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AN ECONOMIC ANALYSIS OF THE IMPACT OF CABLE

TELEVISION ON TELEVISION BROADCASTING

STATIONS

by Robert E. Babe

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I. INTRODUCTION

Cable Television (also known as CATV or community antenna television),
through its function of making available to subscribers a multiplicity of
television channels (the number of channels normally being greater than would
be available to subscribers with a roof top antenna), has been viewed with
some alarm by the Canadian Radio-Television Commission (CRTC). Public policy
with regard to broadcasting in Canada has historically reflected a belief
that broadcasting has special significance with regard to the nation's ability
to survive, that broadcasting is not "just another industry" to be governed
wholly by the impersonal forces of the market place, but rather is to be seen
as an instrument of public policy.[1]

How,
which
interest
groups ?

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1. See, for example, Royal Commission on Broadcasting, Report 1957 (Ottawa:
Queen's Printer) 1957; White Paper on Broadcasting 1966; Special Senate
Committee on Mass Media Mass Media Vol. 1 (Ottawa: Information Canada) 1970;
Broadcasting Act, 1968; Frank Peers The Politics of Canadian Broadcasting
1920-1951 (Toronto: University of Toronto Press) 1969; Austin Weir The Struggle
for National Broadcasting in Canada (Toronto: McClelland and Stewart) 1965.
I define an instrument of public policy as a concern that must take into account
wider ranging social benefits and costs than would be the case for a private
business in its cost-revenue calculations. Such social benefits (e.g., national
unity) and social costs (e.g., U.S. cultural domination) are generally termed
"externalities" in the literature of economics, and they may be internalized
to the firm either through public ownership (e.g., the CBC), regulation (e.g.,
the private broadcasters) or taxation and subsidy.

Should cable television have a deleterious impact on the finances of the broadcasting industry, an important instrument of public policy in Canada would thereby be weakened.

Cable television can have a financial impact on the television broadcasting industry in several ways: (1) By delivering many more television signals into an area than are normally available, cable television fragments the audiences of the local broadcasting stations. By reducing the total audience size, the television station becomes a less attractive advertising vehicle and its revenues may be expected to suffer. *(to the extent it depends on adver-tising).* The fact that distant cable systems may carry the station beyond its normal coverage area, thereby increasing its potential audience size, does not totally alleviate this difficulty. Distant and local audiences are not equal in value to broad-casters as advertisers are less able to pinpoint their desired audiences when television signals are carried over larger and larger geographic areas. For example, a local car dealer might consider the audience watching his advertise-ment via cable in a centre a hundred miles or more from his business to be next to worthless. Even if one assumes that cable only results in a redistribution of audience composition, so that it does not affect each station's total audience size, it could still reduce each station's adver-tising revenues.

Rolla Park has shown that in the United States the shifting of audiences among stations because of cable causes a related difficulty. Cable has a different impact on stations of different sizes due to the fact that each additional viewer is worth successively less to a station (i.e., the marginal value of viewers declines). Stations in large urban centres, which

may be expected to gain net audience, will not gain as much in advertising revenues as stations in small centres will lose due to the decline in their net audience. Therefore, cable television may be expected to cause an over-all decline in television advertising expenditures.[2] (2) The second concern about the effects of cable television upon traditional broadcasters involves the openness of the economy. In a closed system, as one may assume the United States to be for these purposes, cable television will have either a zero impact on total viewer-hours devoted to the broadcasting system or increase this time somewhat (because of greater diversity, or channel clarity). In a closed system, viewer-time lost by one station will be made up by gains to other stations whose reception is attributable to cable.

Canada, however, does not have a closed system. In fact, the raison d'être of cable in Canada has been stated to be its ability to bring signals of American stations into areas beyond their normal coverage.[3] The results of cable's ability to lessen total viewing time to Canadian stations are two-fold. First, Canadian television becomes a less attractive advertising medium because of the decreased audience. Stations will be forced to reduce their rate cards in order to maintain a competitive cost-per-thousand for advertisers using television as opposed to other media. Therefore, total revenue will decline.

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2. Rolla Park, Potential Impact of Cable Growth on Television Broadcasting (Santa Monica: RAND) R-587-FF. October, 1970.

3. Canadian Cable Television Association. "Submission to the Special Committee on Mass Media." March, 1970 (mimeo) p. 41.

(2). Second, some advertisers, especially firms with branch plants in Canada, may find it propitious to abandon the Canadian broadcasting system altogether and attempt to reach the Canadian market through advertisements placed on American television stations. In this way, funds available for all Canadian advertising media will decline by being syphoned across the border. (3) By facing increased competition from American stations, private broadcasters may be even further induced to compete for audiences by using mass appeal, light entertainment programmes of the American genre. At present, the schedules of private stations include material originating in the United States for about 40% of the broadcast day and in prime-time the figure is substantially higher. Increased competition from American stations may force private broadcasters to further lower standards on the 60% produced in Canada in an effort to compete for the mass audience. This effect has been reflected in two recent trends in Canadian broadcasting: (1) co-production with American producers of high cost, light entertainment shows such as Rollin' on the River in order to (a) meet the Canadian content requirements and (b) export programmes into the lucrative U.S. market, and (2) production of low cost "Canadian" shows that formerly appeared on U.S. television such as Beat the Clock and low cost mass entertainment shows such as The Amazing Kreskin and Headline Hunters that are profitable in the Canadian market alone but can pick up additional revenues from export to the U.S. In any case, the result is continentalization of broadcasting, and such continentalization does little in the way of implementing the national policy for broadcasting as set out in the Broadcasting Act, viz "to safeguard, enrich and strengthen the cultural,

rather elitist

political, social and economic fabric of Canada."

Such, then, are the theoretical concerns with regard to the impact of cable television on television broadcasters. The remainder of this report is an empirical analysis attempting to measure the importance of the concerns described above. Section II presents a series of tables on the growth of cable television, growth of television advertising revenues, comparative statistics on the growth of television advertising and other media advertising expenditures, etc., in an effort to determine whether or not cable television has had a financial impact on broadcasters. Section III details an econometric model that measures the impact of cable television on the viewing time to Canadian television stations. Section IV explores the economics of broadcast advertising in Canada, through econometric and other means, in order to explain the continuing growth of television advertising revenues (as developed in Section II) in the face of declining audience shares to Canadian stations (as developed in Section III). Section V tests the hypotheses developed in section IV regarding the economic impact of the increased availability of U.S. channels through cable television on Canadian television stations. Section VI offers some qualifications of the results in Section V, particularly with regard to the expected impact the new television network, Global, on the economics of broadcast advertising in Canada. Section VII offers some public policy conclusions.

II. PAST IMPACT OF CATV ON BROADCASTING REVENUES

There are many factors that will be instrumental in determining

the level of television advertising expenditures at a point in time and
the rate of growth in these expenditures through time. In addition the
number of subscribers to cable television in Canada and the number and type
of stations carried by cable systems, a listing of such "exogenous" factors
would include: the state of the economy and the condition of business
expectations (which may, perhaps, be represented by the level and rate of
growth in GNP), the perceived effectiveness of television advertising per se
and its relative effectiveness in inducing sales vis a vis other media;
the number of Canadian television stations and their population coverage;
the rates charged for advertising time; rates charged by competing advertising
media; sales efforts by television stations in soliciting commercials. In
other words, total advertising receipts to the television broadcasting industry
will be determined by the interaction of the forces of the supply of and
demand for advertising time, and one of the forces that may be expected to
influence the demand for advertising time is the stage of development of cable
television.

It may be possible to build an econometric model with good explanatory
power using total television broadcast revenues as the dependent variable.
Such has not been carried out in this section. Rather, comparision is made
regarding the level and rate of growth of television advertising revenues with
the levels and growth rates of cable penetration, GNP, and revenues to other
advertising media in an effort to infer whether or not cable television has had
a significant impact on the revenues to Canadian television stations. As will
be seen shortly, in spite of the rapid growth in cable television penetration
(and the consequent increased availability of U.S. television stations in Canada),

television advertising revenues have continually grown since 1960 at a
fairly even rate, and have increased slightly in importance relative to
other advertising media. Television advertising revenues have increased
as a percent of GNP in the years since 1960, although they have experienced
a decline relative to GNP since 1967. From this, it seems reasonable to infer
that the effect of cable television on broadcasting has not been so severe
as to make television relatively less attractive than formerly vis a vis
other media, with the result that the growth in television advertising has
kept pace with the growth in the economy generally. These remarks can be
verified by inspecting Tables 1 and 2.

Table 1 compares the rate of growth of subscribers to cable television
and the rate of growth of television advertising revenues. In spite of the
fact that the number of subscribers to cable television have increased from
215,000 in 1964 to 2,130,000 in 1973, a growth of 890%, television advertising
revenues have increased over the same period from $80.7 million (net) to
$179.0 million (net) or by 122%. During the period 1960-1966 television
advertising experienced an average annual rate of growth of 12.4% while in
the 7 year period 1967-1973 (the period during which the presence of cable
television became recognized as a possible threat to the broadcasting system)
television advertising grew by an average annual rate of 8.7%. Throughout
the period under consideration, television advertising has continued to grow
at quite a satisfactory rate (10.4% per year) in the face of a growing cable
television presence. While it is true that the rate of growth in the second
half of the period has declined, it may be unfair to blame CATV for the full
amount of the decline. This latter point is supported by an inspection of
Table 2.

Table 1　　　　　　　　Growth of CATV Subscribers and of Television Advertising Revenues

Year	Number of CATV Subscribers in Canada	% Growth in CATV Subscribers	Total Television Advertising Revenue (Net)[b] (millions of $)	Growth in Television Advertising (%)
1960	na	na	50.0	
1961	na	na	54.1	8.2
1962	na	na	61.7	14.1
1963	na	na	70.2	13.8
1964	215,000	na	80.7	14.9
1965	273,000	27.0	91.6	13.5
1966	na	na	100.4	9.6
1967	517,000	44.6[a]	111.2	10.8
1968	710,000	37.2	114.9	3.3
1969	924,000	30.1	123.8	7.7
1970	1,164,000	26.0	130.6	5.5
1971	1,399,000	20.2	137.8	5.5
1972	1,689,335	20.7	155.6	12.9
1973	2,130,000[c]	26.1	179.0	15.0

Source:　Jones Heward and Co., Ltd., Advertising Media (Montreal, 1971), p. 4;　Mass Media, Vol. II, op. cit.,
　　　　　p. 404;　Committee on Broadcasting, 1965 Report of the Committee on Broadcasting (Ottawa: Queen's
　　　　　Printer, 1965), p. 252;　Statistics Canada, Cable Television 1971 (Ottawa: Information Canada, 1972),
　　　　　#56-205;　Baker, Lovick Mass Media Research Report, Trends in Consumer Media Costs, Ref. # 0174,
　　　　　January, 1974.

[a]Growth rate averaged over two years.

[b]"net" = after agency and sales representatives commissions.

[c] estimate

Table 2 shows a steady increase in the proportion of the total Canadian advertising expenditures going to television. It is also apparent from Table 2 that advertising in Canada has been on the decline relative to GNP in recent years. Whereas in 1960 total advertising accounted for 1.43% of GNP, in 1973 it accounted for only 1.19%.[4] Through the first part of the period (1960-67), television became relatively more important vis a vis other advertising media. However, television's share of total advertising appears to have stabilized in the later years of the period (1968-72) at about 12.5%. Since total advertising expenditures relative to GNP have been declining over time, and since television's share of total advertising has stabilized in recent years, one finds that television advertising in the first half of the period was increasing relative to GNP and has been decreasing in the second half.

The above analysis serves to show that CATV has not yet had such a deleterious effect on television as an advertising vehicle that other advertising media are gaining at television's expense. One factor separate from CATV that has led to the decline of television advertising relative to GNP is the fact that television audience growth has reached the saturation point. The annual growth in the number of households with television was 2.8% during 1966-69 compared with 4.6% during 1960-66.[5] Second, the costs of advertising on television have been rising very rapidly and may be causing television to become less competitive with other media.

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4. A similar trend is apparent in the United States. In 1960, advertising as a percent of GNP was 2.36% while in 1969 the percent was 2.10.

5. Jones Heward and Co. Ltd., Advertising Media (Montreal) 1971, p. 8.

Table 2   Relative Proportion of Television Advertising to All Other Canadian Advertising
                 Revenues and GNP ($ millions)

Year	Television Advertising Revenues (net)	Total Advertising Revenues–All Forms (net)	Television Revenues as % of Total Adv. Revenues	GNP	Total Advertising Revenues as % of GNP	Television Advertising Revenues as % of GNP
1960	50.0	549.9	9.1	38,359	1.43	0.130
1961	54.1	565.3	9.6	39,646	1.43	0.137
1962	61.7	597.3	10.3	42,927	1.39	0.144
1963	70.2	627.2	11.2	45,978	1.36	0.153
1964	80.7	674.5	12.0	50,280	1.34	0.161
1965	91.6	741.7	12.4	55,364	1.34	0.166
1966	100.4	812.6	12.4	61,828	1.31	0.162
1967	111.2	873.7	12.7	66,409	1.32	0.167
1968	114.9	914.7	12.6	72,586	1.26	0.158
1969	123.8	1,008.0	12.3	79,815	1.26	0.155
1970	130.6	1,052.9	12.4	85,610	1.23	0.153
1971	137.8	1,126.5	12.2	93,402	1.21	0.148
1972	155.6	1,227.1	12.7	103,407	1.19	0.150
1973	179.0	1,417.0	12.6	118,678	1.19	0.151

Source: Pitfield, Mackay Ross and Co., Ltd., op. cit., pp. 16, 17, 19; Canadian Advertising Rates and Data,
        April, 1973; Manitoba Debates, March 27, 1973, Appendix p. 1118; Baker, Lovick Media Research
        Report; Trends in Consumer Media Costs Ref. # 0174, January, 1974; Statistics Canada Canadian
        Statistical Review, May, 1974.

Table 3 compares the trend in cost per thousand for seven advertising media over the period 1971-74. The figures for 1974 are projections. It is apparent from the table that from 1971-73, cost per thousand advertising rates for television have risen to a greater extent than advertising rates for the other six media (15% for television vs. 14% for radio, 8% for daily newspapers, 5% for consumer magazines, 7% for rotogravure, 6% for outdoor advertising and 12% for interior transit).[6] In view of the fact that television advertising's share of total advertising has risen from 14.8% to 15.1% over the same period, one must conclude that the demand for television advertising is inelastic.

In summary, aggregated data on advertising expenditure and cost trends by media and comparison of growth rates of television advertising, GNP and cable subscriptions tend to support the hypothesis that cable television has not yet had a significant deleterious impact on the revenues accruing to Canadian television stations, in spite of the rapid growth of cable television itself.

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6. The television cost index is based on 30 second rates and 30 television stations are included in the index. The daily newspaper index is based on the 5,000 line rate; the radio index is based on 60 second rates during early morning for 83 stations; the consumer magazine index is based on 12 national magazines; Source - Baker, Lovick, Media Research Report; Trends in Consumer Media Costs, Ref. # 0174, Jan. 1974.
The annual rate of increase in station time charges per minute of prime-time television over the period 1960-69 was 6.9% compared to an increase of 3.4% in the cost of radio time and 2.8% in newspaper (milline) rates. See Pitfield, Mackay, Ross and Co. Ltd. The Canadian Broadcasting Industry Special Report. (Toronto) 1970, p. 35, and Senate Committe on Mass Media Mass Media Vol II, op. cit., p. 85.

Table 3   Trends In Media Costs - Per Unit, Circulation,
                                                Costs Per Thousand, 1971-74

	1971			1972			1973			1974		
	Index of Unit costs	Index of Circulation	Index of cost per thousand	Index of Unit costs	Index of Circulation	Index of cost per thousand	Index of Unit costs	Index of Circulation	Index of cost per thousand	Index of Unit costs	Index of Circulation	Index of cost per thousand
Television	100	100	100	105	100	106	111	97	115	117	97	120
Radio	100	100	100	107	99	108	113	99	114·	119	99	121
Daily newspapers	100	100	100	106	96	111	111	102	108	118	103	114
Consumer magazines	100	100	100	103	100	103	108	102	105	113	104	108
Rotogravure	100	100	100	108	105	103	112	105	107	118	97	122
Outdoor	100	100	100	110	103	106	113	106	106	124	109	112
Transit (interior)	100	100	100	109	100	108	114	101	112	124	100	123
Total	100	100	100	107	100		111	102		120	101	

Source: Baker, Lovick, Media Research Report; Trends in Consumer Media Costs, Ref. # 0174, Jan, 1974.

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At the same time, however, it is known that CATV has caused a substantial decline in the percentage of total television viewing-hours captured by Canada television stations. Section III below, attempts to measure by means of an econometric model the impact on viewing-hours of American channels through CATV's importation of such stations.

III. ECONOMETRIC MODEL OF THE IMPACT OF CABLE TELEVISION ON THE VIEWING TIME TO CANADIAN TELEVISION STATIONS

The data used in the econometric model below were supplied by the CRTC. The viewing statistics originated from a Bureau of Broadcast Measurement survey conducted for the period of October 27 to November 9, 1969. The survey estimated the average weekly viewing hours for all television stations receivable in Canada for both off-air and cable viewers. These data were available for all Canadian counties and metropolitan areas in which television was viewed.

The model specifies that the audience share captured by any given television station will depend upon:

    (i)   the station's network affiliation;

    (ii) the number and types of television stations available off-the-air within the stations's coverage area;

  (iii) the number and types of channels that are available via cable;

    (iv) the percentage saturation of the cable system(s) in the station's coverage area.

The model distinguishes among four types of stations:

    (i)   alternative (or unduplicated) Canadian channels. Stations

affiliated with the same network are considered to be
duplicate channels.

(ii)   duplicate Canadian channels. These are equal in number
to the total number of Canadian channels available less
the number of Canadian alternative channels.

(iii) American alternative (or unduplicated) channels. Stations
with different network affiliations and independent
stations are considered to be alternative stations.

(iv)   American duplicate channels. These are equal in number
to the total number of American stations available less
the number of U.S. alternative stations available.

The model accepts the proposition that cable viewers, given channel
choice equal to the options of off-air viewers, may exhibit substantially
different viewing habits from off-air viewers.

Specifically, the model specifies that

(1) $V_1/V_3 = f\ (X_1,X_2,X_3,X_4)$

where

V_1 is total viewing hours per week for the test station, off-air.

V_3 is total viewing hours per week for all television, off-air, in
the station's coverage area.

X_1 = number of Canadian alternate channels available off-air in the
station's coverage area.

X_2 = number of Canadian duplicate Channels available off-air in the
station's coverage area.

X_3 = number of American alternate channels available off-air in the station's coverage area.

X_4 = number of American duplicate channels available off-air in the station's coverage area.

In other words, equation (1) specifies that a station's off-air viewing share depends upon the number and type of stations available off-air $(X_1 --- X_4)$.

(2) $\quad V_2/V_4 = f(X_1, X_2, X_3, X_4)$

where

V_2 is total viewing hours per week for the test station, cable audience.

V_4 = total cable television viewing hours for all television in the station's coverage area.

X_1 = number of Canadian alternate channels available on the cable.

X_2 = number of Canadian duplicate channels available on the cable.

X_3 = number of American alternate channels available on the cable.

X_4 = number of American duplicate channels available on the cable.

In other words, equation (2) specifies that a station's cable television share of audience depends upon the number and type of stations available on the cable $(X_1 --- X_4)$.

Separate estimates are developed for CBC and CTV affiliates for both equations (1) and (2).

(3) $\Delta \hat{V} = \left[(V_1/V_3) - (V_2/V_4) \right] \cdot (W_1 \cdot \ddot{a} \cdot H_2)$.

where

$\Delta \hat{V}$ = change in station's total weekly viewing audience in hours due to cable.

$\bar{a}$ = average number of people per household.

H_2 = number of cable households within the station's coverage area.

W_1 = average weekly viewing hours of television by off-air viewers.

In other words, equation (3) gives the predicted impact cable television will have on a station's viewing audience.[7]

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7. Equation (3) is derived as follows:

Let V represents the total number of weekly viewing hours attained by a given television station. V is composed of both off-air and cable viewing hours so that:

$$V = V_1 + V_2,$$ where V_1 and V_2 are as defined above.

Let H. represent the number of households within the station's grade-B contour, H_1 the number of households within this contour without cable and H_2 the number of cable households.

$$H = H_1 + H_2$$

If v_1 represents the average number of hours per week spent watching the local station by each off-air viewer within the grade-B contour of the station, and v_2 represents the same for cable viewers within the grade-B, and if $\bar{a}$ represents the average number of people per household, then

$$V_1 = v_1 \cdot H_1 \cdot \bar{a}$$
$$V_2 = v_2 \cdot H_2 \cdot \bar{a}$$

Represent a hypothetical variable, which is total weekly viewing hours of the local station if cable were taken away, by $\hat{V}$.

Generally, $\hat{V} > V = V_1 + V_2$. This is due to the fact that H_2 households have now lost cable television and one would expect them to view the local station more than V_2. H_1 will not change viewing habits.

Now make two diametrically opposed assumptions. Assume first that the removal of cable causes H_2 to adopt H_1 viewing habits. In this case, the

In order to run such equations as described above, it is first

necessary to develop a standard by which one may declare whether or not

a given channel is available in an area. This is a difficult problem owing

to the wide geographical extent of some of the sample populations. A given

station may attract a sizeable audience in one part of a county, while being

unavailable in other areas of the county. This problem becomes less serious,

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Footnote No. 7 (cont'd)

extra television viewing time of the cable subscribers, over that of off-air
viewers, is attributable entirely to the increased choice and clarity of
television signals brought to the viewers by CATV. These former cable
viewers in total now will watch the local station $v_1 \cdot H_2 \cdot \bar{a}$ hours/week.

We now have

$$\text{(a)} \quad \hat{V} - V = \Delta \hat{V} = v_1 \cdot H_2 \cdot \bar{a} - v_2 \cdot H_2 \cdot \bar{a}$$

However, if cable households simply watch more t.v. in any case, i.e.,
cable is a selector of people who choose to watch television more than
other viewers independent of CATV, then v_1 gives too small a correction
and the new V is:

$$\text{(b)} \quad \Delta \hat{V} = v_1 \cdot H_2 \cdot \bar{a} \cdot \frac{w_1}{w_2} - v_2 \cdot H_2 \cdot \bar{a}$$

where

$w_2 =$ total weekly television hours per viewer by cable subscribers.

$w_1 =$ total weekly television hours per viewer by off-air viewers.

Substituting $v_1 = \dfrac{V_1}{H_1 \cdot \bar{a}}$ and $v_2 = \dfrac{V_2}{H_2 \cdot \bar{a}}$ into equation (a) above we get:

$$\Delta \hat{V} = V_1 \cdot \frac{H_2}{H_1} - V_2 \quad \text{or} \quad \Delta \hat{V} = \frac{V_1}{V_3} \cdot V_3 \cdot \frac{H_2}{H_1} - \frac{V_2}{V_4} \cdot V_4$$

Now, $V_3 = w_1 \cdot H_1 \cdot \bar{a}$ and since assuming $w_1 = w_2$, $V_4 = w_1 \cdot H_2 \cdot \bar{a}$

Therefore, $\text{(3)} \Delta \hat{V} = \left[\dfrac{V_1}{V_3} - \dfrac{V_2}{V_4} \right] \cdot (w_1 \cdot \bar{a} \cdot H_2)$

of course, as the area included in the sample decreases, and for this reason metropolitan areas and small counties were used as much as possible in the sample.

The standard adopted consisted of two rules. First, any station which obtained 0.5% or less of total viewing time in the sample area was assumed to be unavailable. Such a standard is clearly acceptable for off-air viewing, but when applied to cable viewing may bias the results somewhat. Such a low percentage viewing time when applied to CATV viewers may indicate the station is simply not very popular, in which case it should be included in the data. It may also indicate, however, that not all cable systems in the sample area (county or metropolitan area) are carrying the station, or that this station is not being carried for the full broadcast day, in which case the station should not be included in the data. In cases in which several stations showed individual viewing times of less than 0.5% of total viewing time, but cumulatively accounted for over 1% total viewing time, the number of stations said to be available was adjusted upward. For example, if 5 stations each accounted for 0.4% of total viewing time, and cumulatively 2.0% of total time, 2 such stations were declared to be available.

A second, interacting standard, or guideline, was also use. In cases where the off-air viewing share of a station was less than 10% but its share of the cable viewing time more than twice its off-air shaire, the station was assumed to be unavailable off-air. Obviously, when speaking of off-the-air availability of stations, it is necessary to keep in mind a continuum of receptions from excellent pictures to very weak pictures, and when one tries to fit a whole continuum into only two groups (available and

not available difficulties arise. However, it seems reasonable to assume

that a station with a small but significant off-air viewing share, and which

more than doubles its viewing share when placed on an equal footing with

other, less distant, stations via cable, is perceived as a highly desirable

station. Such a station will carry programmes for which many viewers are

willing to put up with an inferior picture, but generally will carry

programmes that many viewers would like to watch but for which they are not

willing to sacrifice a good technical picture. Such a large increase in

these stations' relative viewing shares when placed on cable is indicative

of a general unavailability off-air, even though some off-air viewers, whether

through superior location, or expensive aerials, or sacrifice in picture

quality, may spend considerable time watching the station.

This second standard combines with the first standard for those

cases mentioned earlier, when several stations, each with less than 0.5% of

the total off-air viewing time but cumulatively more than 1%, are investigated.

If some of these stations obtain more than twice the off-air viewing share

on cable, they are declared to be unavailable off-air, and when cumulating

the percentage shares of such marginal stations they are removed from the

total.

These standards may more accurately be termed guidelines. In

recognition of the arbitrariness of such rules, a case by case approach was

taken and other factors were brought in, where appropriate, to determine

whether a station was or was not available. For example, if the county

being studied was small in geographic extent, it was felt the error caused

by omitting a station with a viewing share of close to 0.5% might be greater

than that caused by including it; the opposite held true for counties covering a large geographic area. The sample of counties and metropolitan areas was chosen to minimize the number of such decisions, however; this in turn served to limit the sample population.

Another factor limiting the sample size was a desire to prevent biases in the sample. Populations were chosen only in cases in which there was a significant cable presence, in order that both sets of equations (off-air and cable viewing patterns) would reflect the same populations, differing only in factors related to the acts of subscribing and not subscribing to cable television. In this way, whatever biases that may have been left in the sample through the selection process should apply equally to both the off-air and cable t.v. equations and as a result it is to be hoped that more confidence may be placed in any differences in viewing patterns that show up in the equations estimated for these two groups.

The exposition of the econometric model is given under the following headings:

(a) the effects of CATV on viewing time to the Canadian broadcasting system as a whole;

(b) the effects of CATV on CBC affiliated stations' viewing time, and the effects of CATV on CTV affiliates' audiences.

(a) Effects of CATV on viewing time to the Canadian Broadcasting System as a whole

Three functional forms were used: a simple regression of the number of U.S. and Canadian channels available on the percentage viewing to Canadian

television stations, a Cobb-Douglas or double log function, and the simple

regression described above including the square of the number of U.S. signals.

In each case, the X_i represent <u>one plus</u> the number of U.S. or Canadian signals

available.

The results of the regressions are given in Table 4. In Table 4,

equations A1, A2 and A3 are derived from data on viewing patterns of off-air

viewers only, while equations B1, B2 and B3 are derived from data on viewing

patterns of cable television viewers only. The numbers in parentheses are

t-statistics.

The symbols in Table 4 are:

V_C Total viewing-hours to Canadian television stations in survey

area, off-air.

V_T Total television viewing-hours in survey area, off-air.

X_1 One plus number of Canadian channels available off-air.

X_2 One plus number of U.S. channels available off-air.

V_{CC} Total viewing-hours to Canadian television stations in survey

area, cable audience only.

V_{TC} Total television viewing-hours in survey area by cable subscribers.

X_3 One plus the number of Canadian channels available on cable.

X_4 One plus the number of U.S. channels available on cable.

By inspecting the equations in Table 3, the following conclusions

may be reached.

(1)   The coefficients of the $X_1, X_2, X_2^2, X_3, X_4, X_4^2$

terms are significant in all cases at the 95% level of confidence.

(2)   The coefficient of the X_2 term is greater than the coefficient

of X_1; similarly the coefficient of X_4 is greater than that of X_3.

Table 4   Regressions Explaining Percent of Audience to Canadian Television Stations

Equation	Dependent Variable	Constant Term	X_1	X_2	X_3	X_4	X_2^2	X_4^2	nlX_1	nlX_2	nlX_3	nlX_4	R^2
A1	$\dfrac{V_C}{V_T}$	0.936	0.033 (1.772)	-0.116 (-9.976)									.62
A2	$nl\,\dfrac{V_C}{V_T}$	-0.325							0.273 (2.609)	-0.489 (-10.483)			.65
A3	$\dfrac{V_C}{V_T}$	1.111	0.044 (2.739)	-0.305 (-7.679)			0.029 (4.898)						.73
B1	$\dfrac{V_{CC}}{V_{TC}}$	0.756			0.022 (1.748)	-0.069 (-6.518)							.42
B2	$nl\left(\dfrac{V_{CC}}{V_{TC}}\right)$	-0.475									0.308 (2.916)	-0.473 (-6.771)	.45
B3	$\dfrac{V_{CC}}{V_{TC}}$	1.037			0.034 (3.254)	-0.245 (-7.295)		0.019 (5.427)					.62

This indicates that the negative impact of successive U.S. channels is greater that the positive impact of successive Canadian channels. At the same time, however, each additional U.S. channel will have a successively smaller negative impact and as shown by the significance of the X_4^2 term.

Table 5 and 6 show the estimated percentage viewing times for the Canadian television system under varying Canadian and American channel availabilities. Table 5 is derived from equation B3 and is in reference to off-air viewers, while Table 6 is derived from equation B3 and is in reference to cable viewers. For example, Table 5 estimates that in an area where 3 Canadian and 2 U.S. channels are available off-the-air, the Canadian channels together will attract 63% of the total viewing time.

A closer study of Table 5 reveals the following:

(1) The addition of a Canadian channels may be expected to increase Canadian viewing time by about 4%. The marginal effect of a Canadian channel, then, is quite constant, regardless of the number of American and Canadian channels available, and the marginal effect is also quite small. This leads to the conclusion that most of the audience for additional Canadian channels will come at the expense of other Canadian channels rather than U.S. channels.

(2) The impact of additional American channels declines quite rapidly, but their negative impact tends to be much greater than the positive impact of Canadian channels for the relevant range of station line-ups. For example, the first American channel may be expected to cause a drop in Canadian viewing time of 20-25%, the second of 12-15%, the third 9-11%, the fourth of 4-5%. The fifth U.S. channel will probably have an impact of 0 and 2%.

(3) If the number of available Canadian and American channels is equal, the Canadian channels may expect to obtain 50-60% of total viewing time,

Table 5   Estimated Percentage Viewing Time of Canadian
                 Television Channels by Off-Air Viewers for
                 Various Combinations of Canadian and United
                 States Channel Availability

Number of Canadian Channels	Number of American Channels				
	1	2	3	4	5
1	71	55	44	40	41
2	75	59	49	44	46
3	79	63	53	49	50
4	84	68	58	53	55
5	88	72	62	58	59
6	93	77	66	62	63

Source: Equation A3

$$(Vc/Vt = 1.111 + 0.044X_1 - 0.305X_2 + 0.029X_2^2)$$

$$(2.739) \quad (-7.679) \quad (4.898)$$

$$R^2 = .73$$

Table 6   Estimated Percentage Viewing Time of Canadian
Television Channels by Cable Subscribers for
Various Combinations of Canadian and American
Channels on Cable

Number of Canadian Channels	Number of American Channels					
	1	2	3	4	5	6
1	69	54	43	36	32	32
2	73	58	46	39	35	36
3	76	61	50	42	39	39
4	79	64	53	46	42	42
5	83	68	57	49	46	46
6	86	71	60	53	49	49
7	90	75	63	56	52	53
8	93	78	67	59	56	56
9	96	81	70	63	59	59

Source: Equation B3

$$(Vcc/Vtc = 1.037 + 0.034X_3 - 0.245X_4 + 0.019X_4)$$

$$(3.254) \quad (-7.295) \quad (5.427)$$

$$R^2 = .62$$

but their share will decline slowly as this number rises.

By closely studying Table 5 one may make the following conclusions with regard to cable television viewing patterns:

1) The marginal impact of Canadian channels is quite constant and low (3-4%).

2) The impact of additional American channels again is greater than the impact of additional Canadian channels, but their negative impact upon the audience share of Canadian television tends to decline as successive American channels are added. The second American channel placed on the cable will generally cause a decline of 11-15% in the Canadian audience share, the third will cause a decline of 8-12%, the fourth 4-7%, the fifth 3-5%, and the sixth 0-3%. Additional U.S. channels will probably not cause any significant change in the percentage share of audience of Canadian television. The higher the Canadian audience share before the addition of the marginal American channel (i.e., the greater the number of Canadian channels) the greater will be the reduction in the Canadian audience share, and this reduction will approach the upper limits set out above.

3) All other things equal, cable viewers watch Canadian television slightly less than off-air viewers, the general range being 3-6% less. This small difference in the viewing habits of the two groups is surprising for two reasons. In the first place, cable viewers have expressed a desire for additional television signals by the very act of subscribing to CATV. This could be interpreted as an expression of stronger preference for American signals than would normally be attributed to those who had not made this decision. In the second place, cable equalizes the picture quality of all

channels and one would expect this to have a greater effect on viewing patterns than is apparent from the regressions; it must be point out, however, that this effect has been neutralized to some degree by the guidelines used in deciding whether or not a given television station was available off-the-air.[8]

It appears, then, that CATV subscribers prefer Canadian television only slightly less than off-the-air viewers.

4) There are no significant differences for cable and non-cable viewers in the marginal effects of additional Canadian and American channels upon the percentage share of viewing times of Canadian stations.

5) In cases where equal numbers of Canadian and American channels are carried on the cable, Canadian television's share of total viewing time may be expected to range from about 58%-45%, the lower figure applying when the number of channels is large. This, again, is somewhat lower than for off-the-air viewers.

6) For each functional form, the R^2's for the CATV equations are significantly lower than the corresponding R^2's for the off-the-air equations. The R^2, for example, of equation B3 is .62 while that for equation A3 is .73. The higher unexplained variation in the viewing patterns of cable subscribers is significant when one recalls that the two sample populations were chosen from identical counties and metropolitan areas. One should recall also that the best estimates of viewing patterns of cable and non-cable viewers were identical, except that the former tended to watch Canadian television 3-6%

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8. Since stations with up to 10% off-air share of audience were declared to be unavailable if their cable share more than doubled.

less than the latter. While one may predict identical viewing patterns
between these two groups (after allowing for the 3-6% divergence), the cable
predictions should be treated with less confidence when being applied to
particular populations. The most likely explanation for the phenomena
described above is that while cable subscribers do not show a significantly
greater preference for American television as such (only 3 to 6% more), they
do show greater discrimination in the programmes they watch. The relative
time they watch Canadian television will depend not only on the number of
Canadian and American channels available, but also their "qualities" to
a much greater degree than for off-air viewers. The fact that the regressions
for cable and non-cable populations were so similar indicates that by and large
the "quality" differences were neutralized over the whole sample (i.e., "good"
and "bad" Canadian channels neutralized one another, as did "good and bad"
United States channels). The phenomenon showed upon the R^2, but no attempt
was made to take account of differing qualities of stations.

The study turns now from an analysis of viewing patterns for the
Canadian broadcasting system as a whole to a study of viewing patterns for
individual stations.

(b) Effects of CATV on CBC stations' audience size and CTV stations' audience size

Separate regressions were run for CBC network stations and CTV stations.
The remarks that follow regarding the selection of the sample apply to both the
CBC regressions and the CTV regressions.

Regressions were run for cable and non-cable viewers selected from
the same geographical entity. In order to ensure that the test station in each
case was a local station, the county or municipality in which the station is

located was often used. When other counties or municipalities were used,
by checking maps and the ratings of the station among off-the-air viewers,
the excellence of the television signal in the area was confirmed.

Since the primary purpose of the exercise was to see how CATV's
importation of American channels affects local television stations, predom-
inantly French speaking population areas and French language television
stations were not included in the sample. For the remaining television
stations, generally two sample populations were used. The final sample size
for CTV stations was 22 population areas and for the CBC 38 such areas.

Determining the expected viewing loss an affiliate will suffer
due to the presence of cable involves three steps:

1. A determination of the expected share of the off-the-air audience
the station will attain for various combinations of channels available off-
the-air.

2. A determination of the expected share of the cable audience
the station will retain for various combinations of channels available on
the cable.

3. An application of the results of steps 1 and 2 to the formula
developed earlier (equation (3)).

Tables 7 to 9 present the regressions for CBC and CTV stations.
In these Tables, equations A-CBC-1, A-CBC-2, A-CBC-3, A-CTV-1 and A-CTV-2
are based on data derived from off-air viewing patterns, the first three
equations applying to CBC stations and the last two to CTV stations; equations
B-CBC1, B-CBC2, B-CBC3, B-CTV1, B-CTV2, B-CTV3 are derived from cable audience
data. Table 7 contains equations using the simple regression form. Table 8
contains equations using the Cobb-Douglas form, and Table 9 contains equations

using the square of the number of channels available in order to allow for a declining marginal impact of additional stations.

The symbols used in Tables 7,8 and 9 are now defined.

V_1 Local station's total off-air viewing hours for the survey week by audience within the sample area.

V_3 Total television viewing-hours off-air by population within sample area during the survey week.

V_2 Local station's total cable viewing-hours for the survey week by audience within sample area.

V_4 Total television viewing-hours by cable subscribers within the sample area during the survey week.

X_1 The number of Canadian alternate channels available over and above the test station. In equation numbers beginning with A, X_1 refers to the availability of off-air signals; in equation numbers beginning with B, X_1 refers to the availability of CATV channels.

X_2 One plus the number of Canadian duplicate channels available.

X_3 One plus the number of American alternate channels available.

X_4 One plus the number of American duplicate channels available.

By studying Tables 7, 8 and 9, one may make the following conclusions:

(1) In Table 7, all statistically significant coefficients (at the 95% level) have the expected negative sign (i.e., the larger the number of

Table 7   Estimating Audience Shares for CBC and CTV Affiliates, Off-air and cable; Simple Regression, 1969

Equation	Dependent Variable	Constant term	X_1	X_2	X_3	X_4	R^2
A-CBC1	V_1/V_3	1.250	-0.1697 (-4.657)	-0.0679 (-2.259)	-0.1358 (-5.821)	0.006 (0.151)	.71
B-CBC1	V_2/V_4	0.698	0.0002 (0.005)	-0.059 (-2.947)	-0.076 (-3.452)	-0.0049 (-0.224)	.45
A-CTV1	V_1/V_3	0.321	0.115 (0.861)	0.061 (0.246)	-0.127 (-2.434)	-0.012 (-0.087)	.39
B-CTV1	V_2/V_4	0.889	-0.074 (0.887)	0.042 (1.072)	-0.145 (-6.462)	-0.020 (-0.485)	.79

Table 8 Estimating Audience Shares for CBC and CTV Affiliates, Off-air and Cable;
Cobb-Douglas Function, 1969

Equation	Dependent Variable	Constant term	nlog X_1	nlog X_2	nlog X_3	nlog X_4	R^2
A-CBC2	nlog(V_1/V_3)	0.084	-0.564 (-4.654)	-0.351 (-3.004)	-0.623 (-6.037)	-0.132 (-0.881)	.75
B-CBC2	nlog(V_2/V_4)	-0.249	-0.011 (-0.042)	-0.636 (-3.089)	-0.668 (-2.713)	0.043 (0.191)	.37
A-CTV2	nlog(V_1/V_3)	-1.391	0.733 (0.913)	0.395 (1.560)	-0.662 (-2.403)	-0.209 (-0.371)	.34
B-CTV2	nlog(V_2/V_4)	0.703	-1.458 (-2.237)	0.892 (2.918)	-1.285 (-6.356)	-0.215 (-0.899)	.75

Table 9 Estimating Audience Shares for CBC and CTV Affiliates, Off-Air and Cable, Simple Regression Form Including Squared Terms, 1969.

Equation	Dependent Variable	Constant Term	X_1	X_2	X_3	X_4	X_1^2	X_2^2	X_3^2	X_4^2	R^2
A-CBC3	V_1/V_3	1.675	-0.462 (-2.039)	-0.211 (-2.053)	-0.141 (-5.622)	-0.052 (-0.073)	0.002 (1.333)	0.028 (1.382)	-	0.012 (0.252)	.75
B-CBC3	V_2/V_4	0.783	0.0697 (0.381)	-0.214 (-2.299)	-0.076 (-0.935)	0.032 (0.333)	-0.021 (-0.459)	0.028 (1.669)	-0.001 (-0.071)	-0.004 (-0.296)	.51
B-CTV3	V_2/V_4	2.871	-1.715 (-2.665)	0.421 (3.823)	-0.317 (-4.400)	-0.153 (-0.858)	0.323 (2.508)	-0.070 (-3.258)	0.023 (1.809)	0.029 (0.572)	.91

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stations available, the lower the viewing share of the local station). The

largest coefficient (and most statistically significant) belongs to the X_3

term, indicating that that American alternate stations have the most important

impact on the viewing-time of local stations. The coefficient of X_4 is always

small and never significantly different from zero, indicating that U.S.

duplicate stations have an insignificant impact on the viewing-time of a

local station. Only in the case of CBC off-air reception (equation A-CBC1)

is the presence of a Canadian alternate channel (generally CTV)of any importance

as regards the viewing share of the local station.[9] The presence of a duplicate

CBC station, however, does exert an important negative influence on the audience

share of a local CBC station (see the coefficient of X_2 in equations A-CBC1 and

B-CBC1).[10]

    (2) In Table 8, again, the importance of the number of U.S. alternative

stations and the insignificance of the number of U.S. duplicate stations on the

viewing share of local stations is apparent. Duplicate Canadian channels also

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9. This means that CTV stations generally have little or no effect on the
viewing share of CBC. It appears viewers do not consider CBC a substitute for
CTV and the latter's audience is derived in large part from what would other-
wise have gone to U.S. stations. The exception, in equation A-CBC1, the off-air
audience to a CBC station, probably reflects instances in which only two stations
are available, a CBC and a CTV channel, in which case CTV does exert an impact
on the CBC station. But when U.S. channels are available (see the cable equations
B-CBC1 and B-CTV1), CTV and CBC do not appear to compete.

This result is not as disturbing a finding as one might at first glance
believe. CTV has long concentrated on the importation of U.S. programmes and a
good proportion of its Canadian content is designed for sales in the United States
and is, therefore, little differentiated from the offerings on the American
channels themselves.

10. Duplicate CTV stations are only rarely available.

have an important negative influence on the viewing share of CBC stations, but since CTV stations are only infrequently duplicated on the cable (most of the duplicate channels being CBC) the audience share of a local CTV affiliate is positively correlated with the number of duplicate Canadian channels available. The explanation for this apparent anomaly may be that in areas in which a CTV station faces competion from several CBC stations the density of population would tend to be greater than areas in which there are few CBC stations. Population density is probably associated with high revenues for the CTV station. Given a highly profitable CTV affiliate operation, the station may better be able to withstand American competion (and hence not suffer as great a decrease in audience) as poorer CTV affiliates located in less densely populated areas (and hence served by fewer CBC stations).

(3) In Table 9, the coefficient of X_3 is negative in all cases and significant at the 95% level of confidence in two out of the three equations. The coefficient of X_3^2 is positive in one equation (B-CTV3). These two observations indicate that U.S. alternate stations have a strong negative impact on the viewing share of a Canadian station, and this negative effect may decline in importance as successive U.S. alternate stations are added, but the evidence is weak on this latter point.

The coefficient of X_4 (U.S. duplicates) is never significantly different from zero, indicating that these stations have only an insignificant impact on the viewing-shares in question.

In all cases the coefficient of X_2 (the number of duplicated Canadian stations) is significant and relatively large. Again X_2 is associated with a decrease in the viewing-share of a CBC station and with an increase in that of a CTV station (although in the latter case the coefficient of X_2^2 is negative).

The coefficient of X_1 (Canadian alternates) is negative (as would be expected) in the two cases in which it is significant. And again, in the one instance in which the coefficient of X_1 is positive, the coefficient of X_1^2 is negative, indicating that in this equation (B-CBC3) the coefficient is not significantly different from zero.

Table 10 gives the estimated audience shares a CBC station will attract under some typical channel availabilities and the impact cable television is expected to have on the viewing time to a CBC affiliate. Table 10 is based on equations A-CBC2, B-CBC3 and equation 3. Column 5 gives the results from applying the formula $\Delta\hat{V} = \left[\frac{V_1}{V_3} - \frac{V_2}{V_4}\right] . W_1 \bar{a} H_2$ (from equation 3) to the CBC audience share data, where $\Delta\hat{V}$ is the estimated loss of total audience due to the presence of cable television. The parameter $\bar{a}$ was calculated to be 2.7, reflecting the national average in 1966 of persons over 14 years of age per household.[11] The parameter W_1 was taken to be 23.5 hours/week.[12] A third parameter, $W_3 = 19.5$ hours/week, was used to estimate average weekly prime-time viewing hours (prime-time is 7-11 p.m.) and calculations in column (6) show the estimated change in prime-time audience due to cable.

The X_i in Table 10 represent one more than the number of channels of various types that are available. The first seven rows of Table 10 give

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11. Dominion Bureau of Statistics. Canada Yearbook 1969 (Ottawa: Queen's Printer) 1970, pp. 183-4.

12. Canadian Broadcasting Corporation. "The impact of Cable Television on the Audiences to Canadian TV Stations," TV/69/74, December, 1969. (Mimeo).

identical numbers of available channels for off-the-air and cable viewers, while rows (8) to (12) show the effect of increasing numbers of channels available on cable over the number available off-the-air upon a CBC station's audience.

Row (1), which estimates the audience for a local station when only one Canadian alternative (a CTV station) is available, may over-estimate the audience loss due to cable. No cable system carrying only two Canadian channels was included in the sample and so this sort of extrapolation may be unreliable.

Similarly, row (4), which estimates viewing shares when one Canadian alternative and one Canadian duplicate channel are available, is atypical, and the drop of some 12% in cable viewing time may be too large.

Apart from rows (1) and (4), Table 10 shows that in cases in which CATV only serves to strengthen signals that are already available off-the-air, without adding more distant signals, the audience share of a local CBC station should not be expected to drop off significantly for CATV subscribers as compared to off-the-air viewers. In general, the audience share of cable subscribers will differ by only 4 to 5% from the off-the-air audience.

This finding is highly significant. It reinforces the previous conclusion that cable television subscribers do not have greatly different viewing habits than conventional viewers, and that they apparently do not exhibit, through the act of subscribing to CATV, any greater dissatisfaction with their local television stations. These results indicate also that the only danger inherent in CATV vis a vis the Canadian broadcasting system is

through the ability of cable t.v. to increase channel availability. This is
not meant to minimize this danger, of course, but it bears emphasizing that
CATV by itself does not appear to change viewing habits.

These similarities in viewing habits of the two groups is very
important for the longer range ability of Canadian broadcasting to survive.
Fear has been expressed that Canadians would become more and more addicted to
American television because of its expensive mass-appeal type programming.
It had been forecast that by placing such foreign channels on cable, thereby
equalizing the technical qualities of the American and Canadian signals,
Canadians would begin to shift their preferences toward these more expensive,
lighter, television programmes. Table 10 suggests no such trend.

The concern expressed by the CRTC, broadcasters and observers of
Canadian broadcasting over the deleterious effects of CATV on audiences for
local stations is shown to be well-founded by rows (8) to (12) of Table 10.
This part of the Table gives the estimated loss in viewer hours for stations
when CATV is allowed to bring in distant signals that are unattainable off-
the-air.

For example, row (8) shows that when 1 Canadian alternate and 1
Canadian duplicate channel are available off-the-air and CATV imports an
additional Canadian alternate and one American signal, the percentage of
viewing time attained by the local station on cable may be expected to be some
20% less than off-the-air (36.0% compared to 57.7%). This represents a total
loss in viewing hours per cable household per week of 13.8 hours, or in total
$13.8H_2$ hours, and $11.4H_2$ prime-time hours.

Table 10   Change in Audience of Typical CBC Station with Introduction of CATV, together with Station's Estimated Cable and Non-Cable Audience Shares.

	(1) Channels Off-Air X_1 X_2 X_3 X_4				(2) Channels On Cable X_1 X_2 X_3 X_4				(3) Off-Air Viewing Share (%)	(4) CATV Viewing Share (%)	(5) $\Delta \hat{V}$, Audience Loss (Gain) Due to CATV	(6) $\Delta \hat{V}$, Prime-Time Audience Loss (Gain) Due to CATV
(1)	2	1	1	1	2	1	1	1	73.5	60.4	$8.32H_2$ hrs/wk	$6.91H_2$ hrs/wk
(2)	2	1	2	1	2	1	2	1	47.8	52.5	$(2.98H_2$ hrs/wk$)$	$(2.67H_2$ hrs/wk$)$
(3)	3	2	2	1	3	2	2	1	29.8	36.0	$(3.94H_2$ hrs/wk$)$	$(3.27H_2$ hrs/wk$)$
(4)	2	2	1	1	2	2	1	1	57.7	45.4	$7.81H_2$ hrs/wk	$6.48H_2$ hrs/wk
(5)	2	2	4	2	2	2	4	2	22.2	25.1	$(1.84H_2$ hrs/wk$)$	$(1.53H_2$ hrs/wk$)$
(6)	3	3	4	3	3	3	4	3	14.0	15.4	$(0.32H_2$ hrs/wk$)$	$(0.27H_2$ hrs/wk$)$
(7)	3	4	4	4	3	4	4	4	17.6	14.0	$2.29H_2$ hrs/wk	$1.90H_2$ hrs/wk
(8)	2	2	1	1	3	2	2	1	57.7	36.0	$13.78H_2$ hrs/wk	$11.44H_2$ hrs/wk
(9)	2	1	2	1	3	3	4	3	47.8	15.4	$20.57H_2$ hrs/wk	$17.07H_2$ hrs/wk
(10)	3	2	2	1	3	4	4	4	29.8	14.0	$10.03H_2$ hrs/wk	$8.32H_2$ hrs/wk
(11)	2	2	1	1	3	4	4	4	57.7	14.0	$27.75H_2$ hrs/wk	$23.03H_2$ hrs/wk
(12)	2	1	1	1	3	4	4	4	73.5	14.0	$37.78H_2$ hrs/wk	$31.36H_2$ hrs/wk

Source: equations A-CBC2, B-CBC3, 3.

If, as in row (12), one Canadian alternate is available off-the-air, while CATV carries two Canadian alternates, three Canadian duplicates, three American alternates and three American duplicates, the local station's shares of viewing time are 73.5% off-the-air and 14.0% on cable, representing a total loss in viewer-hours of $37.8H_2$ hours per week.

Table 11 is similar in form to Table 10 except that in this instance the Table shows the anticipated audience shares (cable and off-air) for a CTV station and the estimated impact of CATV on viewing-hours for various channel availabilities. Table 11 is derived from regressions A-CTV1 and B-CTV3, as well as equation 3.

In column four of Table 11, which shows the expected audience shares among CATV subscribers, there is one estimate which seems unreasonable, and this occurs in row four. It is improbable that a CTV affiliate would obtain 87.7% of total viewing time when competing with two CBC channels on cable. The reason that the underlying equation (B-CTV 3) failed to perform well in this instance is due to the fact that cable systems seldom, if ever, carry only three Canadian channels and no American channels, and such backward extrapolation has led to a large error. The remainder of column four appears quite reasonable and the high R^2 of .91 for the supporting equation means it should be quite reliable.

Table 11 shows that when at least one U.S. signal is available off-the-air, and when the CATV system carries the same number and types of channels as are available off-the-air (Rows (2), (3), (5), (6), (7)), the CTV station may experience a slight decline in its viewing share, due to the increased clarity of the American signals. Rows (1) and (4) indicate, however, that when

Table 11 ．Change in Audience of a Typical CTV Station with Introduction of CATV, together with Station's Estimated Cable and Non-Cable Audience Shares

	(1) Channels Off-Air X_1 X_2 X_3 X_4				(2) Channels on Cable X_1 X_2 X_3 X_4				(3) Off-Air Viewing Share (%)	(4) CATV Viewing Share (%)	$\hat{\Delta V}$; (5) Audience Loss (Gain) Due to Cable	$\hat{\Delta V}$; (6) Prime-Time Audience Loss (Gain) Due to CATV
(1)	2	1	1	1	2	1	1	1	47.3	66.6	$(12.26H_2$ hrs/wk)	$(10.18H_2$ hrs/wk)
(2)	2	1	2	1	2	1	2	1	34.6	35.5	$(0.57H_2$ hrs/wk)	$(0.47H_2$ hrs/wk)
(3)	3	2	2	1	3	2	2	1	52.2	48.3	$2.48H_2$ hrs/wk	$2.06H_2$ hrs/wk
(4)	2	2	1	1	2	2	1	1	53.4	87.7	$(21.78H_2$ hrs/wk)	$(18.08H_2$ hrs/wk)
(5)	2	2	4	2	2	2	4	2	14.1	20.5	$(10.41H_2$ hrs/wk)	$(8.64H_2$ hrs/wk)
(6)	3	3	4	3	3	3	4	3	30.5	26.8	$2.35H_2$ hrs/wk	$1.95H_2$ hrs/wk
(7)	3	4	4	4	3	4	4	4	35.4	24.9	$6.67H_2$ hrs/wk	$5.73H_2$ hrs/wk
(8)	2	2	1	1	3	2	2	1	53.4	48.3	$3.24H_2$ hrs/wk	$2.69H_2$ hrs/wk
(9)	2	1	2	1	3	3	4	3	34.6	26.8	$4.95H_2$ hrs/wk	$4.11H_2$ hrs/wk
(10)	3	2	2	1	3	4	4	4	52.1	24.9	$17.27H_2$ hrs/wk	$14.33H_2$ hrs/wk
(11)	2	2	1	1	3	4	4	4	53.4	24.9	$18.10H_2$ hrs/wk	$15.02H_2$ hrs/wk
(12)	2	1	1	1	3	4	4	4	47.3	24.9	$14.22H_2$ hrs/wk	$11.80H_2$ hrs/wk

Source: equations A-CTV1, B-CTV3, 3.

no American signal is available off-the-air or on the cable, the CTV share

may rise due to CATV. The reservations mentioned above for the element in

column (4) row (4) also hold for column (4) row (1), so that the increases in

the cable viewing shares of CTV stations as shown may be inflated but they do

reflect a tendency. This would be due, probably, to the regional character of

the CTV stations so that cable often improves their picture quality.

As would be expected, when CATV imports distant American signals that

are otherwise not available, the CTV station suffers significantly.

When Tables 10 and 11 are studied together, some interesting conclusions

may be reached.

(1) A local CBC television station is able to retain its off-the-air

audience better than a CTV station when the number of off-air channels is few

(compare rows (1), (2), (4)). This is the case in which neither the CBC nor

the CTV station faces substantial duplication.

(2) When the number of channels available off-the-air is large, the

CTV station is better able to retain its audience share. This is due in part

to the fact that the CBC channel now faces direct competition from other CBC

channels, whereas the CTV affiliate generally faces no such duplication. (See

rows (5) and (6)).

(3) An additional American off-the-air alternate will affect both

types of Canadian stations about equally.[13]

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13. Compare the coefficient of -0.623 for CBC to -0.622 for CTV for the $n\log X_3$ terms in equations A-CBC 2 and A-CTV 2; and their respective coefficients of -0.138 and -0.127 in equations A-CBC 1 and A-CTV 1.

(4)   Duplicate United States channels may prove to be relatively more harmful to CTV than CBC stations.[14]

(5)   A CTV outlet appears to fare somewhat better on cable than a CBC outlet when facing only limited competition (rows (1), (2), (4)) due perhaps to the improvement in the former's signal.

(6)   When the number of channels on cable is large, the CTV station will generally gain a larger audience share than the CBC station, in part because of the frequent duplication of CBC channels on cable in contrast to the infrequent duplication of CTV channels. Thus, in row (5), with one duplicate Canadian channel, the CBC station's share of audience is 25.1% while the CTV station's share is only 20.5%, but in rows (6) and (7), as the number of duplicate channels rises to two and three respectively, the CBC station's share falls well below that of the CTV station's share.

(7)   When the number of channels that may be received both off-the-air and on cable is large, the CBC affiliate appears to be less harmed by cable than the CTV station (row (6) and (7)). The former is able to retain quite well its off-the-air share of audience on the cable, while the latter shows a substantial decline in the CATV share of audience. When the signal qualities of American and Canadian stations are equalized through cable, CTV shows itself to be a good substitute for American stations, while the CBC seems to be sufficiently differentiated to withstand this pressure.

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14.   The coefficient of the $n\log X_4$ term and X_4 term for CBC stations in equations A-CBC 2 and A-CBC 1 are respectively -0.132 and +0.006 whereas the corresponding coefficients in the CTV equations A-CTV 2 and A-CTV 1 are -0.209 and -0.012. None of these coefficients are significant at the 95% level.

(8) CTV stations have an insignificant effect on CBC stations on cable. Apparently the CTV audience does not come from the CBC but from what would otherwise have gone to the American networks.[15]

(9) Duplicate Canadian channels hurt the cable viewing share of a CBC station, but are associated with increased cable audience for CTV stations.[16] This apparent anomaly is probably due to the fact that the presence of duplicate Canadian channels on the cable will almost always indicate duplication of CBC stations and almost never duplication of CTV stations. Therefore, it is obvious why duplicate channels will be associated with a decline in a CBC affiliate's audience share and not be associated with a decline in the CTV affiliate's audience share.

(10) American alternate channels harm CTV to a much greater extent than they harm CBC affiliates, again indicating the closer substitutability

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15. This conclusion is not directly apparent from Tables 10 and 11 but is apparent from studying the underlying equations. The coefficients of the X_1 term in equations B-CBC 3 and B-CTV 3 are respectively +0.0697 (t value = 0.381) and -1.715 (t value = 2.715). The fact that the coefficient for X_1 in the CBC equation is not significant and is almost zero indicates the lack of importance on the CBC of CTV's presence. The fact that the coefficient of X_1 in the CTV equation is both significant and large reflects the fact that other Canadian alternate channels in addition to the English CBC (such as the French CBC, independent French station CFTM, independent English station CHCH) will cause a decline in the CTV's viewing share. Remember that the English CBC is always present when the CTV is available.

16. The coefficients of X_2 are -0.214 in equation B-CBC 3 and +0.421 in B-CTV 3, both being significant.

between CTV and American stations than between CBC and American stations.[17]

This would indicate that the CBC is doing a much better job of implementing the mandate set for broadcasting in the Broadcasting Act than are CTV affiliates.

(11) Duplicate American channels also hurt the CTV stations more than CBC stations on cable.

IV. THE ECONOMICS OF BROADCAST ADVERTISING

While it has been established that through time television has been able to maintain its position as a vehicle for advertising vis a vis other media in the face of cable growth, at the same time it has been shown that cable television, through the importation of distant signals, can have a strong negative impact on the audience share of local television stations. Since one would suppose that the number of actual viewers is the service that stations sell to advertisers, one would normally anticipate that decreased audience size would lead to declining advertising revenues. Since declining revenues have not been observed, there cannot be a direct relationship between audience size and advertising revenues for television stations. This is obviously an important hypothesis for projecting the impact of cable on broadcasting, and so this section explores in some depth the determinants of advertising revenues for Canadian television stations.

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17. The coefficients of the X_3 term and the nlog X_3 term are much higher for CTV stations than CBC stations. Compare the CBC coefficients of -0.076, -0.76, and -0.668 (in equations B-CBC 1, B-CBC 3, B-CBC 2) with CTV coefficients of -0.317, -0.145, and -1.285 (in equations B-CTV 1, B-CTV 3 and B-CTV 2 respectively).

In 1971, the television broadcasting industry in Canada was financed by $295.9 million, of which only $145.9 million or 49.3% originated in parliamentary grants. In fact, advertising revenues accounted for 18.9% of the CBC's total television revenues.[18] The importance of advertising to the present Canadian broadcasting structure can not be contested.

The time for broadcast advertising is characterized by an elastic demand and inelastic supply.[19] Supply is fixed due to several causes -- technical reasons (scarcity of spectrum and the resulting interference problems), international treaty, government regulations (governing both the time devotred to advertisements and the number of stations) and policies of the broadcasters (especially the CBC).

Broadcasters are able in practice, however, to affect the supply of commercial time to some extent. By making commercials more effective, they can increase the "productivity" of a given unit of time. This effect inter-acts with the tendency toward shorter commercials (30 second instead of 60 second) and both effects serve to increase the supply of time.

Advertising revenue fluctuations will emanate in the main, however, from factors on the demand side. The advertisers' demand for Canadian television time is a highly complex area of study, and CATV is inseparable from it. In studies predicting the demand for television advertising time it has been traditional to regress broadcast advertising revenues on total viewing-hours

18.   Statistics Canada, Radio and Television Broadcasting 1971 (Ottawa: Information Canada, 1972), p. 11.

19.   O.J. Firestone, Broadcast Advertising in Canada, Past and Future Growth (Ottawa: University of Ottawa Press, 1966), p. 66.

(or total prime-time viewing-hours, or total viewing-hours for people over eighteen years).[20] As has been seen, however, this simple relationship, if accepted, would not allow us to explain the anomaly of increasing television revenues in the face of declining audience size.

The economic theory of advertising is easily summarized. Advertising is treated as any other cost of production, except that it will change the slope and position of the demand curve. In the partial equilibrium situation, the marginal conditions hold and the optimal amount of advertising expenditure is determined.[21]

The demand for advertisements will depend at the very least upon the proportion of prospective customers reached by an advertisement, the length of time in which the message remains in the mind of a given proportion of these prospective customers,[22] the persuasive power of the advertisement, and the advertising practices of competitors. In a world of certainty, an advertiser's marginal cost of reaching and convincing a customer will be the same from medium to medium and within each medium. For instance, if a fullpage newspaper

20. See, for example, Fisher and Ferral et al, "Community Antenna Television Systems and Local Television Station Audience". Quarterly Journal of Economics, 1966, p. 232; and Rolla Park, Potential Impact of Cable Growth on Television Broadcasting (Santa Monica: RAND R-587-FF, 1970), p. 37.

21. See Harold Demsetz, "The Nature of Equilibrium in Monopolistic Competition, "Journal of Political Economy, 1959; George Stigler, "The Economics of Information" in The Organization of Industry (Homewood: Irwin, 1968); Peter Doyle, "Economic Aspects of Advertising: A Survey," Economic Journal, Sept. 1968.

22. Stigler, op. cit., pp. 182-3.

advertisement and a 60 second television commercial were equally effective
in persuasive powers (x% of all readers and viewers purchased the product),
the amounts spent for the advertisement in each medium would be equal on
a cost per thousand people reached basis.[23] Similarly, the cost per thousand
potential customers among newspapers and among television stations would be
equal, and at the margin would equal the marginal revenue forthcoming from the
additional advertising dollar spent less other costs of production.[24]

In practice, uncertainty and irrationality mean the above type of
analysis has only limited value. Major television rating surveys are carried
out only twice a year in Canada. This means that an advertiser, purchasing
time well in advance of the audience surveys, will find it difficult to
predict with any accuracy the audience that will view a specific advertisement
in a given time period on a station. Programmes on a station rise and fall
quickly in popularity, and the programmes offered by competing stations will
change. It is impossible for advertisers to accurately forecast the cost per
1000 viewers actually reached.

Rating surveys are carried out much more frequently in the United
States, and advertisers are better able to assess the quality of their "buy".

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23. The costs expended will not equal the revenues received by the medium,
however, since the former include production costs. Since these are much
higher for television, one would expect on this account that television
revenues per 1000 viewers would be lower than for newspapers.

24. However, as stated earlier, there are restrictions placed upon the
amount of advertising time available on broadcast stations, while there is
no such restriction on the space available in newspapers. This will raise
the cost per thousand in television relative to that of newspapers.

Since greater attention is paid to the ratings of individual programmes in the United States, and because the charges per unit of time vary accordingly, Park was able to obtain an R^2 of .93 when regressing station revenues against average prime-time audience (and the square of audience size) while for Canada the R^2 in such a regression is only .83 (see equation 4 below).

Instead of audience size, then, advertisers in Canada are forced to search for a different (less desirable) measure upon which to base their demand for a station's time. The measure used in practice is reach, the number of homes tuning in the station sometime during the week (i.e., net weekly circulation).

Table 12 presents a series of regressions in which revenues to privately-owned television stations in two years (1970 and 1972) are "explained" by various measures of audience size. As will be noted from the Table, in both 1970 and 1972 the variable "reach" went furthest in explaining the variation in revenues across stations as reflected in the high R^2. The symbols used in Table 12 are defined as follows:

R   Television station's total revenue for year in thousands of dollars.

R_e Station's reach in hundreds of viewers from BBM survey.

V   Total weekly viewing-hours to station in hundreds of hours from BBM survey.

A   Average $\frac{1}{4}$ hour prime-time (7-11 p.m.) audience in hundreds of viewers

Table 12   Regressions "Explaining" The Variation In Television Station Advertising Revenues, 1970, 1972.

Equation Number	Year	Dependent Variable	Constant Term	A	A^2	R_e	R_e^{2}	V	V^2	Q	R^2
4	1970	R	-3082.1	3.876 (9.939)	-0.458×10^{3} (-6.525)					21.532 (3.043)	.79
5	1970	R	20.358			.245 (26.78)					.93
6	1972	R	-483.070			0.374 (5.53)	0.16×10^{-5} (0.834)			5.461 (0.623)	.91
7	1972	R	67.665			0.387 (6.01)	0.14×10^{-5} (0.731)				.91
8	1972	R	-483.762			0.428 (20.71)				4.026 (0.470)	.91
9	1972	R	-4378.3					0.0759 (7.61)	-0.76×10^{-7} (-2.40)	29.88 (2.58)	.83
10	1972	R	-4026.6					0.0539 (13.16)		33.19 (2.76)	.81
11	1972	R	-4204.3	4.49 (7.28)	-0.259×10^{-3} (-2.20)					28.89 (2.47)	.83
12				3.24 (13.13)						32.09 (2.66)	.81

Source: CRTC

Q   Market quality index, mean value 100.[25]

The sample size used for the 1970 regressions was 54 privately-owned television stations and for the 1972 regressions 51 privately-owned stations. The revenue data were derived from the annual financial returns private stations are required to submit to the CRTC.

It will be noted by studying the R^2's of Table 12 that reach has much greater explanatory power as regards the variation in station revenues than the other measures of audience size used (average prime-time audience and total viewing hours). Reach is in fact a good proxy for the population within a station's coverage area since most stations are assured that a very high proportion of the viewers within their reception areas will tune in the station sometime during the week. Reach is, however, a poor proxy for what the stations

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25.   A market's quality index is described by its creators as follows:

A market's percent of the national population can be taken to represent par. Divided into the Buying Power Index, it yields the Quality Index, which shows the extent to which the market's "quality" is above or below par (represented by 100). Since the quality index compares the per capita income and per capita sales to the corresponding figures for the U.S. a high index could reflect either high buying power or a high influx of shoppers....
[The Buying Power Index is]a weighted index that converts three basic elements --population, Effective Buying Income and retail sales--into a measurement of a market's ability to buy, and expresses it as a.percent of the U.S. potential. It is calculated by giving a weight of 5 to the market's percent of the U.S. Effective Buying Income, 3 to its percent of U.S. retail sales, and 2 to its percent of U.S. population. The total of these weighted percents is then divided by 10 to arrive at the BPI....
[Effective Buying Income is]personal income-wages, salaries, interest, dividends, profits, and property income minus federal, state, and local taxes.... Effective Buying Income is generally equivalent to the Government's "disposable personal income".

Sales Management Magazine, June 10, 1970.
For Canadian markets, of course, the bases used are Canadian rather than American.

theoretically sell the advertiser - actual viewers to specific advertisements.
In some sense, then, advertisers are not purchasing exactly what they want
(and this fact, it will be seen, explains the anomaly discussed previously
that has allowed advertising revenues to grow in the face of increased
competition through CATV). As this is such an important point, it is useful
to spend some time in an effort to explain why advertisers have thus far
concerned themselves with reach (potential audience) rather than actual audience
size.

Before proceeding, the reader should be cautioned that many knowledgable
people active in the advertising business do not believe that advertisers purchase
the reach of a television station and when confronted with the proposition
state that advertisers are much more sophisticated in their buying practices
and in fact purchase time on the basis of gross rating points. The remainder
of this section, therefore, will attempt, first, to show the equivalency of
purchasing gross rating points and purchasing reach, and second to provide a
rationale as to why advertisers would rely on this less accurate measure (reach
vs. actual viewing-hours). For the discussion that follows it is useful to
define measures in common use in rating surveys. In the following list of
definitions, it is necessary to distinguish between "micro" variables (variables
related to the audience of a particular advertiser) and "macro" variables
(variables related to the audience of a particular television station), and to
trace out the relation between a particular micro variable and a particular
macro variable

> rating - the percent of potential audience tuning in a particular
> station during a particular (quarter-hour) time period.

This is a micro variable whose macro equivalent is roughly _percent of total viewing hours_ attained by a station for the survey week compared to total viewing-hours for the survey area during the week.

gross –
rating
points

the sum of individual ratings delivered by a number of messages in a common sampled area. For example, if three messages are broadcast on programmes (which may be on different stations in a common market or the same station at different times) with respective ratings of 20%, 30%, and 40%, the gross ratings points for the message are 90. GRP is a micro measure offering a description of the total impressions being delivered by a particular spot schedule _without regard to audience duplication_ in a market. The macro equivalent of GRP is _total viewing-hours per week_ when standardized for community size. That is, gross rating points times an index of population is roughly equivalent to total viewing hours.

reach –

at the micro level, the number of different individuals exposed to one or more announcements during a specified period of time (often expressed as a percent of individuals in the sampled area). At the macro level, reach is the number of different individuals tuning in a particular station during a specified period of time (i.e. net weekly circulation).

frequency –   a micro concept denoting, on average, the number of

times each individual in the survey area receives a

message over a given period of time. Frequency has

meaning within the micro context only.

At the micro level, the measures are related by the following formula:

GRP's = Reach X Frequency

Baker, Lovick Ltd.[26] note three methods used by advertisers to

allocate their advertising budgets among television stations. The most common

and preferred method (GRP's per market) is discussed here. Allocating expenditures

by GRP levels involves weighting individual GRP levels by some measure of the

market's potential (such as last year's sales, population, etc). Allocating

expenditures by GRP's weighted by last year's sales would involve the following

steps:

(i)   determine for each market that market's contribution to total

sales for the last year.

(ii)   estimate the average ratings of a television spot during a

selected time period for each market.

(iii)   divide the cost of a spot by its rating points to derive an

average cost per rating point for each market.

(iv)   add the individual market costs per rating point to arrive

at a total and over-all average cost per rating point.

(v)   apply the over-all average cost per rating point to the total

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26.   Media Research Report, Planning for Television, Ref. no. 1273, December, 1973.

advertising budget to estimate the total GRP's the budget

will buy.

(vi) allocate total GRP's to each market based on the previous

year's sales.

(vii) divide individual market GRP levels by average spot ratings to

arrive at the number of spots for each market.

(viii) multiply the number of spots by the cost of a spot to determine

total expenditure in each market.

To summarize, under the GRP method, the number of GRP's to be allocated

to a given market is determined by that market's potential (i.e. population,

last year's sales, etc) and the firm's total advertising budget.[27] Total

advertising expenditures per market equal the number of GRP's allocated to the

market times the cost of each GRP. The cost of a GRP is the spot rate divided

by the average rating of a programme. Note that the GRP level is determined

independently of the audience delivered by any particular message (rating). Total

expenditures in a market equal the GRP level times the spot rate divided by

the average rating. The spot rate is a result of bargaining between the

advertiser and the broadcaster. In addition to total audience delivered by the

station, a factor that will enter the setting of the spot rate is the ease of

substitution into competing stations or media.

Assume first that there are many good competing advertising media

in the community and that the broadcaster has little monopoly power in setting

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27. The total advertising budget of a firm for all television is generally
beyond the scope of this analysis and hence is treated as an exogenous variable.

the spot rate. Cost per thousand for all media in the community will then be equal and the spot rate will be a direct function of the average rating.

$$TE = GRP\text{'s} \times \frac{\text{spot rate}}{\text{average rating}}$$

$$TE = GRP\text{'s} \times \frac{f\ (\text{average rating})}{\text{average rating}}$$

$$\therefore TE = f\ (GRP\text{'s})$$

where TE = total expenditure per market.

But it has already been shown that the number of GRP's allocated by the firm to any particular market is based on the market's potential (i.e. last year's sales or population). Neutralizing for differences in average disposable income, on average last year's sales will be a direct function of population.

Therefore, $TE = f\ (\text{population})$

Since reach is in fact a good proxy for population, we are back where we started, viz

$$TE = f\ (\text{reach, income})$$

Should the assumption of a constant cost per thousand across all advertising media not be warranted but rather it is felt that there are few good substitutes for television advertising, then the broadcaster may be depicted as setting his rate card monopolistically[28] and the spot rate

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28. This is a realistic assumption in view of the earlier finding that television rates per thousand viewers have been rising more rapidly than costs per thousand for other media while at the same time television revenues have been increasing more rapidly than revenues to other media.

will no longer be a function of the average rating only. In this case:

$$TE = \frac{f \text{ (reach)} \times \text{rate card}}{\text{average rating}}$$

where the rate card is set monopolistically

and is exogenous.

In this formulation, the model predicts that the greater the number of available channels (including U.S. channels imported by CATV) the greater will be the revenues of the local broadcaster since the average rating will vary inversely with the number of channels. A test for this construction of the model would be:

$$TE = f \text{ (reach)} + g \text{ (number of U.S. channels)}$$

where the expected sign of the coefficient of the number of U.S. channels is positive. This test, is carried out in the next section.

To summarize, allocating advertising budgets by the GRP method has been found to be equivalent to purchasing a station's reach (potential coverage) in cases where the broadcaster has little ability to set price (the competitive situation). If the broadcaster is a price-maker (i.e. has monopoly power, as appears likely), then reach plus the number of available signals will explain revenues, both being positively correlated with revenues.

The next question that must be answered is why advertisers would content themselves with reach, a measure of potential coverage, rather than actual viewing-hours when allocating their budgets to particular

stations.[29] The remainder of this section will attempt to resolve this issue.

The first reason that reach is the most important determinant of broadcaster revenues is that, major rating surveys are undertaken only twice a year in Canada. While actual audience may show considerable variation within a short period of time as programmes rise and fall in popularity, reach (or potential audience) shows a great deal more stability through time.. With the infrequency of audience surveys, advertisers may place more weight on the stable measure of a station's potential than on the more volatile (and therefore inaccurate over time) measure of actual audience.

Second, not only are advertisers unable to determine their audience at a point in time accurately, but they are also unable to determine the effects of their advertisements on viewers. Thus far advertisers have not been able to separate out the effects of a change in advertising policy from other variables. They have been also unable to give weights to the relative effectiveness of different advertising media. This means that advertisers have no way of estimating marginal revenue from an increase in advertising. Without accurate information

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29. Returning to the GRP method of allocating advertising expenditures, the same question may be put in these terms: Given that advertisers allocate revenues by market in accordance with the market's potential sales, why are they not able to realize that a dollar spent in market A will not purchase an equal number of viewers as will a dollar in market B if the audience in market A is fragmented? Alternatively, why are advertising budgets allocated on the basis of the market's potential rather than on the basis of the station's ability to attract viewers.

regarding the number of viewers and without estimates of the effectiveness

of advertising, the economic theory of advertising breaks down and

advertisers are forced to rely upon rules of thumb. The reader should

be cautioned before proceeding that for advertising policy there are as

many special cases as there are advertisers. In the following paragraphs

only broad generalizations are discussed, derived chiefly from interviews

with broadcasters and people involved in selling time to advertisers.

Often a firm's advertising budget appears to be fixed to some

percentage of retail sales or corporate profits. One thus finds the

phenomenon whereby the advertising budget falls as sales fall and rises

as sales rise, whereas one would expect advertising expenditures to rise

as sales drop in order to effect a recovery. It is impossible to generalize

on the allocation of the advertising budget among different media that

would be relevant to the analysis.

A related factor mentioned in interviews was that television

advertising confers status upon the firm and its management and this is

apart from and in addition to advertising to increase sales. While it

would be difficult to measure the relative importance of this status reason

for advertising, it will to some degree mean that station revenues are

even less responsive to changes in audience size. The "glamour" of

television may compensate for sagging audiences.

A further departure from cost per thousand that influences

advertising decisions is the fact that there are certain "must-buy"

stations, generally those located in the provincial and federal capitals.

Cost per thousand is not as important a factor for stations located in

these centres as for stations in such municipalities as Dawson Creek,
Rivière-du-Loup, Pembroke and Red Deer. In fact, it has been stated that
many national advertisers are really quite indifferent as to whether their
messages reach people in such small population centres, and stations
located there survive only because the networks pressure these stations
upon network advertisers, albeit by including them in the contract almost
as a bonus for which the advertiser is charged a much lower rate.

CTV network stations are located by and large in "must-buy"
centres (although recent years have witnessed an impressive effort to
extend the service to lesser-populated areas) and for this reason it may
be expected that the rates charged for a time period by CTV stations will
be less responsive to audience size than will be the rates charged by
privately-owned CBC affiliates which are mainly located in these smaller
communities.

Thus far, television stations have been able to defend themselves
against shrinking audiences due to CATV where necessary. CHAN in Vancouver,
for instance, has recently built a string of rebroadcasting stations in
west-central British Columbia, thereby maintaining its audience by enlarging
its coverage area in the face of cable competition. Broadcasters have
also been able to maintain revenues by offering advertisers "package deals,"
e.g. selling one prime-time advertisement at the regular rate and throwing
in a free non-prime-time spot, or in cases where the demand for prime-time
is heavy, selling a prime-time spot only when a non-prime-time spot is
also purchased. Thirty second commercials are relatively more expensive

than sixty second commercials (two thirty-second commercials may sell for 150% of the price of a sixty second commercial) and the stations may push shorter commercials.

All of these factors — the variability through time of ratings to specific programmes and the infrequency of audience surveys, the difficulty of assessing the effectiveness of advertising and the necessity of relying on rules of thumb to determine advertising budgets, the status given by television advertising, and the ability of stations to compensate for declining audiences — as well as a degree of monopoly power held by the broadcaster - help to explain why reach, rather than viewing-hours best explains broadcaster revenues.

In summary, it is the hypothesis of this section that advertisers have to date based their television advertising expenditures on reach rather than actual audience size. So long as a station is able to maintain its predominate position of reach in a market against outside competition through cable's importation of channels, (given current advertiser practice), the station will not be hurt financially by the increased competition - while actual audience size will decline, potential audience (reach) should not decline significantly in spite of the increased competition. Section V now explores this hypothesis in greater detail.

V. THE IMPACT OF CABLE IMPORTATION OF AMERICAN TELEVISION STATIONS
    ON THE REVENUES TO PRIVATE CANADIAN TELEVISION BROADCASTERS

It is useful to summarize the essential points developed thus far:

(1) Cable television, by importing U.S. signals, causes a

significant decline in the audience to Canadian television stations.

(2) The impact of viewing-time differs markedly by the type of station imported, however. U.S. alternate stations exert a large, negative impact on the viewing-time to Canadian channels, but U.S. duplicate channels have an insignificant impact on the viewing-time to Canadian stations.

(3) Revenues accruing to Canadian stations depend primarily on reach, rather than actual viewing-hours. So long as cable television does not significantly reduce a station's reach or net weekly circulation (or, even more importantly, cause the station to lose its position in a market of having the largest reach of all stations available in the market), the station will not experience a decline in revenues, in spite of the fact its total audience has declined.

(4) A study of advertising trends through time does not support the contention that cable television has hurt the Canadian broadcasting system, as a whole, although a few specific stations may have suffered some financial damage.

The major policy conclusion that follows from the preceding analysis is that public policy should be directed toward ensuring that local Canadian stations are able to retain their predominate position regarding reach in their own market. This may be accomplished in two ways: (1) a ban on the importation of American television signals and duplicate Canadian stations, or (2) the requirement that each U.S. alternate station imported by a cable system be accompanied by at least one duplicate U.S. channel.
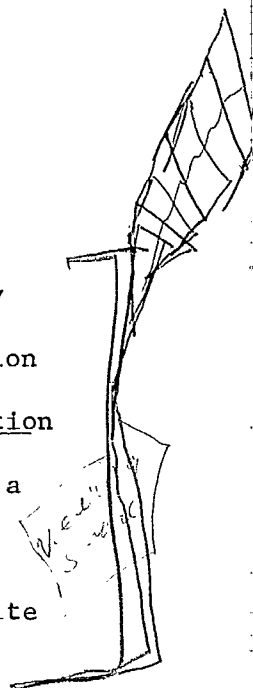
The first proposal would obviously do away with the threat U.S. stations have on the Canadian broadcasting system, but in light of the CRTC's early attempts at regulating the number of U.S. channels that may be carried on cable systems, this proposal does not appear to be politically realistic.

The second proposal rests on the finding that while U.S. alternate stations do have a substantial impact on a Canadian station's audience size, duplicate U.S. stations have an insignificant effect. Therefore, when duplicate U.S. channels are carried on the cable, the audience attained by these stations will come primarily from other U.S. stations on the cable. This fragmentation of the audience to U.S. stations will reduce the reach of any given U.S. station without causing a further reduction in the reach of the local Canadian channel. On the other hand, when only one or a few U.S. channels are available on the cable, the U.S. channel will normally be expected to gain a large reach and thereby become an ideal medium with which to gain exposure to the local Canadian market, especially in view of the fact that 60% of all television advertising revenues in Canada come from U.S. multinational corporations that sell identical products in the United States and Canada.[30] It is hypothesized, therefore, that the larger the number of U.S. channels available in a community, the greater will be the revenues accruing to the local station

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30. Seventy-five percent of national advertising on Canadian television is undertaken by multinational corporation that distribute the same products in Canada and the United States. Eighty percent of television advertising in Canada is undertaken by national advertisers. See Woods Gordon Co. Ltd. CTV Television Network Ltd. Financial Outlook for The Network (Toronto) 1971, p. 47.

(other things constant, such as size of community, average income in the community, etc.). This hypothesis is tested in two ways: first, the Vancouver television market is studied in some detail as in this market a single U.S. station has succeeded in dominating the Canadian stations, and second, regression equations are brought forward that include the number of U.S. channels as independent variables in explaining television revenues.

In Vancouver, three Canadian channels and one U.S. channel are available off-the-air (CBUT, CHAN, CHEK, KVOS), while cable subscribers are able to receive an additional 5 American stations (KCTS., KING, KIRO, DOMO, KTNT). Figure 1 reproduces an A.C. Nielson chart showing the relative audience shares of the stations off-air and on CATV. Figure 1 should be studied in conjunction with Table 13.

Figure 1 shows that a single American station, KVOS, obtained roughly 20% of the cable viewing hours in the Vancouver area, and 36% of the viewing hours of off-air viewers. Cable saturation in Vancouver in 1970 was roughly 50% so that KVOS's total share of audience was 28%, and this share was larger than any other single station in the area. It has already been noted that Canadian television advertisers are most concerned with reach, and in nearly every market in Canada the home station has the greatest reach of all stations available. Such is not the case in Vancouver, and KVOS will have a reach at lest equal to that of the Canadian station with the highest reach.

Table 13 shows the results when a single American station is able to capture the greatest audience share. As the Davey Commission Report states:

The per household revenue of the private
stations in British Columbia is only slightly
more than half of the national average and much
less than received in the other wealthy provinces
of Ontario and Alberta.

It is persuasively argued that this sharp
differential is explained by the fact that the
revenue drained off from the province by KVOS-TV
is excluded from the D.B.S. figures.
... It has been suggested that, in fact,
close to $6 million represents the actual amount
of advertising revenue obtained by KVOS-TV in
Bellingham.[31]

However, the Report then states:

... This assumption regarding $6 million lost is
open to question. Given the fact that both the
reach and the number of viewing hours of KVOS are
only moderately higher than that of CHAN-TV
(according to the B.B.M. survey for November, 1968)
it·seems to be a long leap to the conclusion that
the advertising revenue of KVOS alone is equal to
or greater than the revenue of all the private
stations in the province combined.[32]

Unfortunately, the Mass Media Report missed the main point here.

Advertisers are interested in reaching as many potential customers with

their advertisements as is possible within their budget constraints. KVOS

delivers more of this audience than any other single station. Advertising

on Canadian channels is, then, to some extent, a wasteful duplication.

Many advertisers, in attempting to reach the Canadian market, will

advertise exclusively on the United States channel. This is a world,

it will be remembered, of the multinational corporation.

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31. Mass Media, Vol. II, op. cit., p. 388.

32. Loc. cit.

The Davey Report does point out that "if the advertising revenue of private stations per household were calculated on the basis of ... the Alberta average, it would be nearly $6 million higher".[33] This gives some support to the earlier estimate.[34]

It should be noted in passing that in Vancouver CATV may be expected to help Canadian broadcasting. By adding an additional 5 United States channels for Vancouver residents, CATV has caused KVOS's audience share to drop from a pre-cable share of 36% to a post-cable share of 20%, whereas CHAN has experienced a decline from 27% to 18% and CBUT from 22% to 16%. KVOS's advantage over CHAN has declined from 9% for off-the-air viewers to 2% for CATV viewers, and over CBUT from 14% for off-the-air viewers to 4% for CATV viewers. KVOS's advantage over its two Canadian rivals has almost vanished with CATV. While CATV has caused a substantial decline in the viewing shares of the Canadian stations, this lost viewing time is shared among 5 new American stations, none of which has the reach to make it a viable advertising vehicle for reaching the Canadian audience.

In order to further test the hypothesis, regressions were run, based on a sample of 42 markets in Canada for the year 1972, using
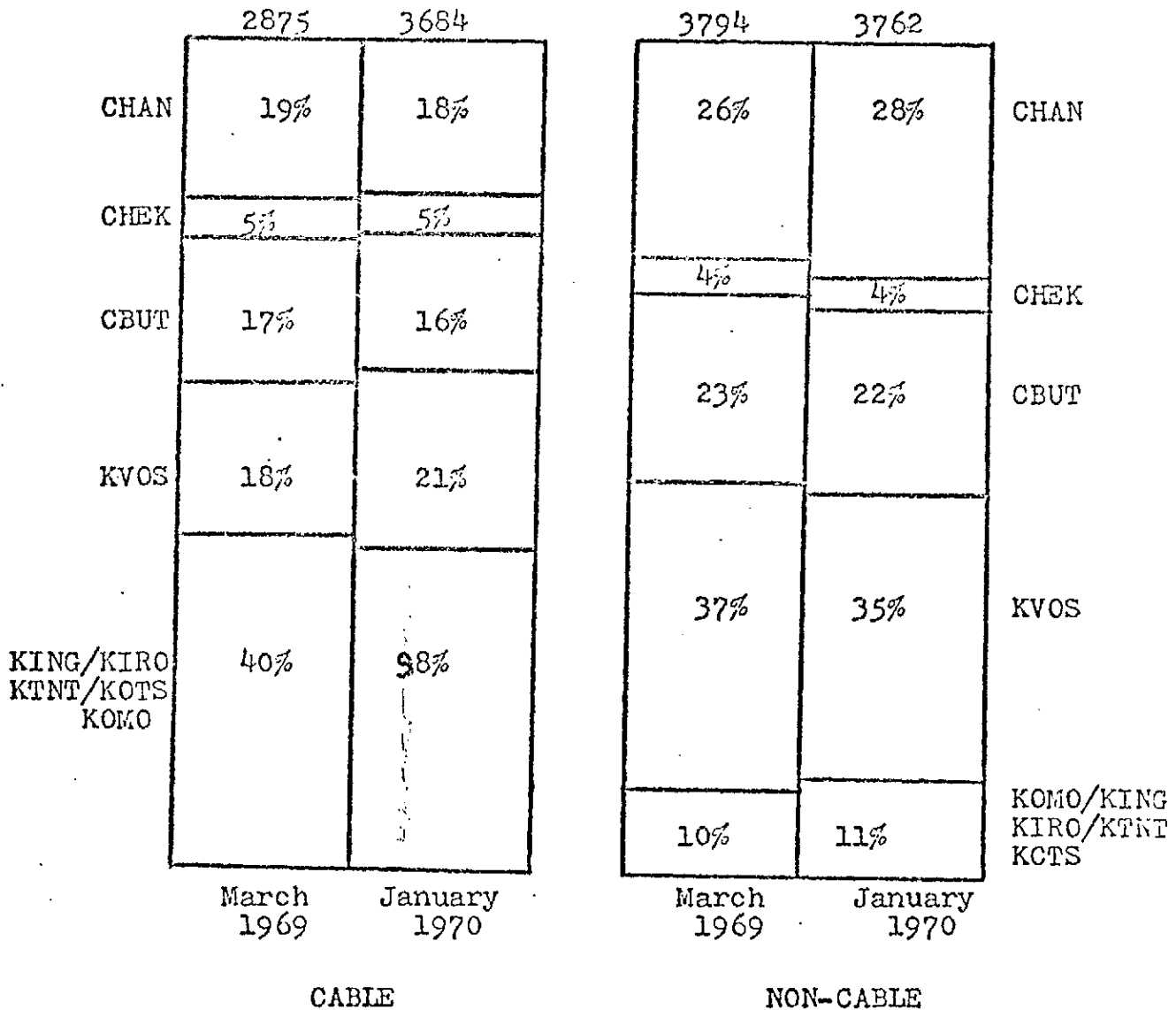
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33. Loc. cit.

34. See Appendix A for a more realistic estimate of the financial impact of KVOS-TV on CHAN-TV as well as estimates of the impact of U.S. signals on stations in Winnipeg and Windsor.

Figure 1

Cable Vs Non-Cable Households
- Canadian Vs U.S. Station Penetration Into Vancouver Central
  Area. (households - average week of three - January 1970)

Total Hours Viewed (000)

	2875	3684		3794	3762	
CHAN	19%	18%		26%	28%	CHAN
CHEK	5%	5%		4%		
					4%	CHEK
CBUT	17%	16%		23%	22%	CBUT
KVOS	18%	21%		37%	35%	KVOS
KING/KIRO KTNT/KOTS KOMO	40%	38%		10%	11%	KOMO/KING KIRO/KTNT KCTS

| March 1969 | January 1970 | | March 1969 | January 1970 |

CABLE   NON-CABLE

A.C. Nielson Co. of Canada Ltd. "Cable Study on Behalf
of the Canada Association of Broadcasters", reprinted in
Standing Committee on Broadcasting Films and Assistance
to the Arts, Minutes of Proceedings and Evidence No. 30,
June 11, 1970, (Ottawa: Queen's Printer) 1970, p. 30:74.

Table 13   Television Advertising per TV Home by Region, 1967

Area	Number of Television Homes ('000)	Total Privately Owned Television Broadcasting Revenue	Average Annual Privately Owned Television Broadcasting Revenue per TV Home
B.C.	538	$ 4,805,738	$ 8.93
Alta.	377	7,532,926	19.98
Man. Sask.	480	8,017,881	16.70
Ont.	1,917	36,532,112	19.06
Que.	1,408	22,120,812	15.71
Atlantic Area	413	5,881,481	14.24
Total	5,135	$84,890,950	$16.53

Source: Mass Media, Vol. II, op. cit., p. 388.

total revenue accruing to all private television stations situated in

the market as the dependent variable and a series of independent variables,

including the number of U.S. stations with various audience shares in

the local Canadian market. If the hypothesis holds, the coefficients of

the variables representing the number of U.S. stations should be positive.

The results of these regressions are presented in Tables 14 and 15.

The symbols used in Table 14 and 15 are now defined:

R*   Total revenue in thousands of dollars accruing
     to all privately-owned television stations
     situated in a given market. Overlapping markets
     such as Toronto-Hamilton, Timmons-Sudbury, are
     treated as single markets. Data from CRTC financial
     returns.

R_e*   Common coverage area population estimates, data
     from BBM. Hundreds of persons.

V*   Total viewing hours accruing to all Canadian private
     television stations situated in market during survey
     week in hundreds of hours.

A*   Average quarter-hour prime-time audience in hundreds
     of viewers accruing to all private stations situated
     in market, from BBM survey.

Q   Market quality index, from Sales Management Magazine.

N   Number of Canadian private stations located in the
     market plus one. Data from CRTC.

Table 14   Estimating The Financial Impact of American
Stations Upon Revenues of Canadian
Stations By Market, 1972

Equation Number	Dependent Variable	Constant Term	R_e^*	R_e^{*2}	Y^*	Y^{*2}	λ^*	λ^{*2}	Q	M	D	US_1	US_2	US_3	US_4	IB_5	R^2
13	R*	-5970.5	0.00534 (8.90)						11.4 (0.52)	1762.9 (2.10)	533.17 (0.58)	-159.9 (-0.77)	-604.9 (-1.02)	723.4 (1.06)	227.8 (0.10)		.88
14	R*	-4166.8	-0.00128 (-1.67)	0.14x10⁻⁸ (9.43)					4.77 (0.42)	1891.3 (4.30)	1802.9 (3.58)	200.0 (1.75)	-208.75 (-0.67)	335.9 (0.94)	161.9 (0.14)		.97
15	R*	-376.38	0.0056 (12.51)													-99.02 (.67)	.84
16	R*	-3067.2					3.558 (18.26)									365.98 (3.87)	.91
17	R*						3.03 (2.64)	0.83x10⁻⁴ (0.64)	20.5 (1.22)	-298.63 (-0.34)	-140.55 (-0.16)	194.87 (1.33)	1080.7 (2.580)	113.75 (0.21)	166.1 (0.95)		.93
18	R*	-4497.8					2.75 (4.23)	0.00011 (1.24)	19.0 (1.20)		221.0 (1.66)	1095.7 (2.76)	50.7 (0.10)	122.5 (0.07)			.93
19	R*	-3150.4			0.0586 (13.92)						-108.4 (-0.146)					385.39 (3.75)	.90
20	R*	-4454.3			0.0676 (3.43)	-0.14x10⁻⁷ (-0.38)			23.2 (1.30)	-719.8 (-0.77)	-628.1 (-0.94)	184.7 (1.18)	1097.1 (2.43)	182.5 (0.32)	372.3 (0.20)		.92
21	R*	-3171.8			0.0582 (16.99)											387.42 (3.85)	.90

Table 15 Estimating The Financial Impact of
American Stations Upon Revenues
of Canadian Stations by Market,
1972

Equation Number	Dependent Variable	Constant Term	$n\log R_e*$	$n\log Y*$	$n\log A*$	$n\log N$	Q	$n\log US_1$	$n\log US_2$	$n\log US_3$	$n\log US_4$	$n\log US_5$	$n\log US_6$	D	R^2
22	$n\log R*$	-4.113	0.730 (6.41)			1.383 (3.42)	0.006 (1.45)	0.0477 (0.37)	-0.020 (-0.095)	0.3433 (1.43)	-0.0422 (-0.069)			0.442 (2.31)	.90
23	$n\log R*$	-3.113	0.726 (6.80)									0.431 (1.89)		0.739 (3.81)	.85
24	$n\log R*$	-4.128		0.962 (10.90)		-0.008 (0.024)	0.007 (2.56)	0.2789 (3.81)	0.367 (2.78)	0.421 (2.54)	0.448 (1.06)			0.180 (1.27)	.95
25	$n\log R*$	-5.384		1.019 (18.80)								1.032 (8.44)			.93
26	$n\log R*$	-5.009		1.062 (19.91)				0.325 (4.72)	0.384 (2.94)				0.875 (3.53)		.94
27	$n\log R*$	-0.0712			0.951 (9.59)	-0.00864 (-0.024)	0.007 (2.16)	0.277 (3.42)	0.386 (2.66)	0.458 (2.48)	0.383 (0.83)			0.277 (1.47)	.94
28	$n\log R*$	-0.747			1.070 (17.99)			0.309 (4.08)	0.408 (2.85)				0.949 (3.47)		.93

D   Dummy variable, 0 if no CBC owned and operate

station in the market, 1 if there are one or more

such stations located in the market.

US_1 One plus the number of U.S. stations that capture

0-10% of total viewing hours of audience in the

market.

US_2 One plus the number of U.S. stations that capture

10.1-20% of total viewing hours of audience in the

market.

US_3 One plus the number of U.S. stations that capture

20.1-30% of total viewing hours of audience in

the market.

US_4 One plus the number of U.S. stations that capture

over 30.1% of total viewing hours of the audience

in the market.

US_5 $US_1 + US_2 + US_3 + US_4$

US_6 $US_3 + US_4$

There are several interesting observations to be made from the

regression equations of Tables 14 and 15.

(1) While in a few cases, the coefficients of the US_i terms are

negative, in no such cases are the coefficients significant at the 95%

level. Generally, then, the Tables support the hypothesis that the greater

the number of U.S. stations available, the greater the revenues accruing

to the Canadian stations.

(2) The coefficients of the U.S.$_i$ terms are generally not significant at the 95% level of confidence in regressions using R_e^* (common coverage area population estimates) as the measure of audience but are generally significant when either V* (total viewing-hours) or P* (average prime-time audience) are used as the measure of audience sizes. At the same time, however, N (one plus the number of private television stations located in the market) is significant only when R_e^* is used as the measure of audience size. The lack of significance of the US$_i$ and the significance of N when R_e^* is used as the measure of audience size are indicative of previous findings that advertisers tend to buy potential coverage rather than actual coverage. It is certain that the number of U.S. stations available will in no way disturb the potential coverage of a station when this potential coverage is defined as population within the coverage area of the station. Parenthetically, this measure of potential, R_e^*, should be a good proxy for reach or net weekly circulation (R_e) as used in the previous section. Therefore, given that advertisers seem to concentrate on potential coverage rather than actual coverage, and given that the number of U.S. stations does not disturb this potential coverage, a lack of statistical significance is associated with the number of U.S. stations available.

It will be recalled that in analyzing the significance of the gross rating points methodology of allocating advertising budgets as regards the reach hypothesis (section IV, pp 52-58) it was stated that one would expect reach alone to be a good predictor of station revenues in competitive situations, whereas if broadcasters have a degree of monopoly

power one would expect that reach plus the number of U.S. signals

available would both be positively correlated with revenues. The lack

of statistical significance of the US_i when accompanied by reach as the

measure of audience size does not support the monopoly power hypothesis.

In the equations using Re* as an independent variable, N

(one plus the number of privately-owned television stations located in

the market) is statistically significant. Like Re*, N represents a

potential, although a potential of a different sort - the potential to

advertise in the market (or, conversely the capacity of the market to

accept advertisements). The fact that the coefficient of N is positive

may indicate that the demand for advertising time to some extent follows

the available supply - the greater supply of time available will stimulate

demand. Alternatively, the observation may be due to an elastic demand

for advertising time (the increased supply causing the price of advertising

to fall, yet total revenues to all stations in the market when aggregated

to rise). This latter explanation does not appear to be satisfactory

however, as all evidence seems to suggest that the demand for advertising

time is price insensitive (i.e. price inelastic). (See Sections II, pp 11-13

and IV pp 58-61 of this Report).[35]

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35. A _priori_ one would not be able to predict the direction of the
effect on revenues accruing to private television stations in a market
of the addition of stations to the market (i.e., an increase in the
supply of advertising time). If an increase in the supply of time is
unaccompanied by a stimulation in demand, then total revenues will rise
or fall depending upon the elasticity of demand as depicted in figures
(a), (b)

Figure (a)
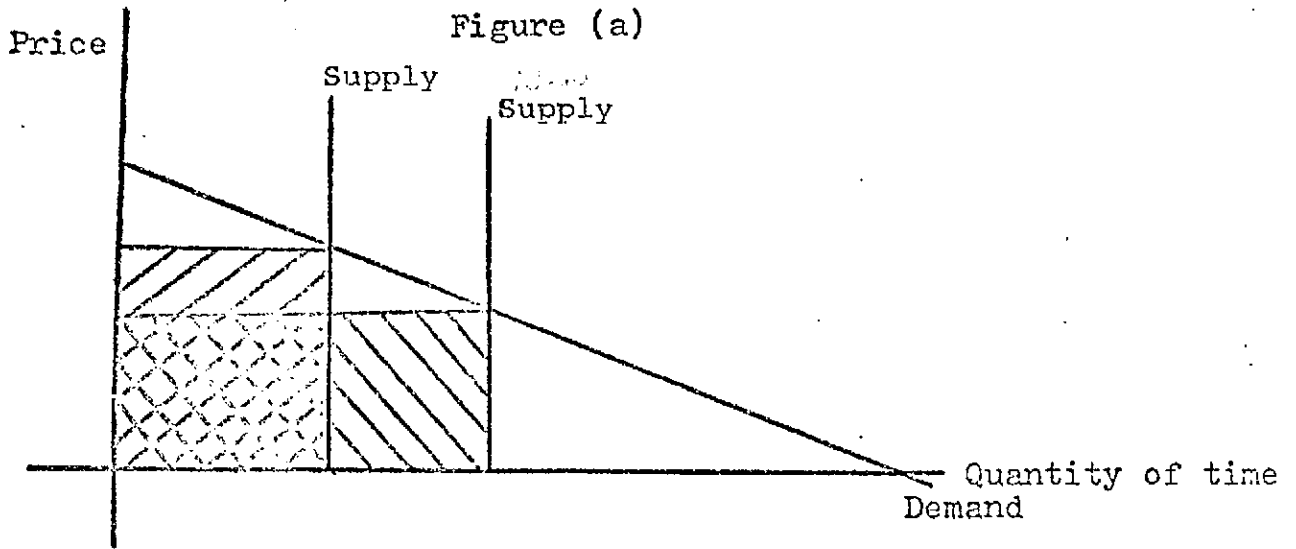
Increase in total revenues with an
elastic demand curve

Figure (b)
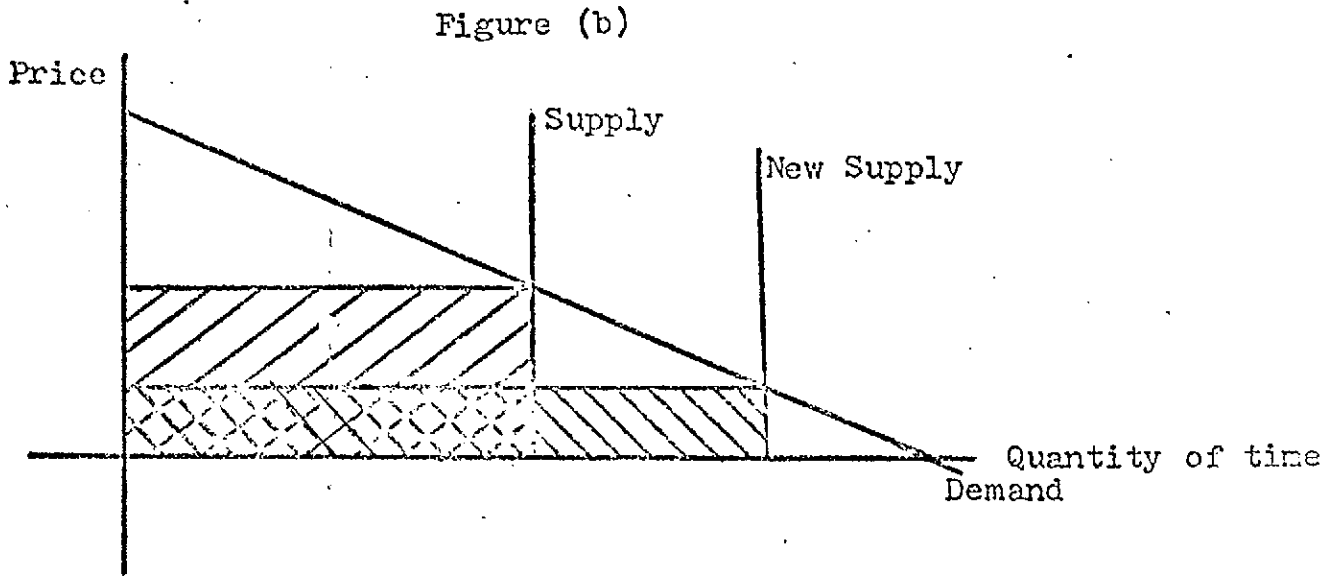
Decrease in total revenues with an
inelastic demand curve

If, however, the demand for advertising time is to a large
extent determined by the available supply, as many broadcasters and
the CRTC appear to believe (see CRTC Public Announcement, July 21, 1972,
CRTC 72-224, in which Global was licensed), total revenues will normally
rise with the addition of a new station. The observation that the
coefficients of the US_i are generally significant and positive when V*
or A* replace R_e* in the regressions again supports the hypothesis being
tested. These measures of actual audiences alone are not sufficient to
explain the total variation across stations in revenues. If two stations
attract equal audiences in terms of viewing-hours (or average prime-time
audience) but differ by the amount of competition they face in terms of
the number of U.S. signals available, the station facing the greater
competition will attain the larger revenues. The greater the number of
U.S. stations available, the greater the fragmentation of the audience to
these channels and therefore the less competitive those channels will be.
In other words, the greater the number of U.S. channels available in the
market, the lower is the potential for reaching the target market in the
Canadian community through any single U.S. channel.

Finally, N, the number of private competitors located in the
market, is not significant when V* or A* are used. The explanation of
this observation may be that the impact of N is absorbed in total viewing-
hours and average prime-time audience (i.e., the larger N is, the greater
will be V* and A*) and given problems of multicollinearity it is impossible
to separate out the impact of N alone.

(3) The lack of significance of the coefficient of Q points to the unimportance of a market's quality in terms of the level of retail sales and disposable income as a variable explaining station revenues.

(4) It does not appear that the theoretical problem raised in the Introduction, that a declining marginal value of audience would lead to a decline in total advertising revenues as large stations gain audience from small stations, is of any importance in Canada. No evidence has been presented to confirm that the marginal value of audience in fact declines. Note that $V*^2$ and $A*^2$ are not significant and that R_e*^2, while highly significant, is positive; these observations are based on equations 20, 17, 18 and 13.

In summary, the evidence in this section supports the hypothesis that the increased availability of U.S. channels helps rather than harms the Canadian broadcasting system, _given_ current advertising practices and _given_ the stage of development of cable television in Canada. These two "givens" form important qualifications with regard to public policy implications, however, and they will be addressed in Section VI.

VI. SOME QUALIFICATIONS REGARDING THE IMPACT OF U.S. TELEVISION
ON CANADIAN BROADCASTERS

Were a cable television consultant attempting to show that CATV has had little or no deleterious impact on broadcasters, he could cite the evidence presented in this study and his case would be quite strong. In short summary, the following points are most important:

(i) Advertisers do not pay close attention to ratings and are

more concerned with reach. CATV may cause the reach of a local station
to decline, but has not yet caused the local station to lose its position
as the station with the greatest reach. Therefore, the local station
remains the best buy for advertisers attempting to reach the population
in the area.

(ii) Television has continually grown in relative importance
vis a vis other media, offering proof that CATV has not adversely affected
television's viability as an advertising medium. While television's
growth has declined in recent years, this may be attributable to exogenous
factors, such as the decline in the growth of new television households.

(iii) Broadcasters have been able to compensate for whatever effects
their fragmented audiences may have had on revenues by offering package deals,
producing more productive commercials, extending their coverage area
through translators, etc.

(iv) Statistically, the number of U.S. channels is positively
correlated to station revenues.

May we then be satisfied that broadcasting and CATV are quite
compatible and that the concern expressed over CATV for the past several
years is misplaced and exaggerated? Not realy. The concern is well placed.
Each of the points above will now be addressed.

(i) While advertisers have thus far been content to rely upon
reach, they are becoming more and more aware of its inadequacies. If
rating surveys come to be undertaken as often as in the United States,
average audience size would then become the most important measure

determining advertising revenues and station revenues would deteriorate accordingly.

The effects of continuing cable growth may be just as harmful without more frequent audience surveys. In 1971, only 18% of television households were cable subscribers, but the industry has been experiencing a growth rate of over 30% per year.[36] By 1972, 27.7% of Canadian households were served by cable.[37] The CRTC has recently announced that CATV systems too far from the border to be able to bring in U.S. signals through conventional means may now do so with microwave. This all points to a very high cable penetration within a few years. It would be clearly naive to believe that advertisers will not become increasingly concerned as audiences become more and more fragmented. In such an event, advertising expenditures on Canadian television could not help but decline.

This process is likely to be accelerated with the advent of Global Television, the new Canadian television network that debuted in January, 1974. Global is offering advertisers a guaranteed cost per thousand viewers whereby Global will compensate advertisers (in bonus advertisements) should the network fail to deliver the full audience promised.

Specifically,

> Advertisers booking contracts with Global Television before
> November 30th, 1973 will be protected at these CPM efficiencies

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36. Statistics Canada, Households, Catalogue number 93-704 (Ottawa: Information Canada, 1972); Statistics Canada, Cable Television 1971 (Ottawa: Information Canada, 1972), catalogue number 56-205.

37. Communications Canada. "CATV Seminar, Economic Policy Planning Unit," Nov. 20, 1973.

for the life of the contract to a maximum of 52 weeks.
Contracts booked after this date will be protected for
the life of the contract or until August 25th, 1974
whichever occurs first ....

Global acknowledges regular BBM reports as the final
arbiter of efficiency in all cases and will make
additional adjustments as may be required at the time
BBM reports are published. Such adjustments are to be
in the form of airtime only within the same broadcast
year and delivering the required audience demographics.
Such delivery will satisfy Global's Guarantee. Further,
BBM reports, starting from March 1974, are the only
basis on which a package may be reduced due to over
delivery.[38]

In other words, Global is replacing reach or potential coverage

with viewers or actual coverage. If the forces of competition among

broadcasters soliciting advertising dollars cause other stations and

networks to similar sales of audiences rather than time based on potential

coverage, then cable television will probably have a severe negative

impact on the revenues flowing to the broadcasting system.

Global is also conducting continuous surveys of audiences in

order to verify its cost per thousand viewers week by week. If this

example set by Global becomes more widespread throughout Canada, so that

surveys come to be as frequent as in the United States, one can again

expect that advertisers will come to rely more heavily upon actual viewing

statistics (which, though still volatile, could be watched week by week

with frequent surveys) and less upon reach (which, though stable, need not

be closely correlated with what the advertisers are really interested in

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38. The Global Television Network. Guarantee of Cost Efficiencies and
Buyer's Handbook. Issued Sept. 1973, see also Broadcaster, October, 1973,
pp. 26-29.

purchasing).

Two consequences may emerge from more frequent surveys and the
use by advertisers of viewers rather than reach in making advertising
expenditures. First, as mentioned, the fragmentation of audiences by
cable television will be reflected in declining revenues. Second,
programming characteristics of Canadian television will come to even more
closely resemble that of U.S. television. In the United States, given
the frequency of rating surveys and the importance of cost per thousand
viewers in terms of advertising revenues, <u>individual programmes</u> must stand
on their own in terms of attracting audience.[39] Programming in the U.S.
is, in the main, dictated solely by the ratings, with the result that the
major part of the programming schedule is bland, middle of the road,
light entertainment fare in an attempt to garner the mass audience.
Canadian television to date has not been under the same pressure since
revenues have depended upon potential rather than actual audience, and
revenues have been based on reach over a week rather than reach for a
single programme.

In short summary, it is difficult to foresee any positive
advantages to the advent of Global Television so far as the health of
the broadcasting system is concerned.

(ii) While it is true that television has continued to capture
a large share of the advertising pie in the face of mounting competition

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39. Programmes are also judged by the size of audience they attract that
will spill over into the following programme.

from stations imported by CATV, its rate of advance has been declining
and most observers feel that television's share has probably stabilized
at about 12.5% of total advertising expenditures. This indicates that
factors which led to television's rapid growth have also stabilized
(increased effectiveness of commercials, increasing saturation of homes
by television, the novelty of t.v.).

In fact, it may be persuasively argued that television will
become a less effective advertising medium in the years ahead. So long
as television depends upon mass advertising, it must deliver a mass
audience. The prospects of television changing into a specialized medium
financed by specialized advertising seem unlikely in view of Canada's
small population, the scarcity of television channels, and the lower level
of advertising relative to GNP in Canada than in the United States. As
the audience size and reach of local stations continue to decline because
of CATV, mass advertisers will find it necessary to advertise more often
and on more stations in order to have the same impact on each given market.
This is the same as saying that each advertising dollar spent will become
less and less effective in inducing sales. This will probably cause a
substantial shift away from television and into other media or simply less
advertising altogether.

It will be recalled that 75% of national advertising in Canada
is undertaken by multinational corporations. National advertising
accounts for 80% of all television advertising. Therefore, multinational
advertisers account for 60% of Canadian television advertising. Total

viewing of American television in Canada accounts for only 18% of all

viewing time. Evidence shows that when U.S. channels obtain a substantial

portion of the audience in border cities (for example, Vancouver and Windsor)

many multinational corporations decrease their advertising expenditures

on the local stations. It seems quite likely if and when American

television succeeds in obtaining a more substantial share of Canadian

viewing time (perhaps 30-40%) there will be a substantial, permanent decline

in television advertising in Canada. U.S. television will undoubtedly

gain at least this percentage of total viewing time when CATV has become

established in most of the cities and towns of Canada and when cable has

obtained a saturation of over 50%. It is also suspected that this decline

in revenues may be quite sudden.[40] It seems quite likely that at some

point in the future, after cable television has approached its ultimate

saturation of perhaps 70-80% of the Canadian population, American television

itself may have the largest single reach as Canadian reach will be fragmented

among three English language networks and two French language networks.

One should bear in mind that CTV and Global coverage will be extended to

most parts of Canada thereby increasing the competition among Canadian

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40. Stations that now compete against a strong U.S. television presence
have not yet felt the full effects of such competition since such stations
are often "tied-in" to network sales. Network sales have not yet suffered
to a great extent since only 18% of Canadian viewing time is spent watching
United States stations. However, any decline in network advertising caused
by an increased viewing share obtained by American channels because of CATV
growth will remove this protection that such stations currently enjoy.
Given the rule-of-thumb policies of advertisers, and the tendency of
competitors to follow each other in advertising expenditures, it is possible
that a few initial decisions to the effect that network advertising is no
longer worthwhile may start a chain reaction.

broadcasters and further fragmenting the audience for Canadian television. A viewing share of 30-40% for U.S. television (base on my econometric model) does not appear out of the question. In such a case, it may be deemed propitious by network advertisers, and especially by the multi-national corporations, to abandon the Canadian broadcasting system altogether and rely on the system with the dominant reach (the U.S. system on which they are advertising in any case).

It should be added that it is unlikely that local advertising will take up the slack. Fragmentation of audiences makes local advertising much less effective on television than national advertising.

(iii) Broadcasters are currently running out of "tricks". Only so many rebroadcasting stations can be built without fragmenting audiences as seriously as does CATV. The time constraint of the broadcast day means that only so many package deals can be offered. Broadcasters have told me that in the past Canadian broadcasting had been inefficiently managed, but the arrival of CATV had caused broadcasters to tighten their belts and become much more efficient. Unfortunately, the belt-tightening has also reached a point at which further cut-backs will cause an audience decline through poorer performance.

(iv) While to date revenues to Canadian broadcasting stations have been positively correlated with the number of American stations available in the community, this positive association has resulted from the fact that to date reach has been the key variable determining revenues. As noted, should reach be replaced by actual audience size, or should

the increased availability of CTV and Global signals further fragment

the Canadian audience, one can predict a significant negative correlation

between revenues and the number of U.S. signals will result.

VI1. PUBLIC POLICY IMPLICATIONS

The policy implications of the foregoing analysis can be briefly

summarized under two headings: (1) policies in the short term and (2) long

run policies.

(1) Policies in the short term.

In the short term, a careful regulation of the number and types

of channels permitted on CATV systems should be sufficient to ensure that

local Canadian television stations retain their predominant positions of

reach in their own markets. To this end the authorities should impose

limits on the number of U.S. alternate stations (probably a maximum of

two or three, depending upon local conditions, such as whether or not the

U.S. stations have in the past actively solicited Canadian advertising)

and at the same time demand that at least one U.S. duplicate station be

carried for each alternate on the system, even if this requirement forces

the cable operator to use expensive microwave techniques. The regulatory

authority should also pay close attention to the number of Canadian

duplicate stations on cable systems as such channels fragment the audience

to Canadian stations the same way as duplicate U.S. stations fragment the

audience to U.S. stations.

(2) Long term policies.

By long term policies I am referring to policies that would

effectively protect the Canadian system against a changing conduct on the

part of advertisers as discussed above in Section VI. Examples of

possible policies follow; some of which have been suggested by the CRTC:

(i) Black-out of programmes duplicated simultaneously (or

within a short period of time such as a week) by the distant station.

Given that most major communities in Canada will be served by three

national networks within the next few years, and that the Canadian content

requirement is only 60% of the broadcast time of each station, a large

proportion of the U.S. network offerings will be carried by Canadian

stations. With non duplication of programming, the U.S. channels would

be deleted from cable systems for a large part of the broadcast day.

The CRTC has ruled that cable systems must respond to the

request by a local station that duplication of its programmes by a distant

station be deleted (CRTC Public Announcement, July 16, 1971).

(ii) Commercial substitution - Commercial substitution requires

that advertisements carried by U.S. stations be deleted and other

material (either public service messages or commercial announcements

sold by Canadian broadcasters) be inserted. This policy was originally

proposed by the CRTC,[41] and some activity has taken place in this regard

in Toronto and Calgary. It appears, however, that the legality of this

policy will have to be resolved in the courts before the practice becomes

more widespread.[42]

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41. CRTC Public Announcement, July 16, 1971.

42. Three Buffalo, New York television stations are challenging this policy
in the Canadian courts by seeing Rogers Cable TV of Toronto for random
commercial deletion. Toronto Star, April 18, 1974.

Regardless of whether reach continues to govern advertising practices or whether it is replaced by actual viewing-hours, commercial substitution should be totally effective in preventing the decline in television advertising dollars. In fact it is probably the only policy that can protect the Canadian system in the long term. As noted, without commercial substitution, policy in the short-term should be directed toward making available a multiplicity of U.S. signals in order to protect the dominant reach position of the Canadian station. In the long term, however, such policy would have two perverse effects - first, it could lead to the abandonment of reach and introduction of viewing-hours as the primary determinant of revenues, in which case the Canadian station would suffer from the multiplicity of U.S. signals; second, it would increase the reach of the U.S. networks on a Canada-wide basis, thereby enabling multi-national network advertisers to reach the Canadian market

through U.S. television only.. Commercial substitution will repatriate all cable viewing-hours to the Canadian system.

Commercial substitution could, however, have an undesirable side-effect. Since the Canadian stations would be assured of 100% of the cable audience (either directly on their own stations or indirectly through commercial substitution on the U.S. stations) there could be a decline in incentives to produce good Canadian programming since the broadcaster would attain the same revenues regardless of whether the audience was tuned to his station or not. Given the high cost of production in Canada, the profit motive could direct broadcasters toward

relying on the revenue forthcoming from commercial substitution. If this effect is considered to be important, revenues from commercial substitution should be directed into a separate programme development fund, rather than being collected directly by the broadcaster.

(iii) Use of supernormal cable profits to finance a Canadian television programme development fund. The high profitability and low risk of CATV are well known. For example, in a previous study the author conducted for the Province of Manitoba, it was estimated that at maturity the two Winnipeg cable systems would be earning a pre-tax rate of return on a net capital rate base of 80% per year. Were cable systems regulated in terms of profits and the excess revenues diverted to such a fund, millions of dollars a year could be used to strengthen the Canadian programme production industry.

Appendix A.

Impact of the Availability of U.S. Television Signals in Three Market Areas - Vancouver, Winnipeg and Windsor

The data presented in the main body of the study support the hypothesis that the increased availability of U.S. channels in Canada through CATV has not had a discernible financial impact on the system as a whole. This observation is due to the fact that the fragmentation of audiences resulting from the importation of U.S. signals has not developed to the extent that Canadian stations have lost their positions of dominant reach in their own markets. However, there are three frequently-cited instances in which the off-air availability of U.S. channels has had the effect of causing a local Canadian station to be unable to attain a position

of dominant reach in its own market. This appendix attempts to measure
the financial impact of this border spill-over effect in the three markets.

In cases in which a multinational firm is able to reach the
Canadian audience by purchasing advertising time on U.S. border stations
and where the American station has a reach among Canadian viewers approx-
imately equal to the reach of the local Canadian station, the multinational
firm is under an incentive to use only the American channel to reach both
the American and Canadian audiences. The best examples of cases in which
U.S. television has a reach of such significance in Canada that the
Canadian stations suffer demonstrable damage are Windsor and Vancouver.
The case of Winnipeg will also be discussed.

In Windsor (November, 1972), CKLW-TV, the only Canadian station
available, attracted only 19.8% of the total viewing-hours of Windsor
residents. Three U.S. stations attracted more viewing-hours than CKLW-TV
(WWJ–23.9%; WJBK–20.4%; WXYZ–19.8%). One U.S. station reached more
residents of Windsor each week than CKLW (86% for WWJ vs. 84% for CKLW),
and two other U.S. stations had a reach almost equal to that of CKLW.

The result was that many multi-national advertisers, who were
purchasing advertising time on the Detroit stations in any event, apparently
decided that it was unnecessary to purchase time on the Windsor station to
reach the Windsor audience, as the Windsor market was adequately covered
by the spill-over effect. At the same time, however, CKLW-TV has coverage
in United States markets and is able to more than recoup the lost Canadian
advertising revenues through revenues forthcoming from U.S. advertisers.

In 1972, CKLW-TV received revenues of $2,850,267 from American advertisers
for its U.S. coverage and $471,397 from advertisers for its Canadian
coverage. Based on the station's Canadian reach only, one would predict
revenues (based on the revenue – reach regressions for Canada as a whole)
of $1.59 million. In fact, however, the Canadian audience was worth only
$0.47 million and one may conclude that the loss to the station due to
the border spill-over effect was $1.12 million. At the same time the
station gained an additional $2.85 million from its U.S. coverage. There-
fore, the net effect of the station's location at the U.S. border was
positive – $1.73 million accrued to CKLW-TV from border spill-over.

In Vancouver, CHAN-TV attracted 20 percent of all Vancouver
viewing-hours in 1972, (the CBC owned station attracted 23 percent). The
viewing-hour shares attracted by the next most popular stations in Vancouver
were KVOS-TV, 23 percent, KOMO-12%; KING-9%; KIRO-8%. It will be noted
that a single U.S. station, KVOS, has a larger viewing share than CHAN-TV.
KVOS also has a reach equivalent to that of CHAN (75% for KVOS vs. 78% for
CHAN). Since the privately-owned station with the largest viewing share
is an American station and since its total reach is equivalent to that of
the Canadian station, one can anticipate that the Canadian station will
suffer in these circumstances. While the Vancouver situation differs
from that of Windsor in that the U.S. station is designed to serve the
Canadian market (in Windsor, multi-national advertisers are trying to
reach the Detroit audience and only co-incidentally reach the Canadian
audience), the American station does prove to be an effective competitor.
Whereas one would predict revenues for 1972 for CHAN of $6.01 million based

on the audience - reach regressions, its revenues were actually $4.598
million. It is estimated by CHAN management that KVOS obtains $4 million
in revenues a year for its Vancouver coverage. If this $4 million figure
is accurate, $1.41 million of this is coming directly at the expense of
CHAN while the remaining $2.59 million would probably not have been spent
on television in the absence of KVOS. In other words, in the event of
a sudden contraction in the supply of advertising time should KVOS go off
the air, the price of advertising time would rise and some advertisers
could be expected to abandon television. Therefore, it would be incorrect
to attribute the total revenues accruing to KVOS as a cost to the Canadian
broadcasters.

It has been shown previously that the introduction of additional
American channels into Vancouver has eroded the position of KVOS to a
much greater extent than the position of CHAN. Therefore, cable television
is helping CHAN by not eroding its reach position as much as it is eroding
the reach of KVOS, the dominant American competitor. None of the channels
introduced by cable have a sufficient reach position considered individually
to be a factor in attracting revenues from Vancouver.

The third market area in which many feel that U.S. competition
is capturing revenues that would normally go to the Canadian broadcaster
is Winnipeg. In Winnipeg, CKY-TV attracts 33.5% of all viewing-hours,
CBWT attracts 34.1%, KCND-TV 22.0%, WDAZ-TV 3.8%; KXJB-TV 3.2% and KTHI-TV 1.9%.[1]

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1.   The French language station in Winnipeg, CBWFT, attracts 1.5% of all
viewing-hours.

At the same time, however, the reach of KCND-TV is substantial enough to make it a viable alternative to CKY, and in 1972 KCND received $1.25 million in revenues from Canadian advertisers trying to reach the Canadian markets.[2] The actual revenues received by CKY-TV in 1972 were $3.078 million. The predicted revenues (from the revenue-reach regression) for CKY-TV were $2.95 million. It appears likely, then, that none of the $1.25 million in revenues accruing to KCND, came directly at the expense of CKY-TV.

The three markets in which observers feel that the negative impact of the availability of U.S. signals is greatest have, then, resulted in a direct loss to the Canadian broadcasting system of an estimated $290,000. It should be stressed that this amount is in addition to whatever negative effect the Canada-wide viewing share of U.S. based stations (19.0% in 1971) may have had on the level of the revenue-reach relationship as discussed in the main body of this study.

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2.   Manitoba, Minister of Consumer, Corporate and Internal Services. Broadcasting and Cable Television: A Manitoba Perspective (Winnipeg: Queen's Printer, 1974) p. 49.

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