is defined as number of man-hours of viewing. Changes in either the number of viewers or the average length of time spent watching television will change audience size.
  6. This is equivalent to estimating the impact on the quantity of chocolate bars demanded when the amount of chocolate in each bar is increased with the price of a bar remaining constant. In this well-known example, the quantity of bars demanded will depend on the elasticity of demand for chocolate. If demand for chocolate is inelastic, the quantity of bars demanded will decrease.

With no theoretical guidance, the impact of Cable on audience size becomes an empirical matter. Prior studies have found little clear-cut evidence of this impact. Fisher et al. (1966) estimated that Cable viewers watched more television than non-Cable viewers, given an equivalent set of broadcast signals. Park (1970, p. 23) refers to four audience surveys where "the percentage of Cable subscribers watching television during prime time is greater than the corresponding percentage of non-subscribers".

On first blush, Canadian data do not appear to agree with either of these findings, since Cable viewers do not appear to watch more television than non-Cable viewers. Table A-4 below shows the breakdown of weekly viewing hours in 1977:

TABLE A-4  
WEEKLY VIEWING HOURS

	<u>Cable</u>	<u>Non-Cable</u>
Men	21.41	21.01
Women	24.27	25.25

(Source: p. 13, TV Basics)

Such gross data, of course, are not proof that Cable does not affect people's viewing habits. In order to clarify the impact of Cable on viewing audience size, I departed from previous research and ran a regression with several demographic variables included. Observations were based on 40 metropolitan areas (populations ranged from 40,000 to 3,000,000) throughout Canada for 1978. Weekly viewing per capita was the dependent variable. The independent variables included, among others, the percentage of homes on Cable and the percentage of homes with color televisions, since it was thought that either of these variables might increase the time spent viewing television.

Cable penetration was also one of the independent variables. It is undoubtedly true that the first people to subscribe to Cable in an area are those who are likely to get the greatest value from it. It is likely that Cable-induced increases in viewing will be larger for early Cable subscribers than for later subscribers, indicating that any Cable-viewing hour relationship would be nonlinear with a decelerating increase in viewing hours as Cable penetration increases. To

test for this we ran Cable penetration in natural logs and a quadratic formulation.

The demographic variables included as independent variables are: percentage of workers in professional/managerial positions, average family income (received doctrine suggests that high socio-economic status tends to be associated with low levels of television viewing), percentage of households without children, percentage of population speaking English as a first language.

The final independent variable is a measure of audience segmentation brought about by local over-the-air broadcasters, defined as the negative squared relative market shares of the local stations in the local market. This variable should be positively related to viewing hours.

The results appearing in Table A-5 are most noteworthy. Cable has a positive impact on viewing hours in all regressions and is significant in the nonlinear estimations, implying that previous research, by either disregarding the impact of Cable on total audience (Park, 1970; Fisher et. al.), or underestimating its impact (Park, 1979), has seriously erred in measuring the impact of Cable on broadcasters. My first report also underestimated this effect.

A superficial examination of the data does not reveal this relationship. The simple correlation between Cable and viewing hours is  $-.08$  and between the natural log of Cable and viewing hours is  $.19$ . The more detailed specification appears to have been well worth the effort.

The percentage of professionals appears to be the most important socio-economic indicator. It is always significant and negative. Percentage of families without children performs in a similar manner although it is not quite significant. The income variable is unimportant in this specification. An interesting result is the strength of the language variable. French-speaking viewers watch more television than their English counterparts. Whether this is due to a cultural difference or a difference in the quality of French programming is difficult to gauge. Neither the color television variable nor the audience segmentation of local programming has a significant impact on viewing. Local audience segmentation does have a surprising negative coefficient, implying that the greater the diversity of local broadcasting the less people watch television. This is unexpected and might be due to the negative correlation of this variable with Cable penetration ( $-.4$ ). This correlation is due to the fact that people are more likely to switch to Cable if the local viewing options are limited.

TABLE A-5

## ESTIMATING INFLUENCES AFFECTING PER CAPITA WEEKLY TELEVISION VIEWING

	K	CAB	LCAB	CABSO	OCC	LAS	ENG	COL	INC	NCH	R <sup>2</sup>
(1)	24.0 (6.02)		.938* (2.70)		-.252* (2.78)	-1.87 (1.43)	-.019* (2.69)	.006 (.12)	.00004 (.10)	-.070 (1.51)	.61
(2)	25.8* (5.66)	.023 (1.38)			-.256* (2.44)	-1.59 (1.00)	-.022* (2.63)	.020 (.33)	.000001 (.01)	-.071 (1.40)	.55
(3)	23.4* (5.24)	.130* (2.51)		-.0012* (2.17)	-.264 (2.65)	-1.57 (1.05)	-.017* (2.14)	.001 (.2)	.4E-6 (0)	-.072 (1.36)	.61

\* significant at 95% confidence level

Dependent Variable: weekly viewing hours per capita in city

CAB: percent of homes using Cable in city

LCAB: natural log of Cab

CABSO: CAB x CAB

OCC: percentage of inhabitants of city in managerial/professional jobs

ENG: percentage of English-speaking inhabitants of the city

COL: percentage of homes with color televisions in the city

INC: average household income in city

NCH: percentage of homes without children in city

LAS: local audience segmentation due to over-the-air television stations in city

Source: Market Statistics Report 1979 Television from Bureau of Broadcast Measurement, Fall 1979, Television Survey.

It is possible to estimate the impact on advertising rates brought about by the increased viewing due to Cable. Substituting a national Cable rate of 50 per cent (compared to 54 per cent in our sample) into our regression implies that Cable has increased viewing hours by 15.7 per cent in regression 1, 15.1 per cent in regression 3 and 4.9 per cent in regression 2. Regression 2, being theoretically and empirically unappealing, will be disregarded. The remaining regressions indicate that the viewing-hour impact of Cable has increased advertising rates by 15 per cent.<sup>7</sup>

### Audience Segmentation

Since Cable increases the number of alternative broadcast signals, it should increase the degree of audience segmentation. Audience segmentation has already been shown to influence advertising rates in Table A-1.

A regression was run with audience segmentation as the dependent variable. The independent variables included Cable penetration, local audience segmentation, percentage of English-speaking persons, and percentage of professionals/managers. This last variable was included to represent possible dispersion of audience tastes, which would tend to cause greater segmentation. This variable measures dispersion of audience tastes because it never attains a value of more than .21 and thus is always positively related to the size of a minority group (professionals) which might have different tastes than the majority. Percentage of English-speaking was included since French viewers might be less likely than English viewers to consider distant English programming on Cable a good substitute for local programming. French viewers should perceive Cable as a smaller improvement in program diversity than English viewers.

The results are portrayed in Table A-6. In regression 1 all variables have the predicted sign, although only Cable penetration is significant. In regression 2 the measure of taste dispersion is dropped and segmentation due to local broadcasters becomes significant. Audience taste dispersion might be expected to influence local segmentation (correlation of .36), so this result is not surprising. However, the coefficient on Cable is the only real concern and is quite stable.

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<sup>7</sup> The mean value of audience size in Table A-1 is 6535. A 15.4 per cent increase in audience size (average of regressions 1 and 3 in Table A-5) caused by Cable implies that the mean audience would be 5663 without Cable. Plugging these values into regression 3 of Table A-1 implies that Cable has increased advertising rates by 14.54 per cent.

TABLE A-6

VARIABLES INFLUENCING DIVERSITY OF TELEVISION SIGNALS

	K	CAB	LAS	ENG	OCC	R <sup>2</sup>
(1)	-.49 (4.1)	.0030* (3.26)	.102 (1.14)	.0007 (1.34)	.0024 (.35)	.50
(2)	-.40 (4.3)	.0031* (3.5)	.164* (2.1)	.0005 (1.03)		.47

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\*Significant at 95% confidence level

Dependent Variable: Diversity of television signals in an area

All variables have been previously defined (see Table A-5)

40 Observations, 1978

CAB: Cable penetration in area

LAS: Audience diversity due to local, broadcasters

ENG: Percentage English-speaking in area

OCC: Percentage of professional/managers in area

These results indicate that a Cable penetration rate of .50 is responsible for 52 per cent of audience segmentation throughout the country. More specifically, it raises segmentation by .15. In Table A-1, regression 5, audience segmentation has a coefficient of \$209. Thus the effect of Cable on advertising rates through segmentation is \$31.35 [.15 x \$209]. The mean advertising rate is \$230. This implies that the audience segmentation effect of Cable will be to increase advertising rates by 14 per cent.<sup>8</sup>

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<sup>8</sup> This compares to 19 per cent measured in the original report. In that report, I took this as the overall effect of Cable because allowing the local-distant distinction in the regressions of Table A-1 did not affect the coefficient Herf. This would be the appropriate interpretation if Herf was a proxy for Cable. In this report, I assign to Herf only one of several impacts of Cable on broadcasters. This new specification is better since it allows a more detailed analysis of the effect of Cable. Given the data of the first report, the specification led to conclusions which overstated the positive impact of Cable. Since the data understated the effect of Cable on viewing hours, these imperfections fortuitously cancelled each other out.

## RESULTS IN PERSPECTIVE

### Total Impact of Cable

The total impact of Cable can now be estimated. We have isolated four distinct effects of Cable on advertising rates. These are portrayed in Table A-7.

TABLE A-7

	<u>Point Estimate</u>	<u>Maximum Negative</u>	<u>Park (1970)</u>
1. Market fragmentation	-11%	-14%	-6%
2. Broadcast size variation	+1	-10	-3
3. Total audience size	+15	+15	0
4. Cable's impact on audience segmentation	+14	+14	0
Total impact	+19%	+5%	-9%

The results, like those of the first report, indicate that Cable has increased advertising rates by 19 per cent. Even if Cable were responsible for all market fragmentation and all audience-size inequality among stations, it would have increased advertising rates by 5 per cent. Park's results are included for comparison.<sup>9</sup>

My results are significantly different to those of previous researchers. This is primarily due to the audience segmentation and total audience-size variables. The broadcast-size variation effect is also considerably different to that of past studies. Some explanation of these differences may be informative to the reader.

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<sup>9</sup> His estimates were based on an estimated Cable penetration rate of 40 to 45 per cent. His first two estimates are quite close to ours although his estimate of the impact of non-linearity seems very small given his regression results (he pulled this figure out of the air). His estimate of viewing hours was due to reliance on past studies which were based on incomplete specifications. The last impact was not taken account of.

### Total Audience Size

The total audience-size variable has been shown to be positively associated with Cable. In my first report, Cable did not affect viewing hours. The superior data supplied by the new BBM survey is entirely responsible for the change in measurements. The  $R^2$  in the new regressions is much higher than the old, indicating that the specification is much improved.

Previous research has been bogged down in comparing two hypotheses regarding Cable's impact on viewing habits. The first is a self selection hypothesis: i.e., people who are more avid television viewers are more likely to subscribe to Cable. Under this hypothesis, Cable has no real effect on viewing habits. The other hypothesis is that people on Cable watch more television because of greater program diversity or higher quality reception.

Park (1979) attempts to distinguish between these two hypotheses. His results point to the conclusion that Cable increases viewing. He attributes this increase entirely to the better reception offered by Cable. His case against greater diversity leading to greater viewing is quite weak and dependent on his (imperfect) measure of program diversity which is included in a regression together with a variable attempting to pick up the effect of Cable. Park does not put much faith in his own results and refuses to abandon the self selection hypothesis even though his own evidence does not support it. He believes that unmeasured variables may have distorted the results, particularly since his dependent variables were capable of explaining so little ( $R^2$  is .06 with OLS) of the variation in the dependent variable.

Fisher, et al., estimate (p. 248) that 98 per cent of Cable viewers watch television during prime time as opposed to 55 per cent for over-the-air viewers. This somewhat absurd result was garnered from a regression run in such a way that the number of alternative programs available to viewers was supposed to be held constant. For this reason the increased viewing would have to come about because of self selection or higher quality broadcast signals. Fisher, et al., are aware of the implausibility of this result but claim that while the absolute magnitudes are incorrect, the rankings of viewing time are correct.



My results are more believable than these others. My estimated equation is in a natural form (unlike those in the previous studies). Cable and non-Cable viewers are merged into a single observation, eliminating the possibility of self selection influencing the results.<sup>10</sup> Many variables are included which have previously been neglected. The independent variables explain a good deal of the variance of the dependent variable. It is unfortunate, however, that my results do not distinguish between increased diversity and superior reception as the cause of the increased viewing. These variables are intertwined in a manner that makes their separation a task of considerable difficulty. In the end, however, it is not of great importance to know which of these effects is responsible for the increase in viewing audience if we merely wish to measure the overall impact of Cable.

### Audience Variation

My findings regarding the impact of Cable on audience size variation were quite different to those predicted in prior studies. The most important distinction to be made is that my study measures this effect whereas other studies merely assert the direction of this effect. For example, Park (1970) states: "It seems likely, though, that stations carried as distant signals will tend to be fairly large ones with strong programming, certainly larger on average than the local stations whose audience they capture" (p. 72). We have some reason to doubt this statement. All network stations carry the same prime-time programming (which accounts for a great majority of the daily audience). There is little reason for a network station with a large home audience to be more attractive in another locality than a different distant station of the same network with a smaller local audience. In fact, the closer station will be preferred because of its stronger signal. If there is no bias in favor of large stations by Cable operators, there is no reason to expect Cable to distort the relative size of large and small stations.

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<sup>10</sup> Unless we believe in a bizarre Tiebout hypothesis. If people move to localities because of the number of stations they can receive, self selection would influence viewing patterns and those areas with high Cable penetration would have more television viewing. This assertion, while cute, is clearly unreasonable.

It is not difficult to understand the motivations for the belief that Cable would benefit large broadcasters. Observation of U.S. data clearly reveal such a pattern and it is quite normal to generalize from easily observable data. Unfortunately, one must also be careful to take institutional factors into account. Clearly, with FCC regulations restricting the growth of Cable in large metropolitan areas, we will find broadcasters in large cities being carried on Cable in small cities but not the symmetric carrying of small-station signals on large-city Cable systems. This distortion, caused by institutional restrictions, will influence the data so that a superficial examination would discover, erroneously, that Cable benefitted large broadcasters at the expense of small broadcasters.

#### Audience Segmentation

Past studies have calculated measures similar to audience segmentation (program diversity variables), but none except mine have attempted to use audience segmentation in a regression with broadcast advertising rates (or revenues) as the dependent variable. The implicit assumption appears to have been that while advertisers value variables other than total audience size, program quality changes would not influence this valuation. This belief can be found in Steiner (1952). Steiner treats all members of the audience as equal and, in his models of program diversity, treats body count as the only important item in determining advertising revenues and program production.

That advertisers do care about their audience is quite evident from their real world behavior. They conduct tests of advertising effectiveness and expend resources to generate a profile of just who it is that views various types of programs. It is no accident that sporting events are usually sponsored by beer producers and men's hygiene products. Of course, it is not necessary for advertisers to be aware of audience characteristics. Some advertisers will find that certain stations will provide greater advertising efficiency than had previously been the case, even with a fixed number of viewers. This will occur in markets with greater audience segmentation. When advertising becomes more effective, firms will increase their expenditure on advertising to the benefit of broadcasters as a whole. This is in fact what my results indicate.

## WHAT WE HAVE MEASURED

We can conclude from these results that Cable has a positive impact on advertising rates. For copyright purposes we would not wish to include the viewing hours (audience size) effect. This is because the principle that copyright payment be related to audience size is one we accept. For copyright policy, we are interested in the transmission mechanism from audience size to advertising rates. The other three effects all influence this mechanism and are thus appropriate to examine in the context of copyright policy. The net effect of these influences is to increase advertising rates by four per cent. Our conclusion is that Cable has influenced the transmission mechanism in such a way that advertising rates have gone up and therefore there is no need to impose copyright liability on Cable television owners.

It should be made clear here exactly what we have measured. We have estimated the "pure" aggregate impact of Cable on broadcast ad rates. By "pure" we mean ways in which Cable influences the transmission mechanism between viewing audience size and advertising rates for Canadian broadcasters. Cable could have other impacts on broadcasters but these other influences are only important for copyright policy if they affect the link between audience and advertising rate.<sup>11</sup>

For example, Cable could give off deadly radiation which destroys half the population. My results are likely to be unaffected by such a situation since advertisers would probably still value a given size audience the same as before.

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<sup>11</sup> It is always possible to have left out some effect. The local-distant, non-linearity and audience-segmentation effect are the only ones which this author can think of. The first two have received much attention in the literature. If there are no other important influences on the transmission mechanism, our results are the best we can get with present data. If new effects of Cable on this mechanism were found then these conclusions would need to be modified to take these effects into account.

None of the regression coefficients would change.<sup>12</sup> If all audiences were half the size, advertising revenues would decrease but this would be no justification for changing copyright policy. Since there is a smaller audience, copyright payments should be smaller. The reader should understand that the results discussed in this section (i.e., market fragmentation, broadcast size variation and audience segmentation) do not necessarily measure the total impact of Cable on broadcasters but merely those impacts of Cable on broadcasters which influence the audience-advertising linkage (and are thus germane to copyright policy).

#### EFFECT OF AMERICAN STATIONS

This distinction is especially important in discussions regarding the impact of Cable on viewing of American versus Canadian stations by Canadian audiences. Our results indicate that Cable makes a given-size audience more valuable to broadcasters. It does not measure the effect of Cable on Canadian as opposed to American broadcasters. It is possible that Cable increases viewership of American broadcasters to the detriment of Canadian broadcasters. This would appear as a reduction in audience size of Canadian broadcasters.

The reader may wonder how this could be, in the face of my regression indicating that Cable increased viewing audience size. The answer lies in understanding that viewing hours is the total time Canadians spend watching television, regardless of whether they watch Canadian or American broadcasters. Our results are compatible with the possibility that Canadian broadcasters may actually be made worse off by Cable.

It should be emphasized that the above scenario could only come about through an impact of Cable on the audience size of Canadian broadcasters. With a smaller audience for Canadian broadcasters (and the programs carried by these broadcasters) we would expect that advertising rates and copyright

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<sup>12</sup> This is not quite true. Distant viewers, a larger percentage of whom use Cable, might die in larger proportions than local viewers, so that the local-distant effect would be found to have a smaller impact.

payments by Canadian broadcasters would decrease. This does not imply a failure of copyright policy. In fact it implies the opposite. If Canadians no longer view shows on Canadian stations, copyright payments by Canadian stations serve their appropriate function when they decrease. Copyright payments should be made to those who provide works which are valued by the public. In this example it would be the artists creating the programs carried on the American stations who are entitled to the copyright payments.

Since this study does not determine the effect of Cable on Canadian broadcasters, one might be curious to know what that impact is and what factors will influence it. The answer to this question deserves an entire study. A rough idea of the issues involved can be sketched here, however.

To answer this question precisely would be no simple task although an adequate answer would not require a herculean effort. The first item to measure should be the possible increased viewing of American stations by Canadians, brought about by Cable. One should also look at the possible increased viewing of Canadian broadcasts by Americans using Cable television. This latter impact is only important if it is found that American viewers are treated as distant viewers by advertisers on Canadian television (a likely result). One could then measure the total impact of Cable on Canadian broadcasters.

Variables such as the type and number of American stations versus the type and number of Canadian stations carried on Cable will influence the extent to which Cable increases viewership of American broadcasters. The number of over-the-air American stations receivable in a locality will also influence the impact. Problems like these complicate the precision of the research.

Table A-8 below gives some idea of the impact.

	<u>TABLE A-8</u>			
	% of Viewers Watching		Cable Penetration	
	American Stations		Rate	
	1969	1978	1969	1978
Calgary	0	32	0	71
Edmonton	0	24	0	65
Montreal	8	14	20	42
Toronto	42	36	20	70
Vancouver	49	46	50	86
Winnipeg	23	30	11	77

In cities which have over-the-air access to American stations, Cable seems to have had little impact on the Canadian/American split. The only cities with dramatic increases in the viewing of American stations are Calgary and Edmonton. These cities are unrepresentative because viewers had no access to American stations over-the-air. Most Canadian cities are close enough to the U.S. border that viewers can watch American stations without resorting to Cable. In these border cities Cable will have a smaller impact on viewing of American stations, as demonstrated in the table above. The experience in these border cities is more typical of average Canadian cities. Even in the extreme cases of Calgary and Edmonton the increase in Cable (68 points) implies that for the national average Cable penetration rate of 50 per cent, only 21 per cent of viewers would switch to American stations. For the other cities (which have larger population as well), Cable has led to a very insignificant change in viewing of American stations. We can only conclude that the data overwhelmingly indicate that less than 19 per cent of viewers switch to American stations due to Cable. A precise number would require the kind of detailed study discussed above, but the switch to American stations is certainly less than the 19 per cent increase in revenue brought about by Cable.

We thus conclude that the Canadian Cable television system benefits the entire group of broadcasters with Canadian viewers, the entire group of Canadian broadcasters and copy-right holders with Canadian viewers.

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