The Impact of Market Structure and Entry Barriers on the Diversity of Television : Theory and Empiricism

Eli M. Noam

New York State Public Service Commission

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1. Introduction

The classic paradigm of industrial organization economics postulated that market structure affects participants' conduct and, in turn, performance. Applied to television, this means that different regimes of entry and participation in broadcasting lead to different outcomes in terms of program diversity and audience satisfaction. And while this is intuitively obvious, there has been little systematic analysis of the relationship.

In Western countries, there are few industries as tightly controlled as television broadcasting. The primary regulatory tools are legal entry barriers and dominance over the few approved television outlets. Only recently have some of the barriers been lowered, in an atmosphere of intense conflict. Part of the controversy has been the fear that program quality would suffer with the entry of commercial broadcasters. Although such concern with the impact of regulatory changes on television programs does not necessarily legitimate restrictiveness, it highlights the need for an analysis of the issues.

Considering that a television set is enshrined in almost every home, and that households allocate extraordinary portions of their disposable time to its viewing, it is somewhat surprising to note how little interest academic economists have taken in the theoretical study of the medium.

In a sparse literature, one can discern two approaches.

The first, by Steiner (1952), dates back to an analysis of radio programming; it was carried on by Rothenberg (1962), Wiles (1963), and Beebe (1977). The basic concept is the assignment of viewer preferences to fixed program categories which are exogenous and discrete. The model does not analyze different control arrangements, except for the difference between a competitive and monopolistic structure, and the political environment does not enter the model. The second approach, taken by Spence and Owen (1977) and expanded by Wildman and Owen (1985), provides a comparative welfare analysis, and incorporates viewer demand functions. That model, too, does not deal with dimension of broadcasting control and its impact on program diversity.

This paper attempts to carry on this analysis and to link it with public choice theory in a third type of model. Public choice theorists have analyzed the optimal political platforms which parties would adopt to maximize their political support, following a Hotelling (1929) approach which was revitalized by Downs (1966). A similar analysis can be applied to television. The aim of this paper is to create a methodological instrument for analyzing program diversity and institutional structure. The model's simplicity provides a tool useful in applications outside of economics, too. For that reason, a geometric presentation is used. The discussion will proceed from a single-channel model under different modes of control and behavior to more

complex assumptions of multi-channel entry.

The paper shows that under the assumptions of the model, both a privately supplied television and a populist-democratic controlled one result in essentially centrist program policies in terms of cultural quality. To overcome this outcome and achieve a higher cultural level of programs requires insulating institutions-- barriers to entry to prevent private market forces, and an independent status as a shield from populist politics. However, these arrangements are unstable, partly due to the tension between democracy and high culture. In time, the provision of higher quality programs will not depend on protective institutions anymore, and the intensity of the political debate will subside. In the meantime, however, the worst policy, in terms of enhancing program diversity, is to lower entry barriers only for a few privileged private broadcasters. Empirical observations from two U.S. cities are added, showing substantially greater diversity than in the past.

2. The Model

Television programs come in a great variety. We assume that they can be ordered along an axis ranging from "low culture" to "high culture," using the terminology of the sociologist Herbert Gans (1974). An ordinal rather than cardinal ranking is sufficient. For most programs, such classification is possible; in some instances, a program speaks on several levels, and an ordinal assignment is more

difficult: but it is in the nature of modeling to simplify.

Any given level of programming, which we call the programming "pitch," appeals to a segment of the television viewing audience in a way that it would normally designate that particular "pitch" as its first viewing preference. Thus, viewers can be ranked by pitch preferences in an ordinal fashion. These preferences are distributed unevenly across the population. Only a few households prefer a program on Plato's philosophy over all other alternatives. At the other extreme one arrives at a level of program simple-mindedness which is the first preference of only a few. The majority of first preferences are somewhere in between. We now assume that preferences are distributed normally across the spectrum of program pitches, as depicted in Graph 1, with the dimensions defined for a standardized normal distribution. There are, of course, other dimensions to a program that affect preferences, such as technical sophistication, "name" actors, etc. These elements could be modelled into a multi-dimensional distribution, but that would complicate the model without adding much to the analysis. Similarly, the use of a single-peaked distribution other than the normal would alter not so much the basic analysis as the details of computation.

Graph 1

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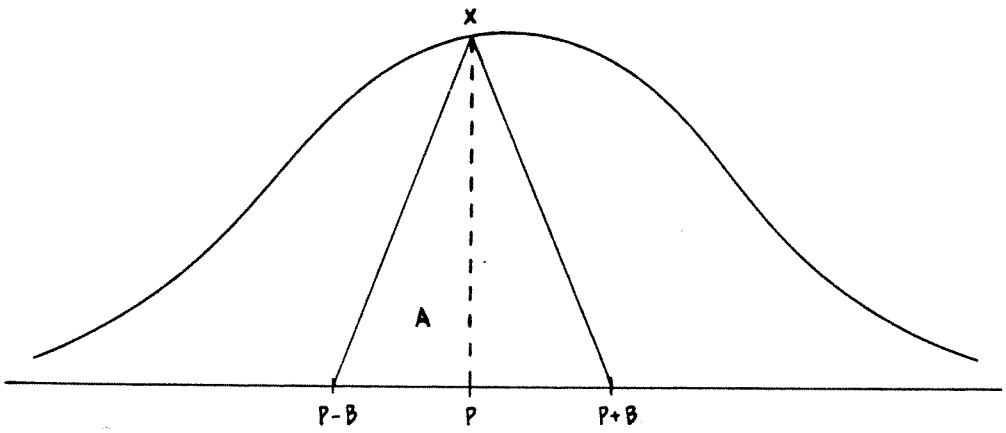


While viewers prefer a particular program pitch, they are willing to watch programs in a general range around their first preference, though at a declining rate. This probabilistic assumption permits a relaxation of the unrealistic binary yes-no decision rules of previous models. We assume that a program of pitch P will be watched within a band of B around P; the audience is represented, on Graph 1, by the triangle bounded by (P-B), (P+B), and X. B is not infinite; programs too distant from individuals' preferred pitch will not be viewed by them. There are, of course, anecdotes about people who will watch "anything," including the test pattern, but these stories go back to the days when

television was a novelty. We make no assumptions on the width of B, only that it is constant.

Programs are delivered to households by broadcasting organizations, operating under a variety of institutional and regulatory settings. Their main programming policy decision is to select the pitch of the programming which they supply. While the selection of programs spans a range of pitches, there is an average pitch for a broadcaster. Illustrations are the pitches of an American public broadcasting station and of a commercial station. In American radio broadcasting, these pitches can be quite narrow and are referred to as "formats" such as "all-news," "classical music," "easy listening" etc. Broadcasters may vary their program pitch over the hours of the day, in response to a changing underlying distribution of program preferences. For example, the pool of daytime audiences has a different composition than the pool of evening audiences. This leads to different pitches, but does not alter the analysis for each time period.

It is important to distinguish between "cultural pitch" and "quality." Lower culture programs are not necessarily easier to create, within the self-defined task of successfully reaching a particular audience. High-brow programs can have their own relentless cliches, while it can be extremely difficult for a popular program to satisfy mass audiences week after week. There is nothing inherent to

private media to produce only low-culture materials. Privately supplied books, films, magazines, and newspapers cover a broad range of tastes.

We assume that the cost of acquiring programs for broadcasting is independent of the program's pitch and that once the station's power is set, the marginal cost of broadcasting to an additional household is zero within the station's reach. Because the impact of additional power on the reception range drops rapidly for VHF and UHF transmissions, and added antenna height quickly reaches the structural limits, programming rather than transmission power is the variable for a broadcaster. Cost aspects will not be discussed in detail in this paper. They are analyzed elsewhere (Noam, 1987. "The Iron Law of Television Americanization: An Economic Analysis" Columbia University, Working Paper).

3. Single License Broadcasting

3.1 Commercial Broadcasting

The first case discussed is an unconstrained, commercial, advertising supported broadcaster X. No other television channels are available. Program choice is based on a maximization of advertiser revenue, which in turn means -- to simplify for the moment -- a maximization of audiences.

X must thus find the pitch P_1 that maximized triangle A in Graph 1. Its height at P_1 is given by the normal distribution:

$$H_{P_1} = (2\pi)^{-\frac{1}{2}} e^{-\frac{1}{2}P_1^2} \qquad (1)$$

With audiences ranging between $\pm B$, total audience is

$$A = \tfrac{1}{2}(2\pi)^{-\frac{1}{2}} e^{-\frac{1}{2}P_1^2} \cdot 2B = (2\pi)^{-\frac{1}{2}} e^{-\frac{1}{2}P_1^2} \cdot B \qquad (2)$$

It is obvious that the maximum A is reached when $P_1 = 0$.

Strictly speaking, advertising revenues will not be simply related to the size of the audience, but broadcasters will weigh the audience by its "consumption power," since this is what advertisers seek. We assume that income equals consumption power, and that income and preference for upper culture are, on average, positively and linearly correlated due to the higher educational levels that are associated with higher incomes. The maximizing pitch P_2 is then determined by maximizing the audience triangle weighted by its median consumption power C, and this is simple analytically, through complicated algebraically. P_2 will be at a higher program pitch than the more "democratic" P_1.

3.2 Governmental Broadcasting

Suppose, alternatively, that the single channel is operated by governmental-controlled broadcasting organization. Depending on the policy goals of the government, different programming choices will be made.

A first policy choice is the "populist" one. Populism

is here defined as policy aimed at satisfying the desires of the majority of the population. (See also Noam, The Efficiency of Direct Democracy, Journal of Political Economy, 1981) Applied to television, the government, in selfless pursuit of making as many citizens as possible happy, aims to provide a maximum audience with programs they like; this will be at $P_3 = 0$, identical to the unweighted commercial solution P_1, and in fact at a lower-quality pitch than the income-weighted commercial P_2.

A second policy choice is that of "uplifting," in which a government sets a program pitch above the centrist P, either in order to educate and uplift the population, or in order to satisfy the viewing influences of more influential segments of society. But where? Clearly one cannot simply maximize program pitch without regard for the loss of audience and the antagonism created in those whose preferences are not served. Hence some form of trade-off takes place in which both audience size and program quality pitch are considered. Their weighting is quite similar to the income-weighting of a commercial broadcaster which was discussed earlier, as long as there is a positive correlation between higher income and higher program preference. The weights, of course, can be different in the two circumstances, and quality weighting may result in a P_4 which is higher than P_2. But the opposite can be the case, too. For example, if in a society only 100 families have money to

use for consumption and education, a commercial television will have a very high program pitch because only the rich and educated will be targeted by advertisers. In such a society, a government channel will likely be of a lower pitch. If it is "populist" in orientation it will be at the center of the distribution; if it is "uplifting" it will be higher, but still not as elitist as in the 100-families scenario. In other words, it is greater income equality (ceteris paribus) which drags down program quality in a commercial setting, by giving the center more influence relatively to the upper classes. This is the fundamental tension between values of democracy and those of cultural refinement. A democratic society is more centrist in terms of culture. This fundamental tension is not usually admitted by the advocates of "quality" television who mistakenly believe that it is commercialism per se that is the foe of quality.

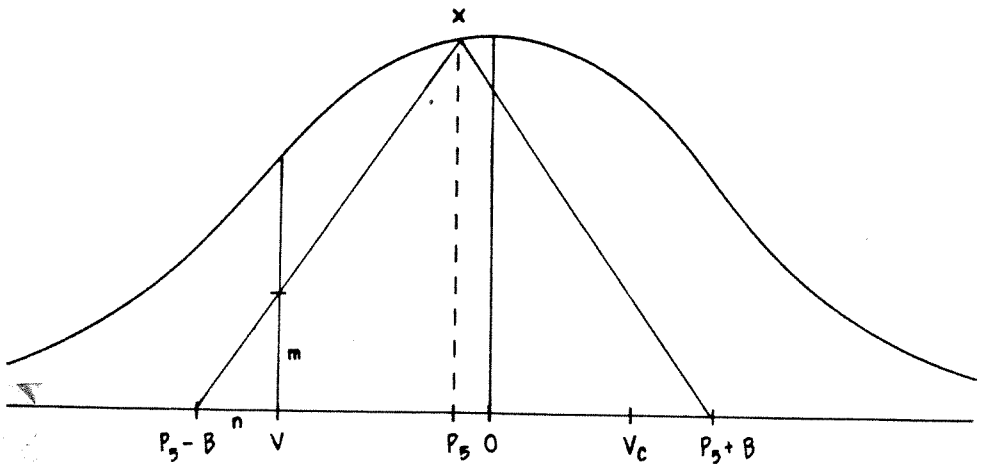
One explanation for state interference is that governmental television program policy is not selfless, but designed to serve a government's interest. Suppose, for simplicity, that electoral contest are carried on by political parties contesting for supporters who have various degrees of program quality preferences. One must recognize that broadcast policy is distributive policy. Setting up a system which satisfies the taste patters of one group is like giving it free passes to the movies. Voters with elitist tastes vote for elitist parties, and voters with popular

tastes vote for populist parties. If television programming policy is the only electorial issue differentiating the parties, they will promise policies designed to maximize voters, i.e. viewers. In a two-party system, this will result in both parties promising a centrist pitch, aiming for the peak of the distribution, P = 0. With multiple parties, however, different platforms would emerge; coalitions would tend to push the equilibrium towards the center, although unstable solutions are also possible. This is the usual voting analysis of public choice theory (Muller, 1979).

Another variant is a governmental "spoils" policy, in which the government rewards its' supporters after a victorious election by providing programs of their preference. This assumes that an election has been conducted on a variety of issues, and that the winning party controls broadcasting. Let us assume that the victorious grouping comprises voters with taste preferences to the right of V. (See Graph 2.)

Graph 2

Graph 2



If the government has such a "spoils"-policy, it will set a P_5 to satisfy the maximum number of its supporters. It will set programming pitch at

(a) $P_5 = 0$, if $|V| \geq \frac{1}{2}B$ (3)

(b) Where the majority is slimmer ($|V| < B$), the general solution is to maximize the triangle defined by P_6 minus the smaller triangle on the left of V. This situation yields, after some algebra, the analytical solution.

$$P_5 = -(1 - \frac{B}{2} + \frac{V_0}{2}) \pm \sqrt{(1 - \frac{B}{2} + \frac{V_0}{2})^2 - 1} \quad (4)$$

A variant exists if a coalition government needs to satisfy its several constituencies. For example, if the winning coalition comprises two parties -- one to the left and one the right of V_C in Graph 2 -- the program pitch may be set a V_C or in its neighborhood to serve both coalition parties. This could carry the programming pitch considerably off center.

A fourth policy would be to take into account that programming is also a propaganda tool that can be consciously wielded in order to influence the hearts, minds, and votes of viewers. It is largely for that potential that control over television has been so fiercely fought over in so many countries. Television is thus not merely a governmental public service, but also a means of widening and securing its voter base. By choosing a certain program pitch, it can influence viewers' values, and eventually their voting preferences. In pursuit of an optimal propaganda strategy, a trade-off must be made between the purity of the pitch (i.e. its being squarely within majority preferences) and its reach of opposition viewers. The more "pure" and distant a pitch is from the opposition voters' preferences, the less likely they are to watch the programs. On the other hand, the closer the pitch is to these voters, the less of a propaganda impact will be made on the actual audience.

For example, the BBC's approach, in its international news broadcasts, has been to be close to the equivalent of V,

projecting a position that is relatively moderate in relation to that prevalent in other countries (Briggs, 1979). In contrast, the Voice of America, for a variety of reasons, aims its programs more at audiences already on its own side of V, and thus is reputed to be less effective.

This analysis of various government program policies showed that in a democratic or in a populist two-party electoral system a centrist program pitch would result. Hence, for viewers with preference for high quality programs, in a single-channel broadcast system neither the market nor the populist process lead to satisfactory supply. As an alternative, to assure the supply of high-quality programs, one must create a different institutional set-up, in which neither the market nor the democratic process are dominant. Most typically, this involves a semi-independent governing authority which sets program policy. Such bodies provide some insulation and can pursue other optimization goals. And while the program preferences of an independent broadcast authority will be guided by its notions of public benefit, the definition of much benefit will be guided by the program preferences of its board, management, and staff, most of whom will have above average education and program preferences. The first board of the BBC included one Earl, two Lords, the Headmaster of the Winchester School, and the wife of the Chancellor of the Exchequer. Of the first 80 governors in the BBC's first 50 years, 40 were Oxford or Cambridge

graduates, and 20 were graduates of Eton, Harrod, and Winchester (Briggs, 1979).

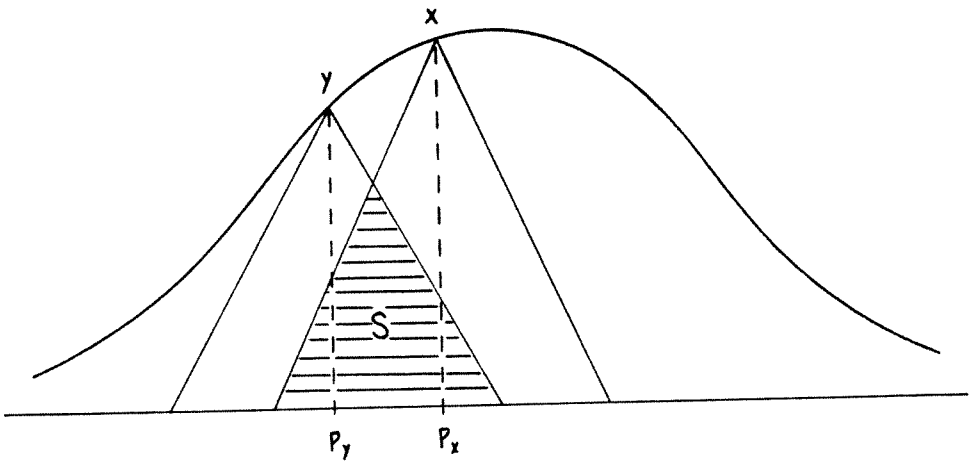
A bias towards higher cultural levels by the dominant broadcasters can be maintained, however, only where entry barriers prevent newcomers to occupy the broad center of the taste distribution, of and where there is a willingness to provide substantial public subsidies to programs favored by those of higher income and education. The arrival of a multi-channel television environment is hence a serious challenge.

4. Multi-Channel Television

The analysis is now extended into systems in which entry barriers are lowered to pursuit more than one channel. Let us again begin with a commercial system. Suppose that a second broadcaster, Y, is licensed. Y will position itself in such a way, relative to an incumbent broadcaster X, so as to maximize its audience. (We ignore the weighting by consumption capacity in the following.)

Graph 4

Graph 4



The decision rule for a choice of P_y, given P_x is to maximize the triangle defined by P_y, minus half of the triangle of overlap S, since overlapping audiences are shared. (See Graph 4.)

It can be shown that the optimization problem for y is to find P_y that maximizes

$$A_y = (2\pi)^{-\frac{1}{2}} e^{-\frac{1}{2}P_y^2} B - \frac{1}{8B}(P_x - P_y + 2B)^2 (2\pi)^{-\frac{1}{2}} e^{-\frac{1}{2}P_x^2} \qquad (S)$$

This relation is a reaction function $P_y = f(P_x)$, since P_x has been assumed as given. But once chosen, the previous P_x would be modified, since y cuts into its audience. Thus

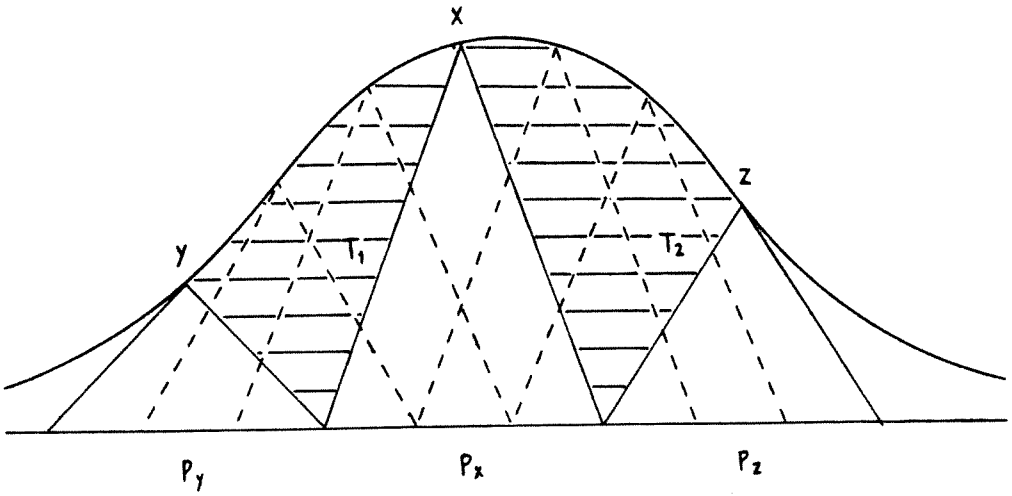
there is also $P_X = G(P_Y)$, creating a simultaneous relation. X and Y settle in an equilibrium at opposite sides of the peak of the distribution. In other words, they do not have the same pitch. Much of the conventional interpretation of television sees commercial broadcasting as inherently striving for identical "lowest common denominator" (Mander, 1978); however, one can see from the model that some differentiation is the rational policy.

The addition of further broadcast stations repeats the process, placing stations $x,y,z_1,\ldots z_n$ across the audience preference distribution. As the number of stations increases, their spread across the distribution widens, i.e. more "outlying" program tastes are reached. At the same time, the spacing between the chosen program pitches decreases, and viewers find closer substitutes for their favored program pitches. In the process, the "band" of primary audience tuned to a station is narrowed. The implication is that program channels become relatively more specialized and more "narrow-casting" in terms of their actual audience. This can be observed in cable television where specialized program channels have emerged. Furthermore, the proximity of spacing is closest near the peak of the distribution; these audiences will have the greatest choice of programs appealing to their taste. This corresponds to the experience of radio station formats in the United States.

Two important measures of program diversity under lowered entry barriers can be defined. The first is the "spread" of programs from the right-most to the left-most pitch. "Spread" as a measure of program diversity concentrates on the reach to outlying preferences, and does not measure the extent of satisfying more centrist ones. Therefore, a second useful measure is that of viewer "preference satisfaction," measured by the extent of viewing participation within the entire population. In Graph 5, the areas T_1 and T_2 are regions of substantial non-viewing in a hypothetical 3-channel spread-maximizing system, i.e. various segments of the audience are not especially satisfied with the programs delivered. T_1 and T_2 are reduced as more intermediate channels emerge. The measure for viewer preference satisfaction is the ratio of the total area under the program triangles and the total population under the curve.

Graph 5

Graph 5



It is also possible to calculate several relations, such as the one between spread S and the number of channels n, and its rate of increase. Similarly, it is possible to calculate the number of stations that would be required in order to reach a desired pitch P_E. One observation is that a certain symmetry exists in a market program provision. As it moves right-ward towards higher quality with larger channel capacity, it also moves left-ward on the graph towards the lower-pitch offerings, and adds centrist offerings. Lower quality thus expands together with higher and intermediate quality. In consequence, it can take a good number of

channels for "upper culture" to be reached.

To say that more channels of program provision than previously provided are technically possible does not mean that they are economically feasible. There are economic barriers to overcome once the legal ones have been lowered. To analyze this it is necessary to introduce a measure of cost into the model, and to relate it to audience size. We assume initially, as before, that the programming cost for each program channel is the same, regardless of pitch. In Graph 6, this is represented by the horizontal line C. The bell-shaped curve is that of revenues. It should be recalled from egn. (2) that total audiences are distributed normally with program pitch, assuming constant width of audience band B.

In providing added channels, total audiences increase, because the unserved audiences are being reached. In Graph 6, this is shown by R_2, the revenue curve for 2 channels for average pitch . On the other hand, this increased total revenue has to be split by more channels. Because average audiences are decreasing with number of channels, revenues are also declining.

If each audience is worth equally in terms of advertising revenues, with a constant "per thousand" advertising charge of t, revenues are also normally distributed, and this defines the range of economically feasible pitches, for a one-channel system between the

intersection points P_L and P_R of cost and revenue curves.

Graph 6

If the upper-pitch audiences are more valued than the lower ones, the curve would be tilted upwards around its peak, resulting in the feasibility range shifting to the right. Conversely, if high-quality programs are more expensive to produce than low quality ones, the cost line will tilt upwards and shift the feasibility range towards lower quality.

Absence of legal barriers still leaves economic barriers, defined by Stigler as "a cost of producing (at some or every rate of output) which must be borne by a firm which

seeks to enter an industry but which is not borne by firms already in the industry." (Stigler 1968, p. 67.) New private entrants must bear a substantial cost in establishing themselves next to the incumbent public broadcasters, whose own entry was without a risk of pioneering. Barriers can be created, for example, by cost structures that are hard to meet for newcomers. Labor agreements are one example (Marvel 1977). Another is for the incumbent to possess excess capacity that deters entry (Spence 1977), or at least accommodation that reduces competition (Dixit 1980), and this has, indeed, been the BBC's strategy with ITV. Entry barriers will be higher in the case of a monopoly market, since a new entrant will qualitatively alter the industry structure much more than where no monopoly exists. Adherents of contestability theory argue that a potential entry can affect a monopolist's behavior as much as actual entry (Baumol, Panzar, and Willig 1982). But this requires no irreversible (sunk) cost, and unrealistic assumptions on incumbent's reaction (Brock and Scheinkmann, 1983.) Applied to television, a public broadcaster could move to a centrist programming policy in order to pre-empt commercial entry. But as the model demonstrates, there will be room on either side for rival program supply. The only way to ward it off would be for the public broadcaster to operate multiple channels that closely cover the entire taste spectrum. This would enormously expand the broadcaster's scale of

operations, its political influence, and its financing requirements. For these and other reasons, public broadcasters do not expand their channel capacity very much.

Thus there are limits to the number of broadcasters even where no legal barriers to entry and no spectrum scarcity exist. At some point audiences may be sliced into such small segments, even as total viewership is expanded, that it becomes uneconomical to add still further stations based on advertising revenues. Further entrants may still try, hoping to displace incumbents by either attracting larger audiences or by operating at lower cost, or by a combination of both. More significantly, they will also seek to increase the number of economically viable channels by creating different mechanisms of support. The new media applications of cable distribution and encoded broadcasting permit distributors to directly transact with audiences --as opposed to the advertiser-supported system in which viewers cede their attention to advertisers who pay program providers to attract these viewers, or to the governmental license fees on television sets which has no relation to actual consumption. The new forms of media create the possibility of direct dealing between program consumers and program distributors. Thus liberalization of entry barriers invariably leads to pressure for a liberalization of financial support schemes. A quantitative increase in options is accompanied by a qualitative change in the entire broadcasting transaction

from quasi-public good (even when supplied by private stations) to market good.

As a consequence, it is possible for program providers to take into account the strength of viewer demand for different program pitches. For example, outlying program preferences held by only small audiences can be satisfied if the demand is sufficiently price inelastic.

For many programs, the revenue maximizing strategy will be a mixed strategy of distribution modes, taking into account the various demand elasticities for a program, and releasing sequentially from low-elasticity to high-elasticity audience segments, at different prices, thereby reducing consumer surplus through price discrimination. This, in turn, creates incentive for a multi-media integration.

Because of the introduction of a more genuine market mechanism, income differentials emerge. Higher taste preferences are better served than before the lowering of entry barriers by permitting the superior economic resources of their holders to make themselves felt. Hence, for the holders of these preferences it is less important than in a limited-channel environment to shape the institutions of broadcast control, be they government operations, independent authorities, or regulatory rules. The market provides acceptable solutions where strict democratic preferences or audience maximization in a limited-channel environment did not. To satisfy elite taste preferences is therefore reduced

as an objective for public broadcasting and for regulatory policies which generated higher quality programs. Much more important becomes the assistance of taste preferences of the poor, for whom the market operates less well.

In a multi-channel environment, there is therefore still a role for public institutions to affect the programs offered to the public.

For example, it may take a good number of additional private channels to reach an outlying point. This creates an impetus for regulatory or public ownership solutions. A government may set up a channel with the requirement to have an outlying pitch P_z (Graph 5). A good example is the American PBS. Similarly, it may by regulation require each commercial station, as condition to entry, to devote part of its broadcast time to programs of pitch P_z, thus in effect creating the equivalent of a channel of type P_z. The latter policy is behind the licensing requirement, in the United States, to provide some programs that deal with issues of concern to the community.

It should be noted that one side-effect of a PBS-type channel is to push to commercial stations towards lower-pitch programs. Commercial television would be somewhat higher in program pitch if the high-quality segment were not occupied by a PBS station. Hence, a casual comparison between commercial and public stations can overstate the "inherent" difference in their program pitches. Similarly, an increase

in commercial stations reduces, after a point, a PBS-type station's audience by providing programs that are near-substitutes. If that PBS station has flexibility in selecting its program pitch, and if it cared either about increasing its audience, or about reaching hitherto unserved audiences, it would move to a higher P. Hence, increased commercial offerings can raise the program quality of a PBS-type station, too.

This illustrates that the introduction of a commercial television channel that competes with a previously monopolistic public channel does not inherently push the public monopolist towards lower program quality.

5. Alternative Entry Policies

One form of structural policy is to permit the entry of additional public channels, either under the control of the existing monopoly institution, or as a separate entity. The advantage of a monopoly is that it can cover a broader variety of program pitches with a lower number of stations, because it can avoid duplication. For example, Graph 5 shows schematically that it takes three monopoly channels to reach a program diversity which would require, in a competitive system, significantly more channels. This would seem to make a monopoly system more efficient in terms of diversity in that diverse viewer preferences can be served with less resources and less duplication. Or, put differently, where only a limited number of channels is available, a monopoly

system can cover a broader spectrum of program diversity. (We assume for simplicity that the cost of operating n independent channels is the same as that of an n-channel monopoly system).

This is a major justification for a state monopoly system if a maximization of program spread is sought. But the argument is problematic in several respects. As discussed above, a simple maximization of spread makes no sense for a government. It would be conceivable primarily if it corresponded to the spoils-systems of major parties in a government coalition. For example, in Italy the public RAI-1 channel is (almost officially) dominated by the Christian Democratic party, while RAI-2 is similarly openly allocated to the appointees of the Socialist party. But the Italian system did not prove stable, because the incentives to serve the centrist audience niches by private providers could not be contained.

Second, a total governmental monopoly is not necessary to achieve such program diversity. Thus, the channel X in Graph 5 could be commercial, with governmental channels Y and Z, which could be independent of each other, serving the outlying areas.

Another entry barrier policy is to permit a small number of private broadcasters to operate, by strictly limiting licenses and frequency allocations. This is the cautious and evolutionary approach in which most governments

have proceeded (except in Italy where events could not be controlled). This limited barrier policy leads to a tiny number of highly profitable and influential private channels, at or near the center of the preference distribution. Public broadcasters tend to feel compelled to woo the same centrist audience with similar programs, lest their audience share drop sharply. In the Netherlands, for example, the success of the de-facto commercial audience association TROS led the established non-profit broadcast associations to modify their programming in what has been called a "TROSsification." Behind such changes is the fear that smaller audiences also reduce public institution's claim on the substantial audience fees on television sets, as well as their hold on potential corporate donors (in the case of the American PBS) or on the supplementary advertising revenues most public broadcasters have come to count on.

Whereas a wide liberalization would, in time, lead to higher quality and specialized audience channels, a limited licenses policy creates centrist program pitches. Furthermore, the scarcity of such licenses leads to high potential profitability and high political influence, causing the question of who will be awarded a license to become a high-stakes game of politics and money (as the recent French experience demonstrates). To avoid this problem, in America, licenses for low power TV are now being awarded by lottery (with some extra help for minority and woman applicants;

however, the value of LPTV licenses is relatively small). The holders of scarce commercial licenses also quickly become staunch opponents of further liberalization. In Britain, the ITV companies hold profitable regional monopolies over television advertising, and oppose a further opening of entry with as much fervor as the BBC. In the U.S., broadcasters fought the FCC's intention to allocate more spectrum to commercial broadcasting and to locate stations closer spaced to each other on the dial. They also succeeded, for a decade, in blocking the expansion of cable television from becoming more than CATV (Community Antenna TV) and to transmit programs unavailable over the air.

A limited licensing is often justified by a scarcity of frequencies, which, it is alleged, permits only a few channels. This argument has always been oversold. First, there is much more spectrum available if one is willing to reduce allocations for other purposes, in particular to the huge segments of the spectrum which governments have assigned to themselves, virtually entirely out-side of public scrutiny and debate. Second, a large number of low power television stations can be fitted within the existing frequency allocations. Thirdly, the microwave range has been technically opened to broadcasting and to an increasingly low-cost reception, both terrestrially and by satellite. And lastly, cable television, whether coaxial or fiber, has overcome the limitations of over-the-air spectrum

limitations. A coaxial cable can carry at present up to 90 video channels; if more channels are needed, several cables can be run in parallel. Fiber has potentially an even greater capacity and smaller volume. For all of these reasons, the safely "scientific" argument for a limitation of television media lives on borrowed time.

If a licensing limited to a tiny number of entrants is chosen at all, a government can try to diversify their otherwise centrist program policy by a variety of entry conditions. Applicants for licenses can be required to provide broad-based programming that would also appeal to minority tastes. Over time, these obligations will be increasingly opposed by broadcasters as burdensome, since they can be expensive in terms of lost profits. In America, broadcasters, who received their licenses for free and pay no real license charges, have long fought requirements of internal program diversity. Another strategy is to award licenses to a diverse set of operators whose pluralism would assure program diversity. Perhaps the best example is the Netherlands, where various ideological "pillar" organizations are licensed to share broadcasting. The fundamental weakness of such a system is its difficulty to adapt itself over time. New entry by new voices will tend to be opposed by a broad coalition of the organizations that already dominate society and the existing broadcast licenses.

Several other forms of entry barriers exist in the United States, which illustrate the variety of concerns that are addressed by structural policy. For example, no licensee can own more than one station in a market. This "duopoly" rule serves to reduce a potential local media dominance, but its side-effect, as discussed earlier, is to reduce program diversity, since a station cannot counter-program against its own first program. Instead of one firm maximizing total joint audience, two firms maximize their separate audience, which lead to a wide program spread.

Related types of barriers to entry exist for certain instances of "cross-ownership." There are restrictions on the ownership of television stations by

(a) telephone companies;

(b) Cable television companies operating in the range of the television station;

(c) Local newspapers, (but not retroactively unless the newspaper and the TV station are the only ones in the community);

(d) Radio stations. (But not retroactively.)

These rules are aimed at media concentration, as well at the potential for vertical integration. Since behavioral regulations could deal with most of the problems which the structural rules try to address, the latest relevance to the new media landscape has been questioned.

Another entry barrier prevents foreign firms from owning more than 25% of an American station. This rule is a bit of an anachronism, and has no counterparts in FCC treatment of cable television or satellite delivery to cable systems. Its origins go back to the early and strong emphasis on localism in station ownership, based on distrust of New York and Los Angeles firms, let alone foreign ones.

Outside of these excluded categories, there are relatively few legal barriers to entry into television distribution left. Money is the main obstacle. For broadcasting an FCC license is required, but anybody without a felony conviction and with enough financial backing can purchase it from an existing licensee. Additional licenses are regularly awarded, though in the major markets all attractive VHF frequencies have already been awarded. UHF licenses, however, are often available. In November 1987 there were 223 UHF stations whose construction has been authorized but which were not yet operating. Women and minorities get a preference in obtaining a license, although this is under review after an unfavorable court decision (Stele v. FCC, ____ F2d ____ (D.C. Cir. 1985)

Another category of rules, in the U.S. as well as in Italy, concerns networking. The 1934 Communications Act does not grant the FCC explicit powers over networks, but it soon attempted to assume such powers. In NBC v. United States, 319 U.S. 190 (1943) the FCC's ability to regulate networks

through its power over local stations was upheld by the Supreme Court. A later case (United States v. Southwestern Cable 392 U.S. 157 [1968]) similarly affirmed the FCC's power over activities reasonably ancillary to broadcasting. However, no license for a network is necessary, and only residual restrictions on network relations with affiliated stations remain.

The primary remaining barrier is that over station group ownership. For a long time, no one could own more than 5 VHF plus 2 UHF stations. This was expanded in 1985 to 12 stations, as long as the total percentage of U.S. audience reached did not exceed 25%. For a while, there was even a limitation (not retroactive) on the ownership of more than one station in the largest fifty local markets. The purpose of such rules was to prevent a dominance by a few giant firms, and to support local ownership. And while the rules did not restrict local stations from carrying network programs, but they established more of an arms'-length relationship of wholesalers and retailers, which, it was hoped, included a stronger impact on programming decisions by the local outlets. In time, however, the group ownership rules had the effect of creating entry barriers for new networks in competition with the dominant three. The reason is that the economics of networks call for a national scope of operation; network-owned affiliates provide a strong foundation for such scope, while those without them have a

"coverage handicap." [FCC, Special Network Inquiry, New Television Networks: Entry, Jurisdiction, Ownership, and Regulation. 1980, Washington D.C.]
Partly for that reason, the ownership rules were relaxed in 1985, and contributed to the entry of the Fox Network.

Structural limitations has made local station ownership relatively unconcentrated. In late 1987 it consisted of over 1300 stations (of which 1006 were commercial) and 409 LPTV stations, with 200 more authorized [Broadcasting, Nov. 9, p. 94]. Network program supply, on the other hand, was for a long time concentrated in three firms, plus independent program providers and syndicators, and ad-hoc networks. The advent of satellite delivery and local cable television distribution changed this and lowered economic entry barriers for new networks. Today more than two dozen program networks exist, with a fairly active turnover.

6. Empirical Observations

The discussion has so far been largely theoretical in nature. While it is beyond the scope of this paper to provide an empirical investigation to all points raised, it will at least be an attempt to look into one aspect, that of the relation between an increased number of channels and the diversity of programming. Two studies investigated program diversity, comparing the change between 1970, before cable television, and 1985 for two cities (New York and Tulsa, Oklahoma.) (Columbia University, Working Papers) [Steven

Fleischmann, An Analysis of Television Programming. 1986] Allan P. Jackson, Has Cable TV Diversified Away the Vast Wasteland? Columbia University, Working Paper, 1986)

Tulsa, Oklahoma, was in 1970 a typical broadcast market, with 3 VHF network affiliates and a VHF PBS station. In terms of its demographics, Tulsa is almost exactly the American average. By 1985, two independent UHF stations were also on the air, but the biggest change was a 35-channel cable system, which by that time had more than 100,000 households as subscribers. (Out of about 220,000) This system added three distant imported broadcast signals, 18 banc cable program channels, four pay-TV networks, two educational channels, two in-house programmed channels. A comparison of programs in the same week in the two years was made.

The summary results show a tremendous gain in the sheer quantity of television programs: from 436 hours in 1970 to 5284 hours in 1985. Even the original stations broadcast 27% more than in 1970. All 1985 program categories increased more than five-fold over their 1970 time allocation. Several new types of programs were measured: adult entertainment, arts documentary, current issues documentary, entertainment news, hearing impaired programs, and auction sales.

Some program categories grew faster than others, their proportion in total programs grew. Especially expanding was popular music (from 2% up to 12%), religion (2% to 8%),

TULSA, OKLAHOMA

Table 1

TOTAL HOURS AND PROPORTION OF TOTAL HOURS TELECAST
ALL CHANNELS, BOTH YEARS
RANKED BY 1985 QUANTITY

	TOTAL HOURS			PROPORTION OF TOTAL HOURS		
Program Category	1970	1985	INDEX	1970	1985	INDEX
INFORMATIONAL	87.2	1015.0	1164	19.95%	19.21%	96
FEATURE FILM	58.7	874.1	1490	13.43%	16.54%	123
ENTERTAINMENT	149.0	768.0	515	34.11%	14.53%	43
POPULAR MUSIC	8.3	614.0	7442	1.89%	11.62%	615
NEWS	54.9	612.3	1115	12.57%	11.59%	92
DEVOTIONAL	9.7	400.7	4143	2.21%	7.58%	343
SPORTS	25.7	361.2	1407	5.88%	6.83%	116
ALPHANUMERIC	0.0	342.2	na	0.00%	6.47%	na
CHILDREN'S	43.5	297.2	683	9.96%	5.62%	56
TOTAL PROGRAMMED HOURS	436.8	5284.5	1210	100.00%	100.00%	100
UNPROGRAMMMED PERIODS	235.2	595.5	253			
	672.0	5880.0	875			
NUMBER OF CHANNELS	4	35	875			

Jackson, Allan, "A Study of Program Supply in Tulsa, Oklahoma, 1970-1985," Research in Progress, Columbia University

TULSA, OKLAHOMA

Table 2

ALL CHANNELS, BOTH YEARS

Program Type	TOTAL HOURS 1970	TOTAL HOURS 1985	INDEX	PROPORTION OF TOTAL HOURS 1970	PROPORTION OF TOTAL HOURS 1985	INDEX
CHILDREN'S						
Animated Ent.	15.0	170.4	1136	3.43%	3.22%	94
Live Entertain.	15.5	96.0	619	3.55%	1.82%	51
Live Information.	13.0	30.8	237	2.97%	0.58%	20
ENTERTAINMENT						
Situation Comedy	38.0	172.0	453	8.70%	3.25%	37
General Drama	4.5	125.5	2789	1.03%	2.37%	231
Adventure, SciFi	6.5	76.5	1177	1.49%	1.45%	97
Quiz, Game	24.9	70.5	283	5.70%	1.33%	23
Police Myst.Susp.	8.5	70.4	828	1.95%	1.33%	68
Daytime Drama	37.1	60.0	162	8.49%	1.14%	13
Performing Arts	4.5	54.5	1211	1.03%	1.03%	100
Western	8.0	44.5	556	1.83%	0.84%	46
Variety	12.5	39.5	316	2.86%	0.75%	26
Humor	4.5	29.8	662	1.03%	0.56%	55
Adult		24.8	na		0.47%	na
INFORMATIONAL						
Classrm.Instruct.	32.8	187.0	570	7.51%	3.54%	47
Public Affairs	2.3	181.3	7883	0.53%	3.43%	652
Finance, Money	1.0	120.2	12020	0.23%	2.27%	994
Instruct.,Advice	6.3	113.0	1794	1.44%	2.14%	148
Health, Fitness		112.1	na		2.12%	na
Conversation...	33.0	98.6	299	7.55%	1.87%	25
Wildlife Nat.Doc.	0.5	27.5	5500	0.11%	0.52%	455
Travel	0.5	25.5	5100	0.11%	0.48%	422
Entertain. News		23.6	na		0.45%	na
Biography Docu.	1	23.3	2330	0.23%	0.44%	193
Auction, Sale		20.0	na		0.38%	na
Curr. Issue Doc.		16.0	na		0.30%	na
Medical Instruct.	1.0	15.5	1550	0.23%	0.29%	128
Law Documentary	0.5	10.5	2100	0.11%	0.20%	174
General Document.	4.5	10.0	222	1.03%	0.19%	18
Arts Documentary		9.8	na		0.19%	na
Foreign Language		7.3	na		0.14%	na
History Document.	0.5	4.8	960	0.11%	0.09%	79
Local Affairs	2.7	3.8	141	0.62%	0.07%	12
Hearing Impaired		3.0	na		0.06%	na
Farm	0.8	2.3	288	0.18%	0.04%	24
SPORTS						
Spts.Event Repeat	2.0	136.0	6800	0.46%	2.57%	562
Sports Anthology	4.1	131.2	3200	0.94%	2.48%	265
Sports Event Live	19.6	94.0	480	4.49%	1.78%	40
UNPROGRAMMED						
Off Air	235.2	564.3	240			
To Be Announced		31.3	na			
TOTAL PROGRAMMED HOURS	437.0	5284.6	1209			
TOTAL HOURS	672.0	5880.0	875			
CHANNELS	4	35				

Jackson, Allan, "A Study of Program Supply in Tulsa, Oklahoma, 1970-1985," Research in Progress, Columbia University

NEW YORK CITY

Table 3

PROGRAM CATEGORY	HOURS* 1969	HOURS* 1985	ABSOLUTE CHANGE	%CHANGE	% OF TOTAL 1969	% OF TOTAL 1985
CHILDREN'S	127.0 (3)	307.0 (5)	180.0	142.0	12.5	9.0
COMEDY	45.5 (8)	169.0 (9)	123.5	271.0	4.5	4.9
CULTURAL	24.5(12)	42.5(16)	18.0	73.0	2.4	1.2
DISC./TALK/INT.	138.5 (2)	314.5 (4)	176.0	127.0	13.6	9.2
DOCUMENTARY/BIOG.	22.0(13)	43.0(15)	21.0	95.0	2.2	1.3
DRAMA	77.0 (4)	226.5 (7)	149.0	194.0	7.6	6.6
FINANCIAL	17.0(14)	166.0(10)	149.0	876.0	1.7	4.8
FOREIGN LANGUAGE	47.0 (7)	213.5 (8)	166.5	354.0	4.6	6.2
GAME/QUIZ	54.0 (6)	74.5(13)	20.5	4.0	5.3	2.2
GENERAL NEWS	69.5 (5)	239.0 (6)	169.5	244.0	6.8	7.0
HEALTH/MEDICINE	11.0(18)	90.0(12)	79.0	718.0	1.1	2.6
MOVIES	258.0 (1)	540.0 (1)	282.0	109.0	25.4	15.7
MUSIC	11.0(18)	425.0 (2)	414.0	3764.0	1.1	12.4
RELIGIOUS	14.0(15)	135.0(11)	121.0	864.0	1.4	3.9
SCIENCE/NATURE	13.0(16)	37.5(17)	24.5	188.0	1.3	1.1
SOAPS	30.0(10)	65.0(14)	35.0	117.0	3.0	1.9
SPORTS	31.5 (9)	337.0 (3)	305.5	970.0	3.1	9.8
VARIETY	25.5(11)	7.0(18)	-18.5	-73.0	2.5	0.2
TOTAL	1016.0	3432.0	2416.0	238.0	100.0	100.0
H-INDEX					0.1207	0.0874
CONCENTRATION					59.1	47.1

*THE NUMBER IN PARENTHESIS INDICATES THE RANK.

finance and money (.5 to 2%) and public affairs (1% to 3%) while entertainment fell from 34% to 15%, and children's programs from 10% to 6%. Informational programs were the largest category with 19%.

In New York City in 1969 there were 9 VHF TV stations. In 1985, Manhattan Cable offered 28 plus 7 other channels (local origination public affairs, etc.) There were also 5 additional UHF channels. The table shows that here, too, there were large increases in quantity (238%) in virtually every category (except for variety shows). [add]

7. Conclusion

This paper has established a simple model for the analysis of program diversity under different regimes of ownership and entry barriers.

The paper traces the programming policies which result from different types of entry regimes. It concludes that program policies would not be substantially different in a market system or in a populist democracy. In consequence, in order to provide higher culture programs favored by educated and influential subgroups of the viewing population, affirmative structural or behavioral policies have been necessary, for example independent public broadcast institutions, program regulation, and entry restrictions. However, the need for these policies to assure higher culture programs declines as television program distribution -- due to technological and entrepreneurial changes -- enters the

realm of regular economic transactions, as opposed to that of political allocation. The constituencies that are supportive of higher culture programs will increasingly be served by the market, where their economic strength generates consumption options which previously needed to be provided through the political system. Hence, the importance of politics in broadcast issues is reduced, because the re-distributive role of the medium is less important, in particular vis-a-vis the educated segment of the audience.

A multi-channel environment provides the potential and reality of greater variety of programs. Although it is often said that more private television channels are just more of the same, empirical investigations reported in this paper show that the new environment in the U.S. provides a greater program diversity than in the past.

Because such enhancement still leaves some program categories inadequately served, there is still an ongoing role for government to assure the production and distribution of programs with a high social value, where private provision fails. Hence, there is a continued role for public broadcasting. In addition, there are forms of subsidy which can encourage such programs. In print publishing, a variety of mechanisms of public support exist -- to authors, authors' employer, authors' employees, authors' publishers, and authors' readers. There is no reason why similar subsidy could not also aid valued television programs. But to try

regulating the program pitch of television by structural entry barriers is not only futile in the long term -- if the long history of communication is any guide for the future -- but it is also inefficient even within its own terms. In the future, media diversification will have to be achieved by additive policies rather than by subtractive means of entry barriers but this development puts television distribution merely where print publishing and film distribution have been for a long time, and constitutes a "normalization" of the anomalous segregation of electronic media from the rest of the economy. One may regret this tendency, but it constitutes a historic force which can be stemmed only with more repression than democratic societies are ready to employ.

References

Beebe, J.H.

(1977) Institutional Structure and Program Choice in Television Markets. Quarterly Journal of Economics, 91: 15-37.

Briggs, A.

(1979) Governing the BBC. London: BBC

Gans, H.

(1974) Popular culture and high culture. New York: Basic Books.

Hotelling, H.

(1929) Stability in competition. Economic Journal, 34, pp. 41-57

Mander, J.

(1978) Four arguments for the elimination of television. New York: Williams Morrow and Co.

Rothenberg, J.

(1962) Consumer sovereignty and the economics of television Programming. Studies in Public Communication, 4: 45-54.

Spence, M.A., and Owen, B.M.

(1977) Television programming: Monopolistic

competition and welfare. Quarterly Journal of Economics, 66: 194-223

Steiner, P.O.

(1952) Program patterns and preferences, and the workability of competition in radio broadcasting. Quarterly Journal of Economics, 66: 194-223

Wildman, S.S., and Owen, B.M.

(1985) Program competition, diversity, and multi-channel bundling in the new video industry. Video Media Competition, ed. E.M. Noam. New York: Columbia University Press.