Determinants of Cable Service to Minority Audiences

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The growth of cable television in the 1970's brought with it the promise of expanded programming aimed at groups with special interests or tastes. While the growth and development of national program suppliers such as BET and SIN might suggest this promise has been fulfilled, the availability of special interest programming is not uniform across television markets. Some cable operators offer a wide variety of programming; others don't.

This paper presents an economic model of programming choice to examine the factors which determine whether a local cable operator carries programming which appeals to groups with special interests or tastes. A probit model is estimated to examine the significance of channel capacity, audience size and political influence in determining whether a particular programming service, BET, is carried by a cable operator. The results suggest that "must carry" requirements and other precommittments of channel capacity are important factors limiting the availability of national programming services which cater to special interests.

The expectation for greater programming diversity with cable television than with advertiser supported, over-the-air television was fueled, in part, by economic models of programming choice developed by

Steiner (1952), Spence and Owen (1977), and others. These models predict that under advertiser supported television, competition in channel ownership leads to wasteful duplication, while monopolization of channel ownership leads to least common denominator programming. In either case, small groups with distinct preferences are not being served. Expanded channel capacity reduces this tendency. Pay television offsets this pattern by allowing groups with special tastes to substitute dollars for numbers. Thus, cable television, by offering expanded capacity and some characteristics of pay television, should expand the availability of programming catering to special groups.

An Example

An example will highlight some of the differences between purely advertiser supported television, pay television, and cable television. This example expands upon those discussed in the previous literature by the introduction of uncertainty.

There are three types of programs - A, B, and C. The potential audience consists of three groups of consumers, I, II, and III, who differ in their tastes for the three television program types. Ex ante, consumers do not know which program type they will prefer. There are two equally probable

states of the world. Table one describes for each consumer group their willingness to pay for each programming type in each state of the world.

Table One
Example

		Willingness to Pay					
		State 1			State 2		
	Size	A	B	C	A	B	C
Group I	100	35	25	10	15	25	10
Group II	40	20	40	0	20	15	0
Group III	30	20	0	60	20	0	60

Group I in state of the world 1 is willing to pay 35 for program type A, 25 for program type B, and 10 for program type C. In state of the world 2, Group I is willing to pay 15 for program type A, 25 for program type B, and 10 for program type C. Hence, in state of the world 1, Group I prefers program type A while in state of the world 2, it prefers program type B. Group I's expected willingness to pay for program type A is 25 [= 1/2(35) + 1/2(15)]; for program type B, 25. So, in expected value terms, Group I is indifferent between A and B. Table One describes the preferences of

Groups II and IIII in a similar fashion. Notice that Group III's tastes do not depend on the state of the world.

With advertiser supported programming and competitive ownership of television channels, each station seeks to maximize its expected audience size. Programming which attracts the largest audience generates the most revenues. Programming whose audience is a small group with specialized tastes may be less atttractive than programming which duplicates that already offered, but whose audience is a subdivision of a larger group. Stations must make programming decisions before the true state of the world is revealed. Table two describes programming choices with competitive ownership of channels. The column headings represent available channels. Each channel is independently owned and operated.

Table Two
Competitive Ownership of Channels

	Two Channels		Three Channels			Four Channels			
Channels	1	2	1	2	3	1	2	3	4
Program	A	A	A	A	B	A	A	B	B
Expected Audience	85	85	50	50	70	50	50	35	35

With competitive ownership, program types A and B are repeated while

program type C is not offered. Program type C would not be offered until five channels were available.

Table three depicts the outcome under monopoly. With monopoly control over channels, programming which everyone will watch but nobody loves is more attractive than programming which one group loves but no other group will watch.

Table Three
Monopoly Ownership of Channels

	One Channels	Two Channels		Three Channels		
Channels	1	1	2	1	2	3
Program	A	A	-	A	-	-
Expected Audience	170	170		170		

The monopolist offers only programming type A. Everyone will watch A if nothing else is available. However, it is not the first choice of Groups II and III.

With pay television, a fee is collected per channel of programming. With advertiser supported television, programming which attracts the largest audience generates the most revenues. If a small group of consumers are willing to pay a large premium for their first choice of

programming, they may outweigh a large group of consumers who have a lower willingness to pay. Table four describes the programming choices of a monopoly pay television operator. It assumes that the monopolist can exclude consumers who purchase one channel from viewing another channel at zero cost. It also assumes that programming decisions and purchase decisions are made before the true state of the world is revealed. Programming costs equal $100 per program.

Table Four
Monopoly Pay Television

	One Channel	Two Channels		Three Channels		
Channels	1	1	2	1	2	3
Program	A	B	C	A	B	C
Prices	p=20	p_1=25	p_2=60	p_1=25	p_2=27.5	p_3=60
Expected Revenues	3500	5300		5400		

A single channel pay television monopolist has the same tendencies as an advertiser supported monopolist - least common denominator programming. With more that one channel, the pay television monopoly responds to a consumer group's willingness to pay as well as to its size. The smallest group of consumers, Group III, get their first choice of

programming because of the strength of their preferences.

In practise, cable television does not correspond to the 'pay televison' envisioned in early economic analyses of programming diversity. First, cable television does not rely solely on payments from viewers for revenues. Programming may be advertiser supported as well as subscriber supported. Advertiser supported services have zero or negative charges per subscriber to the cable system. Subscriber supported services have a positive, and significant charge per subscriber. Advertiser/subscriber supported services generally specify a nominal fee per subscriber. The cost to the cable operator of providing a program type will depend on whether it is advertiser supported, subscriber supported, or advertiser/subscriber supported. Consequently, audience size may be more important to the cable operator than it is to the pay television monopolist.

A second difference between the pay television monopolist and real world cable television is that it is costly to prevent a consumer who purchases one channel from viewing a second. An inability to exclude a consumer of one channel from watching the programming of a second may reduce the pay television monopolist's revenues and hence, affect its programming decisions. The two channel example illustrates. If Group III can purchase channel one and watch channel two, they will never pay $60

for the privilege of watching channel two. Revenues would be reduced to $4250. A more profitable alternative for the pay television operator would be to offer program type A on one channel and program type B on the second and then sell channel one and channel two as a package. With the price of the package equal $37.50, consumers in Group I and Group II will purchase the service. Total revenues are $5250. Even if the costs of scrambling signals were only $100, the package selling strategy would be more profitable than selling each channel individually. Owen and Wildman (1985) examine the impact of this practise of package selling, or commodity bundling, on competition among different types of technologies and on content diversity.

The practise of bundling recognizes that consumers have preferences among program types, but also have preferences for program variety. In this example, consumers in Group I are willing to pay $25 for programming service A only; $25 for program service B only, but $37.50 for a bundle which offers a choice of either A or B. In this example the bundle is like an insurance policy. Whichever state of the world occurs the consumer can watch his most preferred program. Package selling may be attractive even without the insurance policy attributes. (Adams and Yellen, 1976; Conrad and Dansby, 1982) With package selling, the

profitability of carrying a program type will depend not only on how much revenues it generates on its own, but also on how much it increases the revenues of the package.

In our example, because the bundle consisting of A and B generates more revenues than the bundle consisting of B and C. Program A is substituted for program C. Program C is offered only when channel capacity is expanded to three.

A third difference between cable television in practise and the theoretical concept of pay T.V. is the potential for politics to influence programming decisions. Although their power is weakening, local governments do exercise some control over the cable operator. The primary source of control is through the franchise award and renewal process. As part of its initial proposal, the cable operator outlines the programming services its plans to offer so its programming decisions may affect the probability of winning the franchise. The local government also may influence programming decisions through the threat of nonrenewal. Hence, a cable operator may offer programming which appeals to a strategically important group in local politics even if that programming is not the most profitable choice.

This analysis suggests that a programming service is more likely to be

offered the larger channel capacity, the larger the audience it attracts relative to other audiences, and the stronger and more specialized the tastes of that audience. The availability of a programming service will also depend on the degree to which it is complementary with other programming services. A programming service is more likely to be offered, other things equal, the more important its audience is in local politics.

Empirical Analysis

The cable operator will carry BET if it adds more to total revenues than the next best alternative. We call the difference between what BET adds to total revenues and what the next best alternative adds, incremental revenues (IR). IR is a continuous random variable. Our economic analysis suggests that IR should depend on a number of demographic factors as well as on charactistics of the cable system. This list of factors is described by the vector Z. IR is:

$$IR = \beta Z + \Omega$$

where Ω is the random component of IR. Ω is assumed to be normally distributed. When $IR \geq 0$, the cable operator carries BET. When $IR < 0$, the cable operator does not carry BET.

Values of IR can not be observed directly, but we can observe whether or not a cable operator carries BET. To find information about β, I estimate a probit model using maximum likelihood techniques. The dependent variable, BET, is as follows:

BET = 1, if BET is carried,

0, if not.

Explanatory variables include:

BPOP = the black population of the city or county in which the cable company operates.

BPOP% = the percentage of the total population which is black for the city or county in which the cable company operates.

CAP = the channel capacity of the cable operator.

MCA = the number of over-the-air stations, advertiser supported television stations in the television market where the cable system is located.

ECAP = MCA/CAP

BEO = the number of black elected officials in the local area.

BPOP and BPOP% are both measures of audience size. BPOP is a measure of the absolute size of the audience. BPOP% is a measure of the size of the audience relative to other groups in the television market. Recognizing that not all blacks watch BET and that not all of BET's audience is necessarily black, these variables represent rough approximations of the potential audience for BET. Holding other factors constant, increases in BPOP or BPOP% should increase the probability that BET is carried.

CAP is the total channel capacity of the cable operator. In the short run,

capacity of the cable system is fixed which justifies treating capacity as an exogenous variable. As CAP increases, the probabilty that BET is carried should increase. Total channel capacity does not completely describe the channel capacity available to the cable operator for programming. Federal rules (until very recently) and local franchise agreements precommitt a portion of channel capacity. Precommittments include channels dedicated for local access programming, channels dedicated to satisfying must carry requirements, and channels dedicated for governmental or educational uses. Hence, CAP may not reflect the capacity actually available for the cable operator to program.

The inclusion of the variable ECAP adjusts for these factors. MCA is an attempt to measure the must carry requirements of the local cable operator. This variable may underestimate actual requirments since it excludes signals from adjacent markets, watched by a significant portion of the market. ECAP is the percentage of channel capacity devoted to satisfying those requirements. It is a measure of the extent of precommittments. Holding other factors constant, as ECAP decreases the probability that BET will be offered should increase.

BEO measures the political activism of blacks. We'd expect the larger BEO the greater the probability that BET will be offered. This variable may

pose problems in the empirical analysis because it is likely to be strongly correlated with BPER, the percentage of the population which is black.

Description Of The Data

BET, CAP, and MCA are drawn from the *Broadcasting/Cablecasting Yearbook 1985.* The demographic statistics - BPOP and BPOP% are drawn from census data reported in the City, and County Handbook.

There are sixty observations in the sample. These observations are drawn from the top one hundred cable television systems, (ranked in order of subscribers). Some cable television systems were eliminated because information on some variables was not reported. Others were eliminated systems because the appropriate area of observation for the demographic statistics could not be identified. Census tracts and the geographic area served by the cable companies do not always conveniently overlap.

The cable systems range in size from 218,902 to 33,893 subscribers. The populations of the communities served range from 1,428,285 to 30,021. The average population is 289,257. The minority percentages for these communities range from 55.62% to .46% for blacks and from 62.55% to .47% for spanish-surnamed individuals. The average percentage black is 18.6%. Average channel capacity is 32 channels.

Table five contrasts the cable systems which do carry BET with those that don't.

Table Five
All Cable Systems

	BPOP%	BPOP	CAP	ECAP
BET = 1	25.48	63,537	35	.14
BET = 0	14.86	36,170	30	.15
All SYS.	18.60	50,527	32	.15

What is apparent by inspection of this table is that the average percentage black for the group of stations that carry BET is substantially different from the average percentage for the systems that don't carry this programming. Cable systems which carry BET tend to serve communities which have a greater percentage of blacks, on average, as compared to those which don't carry BET. In addition, cable systems which carry BET tend to serve communities with nearly twice as many blacks on average than cable systems which don't.

Results

Tables six and seven describe the estimated coefficients and t-statistics for two estimated models. The first uses CAP, BPER, MCA and

BEO as explanatory variables. The second uses ECAP, BEO and BPER.

Table Six
Regression One

Variable	Coefficient	Standard Error	T-Statistic
CAP	-.5162740E-02	.1103692E-01	-.4677700
BPER	.15113117E-01	.1104185E-01	1.368717
MCA	-.1500295	.8293996E-01	-1.808893
BEO	.5017732E-01	.2613250E-01	1.920112

Cases Correct: 40/60

The results in table six are diasppointing. Convergence was reached on the fifth iteration. 66% of the cases are correctly predicted by the model. None of the coefficients are significantly different from zero.

Table seven substitutes a measure of excess capacity for the capacity variable. As ECAP gets smaller, excess capacity is larger so we'd expect an decrease in ECAP would increase the probability that BET is carried. This is exactly what the estimates suggest. %66 of the cases are correctly predicted by the model. The coefficients on ECAP and BEO are significant at the 95% confidence level.

Table Seven
Regression Two

Variable	Coefficient	Standard Error	T-Statistic
ECAP	-7.209441	2.191491	-3.289743
BPER	.2057257E-01	.1130233E-01	1.820207
BEO	.5517444E-01	.2535292E-01	2.176256

Cases Correct: 40/60

Any interpretation of these results must include two caveats. First, the sample size is small and the sample is restricted to the cable systems with the largest number of subscribers. It is possible that these systems behave differently from other cable systems. Second, the variable ECAP needs to be improved. However, they do suggest that further investigation of the relationship between channel capacity, precommittments, and narrowcasting is warranted.

Conclusions

Subject to the caveats I've discussed above, these results do suggest important policy related conclusions. They provide support for the argument made in recent court cases that must-carry rules narrow the diversity of programming. The smaller the percentage of capacity devoted

to rebroadcasting over-the-air signals, the greater the probability that BET is carried by a cable operator.

These results also suggest the existence of a trade-off between the availability of channels for local access or local programming and the availability of nationally supplied programming aimed at special interest groups. The larger the number of precommitted channels, the smaller the probability that a nationally supplied special interest programming service will be supplied. However, the special interest group may have their tastes better served by locally produced programs. A discussion of which approach better serves the needs of special interest groups is beyond the scope of this research. However, one additional extension of this research will be to include information on the number of channels devoted to local access programming.

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