19

CABLE TELEVISION COSTS, REVENUES AND PROFITABILITY

The Issue of Tapping the Cable "Surplus" to Improve Broadcasting

Robert E. Babe

August 1974

Reprinted:
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TABLE OF CONTENTS

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Robert E. Babe

I Introduction

In May of 1974, the Minister of Consumer, Corporate and Internal Services, Province of Manitoba, published a discussion paper, Broadcasting and Cable Television: A Manitoba Perspective which contained historic and projected cost-revenue data for the two cable television systems located in Winnipeg. It was a major contention of the discussion paper that the cable systems in Winnipeg would be earning substantial profits over and above the competitive rate of return over the next few years as a result of their publicly-sanctioned monopoly position. The essentials of the Manitoba findings are reproduced in Table 1.

It will be noted from Table 1 that the projected rate of return on net investment in 1978 for Winnipeg cable systems is 89.1% before tax.[1]

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1. Unlike the Manitoba discussion paper, interest payments are not subtracted from operating profits here. There is good justification for including interest payments in the profit figures. Since profits (as opposed to wages, salaries, rents) are the reward to investors for the sacrifice made in contributing to new investment (the sacrifice entailing the postponement of consumption and compensation for the risk involved in making the investment), it does not appear to be reasonable to distinguish between the two types of investors. Both equity holders and bond holders have contributed to the tangible investment in a cable company and their rewards for the sacrifice take the form of "profits" to the shareholders and "interest" to the bond holders, but the sum of these two elements represents the total reward for the sacrifice made.

Should one wish to distinguish between the reward to equity holders and bondholders in calculating the rate of return, the relevant ratio is not profits net of interest over total investment, but rather profits net of interest over the shareholders' contribution to total investment; i.e., shareholder equity.

Table 1 Cable Television in Winnipeg (Two Systems* Combined) 1969-78

	Inception to Aug 31,	Year ending Aug 31							
	1969	1970	1971	1972	1973	1974	1975	1976	1977	1
New investment in year ($'000)	3,830	2,780	760	1,630	810	976	523	529	476	
Original investment (cumulative)	3,830	6,610	7,370	9,000	9,810	10,786	11,309	11,838	12,314	12
Depreciation in year (10%)	192	522	699	819	940	1,029	1,105	1,157	1,207	
Depreciation (cumulative)	192	714	1,413	2,232	3,172	4,201	5,306	6,463	7,670	
Net investment (cumulative)	3,638	5,896	5,957	6,768	6,638	6,585	6,003	5,375	4,671	
Revenues (@$55 per subscriber) ($'000)	483	1,511	2,316	3,130	4,180	4,840	5,390	5,940	6,380	
Operating Expenses	859	1,258	1,273	1,350	1,600	1,808	1,935	2,012	2,072	
Operating Profit	-376	253	1,043	1,780	2,580	5,612	3,455	3,928	4,308	
Depreciation	192	522	699	819	940	1,029	1,015	1,157	1,207	
Profit before interest and tax	(568)	(269)	(344)	961	1,640	2,003	2,350	2,771	3,101	
Rate of return before tax on net assets	(15.6)	(4.6)	5.8	14.2	24.7	30.4	39.1	51.6	66.4	

*The systems are: Greater Winnipeg Cablevision and Winnipeg Videon. (years subsequent to 1972 estimates)

[redacted]

If it is assumed that the cable systems in Winnipeg cease operations at the end of 1978 and the owners sell their systems at the net value of the tangible assets, the internal rate of return for the systems over their ten year life would be 19.3% before tax.[2]

On the assumption that the cable systems face an infinite time horizon, that gross operating profits in the years subsequent to 1978 are constant at $5,000,000 per year, the internal rate is 21.1% before tax.[3]

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2. In calculating the internal rate of return, investments made in years subsequent to 1969 are discounted back to 1969, using a 10% discount rate to reflect the cost of capital, in order to determine the present value (as of 1969) of the full stream of investments. The stream of gross profits (before payments of interest and depreciation) plus net assets in the year 1978 are discounted back to 1969 at a discount rate that will make the present value of the profits equal to the present value of the investment. The rate of discount (19.3%) is the internal rate of return.

P.V. of investment:

$$10382.6 = -376 + \frac{253}{1+r} + \frac{1043}{(1+r)^2} + \frac{1780}{(1+r)^3} + \frac{2580}{(1+r)^4} + \frac{5612}{(1+r)^5} + \frac{3455}{(1+r)^6} + \frac{3928}{(1+r)^7} + \frac{4308}{(1+r)^8} + \frac{4707}{(1+r)^9} + \frac{3872}{(1+r)^9}$$

3. P.V. of investment

$$10382.6 + \frac{500}{.1(1.1)^{10}} = -376 + \frac{253}{1+r} + \frac{1043}{(1+r)^2} + \frac{1780}{(1+r)^3} + \frac{2580}{(1+r)^4} + \frac{5612}{(1+r)^5} + \frac{3455}{(1+r)6} + \frac{3928}{(1+r)^7} + \frac{4308}{(1+r)^8} + \frac{4707}{(1+r)^9} + \frac{5000}{(1+r)^{10}.r}$$

Note that depreciation need not be taken into account in this formulation since on the left hand side of the equation we are dealing with gross additions to plant and equipment and on the right hand side profits before depreciation.

It should be emphasized that the starting point for calculating the internal rate of return was the date of inception of the companies, and the early years of operation (which are weighted the most heavily in any discounting procedure) attain lower levels of profitability. If one assumes that the Winnipeg cable systems have matured by 1976 (the year the Manitoba study projects all debt will have been repaid), one may calculate the internal rate of return for the systems at maturity, using 1976 as the base. The present value of the investment in 1976 is net assets in 1976 ($5,375,000) plus $476,000 discounted one year plus $483,000 discounted two years plus $5,000,000 discounted three years. Under such assumptions, the internal rate of return of mature cable systems in Winnipeg is 65.2%.[4] This last figure (65.2%) may be interpreted as the internal rate of return a buyer of a mature cable system would earn if he compensated the present owners only for the net value of plant and equipment (i.e., no "goodwill"). In other words, if the builders of a cable system operated the system until maturity and until such time as they had realized a reasonable return on their investment, and then sold the system for a price reflecting the value of tangible assets, the purchasers of the system could expect to realize an annual return on investment of over 60% a year. Such an occurence is most unlikely, of course, since the purchase price of a mature system with a guaranteed monopoly position will be determined not only by the physical

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4. P.V. investment:

$$5{,}375 + \frac{476}{1.1} + \frac{483}{(1.1)^2} + \frac{500}{.1(1.1)^3} = 3{,}928 + \frac{4308}{1+r} + \frac{4707}{(1+r)^2} + \frac{5000}{r(1+r)^3}$$

assets of the system but also by the discounted value of future monopoly profits (i.e., "goodwill") and such a purchase price will result in a large capital gain to the original owners of the system.

A major conclusion of the Manitoba study was that the large monopoly profits accruing to the cable operators in Manitoba should be tapped in order to strengthen the broadcasting system in the province, rather than allowing such excess profits to enrich the cable licensees.[5]

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5. In a presentation based on the discussion paper before the CRTC, the Minister responsible for communications in Manitoba stated:

> *"Assuming that these companies, which operate as private monopolies through privileges granted by the federal government, do not indulge in rate base padding or imprudent investment over the next number of months, the following kinds of profits are likely to ensue in the next two years alone.*
>
> *In 1974, their projected profit is $1,437,000, which is a rate of return on depreciated capital of 17%. In 1975, their projected profit is $1,606,000, for a rate of return of 19%.*
>
> *Based on these estimates, which in our view reveal potential for excessive profit-taking, I believe there is ample justification for the Commission to order, effective the beginning of 1975, that a certain substantial compensation be paid by the cable companies to the CBC, the private Winnipeg broadcaster and the third Winnipeg English-language station, should it be licensed.*
>
> *In the long term, the amount of compansation paid over by the cable monopolists to the broadcasting system would be determined by what, in the opinion of the Commission, is a fair rate of return to the cable operators. In deciding on a fair rate of return, the Commission might be guided by the example of the Manitoba Public Utilities Board, which allows the Greater Winnipeg Gas Company a return of 9.1% on an allowable rate base, or the Canadian Transport Commission, which allows Bell Canada 8.2%. If, however, the Commission were to decide to be more generous and permit the Winnipeg cable operators a return on depreciated (sic) capital of 12% in 1975, profits in excess of 12% could amount to $602,000, or about 50 cents per subscriber per month.*

Hon. Ian Turnbull, Minister responsible for Communications, Government of Manitoba. "Presentation to the Canadian Radio-Television Commission" Winnipeg, May 14, 1974.

The present study attempts to estimate the magnitude of "excessive" cable profits for Canada as a whole and project such profits into the future, and to analyse various public policy alternatives in dealing with these profits.

Section II provides some background information on the growth and development of the cable industry on Canada. Section III presents revenue (demand) estimates for cable television. Section IV presents cost (supply) estimates for cable television. Section V integrates the revenue - cost analysis fo the previous sections and projects the profitability of the industry. Appendix A studies the largest cable system in Canada in historical perspective.

II Background Information on Cable Development

Cable television began in Canada in 1952 in London, Ontario. The London cable systems were designed to bring American television to a community which did not, at the time, have a television station of its own.[6] In spite of the early beginnings of the industry, however, CATV did not develop into a major means of distributing television signals in Canada until the mid 1960's. Even by 1964, for example, twelve years after the establishment of the London cable systems, there were only 215,000 cable subscribers in Canada,[7] although some 250 cable systems were operating throughout the country. Most of the systems up to the mid 1960's were small (the average number of homes per system in 1964 was 1,097) reflecting the fact that cable was located, by and large, in communities with little, if any, over the air television.[8]

During recent years, however, cable television has been experiencing remarkable growth in large urban communities with the result that by 1973 2,025,000 homes were connected to cable systems. The industry has been growing in terms of the number of subscribers by 20-30% per year during the last decade. By 1973 an estimated 32% of Canadian households were cable subscribers. The growth patterns through time of the CATV industry is shown in Table 2.

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6. Canadian Radio-Television Commission. Cable Television in Canada, January, 1971, p.4.
7. Committee on Broadcasting. 1965 Report of the Committee on Broadcasting (Ottawa" Queen's Printer, 1965) p. 232.
8. There were in 1965, however, at least two large systems of 30,000 subscribers, in Montreal and Vancouver. Ibid, p. 253.

Table 2. Cable Television Growth 1964-1974

Year	Number of Systems	Number of Subscribers	Average Number of Subscribers per System	Growth Subscribers (%)	Total CATV Revenues ($M.)	Perce House CATV Subsc
1964	247	215,079	1,097	-		4.3
1965	347	272,910	1,300	21.2		5.6
1966	n/a	n/a	n/a	n/a	n/a	n/a
1967	314	517,000	1,646	-	22.1	10.3
1968	377	710,000	1,883	19.3	31.3	13.2
1969	400	924,000	2,310	30.1	37.3	16.8
1970	314	1,164,000	3,707	24.0	54.9	20.6
1971	326	1,398,000	4,288	20.1	66.6	24.2
1972	346	1,689,000	4,882	20.8	79.7	27.7
73	360	2,025,000	5,625	19.9	94.0	32.3
1974	370	2,625,000	7,095	29.6	116.0	-

Source; 1965 Report on Broadcasting op. cit. pp. 252-3; A.E. Osler Gendron Ltd. Cable TV Industry; Statistics Canada Household Facilities and Equipment catalogue no 64-202.

Cable television is both a natural monopoly and a publicly-sanctioned monopoly. It is a natural monopoly due to the fact that there is a large fixed cost element in the provision of CATV service due to the high costs of contructing the cable system. The marginal cost of adding subscribers to a system already built is very low. Therefore, the greater the subscriber penetration for any given cable system, the lower the average cost (per subscriber) since the large fixed costs would be spread over more homes which may be connected to the system at little incremental cost. Direct competition in the industry, under these circumstances, would prove to be wasteful.

Cable television possesses most of the characteristics of a public utility:[9]

(1) It is a natural monopoly, since there are reasons for believing that direct competition, if introduced, would be ephemeral.

(2) There is a direct physical connection between the firm and its customers, indicating that there may be need to protect the consumer against undue price discrimination.

(3) There are social and political reasons for regulating the industry due to external economies and diseconomies associated with the industry. Such social costs and benefits, which without regulation would not be included in the cost-revenue calculations of a private cable entrepreneur but which should be internalized[10] into his profit calculations in order to promote efficiency, include the following" (a) cable operators make

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9. Charles Phillips, The Economics of Regulation (Homewood:Irwin, 1969) p. 4; James Bonbright, Principles of Public Utility Rates (New York: Columbia, 1961) p. 8.

10. Externalities may be internalized either through taxes and subsidies, public ownership, public regulation of private ownership, or through a legal system which would facilitate compensation payments.

use of free over-the-air broadcasting signals in providing their service, but since these signals are free to the cable operator, he is under an incentive to "over-use" such broadcast signals with the result that the ensuing audience fragmentation may inflict severe financial harm on the over-the-air broadcasting system; (b) broadcasting itself has been seen by policy-makers as having significant external economies and has been used to "safeguard, enrich and strengthen the cultural, political, social and economic fabric of Canada"; cable television, by directing audiences to U.S. television, weakens the ability of the Canadian broadcasting system to fulfil these goals.

In addition, cable television may very well have a substantial financial impact upon the established communications common carriers should it be allowed to develop into a two-way wide-band telecommunications distribution system[11], which again would justify some degree of regulation.

To date the Canadian Radio-Television Commission has been most concerned with item (3) above - the impact of cable television on the broadcasting system[12] and has passed regulations regarding the number and types of signals cable systems may carry, the deletion of channels simultaneously broadcasting programming of local stations, and commercial substitution into the commercial time of American stations in an effort to protect the financial position of the established broadcasters.

The CRTC has recognized the natural monopoly aspects of the cable industry and for that reason has refrained from licensing more

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11. Robert Babe "Public and Private Regulation of Cable Television: A Case Study of Technological Change and Relative Power" Canadian Public Administration, summer, 1972.

12. For an economic analysis of the impact of CATV on broadcasters see Robert Babe "An Economic Analysis of the Impact of Cable Television on Television Broadcasting Stations"(August , 1974).

than one system for any given licensed area. But, having removed the control factor of competition, the Commission has not deemed it necessary to protect the consumer from monopolitic exploitation by regulating the rate of return as do most commissions when granting an exclusive franchise.[13] For this reason, the profitability of mature cable systems is very high when compared to profit rates enjoyed by the telephone companies or Canadian manufacturing.

Data on the profitability of the Canadian cable television industry are published annually by Statistics Canada. Table 3 presents aggregate data on costs, revenues, profits and rate of return for the Canadian cable television industry from 1967-1974. With regard to the

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13. The only control at present exercised by the CRTC over rates charged is the requirement of CRTC approval before rate adjustments are made. Rates charged are a condition of licence. The CRTC has seen fit (by and large) to approve the North American industry standard of $4.50 to $6.00 per month. The only general restriction with ragard to rates thus far announced by the CRTC is contained in the following policy statement: [The CRTC] will not entertain applications for changes in the conditions of CATV licences as regards customer charges solely to adjust to a capital valuation or terms of payment arrived at in the bargaining between the seller and buyer." (CRTC, Public Announcement, 10 July, 1969).

In conversation with Mr. Saxe, Head Corporate Analyst of the Financial Analysis Division, CRTC, it was explained that the CRTC is concerned with the rate structure only when applications are made to increase rates. At such time, the CRTC takes into consideration the present level of profits as well as any proposed new services in deciding whether or not to approve the rate increase application. It does not appear that the CRTC had developed any general standards as regards to the reasonableness of profit levels and it appears to consider the cable industry as one with a substantial amount of risk.

Table 3 Costs, Revenues, Profits of Canadian Cable Television Industry 1967-74

($ millions)

	1967	1968	1969	1970	1971	1972	1973[a]	1974[a]
Revenues	22.1	31.3	37.3	54.9	66.6	79.7	94.0	116.0
Operating Expenses	13.7	18.6	22.2	30.3	35.2	40.4	47.0	60.0
Net Operating Profit	8.4	12.7	15.1	24.6	31.4	39.3	47.0	56.0
Depreciation	5.2	6.2	16.6	12.4	13.5	16.5	20.0	22.0
Net profit plus interest before tax	3.2	6.5	8.5	12.2	17.9	22.8	27.0	34.0
Net fixed assets	34.1	48.9	71.7	87.9	103.5	132.4	149.0	179.0
Rate of return (net profit/net assets) (%)	9.4	13.3	11.9	13.9	17.3	17.2	18.1	19.0

a = estimate

Source: A.E. Osle , Gendron Ltd. Cable TV Industry in Canada

Table, two cautionary remarks should be made. First, depreciation rates used are based on the rates used for income tax purposes and so may not reflect the "true" depreciation of equipment but rather depreciation for tax purposes. Second, older systems and newer ones are averaged together, thereby understating the long-term profitability of the industry. In spite of the qualifications, it will be noted that the industry shows a distinct upward trend in the rate of return (9.4% in 1967 vs. 19.0% in 1974) and that the average rate of return in 1974 was quite satisfactory.

Table 4 presents data similar in nature to those of able 3 except that cable companies are grouped by revenue class. There are several points worth noting as developed from Table 4.

(1) There is a movement toward increasing concentration in the industry. Whereas in 1970 the top 19 firms accounted for 49% of industry revenues and 52% of industry profits, in 1972 the 21 largest firms accounted for 66% of industry revenues and 81% of industry profits.

(2) The largest firms tend to be relatively more profitable than smaller firms. In 1972, the largest 21 companies accounted for 66% of industry revenues but only 58% of industry operating expenses and for 81% of industry profits.

(3) The largest systems are becoming more profitable through time. The rate of return has increased from 11% in 1970 to 21% in 1971 to 26% in 1972 for the group of firms with revenues exceeding $800,000.

(4) Firms with less than $50,000 in annual revenues appear to be unable to earn a competitive rate of return.

Table 4. Costs, Revenues, Profits of Canadian Cable Television Industry, By Revenue Group 1970, ($'000)

	1970					1971					1972				
	Under $50,000	$50,000 to $199,999	$200,000 to $399,999	$400,000 to $799,999	$800,000 and over	Under $50,000	$50,000 to $199,999	$200,000 to $399,999	$400,000 to $799,999	$800,000 and over	Under $100,000	$100,000 to $199,999	$200,000 to $399,999	$400,000 to $799,999	$800,000 and over
Number of Companies (% of total)	150 (51)	83 (28)	33 (11)	20 (6)	19 (6)	137 (53)	64 (25)	24 (9)	15 (6)	21 (8)	35 (26)	31 (23)	31 (23)	19 (14)	21 (15)
Revenue (% of total)	2,393 (4.4)	6,855 (12.6)	7,643 (13.9)	10,593 (19.3)	26,855 (48.9)	2,368 (3.8)	6,671 (10.2)	6,609 (9.9)	8,153 (12.2)	42,819 (64.3)	2,782 (3.4)	4,470 (5.6)	8,931 (11.1)	11,127 (14.0)	52,326 (65.9)
Operating expenses (% of total)	2,470 (6.1)	6,695 (16.6)	4,050 (13.4)	5,422 (17.9)	13,244 (43.7)	2,152 (6.1)	4,813 (13.7)	3,971 (11.3)	3,876 (11.0)	20,354 (57.9)	2,050 (5.1)	2,906 (7.2)	5,773 (14.3)	6,431 (15.9)	23,225 (57.5)
Depreciation* (% of total)	701 (5.3)	1,274 (9.7)	1,193 (9.1)	2,084 (15.9)	7,861 (59.9)	389 (2.9)	1,350 (10.0)	1,317 (11.3)	1,345 (10.0)	8,857 (65.8)	521 (3.2)	814 (4.9)	1,708 (10.4)	2,541 (15.4)	10,693 (66.1)
Net physical assets (% of total)	4,647	7,565 (8.5)	7,196 (6.6)	16,339 (19.6)	52,602 (63.2)	6,088 (5.9)	11,076 (10.7)	9,333 (9.0)	10,980 (10.6)	66,030 (63.8)	6,882 (5.7)	6,273 (5.2)	14,287 (11.8)	22,791 (19.9)	72,615 (59.4)
Net profit before tax (% of total	-778 (n/a)	323 (4.3)	2,400 (21.8)	3,087 (28.1)	5,750 (52.3)	-173 (n/a)	508 (2.8)	1,067 (6.0)	2,932 (16.4)	13,578 (75.8)	131 (0.6)	750 (3.3)	1,370 (6.0)	2,145 (9.5)	18,431 (80.7)
Rate of return on net assets	-16%	3.4	33.4	18.9	10.9	-2.8	4.6	11.4	26.7	20.6	1.9	11.8	9.6	10.0	25.6

It may be concluded that the largest systems are the most profitable and that the rate of return in these systems is increasing through time. In discussing the possibility of using excess cable revenues to cross-subsidize broadcasting, primary attention should be focussed on the largest systems.

III The Demand for Cable Television

There are two major studies that have attempted to estimate the demand for cable television in Canada: a study by the International Institute of Quantitative Economics and a Ph.D. thesis by Len Goode.[14] A summary of the findings of the studies as regards penetration rates of CATV are given below.

The dependent variable in the Institute's study was

$$Y = \frac{\ln (1 - P/I)}{\ln PR}$$

where P = annual subscriber charges
I = mean annual income of subscribers
PR= penetration ratio

Y was regressed on a series of independent variables that measure the improvement in television channel choice made available by cable as compared with off-air reception; on time (or age of the system), cablecasting, sales effort by the cable companies, and on a demographic variable ("big city dummy"). Specifically, the independent variables were :

$$XPC = \frac{(1 + \text{no. of Cnd. unduplicated networks stations on cable})}{(1 + \text{no. of Cnd. unduplicated networks stations over-the-air})}$$

$$XDC = \frac{(1 + \text{no. of Cnd. duplicate stations on cable})}{(1 + \text{no. of Cnd. duplicate stations off-air})}$$

$$XIC = \frac{(1 + \text{no. of Cnd. independent stations on cable})}{(1 + \text{no. of Cnd. independent stations off-air})}$$

$$XEC = \frac{(1 + \text{no. of Cnd. educational stations on cable})}{(1 + \text{no. of Cnd. educational stations off-air})}$$

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14. International Institute of Quantitative Economics. "Economic Study of the Financial and Market Characteristics of the 16 Largest CATV Companies in Canada" (July, 1974)" Len Goode, Ph.D. thesis for Department of Economics, University of Western Ontario, to be submitted in August, 1974.

XPU, XDU, XIU, XEU represent the ratio of U.S. stations of the four types available on cable and off-air.

T = age of the system

DBC = big city "dummy" variable, equal to 1 if the system is located in a large city, 0 otherwise

DAP = automated programming dummy

CA = advertising expenditures per potential subscriber

CP = programming expenditures per potential subscriber

Two of the regressions of the Institute are now given:

(1) $Y = .037425 + \underset{(1.709)}{} + \underset{(2.516)}{0.0627 \ln Xpc} - \underset{(-0.278)}{0.0016 \ln Xdc} - \underset{(-0.376)}{0.0032 \ln Xic}$

$\underset{(-1.131)}{-0.0104 \ln Xec} - \underset{(-0.042)}{0.004 \ln Xpu} - \underset{(4.138)}{0.0218 \ln Xdu} + \underset{(2.577)}{0.0241 \ln Xiu}$

$- \underset{(-0.441)}{0.0022 \ln Xeu} - \underset{(-5.361)}{0.0232 DBC}$ $\qquad \bar{R}^2 = .767$

(2) $Y = .021547 + \underset{(1.217)}{} + \underset{(1.802)}{0.0309 \ln Xpc} - \underset{(-0.473)}{0.002 \ln Xdc} - \underset{(-0.7098)}{0.0045 \ln Xic}$

$- \underset{(-1.323)}{0.0097 \ln Xpu} + \underset{(5.666)}{0.022 \ln DU} + \underset{(3.134)}{0.0207 \ln Xiu} + \underset{(1.219)}{0.0031 \ln T}$

$- \underset{(-8.237)}{0.0265 DBC} - \underset{(-2.896)}{0.0079 DAP} + \underset{(4.708)}{0.0178 \ln Ca} + \underset{(2.1242)}{0.0093 \ln Cp}$

$\bar{R}^2 = .872$

Several interesting observations can be made regarding equation (1):

(i) Of the Xi (variables reflecting increased channel choice) Xpc has the largest coefficient, which indicates that if cable is able to increase the number of primary Canadian (unduplicated-network) stations, the

cable system will show a high penetration

(ii) The second highest coefficient is associated with Xdu (U.S. duplicates) and of all the independent variables it is the most statistically significant (highest t- statistic).

(iii) Independent U.S. stations, Xiu, are also positively correlated with increasing penetration

(iv) The following types of signals are negatively correlated with saturation: duplicate Canadian channels (Xdc), independent Canadian channels (Xic), educational Canadian channels (Xec), American primary stations (Xeu). None of these coefficients are, however, statistically different from zero. The most surprising of these results is, of course, the lack of significance (and the negative sign) of Xpu. This result is impossible to explain on an a priori basis and its validity must be questioned.

(v) The negative coefficient of DBC (highly significant by any test) shows that cable systems located in large cities will expect a lower penetration than systems in smaller centres, due undoubtedly to the greater availability of alternative entertainment.

Several interesting observations can be made regarding equation (2):

(i) Generally, the preceeding remarks regarding Xi in equation (1) are applicable to the Xi of equation (2) except that in equation (2) the coefficient of Xiu is positive and statistically significant.

(ii) DBC again is highly significant and its coefficient is negative.

(iii) Automated programming (DAP) is negatively correlated with penetration, but live programming (Cp) is positively correlated.

TABLE 5. EXPECTED CABLE PENETRATION -- VARIOUS Xi

X_{PC}	X_{DC}	X_{IC}	X_{EC}	X_{PU}	X_{DU}	X_{IU}	X_{EU}	DBC	Y	* Penetration PR (%)
2	1	1	1	1	1	2	2	1	0.072865	75.8
3	2	2	1	2	2	1	1	1	0.092119	80.3
1	3	1	1	3	3	2	2	1	0.047200	65.2
2	2	2	1	4	3	1	1	1	0.072760	75.8
3	1	1	1	1	1	2	2	1	0.098288	81.4
1	3	2	1	2	2	1	1	1	0.023696	42.6
2	3	1	1	3	3	2	2	1	0.090663	80.0
3	1	2	1	4	1	1	1	1	0.075345	76.5
2	1	1	1	1	1	2	2	0	0.096065	81.0
3	2	2	1	2	2	1	1	0	0.115319	83.9
1	3	1	1	3	3	2	2	0	0.0704	75.1
2	2	2	1	4	3	1	1	0	0.09596	81.0
3	1	1	1	1	1	2	2	0	0.121488	84.7
1	3	2	1	2	2	1	1	0	0.046896	65.0
2	3	1	1	3	3	2	2	0	0.113863	83.7
3	1	2	1	4	1	1	1	0	0.098545	81.5

Source = equation 1

In Table 5, simulations for various Xi are carried out in order to determine predictions of cable penetration as based on equation (1). As pointed out previously, the most important variable in determining saturation (in terms of the size of the coefficient) is Xpc, the ratio of one plus the number of unduplicated Canadian network stations available on the cable to one plus the number of unduplicated Canadian channels available off-air. One would anticipate, however, for big city cable systems Xpc would normally equal 1 since network stations are located in the largest markets. Such being the case, the regression predicts normal penetration for big cities of 40-65 per cent. There are three reasons for believing this estimate to be on the low side, however:

(i) the negative coefficient and the level of statistical significance of the coefficient with respect to Xpu. It is widely-held that the major attraction of cable in larger markets is its ability to import U.S. network signals.

(ii) the large coefficient of Xpc. Since all big city cable systems receive the full compliment of Canadian network signals off-air, it is not possible to explain cable penetration in big cities by varying Xpc.

(iii) the high negative coefficient associated with DBC. The sample was based on 20 systems all with over $700,000 in revenues and over 15,000 subscribers in 1972. In other words, it is not at all clear that DBC is in fact a "big city dummy". DBC = 1 for cities of 200,000 and over and 0 otherwise.

The second study on the demand for cable employed a substantially different model. Goode's regressions utilized the following independent variables.

P - Price (12x monthly charge + .2 of installation fee).
N - Population of urban centre (in '000) in which the CATV system is located.
Y - Average wage and salary income in the urban centre ($'000).

A - age of system defined as (- 1/age in months^2)

L - amount spent on local programming ($ '000)

Q - index of off-air reception

$$Qj = \frac{\sum Cij\ Aij}{10 \sum i}$$ where Qj = reception quality index for system j

Aij = the i^{th} off-air signal received in system j

Cij = the weight applied to the i^{th} off-air signal and Cij - 10 if Aij is an A contour signal; Cij = 5 if Aij is a B contour signal; Cij = 1 if Aij is neither of the above.

NS - network signals, unduplicated, ratio $\frac{1 + \text{No. of cable channels}}{1 + \text{No. of off-air channels}}$

RS - remaining signals

CN - Canadian network signals, unduplicated

AN - American network signals, unduplicated

CS - Canadian signals

AS - American signals

DS - duplicate signals

IS - independent signals

ES - educational signals

CD - Canadian duplicate signals

AD - American duplicate signals

CI - Canadian independent signals

AI - American independent signals

CE - Canadian educational signals

AE - American educational signals.

Goode regressed two dependent variables against various independent variables for a sample of 152 cable systems (1972). His dependent variables were Ro, the overall penetration ratio, and R_H, the home penetration ratio. A sample of his results follows:

$$(3)\quad Ro = \underset{(1.77)}{1.60} - \underset{(-2.68)}{0.57}\ nl\,P - \underset{(-2.66)}{0.07}\ nl\,N + \underset{(1.89)}{0.42}\ nl\,Y + \underset{(2.98)}{32.63}\ \Lambda + \underset{(2.78)}{0.03}\ nl\,L$$

$$- \underset{(-4.34)}{0.83}\ Q + \underset{(3.02)}{0.40}\ nl\,NS + \underset{(0.31)}{0.02}\ nl\,RS \qquad R^2 = .35$$

(4) R_{II} = 1.76 − 0.56 nl P − 0.05 nl N + 0.32 nl Y + 26.06 A + 0.03
(2.09) (−2.84) (−2.09) (1.54) (2.56) (2.95)

− 0.86 Q + 0.35 nl NS + 0.01 nl RS
(4.85) (2.89) (0.19)

R^2 = .34

(5) Ro = 1.82 − 0.55 nl P − 0.08 nl N + 0.33 nl Y + 27.20 A + 0.04 nl L
(1.94) (−2.53) (−2.67) (1.42) (2.36) (3.22)

−0.80 Q + 0.27 nl CN + 0.08 nl AN − 0.04 nl CD + 0.32 nl AD
(3.90) (1.50) (0.94) (−0.45) (2.69)

− 0.19 nl CI + 0.04 nl AI − 0.02 nl CE − 0.15 nl AE
(−1.00) (0.23) (−0.12) (−1.05)

R^2 = .37

The following general remarks on the results are of interest:

(i) the demand for cable television is inelastic with respect to price, which is in accord with the Institute's finding.

(ii) the population of the centre is negatively correlated with penetration; again this supports the Institute's negative coefficient for DBC.

(iii) the most significant independent variable is Q, the index of the quality of off-air reception, which is, of course, negatively correlated with penetration.

(iv) American duplicate channels have the greatest effect on increasing penetration, followed closely by Canadian network stations; U.S. network stations and U.S. independent stations have a much weaker impact on penetration; Canadian duplicates, independents and educational stations are negatively correlated with penetration, although none of the coefficients are significant; U.S. educational stations are also negatively correlated with penetration, although again the coefficient is not significant. These results broadly conform with those of the Institute.

(v) While the age of the system is important in predicting penetration, 95% of the ultimate penetration is achieved after 2 years. The impact of age on penetration is treated more fully in the table below.

System age in years	Per cent of ultimate penetration
0.5	43
1.0	81
2.0	95
3.0	98
4.0	99

Goode develops a series of demand simulations. Assuming a $5 per month charge, an urban centre of 50,000, an average wage and salary income of $7,942, a system that has been operating for 3 years, that $5,000 is spent on local programming per year, that Q = .51, that the community receives 2 non duplicate network signals off-air and 4 on cable and 2 other signals off-air and 5 other stations on cable, Goode predicts a penetration of .69. Maintaining all but one of these assumptions at a time, he shows how penetration changes as each variable in turn is adjusted.

1. Different levels of population:

Population	expected penetration
1,500	.89
10,000	.77
50,000	.69
100,000	.65
1,000,000	.55

2. Different levels of off-air signal reception quality

Q	expected penetration
.3	.81
.4	.75
.5	.69
.6	.64
.7	.59
.8	.55

3. Different ratios of networks available without W/O cable

off-air	cable	expected penetration
2	3	.63
2	4	.69
2	5	.74
1	3	.74

In Table 6, Goode's equation 11[15] is used to project ultimate penetration, annual revenues and number of subscribers for the 45 largest Canadian cable systems. The 45 systems collectively accounted for $57,754,500 in revenues (or 72.5% of all cable revenues) in 1972 and for 1,256,474 subscribers (or 75.0% of all CATV subscribers) in 1972 Column (1) shows 1972 penetration levels and number of subscribers, Column (2) the likely range of ultimate penetration rates based on Goode's equation, the Institute Study, and Column (1); Column (3) the number of households within the licensed area in 1972. Column (4) estimates the expected number of subscribers to each cable system at maturity and is based on Columns (2) and (3) and assumes no change in licensed area boundaries or housing growth. Column (5) gives the range in expected annual revenues for the cable systems at maturity as based on Column (4) and assuming both $50 and $55 of annual revenue per subscriber. The average revenue per subscriber in 1972 for the 45 systems was $45.66 with a range of

15. $^{(6)}$ nl Ro = 0.16 − 0.69 nl HR − 0.08 nl N + 0.50 nl Y + 31.47 A
(0.32) (−2.88) (−2.65) (2.19) (2.87)

+ 0.03 nl L − 0.79 Q + 0.40 nl NS + 0.03 nl RS
(0.03) (−4.12) (0.40) (0.03)

R^2 = .35

System (Location)	(1) 1972 subs (% penetration)	(2) Penetration at maturity (%) (Goode's projection)	(3) Homes in licensed area 1972	(4) Subscribers at Maturity		(5) Revenues at maturity			
						min. sub. estimate		max. sub. estimate	
				Minimum	Maximum	$350 per sub.	$350 per s.h.	$350 per sub.	$350 per s.h.
Cad. Wireviision (Vancouver)	152.8 (75)	73 - 80 (63)	196.0	152.9	156.8	7,644	9,410	7,840	8,624
National Cable (Montreal)	90.7 (29)	45 - 50 (49)	453.1	203.9	226.6	10,195	11,215	11,330	12,463
Grand River (Kitchener)	61.2	75 - 80 (76)	82.0	61.5	65.6	3,075	3,383	3,280	3,608
Cable TV (Montreal)	64.2 (33)	45 - 50 (49)	195.6	88.0	97.8	4,400	4,840	4,890	5,379
Metro Cable (Toronto)	61.0 (41)	50 - 60 (53)	148.3	74.1	89.0	3,705	4,076	4,450	4,895
Ottawa Cable (Ottawa)	51.7 (74)	75 - 80 (48)	70.0	52.3	56.0	2,615	2,877	2,800	3,080
Victoria Cable (Victoria)	50.0 (68)	88 - 90 (65)	56.8	50.0	51.1	2,500	2,750	2,555	2,811
Skyline Cable (Ottawa)	45.3 (59)	60 - 65 (48)	77.0	46.2	50.1	2,310	2,541	2,505	2,756
London Cable (London)	45.2 (88)	90 - 95 (94)	51.5	46.4	48.9	2,320	2,552	2,445	2,690
York Cable (Toronto)	44.2 (56)	56 - 60 (53)	78.7	44.2	47.2	2,210	2,431	2,360	2,596
Rogers Cable (Toronto)	43.5 (40)	50 - 60 (53)	109.8	54.9	65.9	2,745	3,020	3,295	3,625
Winnipeg Videon (Winnipeg)	40.7 (35)	50 - 55 (47)	116.9	58.4	60.4	2,925	3,218	3,020	3,322
Maclean Hunter (Toronto)	26.8 (37)	50 - 55 (53)	71.8	35.9	39.5	1,795	1,975	1,975	2,173
Coaxial Colourview (Toronto)	28.6 (42)	50 - 60 (53)	68.0	34.0	37.4	1,700	1,870	1,870	2,057
Hamilton Coax (Hamilton)	25.1 (62)	62 - 65 (58)	40.5	25.1	26.3	1,250	1,375	1,315	1,447
Telecable de Quebec (Quebec)	23.5 (51)	55 - 60 (57)	46.3	25.5	27.8	1,275	1,403	1,390	1,529
Maclean Hunter (Thunder Bay)	22.2 (77)	77 - 80 (53)	28.9	22.3	23.1	1,115	1,227	1,155	1,271
Coquitlam CTV (Vancouver)	21.9 (65)	65 - 70 (63)	33.0	21.9	23.1	1,090	1,199	1,155	1,271
Maclean Hunter (London)	20.5 (75)	82 - 85 (94)	27.5	23.4	24.8	1,170	1,287	1,240	1,364
Greater Winnipeg (Winnipeg)	20.4 (46)	50 - 55 (47)	44.1	22.1	24.3	1,105	1,216	1,215	1,337
N.W. Comm. Video (Vancouver)	31.7 (72)	75 - 80 (63)	44.1	33.1	35.3	1,655	1,821	1,765	1,942
Maclean Hunter (Guelph)	16.6 (82)	82 - 85 (66)	20.1	16.6	17.1	825	908	855	941
Express Cable (Vancouver)	15.4 (84)	84 - 86 (63)	18.3	15.4	15.7	770	847	785	864
Jarmain Cable (Brantford)	20.6 (60)	75 - 80 (77)	35.4	25.9	27.6	1,295	1,425	1,380	1,518
Peterborough CTV (Peterborough)	14.8 (62)	82 - 85 (73)	19.0	14.8	15.1	740	814	765	842
Cablevue Belleville (Belleville)	14.9 (52)	55 - 65 (60)	35.5	19.5	23.1	975	1,073	1,155	1,271

(TABLE 6. cont'd)

Mountain Cable (Hamilton)	14.5 (55)	58 - 60 (58)	26.2	15.1	15.7	755	831	785	864
Fraser Valley (Vancouver)	14.5 (59)	63 - 65 (63)	24.5	15.2	15.7	760	836	785	864
Pine Ridge Cable (Oshawa)	13.7 (39)	65 - 70 (69)	35.0	22.8	24.5	1,140	1,254	1,240	1,348
Calgary Cable (Calgary)	13.3 (20)	55 - 60 (56)	66.4	36.5	39.8	1,825	2,008	1,990	2,189
Western Cablevision (Vancouver)	12.6 (87)	87 - 90 (63)	14.5	12.6	13.1	630	693	655	720
Laurentian CTV (Hull)	12.4 (76)	76 - 78 (53)	16.4	12.5	12.8	625	688	640	704
Huron Cable TV (Sarnia)	12.2 (63)	75 - 80 (81)	19.3	14.5	15.4	725	798	770	847
Community Antenna (Calgary)	12.0 (20)	55 - 60 (56)	58.9	32.4	35.3	1,620	1,782	1,765	1,942
Cornwall Cablevision (Cornwall)	10.7 (85)	85 - 86 (71)	12.5	10.7	10.8	530	583	540	594
Classic Communic. (Richmond Hill)	10.5 (46)	55 - 60 (53)	23.1	12.7	13.9	635	699	695	765
Capital Cable (Edmonton)	10.5 (16)	50 - 60 (51)	65.0	32.5	39.0	1,625	1,788	1,950	2,145
Delta Cable (Delta)	10.4 (87)	87 - 90 (65)	12.0	10.4	10.8	520	572	540	594
Bramalea Telecable (Bramalea)	10.4 (52)	52 - 55 (51)	19.9	10.4	10.9	515	567	545	600
Keeble Cable (Toronto)	10.1 (38)	45 - 55 (53)	37.6	16.9	20.7	845	930	1,035	1,139
Maclean Hunter (Hamilton)	9.6 (76)	76 - 80 (58)	12.7	9.7	10.2	485	534	510	561
Graham Cable TV (Toronto)	9.1 (30)	50 -55 (53)	30.0	15.0	16.5	750	825	825	908
Allview Cable (St-Thomas)	8.7 (74)	85 - 95 (100)	11.7	9.9	11.1	495	545	555	611
Western Cable TV (Edmonton)	8.7 (83)	80 - 83 (51)	10.8	8.7	9.0	430	473	450	495
Maclean Hunter (St-Catherines)	8.6 (27)	45 - 55 (50)	32.0	14.4	17.6	720	792	880	968
TOTAL	1,266.0	58.6 - 63.1	2,695.7	1,580.6	1,718.6	79,030	86,951	85,945	94,537

$60.46 (Thunder Bay) to 32.82 (Calgary), but the average may be expected to rise and the range to narrow as all systems approach maturity. This expectation is founded on two observations: first, as systems mature it is no longer necessary to offer periods of free cable service to attract subscribers and second, mature systems will have a greater percentage of subscribers that are connected to the system for the full year.

At maturity (and according to Goode's estimate, systems achieve 98 per cent of ultimate penetration in three years) it is projected that the 45 systems under examination will collectively account for 1,580,000 to 1,719,000 subscribers, representing a penetration rate of 59 to 64 per cent, and receive annual revenues of $79,000,000 to $94,500,000.

IV Costs of Cable Service

There are three major studies that have attempted to measure the costs of cable service, those by Babe[16], Goode[17], and the Institute of Quantitative Economics[18]. In addition, the Economic Policy Planning Unit of the DOC has done work on the topic. The major findings of each of these studies is now summarized and the findings are integrated in order to estimate the annual costs that will be faced by the 45 cable systems at maturity.

Cable systems face a large fixed cost element that is independent of the number of subscribers to the systems, but which is directly related to the geographic extent of the system. These costs include the annual depreciation of trunk and distribution cable, the head-end, and perhaps the studio. In addition, a proportion of the operating costs (chiefly maintenance, pole rental, insurance) may be expected to be more closely related with system length than with the number of subscribers. On the other hand, certain operating costs may be expected to be quite closely correlated with the number of subscribers and/or percentage penetration (selling expenses, administration, certain maintenance expenses). In addition, one fixed cost element is directly related to the number of subscribers, namely the depreciation of subscriber drops. In sum, there are three measures of system size: number of subscribers, number of households passed by the cable system (potential sbuscribers) and number of miles of distribution cable.

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16. Robert E. Babe The Economics of the Canadian Cable Television Industry, Ph.D thesis, Michigan State University, 1972.

17. Len Goode An Econometric Model of the Canadian Cable Television Industry and the Effects of CRTC Regulation, Ph.D thesis, University of Western Ontario, 1974.

18. International Institute of Quantitative Economics "Economic Study of the Financial and Market Characteristics of the 16 Largest Cable Companies in Canada" 1974.

These measures should be used simultaneously to predict annual expenses.

Babe found a close relationship between original investment and miles of cable plant. Systems with 100 to 200 miles of plant had a fixed original investment per mile of $5000 to $6500; systems of 300 to 500 miles had an original investment of $7500 to $8500 per mile; systems of 700 to 1100 miles had an original investment of $9500 to $10,500 per mile. Babe also found a very tight relationship between fixed assets per potential subscriber and number of potential subscribers for systems with over 45,000 potential subscribers. Investment per household passed for such systems ranged from $27 to $32. For systems under 40,000 potential subscribers, it was found necessary to take into account penetration rates: for systems with penetration rates of 0-40% (low penetration), investment per household passed ranged from $60 for systems 8,000 to 15,000 potential subscribers to $20 for systems with over 20,000 potential subscribers. For systems with medium saturation (30-60%), investment costs per potential subscriber ranged from $60 to $80 (for systems up to 40,000 potential subscribers) to $20-$25 (over 40,000 potential subscribers. For systems with high penetration (50-100%) there was high variability in investment per household passed for systems up to 30,000 potential subscribers ($35 to $85), but stabilized at about $25 for systems over 30,000 potential subscribers.

In addition, a close relationship was found between operating costs and two variables, the number of potential subscribers and percentage penetration. For all systems with more than 20,000 potential subscribers, annual operating costs were $9 to $10 per potential subscriber.

For systems with 10,000 to 20,000 potential subscribers and low penetration (0 to 40%), annual operating costs were $10 to $12 per potential subscribers; for systems with medium penetration (30 to 50%) operating costs ranged from $15 (less than 10,000 potential subscribers) to $10 (10,000 to 20,000 potential subscribers). For systems with high penetration (50 to 100%) operating costs per subscriber were $15 to $18 for systems under 10,000 potential subscriber and $10 for larger systems.

A summary of the major findings of the Babe study is given in Table 7.

TABLE 7

ANNUAL EXPENSES, CABLE TELEVISION

BABE STUDY

Potential Subscribers	Miles of Cable Plant	Penetration (%)	Depreciation per Mile ($)	Operating Costs per Household Passed ($)
to 10,000	200-300	0-40	550-650	12-13
	300-600	30-60	750-850	14-17
	700 & Over	50-100	950-1100	12-18
10,000 to 20,000	200-300	0-40	550-650	9-10
	300-600	30-60	750-850	9-10
	700 & Over	50-100	950-1100	9-10
20,000 to 40,000	200-300	0-40	550-650	7-8
	300-600	30-60	750-850	9-10
	700 & Over	50-100	950-1100	9-10
40,000 and Over	200-300	0-40	550-650	5-7
	300-600	30-60	750-850	8-9
	700 & Over	50-100	950-1100	9-10

Source: Babe Economics of Canadian Cable Television Industry

Babe made the following conclusions:

(1) Fixed investment per mile of CATV plant increases with system size. Firms under 250 miles have invested $4000 to $6000 invested per mile (exclusive of capitalized drops) while firms with over 300 miles of cable have $7500 to $10,000 invested per mile of plant.

(2) Fixed investment per household passed by the cable declines up to 30,000 potential subscribers and for larger systems is constant at $25 to $30.

(3) Original fixed investment per potential subscriber is about $25 for all systems with 150 households per cable mile and over.

(4) Operating costs per subscriber are at a minimum ($18 to $27) when penetration exceeds 30%.

(5) Lowest total costs per subscriber are $25 per year when penetration exceeds 80%. Lowest total costs per mile are $2200 per year for systems of 150-250 miles of plant.

Goode regressed costs against subscribers, miles of plant and a microwave dummy variable for a sample of 152 systems. Three of his equations are given below:

$$(7)\quad OPEX = \underset{(2.71)}{19.36} + \underset{(7.34)}{9.79S} + \underset{(2.00)}{0.65S^2} - \underset{(-3.07)}{0.0005} \qquad R^2=.89$$

$$(8)\quad DEP = \underset{(4.57)}{41.83} - \underset{(-1.74)}{0.23CM} + \underset{(11.80)}{0.003\ CM^2} - \underset{(-14.77)}{0.000002\ CM^3} \qquad R^2=.89$$

$$(9)\quad TCA = \underset{(3.08)}{36.02} + \underset{(10.47)}{22.73S} + \underset{(1.98)}{0.12S^2} - \underset{(-2.87)}{0.0009S^3} + \underset{(5.75)}{0.0016CM^2}$$

$$- \underset{(-5.83)}{0.00000091CM^3} + \underset{(3.03)}{125.21M} \qquad R^2=.97$$

where OPEX - operating expenses less local programming expenses and technical expenses ($'000)

DEP - depreciation ($'000)

S - total subscriber ($'000)

T - miles of trunk cable

D - miles of distribution cable

M - dummy variable, equal to 1 if microwave used

TCA - total cost less local programming expenses

CM - total cable miles (D & T)

It is possible to simulate Goode's model for various system sizes.

TABLE 8

CATV COST SIMULATIONS

GOODE STUDY

Subscribers	Miles	Total Annual Expense	Cost per Mile	Cost per Subscriber
150,000	925	85,196,500	5,620	$34.64
100,00	900	3,241,600	3,602	32.42
60,000	700	2,109,300	3,013	35.15
50,000	650	1,786,100	2,748	35.72
45,000	375	1,396,900	3,725	31.04
27,000	192	778,500	4,055	28.83
21,000	300	677,400	2,258	32.26
10,000	175	318,500	1,820	31.85
8,600	110	257,900	2,345	29.99

The best equation in the Institute's study regarding costs is:

$$(10) \quad C = \underline{492.14} + \underline{0.6041S^2} - \underline{0.001617S^3} \quad R^2=.94$$

where C - operating costs, including depreciation, in $'000

S - subscribers in thousands

Typical simulations of the equation are shown in Table 9.

TABLE 9

COST SIMULATIONS

INSTITUTE STUDY

Subscribers	Total Cost	Average Cost per Subscriber
15,000	$ 622,600	$ 41.51
25,000	844,400	33.78
60,000	2,317,600	38.63
90,000	4,206,600	46.74
140,000	7,895,500	56.40

The bulk of the Institute's observations fall in the range of 15,000 to 70,000 subscribers, however, and the projections of costs for systems larger than 70,000 subscribers appear to be unreliable.

It is possible to estimate the annual total costs for the 45 systems at maturity using the three studies of costs for these systems.

This exercise is carried out in Table 10. For each of the three studies on cable costs, two estimates of costs per annum are provided based on the minimum and maximum penetration rates at maturity as developed in Table 6. For minimum penetration estimates, the total costs for the 45 systems are $50.2 million for the Babe study, $46.9 million for the Goode study, and $55.6 million for the Institute study. For maximum penetration estimates, the Babe study gives total annual costs of $53.8 million, the Goode study $52.4 million, and the Institute study $58.2 million. The cost figures from the three studies show a close enough correspondence that these cost projections can be used with some degree of confidence in estimating cable profits.

	[illegible] ('000)		[illegible] OF UNIT (1972)	[illegible] (1972)					
				MEDIAN			RANGE		
	MIN.	MAX.		BASIC	[illegible]	INCENTIVE	[illegible]	[illegible]	[illegible]
Cnd. Wirevision (Vancouver)	152.9	156.8	926	3,975	3,749	n/a	4,076	3,790	n/a
Nat'l Cable (Montreal)	203.9	226.6	1,100	2,340	2,755	n/a	3,150	n/a	n/a
Grand River (Kitchener)	61.5	65.6	731	1,722	2,178	2,777	1,832	2,289	2,635
Cable TV (Montreal)	88.0	97.8	855	3,168	2,930	n/a	3,521	3,143	n/a
Metro Cable (Toronto)	74.1	89.0	754	2,568	2,533	3,809	2,937	2,895	n/a
Ottawa Cable (Ottawa)	52.3	56.0	650	1,785	1,850	2,144	1,910	1,953	2,103
Victoria Cable (Victoria)	50.0	51.1	438	1,300	1,591	2,002	1,329	1,621	1,854
Skyline Cable (Ottawa)	46.2	50.1	436	1,478	1,482	1,782	1,603	1,592	1,805
London Cable (London)	46.4	48.9	372	1,160	1,434	1,792	1,223	1,504	1,768
York Cable (Toronto)	44.2	47.2	433	1,414	1,424	1,672	1,510	1,508	1,668
Roger Cable (Toronto)	54.9	65.9	391	1,922	1,687	2,313	2,307	1,988	2,653
Winnipeg Videon (Winnipeg)	58.4	60.4	679	2,044	2,046	2,552	2,114	2,101	2,340
Maclean Hunter (Toronto)	35.9	39.5	192	1,257	1,018	1,271	1,383	1,118	1,335
Coaxial Colourview (Toronto)	34.0	37.4	372	1,224	1,087	1,190	1,197	1,181	1,253
Hamilton Coax (Hamilton)	25.0	26.3	207	775	726	870	815	761	881
Telecable de Quebec (Quebec)	23.3	27.8	215	816	744	835	890	806	924
Maclean Hunter (Thunder Bay)	22.3	23.1	247	580	677	793	601	698	795
Coquitlam Cable (Vancouver)	21.8	23.1	570	632	931	779	670	965	795
Maclean Hunter (London)	23.4	24.8	300	608	742	583	665	779	539
Greater Winnipeg (Winnipeg)	22.1	24.3	317	774	719	787	851	775	826
N.W. Community Video (Vancouver	33.1	35.3	574	927	1,242	1,156	953	1,333	1,174
Maclean Hunter (Guelph)	16.5	17.1	510	429	715	952	665	751	961
Express Cable	15.4	15.7	111	383	569	695	543	547	615

(TABLE 10, cont'd)

Peterborough Cable (Peterborough)	14.8	15.3	196	385	450	624	398	463	628
Cablevue Belleville (Belleville)	19.5	23.1	194	644	572	722	739	668	795
Mountain Cable (Hamilton)	15.1	15.7	143	527	434	630	424	449	635
Fraser Valley (Vancouver)	15.2	15.7	211	456	469	632	471	482	635
Pine Ridge Cable (Oshawa)	22.8	24.5	214	684	670	806	735	716	831
Calgary Cable (Calgary)	36.5	39.8	480	1,205	1,250	1,297	1,313	1,342	1,347
Western Cablevision (Vancouver)	12.6	13.1	n/a	315	n/a	588	328	n/a	592
Laurentian CTV (Hull)	12.5	12.8	185	338	386	587	346	394	588
Huron Cable TV (Sarnia)	14.5	15.4	185	392	437	619	416	460	630
Community Antenna (Calgary)	32.4	35.3	304	1,069	990	1,126	1,165	1,071	1,174
Cornwall Cablevision (Cornwall)	10.6	10.8	102	276	305	560	281	310	561
Classic Communications (Richmond Hill)	12.7	13.9	286	419	452	590	459	482	605
Capital Cable (Edmonton)	32.5	39.0	405	1,170	1,073	1,130	1,287	1,254	1,315
Delta Cable (Delta B.C.)	10.4	10.8	223	260	354	557	270	364	561
Bramalea Telecable (Bramalea)	10.3	10.9	176	350	326	536	371	341	562
Keeble Cable (Toronto)	16.9	20.7	170	659	492	665	704	592	737
Maclean Hunter (Hamilton)	9.7	10.2	n/a	262	n/a	549	275	n/a	553
Graham Cable TV (Toronto)	15.0	16.5	117	540	421	628	561	460	649
Allview Cable (St Thomas	9.9	11.1	109	248	290	551	278	320	564
Western Cable TV (Edmonton)	8.6	9.0	157	224	276	537	234	286	540
Maclean Hunter (St-Catherines)	14.4	17.6	309	562	511	617	598	594	670 *
TOTAL				50,177	46,829*	55,649*	53,766	52,398*	58,215*

* for total, where n/a or in figs another column used.

V Cable Television Profitability

By combining revenue estimates (Table 6) and cost estimates (Table 10), profit estimates for the 45 systems at maturity can be calculated. For both the minimum and maximum penetration estimates, a simple average of the cost estimates from the Babe, Goode and Institute studies are used.

In addition, the expected pre-tax rate of return is calculated by dividing the simple average profits as discussed above by the estimated net assets of the systems at maturity. Net assets at maturity are estimated as net assets in 1972 plus $10 times the charge in the number of subscribers from 1972 to maturity[19] (this latter figure representing additional drop costs). The above calculations are displayed in Table 11.

The assumptions underlying Table 11 are:

(1) There is no change in licence area boundaries from the 1972 areas.

(2) There is no new housing in the licenced areas.

(3) Each subscriber is worth $55 per year to the systems.

(4) There is no change in the number and types of channels carried by the CATV systems from the 1972 channel carriage.

(5) There are no new services offered by CATV systems.

(6) The net tangible asset position of the cable companies at maturity equals the 1972 net asset position plus $10 times the change in subscribers since 1972.

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19. Drops are generally costed at $20 to $30 each and depreciated over 4 - 5 years. The $10 drop cost figure will provide an "average" of the value of drops over the 5 year depreciation period.

Each of these assumptions (with the exception of assumption (3)), has the effect of understating the long run profitability of cable systems. In this regard the only assumption warranting further discussion is (6). It will be noted from the Winnipeg projections of part I that depreciation is generally greater than replacement investment for several years of CATV operation. In other words, by accepting 1972 net investment as the base, there is an overstatement of net investment as net investment may be expected to decline through time (apart from new investment as reflected in $10 X subscribers).

Apart from the downward bias in profitability resulting from the restrictive assumptions noted above, there are at least two other reasons for believing the profit estimates of Table 11 to be conservative:

(1) Goode's regressions appear to underestimate ultimate penetration. In 18 of the 45 systems, Goode's projection of ultimate penetration is lower than 1972 actual penetration and in 11 of these systems Goode's ultimate penetration is at least 15% less than 1972 levels. While Goode's projections were rejected for systems with 1972 penetration levels greater than those projected from Goode's model, these observations would indicate that acceptance of Goode's projections for the remaining systems would place subscriber estimates on the conservative side.

(2) For the smaller cable systems in the group of 45 studied, costs are probably over-estimated. It is known that cable systems suffer from diseconomies of scale when the systems are over 200 miles in length. The Institute's study was based on a sample of 16 largest cable systems and so that sample reflects diseconomies of scale. It will be noted that the Institute's cost estimates in Table 10 are nearly always higher than those of the Babe

and Goode studies. In estimating the costs for each system for the table on profitability (Table 11), a simple average of the estimates of the three studies was taken. Therefore, costs estimates are probably too high for a large number of systems.

With the above remarks in mind, one way assess the profitability of CATV by inspecting Table 11. Total profit before tax for the 45 systems considered collectively is projected for maturity at $34.1 million to $38.7 million for an overall rate of return on net investment of 50.8% to 57.4% (weighted average). If one may take as reasonable a pre-tax rate of return of 16% (approximately equal to that permitted the telephone companies) the monopolistic (surplus) profits accruing to the top 45 firms per year will be $23.37 million to $27.89 million (before tax). The non-weighted average rate of return in sample is 42.6% for minimum penetration to 47.9% for maximum penetration.

It would appear to be desirable to relax one of the restrictive assumptions in these estimates, namely zero growth in housing. If one assumes an average annual rate of growth of housing of 2% for each licensed area, by 1977 the total subscribers for each system should be inflated by 1.104 (i.e., 1.02^5). Table reestimates profits for 1977, assuming all systems have reached maturity and assuming 2% annual growth in housing.

System	Minimum penetration					Maximum penetration				
	BABE	COODE	INSTITUTE	AVERAGE	r	BABE	COODE	INSTITUTE	AVERAGE	r
Cnd. Wirevision	4,435	4,661	n/a	4,448	45.9	4,548	4,894	n/a	4,721	48
Nat'l. Cable	3,875	n/a	n/a	3,875	136.6	4,305	n/a	n/a	4,305	140.5
Grand River	1,661	1,205	606	1,157	45.0	1,775	1,319	973	1,356	51.
Cable TV	1,672	1,910	n/a	1,791	40.6	1,858	2,236	n/a	2,047	45.
Metro	1,408	1,543	267	1,073	20.3	1,958	2,000	n/a	1,979	38.3
Ottawa Cable	1,092	1,027	733	951	39.6	1,170	1,127	977	1,751	71.8
Victoria Cable	1,450	1,159	748	1,119	58.6	1,482	1,190	957	1,210	62.5
Skyline	1,241	950	539	910	40.1	1,427	1,135	902	1,155	50.1
London Cable	1,392	1,118	760	1,090	86.6	1,467	1,185	942	1,198	93.4
York Cable	1,017	1,007	759	928	33.6	1,086	1,088	928	1,034	37.0
Rogers Cable	1,098	1,333	707	1,045	28.8	1,318	1,637	972	1,309	35.0
Winnipeg Videon	1,174	1,172	666	1,004	23.2	1,208	1,221	982	1,137	26.2
Clean Hunter	718	957	704	793	n/a	790	1,055	838	894	n/a
Axial Colourview	646	783	680	703	26.0	860	876	804	847	30.9
Milton Coax	600	649	505	585	54.6	632	686	566	628	58.0
Cable Quebec	587	659	518	588	49.0	639	723	605	656	53.6
Jean Hunter	647	550	434	544	60.2	670	573	476	573	62.8
Hamilton	567	268	420	418	32.3	601	306	476	461	35.3
John Hunter	679	545	404	543	62.4	719	585	525	610	69.0
Our Winnipeg	442	497	429	456	29.7	486	559	511	519	33.4
	894	579	667	713	40.0	989	639	768	799	44.3
[illegible] Hunter	479	173	251	301	56.0	496	190	280	322	59.4
[illegible] Cable	462	417	212	364	55.2	471	427	329	376	56.8

(TABLE 11. cont'd)

Jarmain Cable	726	601	528	618	57.9	773	647	600	673	62.2
Peterborough	429	364	190	328	70.6	444	379	214	346	73.7
Cablevue Belleville	429	501	351	427	58.7	532	603	476	537	62.3
Mountain Cable	304	397	201	301	30.2	440	415	229	361	36.0
Fraser Valley	380	367	204	317	27.5	393	382	229	335	29.0
Pine Ridge	570	584	448	534	44.7	613	632	517	587	48.5
Calgary Cable	803	758	711	757	25.3	876	847	842	855	28.3
Western Cablevision	378	n/a	105	242	66.5	392	n/a	128	260	70.4
Laurentian	350	302	101	251	32.1	358	310	116	261	33.2
Huron Cable TV	460	412	211	361	34.1	501	453	259	404	38.0
Community Antenna	713	792	656	721	22.1	777	871	768	805	24.4
Cornwall Cable	307	278	23	202	36.0	313	284	33	210	37.3
Classic Comm.	280	247	109	212	14.0	306	283	162	250	16.3
Capital Cable	618	715	658	664	24.5	858	891	830	860	30.3
Delta Cable	312	218	15	182	19.2	324	230	33	196	20.5
Bramalea	217	241	11	156	12.5	229	259	38	175	14.0
Keeble Cable	271	438	265	325	22.5	435	547	402	461	31.1
Maclean Hunter	272	n/a	-15	129	81.9	286	n/a	8	147	90.4
Graham	285	404	197	295	27.7	347	448	259	351	32.4
Allview Cable	297	255	-6	182	66.1	333	291	47	224	77.9
Western Cable TV	249	197	-64	127	41.6	261	209	-45	142	46.1
Maclean Hunter	230	281	175	229	13.1	370	374	298	347	19.5
TOTAL	37,116	35,879	29,351	34,115		41,116	42,484	36,667	38,673	

It will be noted that a 2% annual rate of housing growth increases pre-tax profits for the 45 cable systems to an estimated $35.1 million to $38.0 million. The weighted rate of return falls, however, to 40.5% to 43.1%, probably reflecting the diseconomies of scale noted earlier. The total profits that would be available for transfer to the broadcasting industry, after allowing a pre-tax rate of return of 16%, are estimated at $21.2 million to $23.9 million.

It will be recalled that in 1972 these 45 systems accounted for 72.5% of cable television revenues in Canada. Assuming that in 1976 this ratio is maitained and that one can infer that these systems also will account for 72.5% of total cable profits, the total surplus in cable operations would range between $29.2 million and $33.0 million.

It should be emphasized that if the government foresees some sort of profit regulation in the CATV industry in the foreseeable future, it is necessary to act now to prevent the sale of cable systems at prices that include the capitalized future stream of profits; otherwise profit regulation will prove to be illusary. At the very least, the government should announce that henceforth cable systems, may be traded at prices that reflect the value of net tangible assets only.

TABLE 12. CABLE PROFITABILITY IN 1976 - 45 LARGEST SYSTEMS (2% annual housing growth) ($'000)

SYSTEM	MINIMUM				MAXIMUM			
	NET INVESTMENT	TOTAL COST*	TOTAL REVENUE	R	NET INVESTMENT	TOTAL COST	TOTAL REVENUE	R
Cdn. Wirevision	9,849.6	4,084.9	9,284.0	52.8	9,887.0	5,408.0	9,520.5	41.6
National	3,048.0	10,831.4	12,380.8	50.8	3,300.0	11,120.0	13,759.2	80.0
Grand River	2,635.1	2,218.3	3,734.5	57.5	2,701.0	2,489.5	3,982.0	55.3
Cable TV	4,503.3	3,813.9	5,346.0	34.0	4,620.8	4,277.4	5,940.0	36.0
Metro	5,362.7	3,133.5	4,499.0	25.5	5,176.4	3,710.7	5,406.5	32.7
Ottawa	2,455.5	1,918.0	3,173.5	51.1	2,496.7	2,066.3	3,399.0	53.4
Victoria	1,961.6	1,725.5	3,036.0	66.8	1,989.0	1,767.5	3,102.0	67.1
Skyline	2,317.3	1,612.2	2,205.0	51.5	2,357.4	1,820.5	3,041.5	51.8
London	1,306.7	1,568.9	2,816.0	95.4	1,333.7	1,665.1	2,970.0	97.8
York	2,807.9	1,635.1	2,684.0	37.3	2,843.6	1,755.8	2,865.5	39.0
Rogers	3,685.5	2,125.5	3,333.0	32.8	3,809.0	2,398.0	3,877.5	38.8
Winnipeg Videon	4,388.6	2,368.7	3,547.5	26.9	4,403.0	2,445.6	3,668.5	27.8
MH Toronto	3,209.0	1,295.2	2,178.0	27.5	3,241.0	1,407.3	2,398.0	30.6
Coax Colourview	2,738.8	1,291.6	2,062.5	28.1	2,780.1	1,354.0	2,271.5	33.0
Hamilton Coax	1,092.4	853.5	1,518.0	60.8	1,109.8	905.5	1,595.0	62.1
Telecable Qué.	1,227.0	863.3	1,551.0	56.0	1,253.9	914.0	1,688.5	61.8
M.H.T. Bay	926.7	737.2	1,353.0	66.5	936.4	716.2	1,402.5	68.5
Coquitlam	1,317.1	829.1	1,325.5	37.7	1,329.9	858.9	1,402.5	40.9
M.H. London	893.2	772.6	1,419.0	72.4	910.1	805.8	1,507.0	77.0
Greater Winn.	1,538.4	829.2	1,342.0	32.9	1,578.9	8[illegible]0	1,474.0	37.4
N.W.C.V.	1,816.5	1,169.0	2,007.5	46.2	1,840.6	1,245.3	2,145.0	48.9
M.H. Guelph	553.5	645.1	1,001.0	64.3	560.1	667.1	1,039.5	67.4
Expresa	675.4	524.0	935.0	60.9	678.9	531.1	951.5	61.9

Jarmain	1,094.4	872.0	1,573.0	64.1	1,111.0	927.3	1,677.5	67.5
Peterboro	479.6	519.5	896.5	78.6	485.5	533.7	929.5	81.5
Belleville	747.4	703.7	1,182.5	64.1	886.0	785.1	1,402.5	70.0
Mountain	1,012.7	559.7	918.5	35.4	1,018.8	575.2	951.5	36.9
Fraser Valley	1,168.7	556.4	924.0	31.5	1,171.7	569.0	951.5	32.6
Pine Ridge	1,218.6	780.3	1,384.0	49.5	1,237.8	831.5	1,487.5	53.0
Calgary Cable	3,030.1	1,357.6	2,205.5	30.0	3,061.2	1,475.1	2,414.5	30.7
Western Cablevis	376.9	476.0	764.5	76.5	383.3	488.4	797.5	80.6
Laurentian	794.9	464.9	759.0	37.0	799.1	471.1	775.5	38.1
Huron	1,073.7	516.0	880.0	33.9	1,079.2	539.9	935.0	36.6
Com. Ant.	3,277.4	1,164.7	1,969.0	24.5	3,336.2	1,258.7	2,145.0	26.6
Cornwall	572.1	399.1	643.5	42.7	574.0	403.4	654.5	43.7
Classic	1,527.3	522.3	770.0	16.2	1,576.5	550.3	841.5	18.5
Capital	2,744.2	1,218.4	1,974.5	27.6	2,879.3	1,425.2	2,370.5	32.8
Delta	958.9	412.8	632.5	22.9	967.1	421.3	654.5	24.1
Bramalae	1,259.0	444.2	627.0	14.5	1,261.0	459.1	660.0	15.9
Keeble	1,462.4	562.6	1,028.5	31.9	1,504.3	631.9	1,259.5	41.7
M.H. Hamilton	167.5	532.1	588.5	33.7	173.6	592.6	621.5	16.6
Graham	1,081.0	576.0	913.0	31.1	1,100.3	601.9	1,001.0	36.3
Allview	285.3	383.2	599.5	75.8	299.5	412.6	676.5	88.1
Western CTV	317.3	363.4	522.5	50.1	317.3	371.7	544.5	54.5
M.H. St. Cath.	1,763.1	606.4	874.5	15.2	1,797.5	669.6	1,067.0	22.1
TOTAL	86,742.3	60,836.0	95,962.3	40.5	88,156.6	66,248.2	104,225.2	43.1

* costs simple average of costs predicted by the Babe, Coode and Institute studies.

Appendix

A Case Study of Premier Cablevision
- by Peter Anderson and Robert Babe[1]

In the text the extraordinary profitability of CATV operations was noted. It was also noted that while the Canadian Radio-Television Commission possesses powers to regulate rates, (approval is required when CATV licences are granted and such rates are included in the conditions of licence) the CRTC has refused to systematically regulate the prices charged by CATV undertakings and, in fact, has generally seen fit to approve the rates applied for by the companies. While it is possible to point to a handful of cases in which the CRTC has refused an application for a rate increase, such is generally not the case.

There would appear to be three possible explanations for the absence of profit regulation in the CATV industry. As one possible explanation it can be pointed out that the CRTC is very weak in economics. In August of 1974, the economic policy unit was composed of three economists, none with more than a masters degree in economics. Therefore, the CRTC as currently structured does not have qualified personnel to regulate the rates of the 350 odd cable systems in Canada. This is, of course, not a justification of refusing to limit profits in the industry. It is, rather both an explanation and an indictment of the Commission.

A second explanation of CRTC refusal to limit the profits of the cable monopolies it supports, which could also serve as justification for such refusal, is the possibility that, by protecting the monopoly profits accruing to the industry, the CRTC is able to "encourage" other social goals, such as

extension service to unprofitable areas,[2] good local programming on the cable-casting channel, technological advance, and the like. The philosophy that private enterprise will carry out social goals in return for state protection has historically pervaded the federal government and, although generally discredited among outside observers,[3] this philosophy is current in the CRTC. It is this explanation/justification that will be tested in this appendix.

A final explanation, certainly not a justification, would be that the CRTC and the federal government are trying to enlist the support of the Canadian Cable Television Association in the battle over CATV jurisdiction with the provinces. Presumably the cable industry will support the level of government it feels will do the least as regards regulation. At least two provinces have publicly stated that they favour profit limitation (Manitoba and Saskatchewan). Consequently, the CCTA supports federal jurisdiction.[4]

As only the second explanation could justify governmental inaction, this appendix attempts to analyse by case study the reasonableness of the underlying hypothesis. Does the public receive back in kind what it is forced to pay out through unregulated rates?

I. Background

Premier Cablevision Limited is a holding company with six large Canadian CATV subsidiaries, including Canadian Wirevision, the world's largest cable system (over 150,000 subscribers). It also has interest in or controls cable television equipment manufacturing and distributing companies, CATV management and engineering consulting firms, cable systems in England, Ireland,

Hawaii and New Zealand, an NHL hockey team, a pay television company, as well as other interests. Although traded on the Toronto Stock Exchange, control over Premier is tightly held by the Columbia Broadcasting System Inc. (U.S.) and three Canadian gentlemen through both direct ownership and through at least seven other holding companies.

Although Premier began in the early 1950's as a cable system serving a single apartment building, it is grown into a multinational conglomerate controlling the world's largest CATV undertaking. By studying the corporate history of Premier, it is hoped some insight may be gained as to:

(i) the costs and benefits of CRTC refusal to regulate the rates of a mature, highly profitable cable television undertaking;

(ii) the complexities of regulating a multinational, vertically integrated conglomerate whose largest single shareholder is itself a multinational conglomerate.

II. Corporate History

(a) Early Years

In 1953, Messrs. Sydney W. Welsh, John Shepard and Garth Pither entered the cable television business with the installation of a system to serve one apartment building in Vancouver.[5] As CATV equipment suppliers, (Fred Welsh Antenna Systems) these three men also engineered or equipped cable systems in 11 British-Columbia communities during the mid 1950's.[6] During the late 1950's and early 1960's half a dozen separate cable systems were built in Vancouver and in 1962 these systems were consolidated into a single

large system, perhaps the first large city cable system ("Canadian Wirevision").[7] Canadian Wirevision came to be controlled through a holding company owned by the Welsh group - Vancouver Cablevision.

On April 29, 1964, pursuant to the Companies Act of British Columbia, 75% of the Vancouver cable system was taken over by Classic Developments Ltd. Classic Developments was founded by the Columbia Broadcasting System Inc. (U.S.) as a holding company whose only holding up to 1971 was 75 percent of the issued common shares of Canadian Wirevision Ltd.[8] which was purchased from Vancouver Cablevision.

(b) National Cablevision

In 1965, Mr. Welsh and his group, together with CBS, formed a new company, National Cablevision Ltd. which acquired systems in Montreal and surrounding communities (from Rediffusion, England) and in the Coquitlam area of British Columbia. Subsequently, through subsidiaries of National, service was extended to Quebec City (Télécâble de Québec, 1966) and Toronto (York Cablevision, 1967). Additional systems were built in North Vancouver and Surrey, B.C.[9]

(c) Cascade Electronics

In 1966 Mr. Welsh founded Cascade Electronics Ltd., a manufacturer of electrical and other specialized equipment used in the cable television industry.

(d) Victoria Cablevision

In 1960 Victoria Cablevision was started by the Curran brothers and this company was later taken over by Messrs. Welsh, Shepard and Pither, CBS, and local Victoria shareholders.[10]

(e) Hawaii and Oakville

In 1968 the Welsh - CBS combination constructed a cable system on Oahu Island, Hawaii (Mililani Cablevision) and began construction of Oakville Cablevision with local Ontario Partners.[11] The Hawaiian cable system, according to the Financial Post is a separate venture by B.J. Shepard, President of Premier[12] but in a report to the shareholders for the nine months ending May 31, 1974 the Chairman of the Board of Premier (Sydney Welsh) states:

> Your directors have also authorized your Company to proceed with certain cablevision ventures in the South Pacific under the direction of B.J. Shepard and it is expected that a start will be made on these systems in the Fall of this year.[13]

Oakville Cablevision is owned by Evergreen Cablevision Ltd. (41.8%), Biron Enterprises Ltd. (35.3%), Queensboro Investment Co. (11.7%) and 4 individuals (including Messrs. Shepard and Welsh). Evergreen Cablevision Ltd. is owned by Welsh Cable Vision Ltd. (24%), Farwest Cablevision Ltd. (23%), Southlands Cablevision Ltd. (23%), Quadra Sales Ltd. (12.5%). Welsh Cable Vision Ltd. is owned by S.W. Welsh (99% of the common "A" shares). Farwest Cablevision Ltd. is owned by the Shepard family (100%). Southlands Cablevision

is owned 100% by the Pither family. Queensboro Investment is owned in part by Welsh Cable Vision (25%).[14]

(f) Ireland

In 1970, Premier moved "on to the old sod in Dublin's fair city"[15] through Marlin Communal Aerials Ltd. Shamrock Cablevision Ltd., a British Columbia Company owned 20 percent by Welsh Cablevision Ltd. acquired 25.9 percent interest in Marlin.[15]

In October 1972, Premier itself purchased 28 percent of Marlin for $30,000 and agreed to lend Marlin an additional $1,120,000. In addition, Premier purchased 49 percent of Wirevision Ltd. of Dublin Ireland and agreed to lend Wirevision $150,000. Wirevision itself holds 26 percent interest in Marlin Communal Aerials.[16] Marlin currently has approximately 30,000 subscribers.

Premier is planning on expanding its interest in Ireland:

> Your Company, which already controls Marlin Communal Aerials Limited in Dublin, Eire, is negotiating the purchase of assets of two adjacent cablevision companies. On finalization of these acquisitions the 10,000 subscribers of Rentel Limited and 6,000 subscribers of Television Erectors Limited will be served by Marlin. Through a subsidiary we have also been granted a cablevision franchise in Waterford Eire.[17]

(g) CBS Divestiture

By Order in Council PC 1969-2229, all broadcasting undertakings in Canada are required to have at least 80 percent Canadian ownership. Therefore, CBS was required to reduce its holdings in the various companies to not more than 20 percent. In order to effect the transfer of shares, Classic Developments (now Premier) agreed to

> acquire for cash and through exchanges all issued preferred shares of Wirevision and the balance of its issued common shares, and all the issued common shares of Victoria, Coquitlam and York.[18]

Classic Developments obtained the 75 percent of the preferred shares in Wirevision held by CBS for $1,318,895 and the 25 percent interest in Wirevision held by Vancouver Cablevision Ltd. (the Welsh Group) for $439,632; it purchased Coquitlam Cablevision from CBS and from Evergreen Cablevision Ltd. in return for shares in Classic; it purchased Victoria Cablevision from CBS, the Curran brothers and from Fred Welsh Antenna Systems (the latter partnership composed of Welsh Cable Vision Ltd., Farwest Cablevision Ltd., and Southlands Cablevision Ltd.), and from other minority shareholders of Victoria in exchange for shares. It purchased York Cablevision from CBS and Evergreen Cablevision Ltd. for an exchange of shares. CBS and Evergreen Cablevision Ltd. had founded and organized York and Coquitlam indirectly through National Cablevision.[19] On August 20, 1971, the name of the holding company was changed from Classic Developments to Premier Cablevision Ltd. and on October 8, 1971 Premier was converted to a public company.

As of December 1973, all shareholders of Premier owning directly or indirectly 10 percent or more of the common shares in the company or having a management interest in the Company were:[20]

Columbia Broadcasting System Inc.	19.88%
Sydney Wallis Welsh	12.07%
B.J. Shepard	6.18%
W.G. Pither	5.69%

Dividends of $16,796 were paid on common shares outstanding during 1971, all owned at the time by CBS Inc. No dividends have been paid since the public offering in 1971.[21]

(h) Fred Welsh Antenna Systems

An agreement, dated August 17, 1971, between Premier and Fred Welsh Antenna Systems (FWAS) was signed whereby FWAS will provide technical, marketing, advertising, consulting, management, and other services and cable television equipment for a term of 5 years at a remuneration equal to:

a) the salaries and fringe benefits of employees, agents, or servants of Fred Welsh Antenna Systems who provide services to the Company and its subsidiaries, plus 12½% of the sum payable for technical and operating services and 35% of the sum payable for management and consulting services;

b) 12½% of the cost of equipment and hardware sold by Fred Welsh Antenna Systems to the Company or its subsidiaries, provided that the Company and the subsidiaries shall be free to purchase equipment from others at more favourable prices, if obtainable.[22]

FWAS supplies, on a worldwide basis, equipment and services relating to the construction, operation and maintenance of CATV systems. In addition to supplying such services to its own Canadian subsidiaries, FWAS has extended to South America, certain Western European countries, New Zealand, and Hawaii [again, mostly subsidiaries of Premier]. FWAS also holds 15 percent interest in Oceanic Cablevision Inc. which in turn holds 100 percent interest of cable systems in Honolulu, Milani, and Waipio, Hawaii. In addition, the 15 percent share of Cablevision (New Zealand) Inc. held by Southlands Cablevision Ltd. is assignable to FWAS.[23]

In August, 1973 the Directors of Premier (including Messrs. Welsh, Shepard and Pither) passed a resolution whereby Premier would acquire "certain assets and rights of Fred Welsh Antenna Systems used in the conduct of its business in supplying equipment and services relating to the construction, operation, and maintenance of cable television systems".[24] The resolution was approved by the shareholders in October, 1973.

> The purchase price is equal to the book value of the assets and rights to be purchased determined pursuant to the audited financial statements of FWAS as at May 31, 1973 together with the sum of $53,931 in respect of goodwill reduced by the amount of the trade accounts payable and bank indebtedness of FWAS relating to the business as at such date. [The purchase price was $1,118,640].[25]

Had the Acquisition Agreement been in effect during the twelve month period ended August 31, 1973 it is estimated that the elimination of charges by FWAS to the Company and its subsidiaries would have resulted in a saving of expenses to the Company of approximately $150,000. In addition, the Company anticipates that the implementation of the Acquisition Agreement will result in an improvement in the projected consolidated net earnings of the Company for the year ending August 31, 1974 in excess of $100,000.[26]

(i) English Interests

In October 1973, Premier purchased from Fraser Cablevision Ltd. and from Carricke Communications Ltd. 75 percent of Albion Cablevision Ltd. for £10,154 pounds sterling plus $13,816. In addition, Premier undertook to provide Albion with funds as required.

Albion Cablevision Ltd. is incorporated in the United Kingdom and through a wholly-owned subsidiary, Greenwich Cablevision Ltd., owns the equipment used in a cable television system in the London Borough of Greenwich. Greenwich Cablecasts Ltd. (a subsidiary of Carricke Communications Ltd.) holds the licence to operate the Greenwich cable system (13,000 subscribers, 20,000 homes passed by the cable) and it in turn employs the facilities of Greenwich Cablevision Ltd.

Fraser Cablevision Ltd. is a British Columbia company owned 17.3 percent by Welsh Cable Vision Ltd., 17.3 percent by Farwest Cablevision Ltd., and 17.3 percent by Southlands Cablevision Ltd.[27]

(j) Delta-Benco Ltd.

On June 22, 1972, Premier purchased from Evergreen Cablevision Ltd.,

Spectrum Cablevision, Welsh Cable Vision, Farwest Cablevision and from Southlands Cablevision 128,553 common shares of Delta-Benco Ltd. and an option to acquire a further 36,000 common shares of Delta-Benco Ltd. for the total sum of $498,023.32. This sum was paid by issuing 19,000 common shares of Premier (at $17.625 per share) plus $163,149.23 cash.[28]

On May 5, 1972 Mr. Sydney Welsh announced the merger between Delta-Benco Ltd. and Cascade Electronics Ltd. Delta-Benco acquired all of the outstanding shares of Cascade in exchange for 196,600 common shares of Delta plus options for an additional 45,000 Delta common shares exercisable over three years at $2.75 per share.

> Delta-Benco Ltd. is a public company based in Toronto with shares listed on the Toronto Stock Exchange, and is engaged in the manufacture of electronic equipment and devices primarily for cable television systems. It has been owned by the Rediffusion group of London, England, one of the largest cable television system owners. After giving effect to this share exchange the Rediffusion interest in Delta-Benco will be reduced to 59% and will be further reduced to 55% if the options held by the Welsh group are exercised.[29]
>
> Cascade has manufacturing facilities at Port Moody, B.C. and Bellingham, Washington, and has been producing cable television equipment since 1965... This share exchange will give the Welsh group a 27% interest in Delta-Benco

> which may be increased to 31% upon exercise of the options...
>
> Under the agreement with the Cascade shareholders the marketing rights of Cascade equipment in Canada and Hawaii will continue to be held by Fred Welsh Antenna Systems who have distribution centres in Vancouver, Calgary and Toronto.[30]

(k) Optical Systems Corporation

Premier Cablevision Ltd. and Optical Systems Corporation of Los Angeles formed a new company on November 23, 1971 - Canadian Optical Systems Ltd. for the purpose of introducing pay television in Canada. Premier and Optical each own 50% of the new company.

(l) Vancouver Canucks

On May 2, 1973, Premier purchased shares representing 10% interest in Northwest Sports Enterprises Ltd., owners of the Vancouver Canucks.[31]

(m) Summary

From origins of serving a single Vancouver apartment building Canadian Wirevision Ltd. grew into the world's largest cable television system, financed in part by the Columbia Broadcasting System. Through the instrument of a holding company that controlled Canadian Wirevision (Classic Development) other larger Canadian cable systems came under the control of the owners of Canadian

Wirevision. The original builders of Canadian Wirevision (Messrs. Welsh, Shepard and Pither) came to exercise control not only directly through share ownership of Canadian Wirevision (or Premier Cablevision or Vancouver Cablevision) but also through three other holding companies (Welsh Cable Vision Ltd., Farwest Cablevision Ltd., and Southlands Cablevision Ltd., which collectively formed the partnership known as Fred Welsh Antenna Systems). These secondary holding companies also have interest in other holding companies (Fraser Cablevision, Spectrum Cablevision, Shamrock Cablevision Ltd., Queensboro Investments Ltd., Evergreen Cablevision).

Through various holdings, companies owned by the Welsh group provide services to Premier Cablevision - equipment through Cascade Electronics and Delta-Benco, equipment purchasing, management and engineering consulting advice through Fred Welsh Antenna Systems.

The company has developed into an international conglomerate. Not only is the largest single shareholder of the company a multinational conglomerate (CBS, which has interest in television and radio broadcasting stations and networks, record manufacturing and distributing companies, musical instrument manufacturing, toy manufacturing and distribution, book publishing, motion pictures, magazine publishing, electronic equipment manufacturing, a baseball team) but itself has interest in cable systems in England, Ireland, Hawaii, New Zealand (Fraser Cablevision, Albion Cablevision, Greenwich Cablevision, Marlin Communal Aerials, Shamrock Cablevision, Wirevision Ltd., Rentel Ltd., Television Erectors Ltd., Oceanic Cablevision Ltd., Cablevision (New Zealand Ltd.,) and in non broadcast, non cable endeavours (Optical Systems, Northwest Sports Enterprises).

In short, it would appear that the CRTC's refusal to restrain the exploitation of the privileged position granted to Premier by the CRTC has allowed Premier to expand and diversify into areas that have little or no relation to the improvement of Canadian broadcasting. At the same time, the CRTC's inaction has allowed the creation of a vertically-integrated, multinational conglomerate which will prove to be very difficult to regulate in the future.

III. A Review of Canadian Wirevision, Victoria Cablevision, York Cablevision, and Coquitlam Cablevision

It can reasonably be hypothesized that a major factor allowing the Welsh group to diversify both at home and abroad has been its ability to earn supernormal profits from it four primary cable television endeavours in the absence of regulatory constraint.[33] The earnings of each of these four cable systems is given in the following tables for the years 1971-72.

If one may take as a reasonable rate of profit a return of 16 percent of net assets before tax, the surplus accruing to the four cable subsidiaries of Premier was $2.4 million in 1971 and $3.1 million in 1972. It must be concluded that profit regulation by the CRTC could result in substantial consumer benefit, especially in view of the fact that Canadian Wirevision spent under 2% of revenues in 1972 on local origination.[34] None of the systems have extended service to an appreciable extent as evidenced by the slow growth in households passed by cable.

TABLE B-1

Canadian Wirevision 1966-1972

	1966	1967	1968	1969	1970	1971	1972*
households passed	na	na	na	na	na	190,870	196,6
subscribers	na	73,320	87,011	107,262	124,320	139,950	149,9
revenues	$2,059,000	$2,685,000	$3,388,000	$4,255,000	$5,046,000	$5,836,000	$6,260,0
operating expenses	862,000	$1,133,000	$1,260,000	$1,606,000	$1,996,000	$2,189,000	$2,316,0
depreciation	521,000	629,000	734,000	873,000	$1,058,000	$1,240,000	$1,345,0
net physical investment	$4,656,000	$4,900,000	$5,209,000	$5,838,000	$6,000,000	$6,400,000	$6,900,0
profit before tax and interest payments	676,000	923,000	$1,394,000	$1,776,000	$1,992,000	$2,407,000	$2,599,0
profits as percent of net investment*	14,5	18.8	26,8	30.4	33.2	37.6	37.7

Source: A Review of Premier Cablevision and confidential industry source
*estimate

TABLE B-2

Victoria Cablevision 1966-1972

	1966	1967	1968	1969	1970	1971	1972*
households passed	na	na	na	na	na	50,620	52,140
subscribers	na	27,528	34,681	39,759	43,535	45,270	46,660
revenues	$894,000	$1,153,000	$1,500,000	$1,717,000	$1,863,000	$1,970,000	$2,005,000
operating expenses	391,000	472,000	617,000	685,000	692,000	749,000	742,000
depreciation	127,000	166,000	206,000	241,000	277,000	291,000	328,000
net physical investment*	847,000	$1,107,000	$1,373,000	$1,607,000	$1,847,000	$1,900,000	$2,000,000
profit before tax and interest payments	376,000	515,000	677,000	791,000	904,000	930,000	935,000
profits as percent of net investment*	44.4	46.5	49.3	49.2	48.9	48.9	46.8

Source: A Review of Premier Cablevision
*estimate

TABLE B-3 Coquitlam Cablevision 1966-1972

	1966	1967	1968	1969	1970	1971	1972*
households passed	na	na	na	na	na	25,720	27,970
subscribers	na	5,478	8,703	12,187	16,407	19,020	21,280
revenues	$174,000	$272,000	$430,000	$609,000	$820,000	$961,000	$1,046,000
operating expenses	$115,000	$136,000	$221,000	$278,000	$370,000	$356,000	387,000
depreciation	54,000	75,000	98,000	127,000	156,000	186,000	212,000
net physical investment*	360,000	500,000	653,000	847,000	$1,040,000	$1,200,000	$1,200,000
profit before tax	5,000	61,000	111,000	204,000	294,000	419,000	447,000
profits as percent of net investment*	1.4	12.2	17.0	24.1	28.3	34.9	37.3

Source: A Review of Premier Cablevision
*estimate

TABLE B-4

York Cablevision 1968-1972

	1968	1969	1970	1971	1972*
households passed	na	na	76,500	77,742	79,672
subscribers	11,077	26,758	33,711	39,042	42,582
revenues	$256,000	$1,110,000	$1,650,000	$2,051,000	$2,247,000
operating expenses	$416,000	781,000	867,000	$1,035,000	$1,056,000
depreciation	$107,000	249,000	358,000	397,000	414,000
net physical investment*	$713,000	$1,660,000	$2,387,000	$2,500,000	$2,760,000
profit before tax and interest payments	$267,000	80,000	425,000	619,000	777,000
profits as percent of net investment*	-	4.8	17.8	24.8	28.2

Source: A Review of Premier Cablevision
*estimate

IV. Conclusions

In light of the corporate history and data presented, the following conclusions appear to be warranted:

(i) Although the cable television operations in question are highly profitable, it does not appear that the high retained earnings have induced, in a significant way, local programming expenditures, extension of service to unprofitable areas, or technological advance.

(ii) High cable profits have allowed the Welsh group to expand their cable holdings and to diversify into other fields. A significant factor enabling such expansion was the injection of capital by CBS but, if anything, the acquisition policies of Premier have accelerated since the CBS divestiture. Significant amounts have been invested abroad.

(iii) Many of the acquisitions are of a form that will make any form of profit regulation difficult to implement. The electronic equipment used in the Premier system is manufactured by a Premier subsidiary (Cascade Electronics - Delta-Benco), and is distributed to the cable subsidiaries by another subsidiary (Fred Welsh Antenna Systems). Similarly, engineering and management consultant advice is supplied through Fred Welsh Antenna Systems. During 1972, Fred Welsh Antenna Systems received $1,807,000 from the cable subsidiaries. The minority interest purchased in the Vancouver Canucks and the formation of Canadian Optical Systems may lead to the distribution of

hockey games by pay television on the Premier cable systems. Such vertical integration makes regulation much more difficult than it otherwise would be. Any profit regulation of the Premier cable operations would create an incentive to transfer some of the monopoly profits earned by the cable operations to other vertically related subsidiaries by contractual arrangements, thereby requiring the regulating body to supervise profits in non cable operations in order to ensure effective regulation.

(iv) The CRTC policy of approving rates requested by cable operators is encouraging the formation of multinational conglomerates. Since cable operations generate excessive profits, the funds generated must find an outlet. The CRTC does not require that such funds be used to improve the broadcasting system and so one observes the funds entering other industries and other countries. By protecting cable companies in Canada, the CRTC is indirectly encouraging the development of CATV in other countries.

(v) As a general principle, high levels of retained earnings will not encourage the pursuit of social goals if such activities do not themselves earn a high rate of return. Conversely, low levels of retained earnings will not foreclose the pursuit of these same goals if they give a high return as the firm can always borrow funds on the market. Briefly, if social policy is to be carried out by private enterprise, the incentives must

be structured in such a way that the firms find it to be in their economic interest to pursue such goals. The philosophy of structuring incentives in this manner has escaped the CRTC.

Footnotes to Appendix

1. Peter Anderson is research assistant; Telecommunications Research Group, Simon Fraser University.

2. The CRTC is not, however, interested in extending cable service. Mr. Juneau, Chairman of the CRTC states:

> There is no question about it, cable is part of a regulated industry ... but we don't take the approach that control of rate of return is a good approach. It's related to the public utility concept ... Every time we talk about developing cable as if it were a public utility, like telephone or hydro or water, what you are saying in fact is "Let's make sure you get those four American networks into Canada as fast as we can" ... We are not trying to find ways of subsidizing cable or cross-subsidizing cable in order to make the American channels available faster than they would otherwise be available ... Our mandate is not to wire up Canada as fast as possible for American television.

Quoted in Broadcasting and Cable Television: A Manitoba Perspective p. 34.

3. See Philip Mathias Forced Growth - 5 Studies of Government Involvement in the Developments of Canada (Toronto: James Lewis and Samuel, 1971); David Lewis Louder Voices The Corporate Welfare Bums (Toronto: James Lewis and Samuel, 1972); Robert Chodos "The Great Canadian DREE Machine" in Mark Starowicz and Rae Murphy (eds) Corporate Canada (Toronto: James Lewis and Samuel, 1972).

4. The CCTA states "Cable television comes under the authority of the Broadcasting Act and of the CRTC. CCTA members support this Act and believe the orderly expansion of cable television can best be achieved by regulation and supervision at the Federal level, but with Provincial input ... The Canadian cable industry is already highly regulated with the CRTC and DOC prescribing territorial coverage, type of service, rates and standards of performance. Duplicating or conflicting regulation impedes cable service, wanted by the public, and widens the gap between the expectations and delivery of cable services". Canadian Cable Television Association "A Brief to the Honourable Robert M. Strachan, Minister of Transport and Communications, Government of British Columbia on Cable Communications in British Columbia", August 30, 1974, mimeographed. pp. 24-5.

5. Premier Cablevision Ltd. Preliminary Prospectus, Sept. 2, 1971, p. 3.

6. CHIMO, vol. 1, no. 2.

7. Ibid.

8. McLeod Young Weir and Wood Gundy Ltd. "A Review of Premier Cablevision Ltd." Oct. 5, 1971, p. 10 and Preliminary Prospectus.

9. CHIMO, vol. 1, no. 2, January, 1972 and Prospectus.

10. "A Review of Premier Cablevision".

11. CHIMO Newsletter.

12. Financial Post, 27 July, 1974, p. 15.

13. Premier Cablevision Ltd. Report for the Nine Months Ending May 31, 1974.

14. CRTC Ownership (Ottawa: Information Canada, 1973).

15. G. Pither, CHIMO newsletter, vol. 1, no. 2, January 1972; Premier Cablevision Ltd. Notice of 1973 Annual Meeting of Shareholders.

16. Ibid.

17. Premier Cablevision Ltd. Report for the Nine Months Ending May 31, 1974.

18. Premier Prospectus p. 11.

19. Premier Prospectus p. 12.

20. Premier Cablevision Ltd. Notice of Annual Meeting of Shareholders December 24, 1973.

21. Premier Cablevision Ltd. Report for the Three Months Ended March 31, 1972.

22. Note there is no provision in (a) for purchasing consulting services at lower prices elsewhere. Premier Cablevision Ltd. Notice of 1973 Annual General Meeting of Shareholders. The Notice also states:

> Fred Welsh Antenna Systems is a partnership of three equal corporate partners, two of which are Welsh Cable Vision Ltd., a company controlled by Sydney Wallis Welsh, and Farwest Cablevision Ltd., a company controlled by

Bud John Shepard, and as such the partnership and the said two partners have an interest in the supply of technical and operating personnel, management and consulting services and the sale of cable television equipment to each subsidiary of the Company. The approximate aggregate amount paid or payable by the subsidiaries of the Company, directly or indirectly, to Fred Welsh Antenna Systems for such services and equipment during the 1972 fiscal year was $1,807,000. Ibid.

23. Premier Cablevision Ltd. Notice of Extraordinary General Meeting, issued 7 September, 1973.

24. Premier Cablevision Ltd. Notice of Annual Meeting of Shareholders, 1974.

25. Premier Cablevision Ltd. Information Circular, September 7, 1973.

26. Ibid.

"The approximate aggregate amounts paid by the subsidiaries of Premier [over the period 1968-71] to Fred Welsh Antenna Systems for cable television equipment were $1,561,000 in 1968, $1,590,000 in 1969, and $1,837,000 in 1970 and $824,000 for the six months ending June 30, 1971. The approximate aggregate amounts paid for all technical, operating, management and consulting services during these periods were $466,000 in 1968, $696,000 in 1969, and $857,000 in 1970 and $459,000 for the six months ended June 30, 1971." Premier Cablevision Ltd. Preliminary Prospectus, September 2, 1971.

27. Premier Cablevision Ltd. Notice of Annual General Meeting of shareholders, December 24, 1973.

28. Premier Cablevision Ltd. Notice of 1973 Annual General Meeting of Shareholders, Welsh, Shepard and Pither each own 33⅓% of Spectrum Cablevision Ltd.

29. "Cascade Electronics Ltd., a supplier to Fred Welsh Antenna Systems of some of the cable television equipment it sells to the subsidiaries, was owned by CBS to the extent of approximately 44% and by Evergreen, to the extent of approximately 44% and as such Mr. Welsh and Mr. Shepard have and CBS has had an indirect interest in the sale of equipment to the Subsidiaries by Fred Welsh Antenna Systems. CBS ...

agreed to sell as of August 31, 1971 its remaining interest in Cascade Electronics Ltd. to Spectrum Cablevision Ltd., a company owned by Messrs. Welsh and Shepard and Mr. William Garth Pither." Premier Cablevision Preliminary Prospectus, September 2, 1971.

30. Welsh Cable Vision News Release, Vancouver, May 5, 1972.

31. Premier Cablevision Report for the Nine Months Ending May 31, 1974.

32. Philip Bandy Direct and Indirect Relationships Between Network Corporate Growth and Documentary Programs, masters thesis, Michigan State University, 1972, pp. 47-55.

33. It will be recalled that Premier Cablevision started as a cable system serving a single Vancouver apartment building.

34. Informed industry estimate.