American Commercial Television

Competition, Collusion, Regulation

by

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VITA

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Doctoral Dissertation

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Abstract

AMERICAN COMMERCIAL TELEVISION
COMPETITION, COLLUSION, REGULATION

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This paper's objective is to use economic theory to
predict behavior of the National Association of Broadcasters
(NAB), a commercial broadcast television trade association.
To make predictions about a trade association of television
stations, it is necessary to understand behavior of
television stations broadcasting in a market with no trade
association.

Advertisers wish to show commercials to television
viewers. Thus, television stations sell the exposure of
viewers to commercials. A station in a market with no
television trade association maximizes profit from sale to
advertisers of commercial exposures. A television station
uses three inputs to produce commercial exposures. A
station can change number of commercials in a program,
change the type of program broadcast, or change program
quality.

A television trade association wishes to increase profit to existing television stations. An association achieves this objective by lobbying to prevent entry by new commercial television stations and entry by alternatives to commercial broadcast television. A television trade association is unable to control price or output of commercial exposures. Because of the difficulty of measuring other inputs to commercial exposures, a trade association can only control number of commercials of member stations. To encourage voluntary membership, a television trade association offers valuable products to member stations at prices below what non-members pay and makes association membership known to all stations.

Behavior of the NAB is consistent with predictions. NAB lobbying is used to restrict entry. Provisions of the Television Code of the NAB restrict number of commercials shown by member stations. Regression analysis shows increased profit to stations in markets where a high proportion of stations are code members.

Because the television industry is so extensively regulated by the federal government, predicting behavior of stations and their trade association also requires understanding government regulation of television broadcasting. Government regulators, such as the Federal Communications Commission, maximize political support by responding to preferences of all politically powerful

interest groups. The NAB cannot rely on consistent
favorable regulation because the FCC also responds to
preferences of a large number of other broadcast interest
groups.

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CHAPTER ONE

OVERVIEW

Using economic theory to study an industry like
commercial television broadcasting is interesting, but not
because the objective of broadcasters is interesting.
Television broadcasters, like other firms, seek to maximize
profit given production costs and given the institutions and
structure of their particular industry. Television
broadcasting is an attractive topic for study because
applying the assumption of broadcaster profit maximization,
given the nature of television program production and
current institutions and industry structure, yields a unique
set of implications for behavior of television stations,
implications which can be tested by observing the broadcast
industry.

The primary objective of this paper is to use economic
theory to examine behavior of the largest commercial
television trade association: the National Association of
Broadcasters. However, to predict actions of a trade
association of television stations it is necessary to
achieve a second objective of this paper: an understanding
of behavior of competing television stations broadcasting in
a market with no trade association. Because the television

industry is so extensively regulated by the federal government, predicting behavior of stations and their trade association also requires achieving this paper's third objective: an understanding of government regulation as it is applied to television broadcasting.

For readers unfamiliar with the television industry, the first part of chapter two of this paper provides a brief history of television, a description of the current system of program distribution, and an introduction to television advertising. The second part of the chapter explains exactly what product television stations sell to advertisers. Advertisers wish to show commercials to television viewers. Thus, television stations sell to advertisers the exposure of viewers to commercials.

The third chapter presents a mathematical model of behavior of a commercial television station competing in a market with no television trade association. A television station acts to maximize profit from sale to advertisers of commercial exposures taking market price of commercial exposures and behavior of other stations as given. A television station uses three inputs to production of commercial exposures. To increase output of commercial exposures, a station can increase number of commercial messages included in a program, change the type of program broadcast, or change program quality. Changes in program type are defined as a costless way to change number of

viewers of a program. An increase in program quality is assumed also to attract viewers, but an increase in program quality increases program cost.

The National Association of Broadcasters is the subject of the fourth chapter. After a history and description of the NAB, the chapter considers objectives of a television trade association. A television trade association wishes to increase profit to existing television stations. An association achieves this objective by lobbying to prevent entry by new commercial television stations and entry by alternatives to commercial broadcast television. A television trade association is unable to control price or output of commercial exposures, and thus increase station profit, so the association seeks to control inputs to production of commercial exposures. Because of the difficulty of measuring and enforcing standards on other inputs to commercial exposures, a trade association can only control number of commercials shown by member stations. To encourage voluntary membership, a television trade association offers valuable products to member stations at prices below what non-members pay and makes association membership known to all stations.

Chapter five uses the mathematical model introduced in chapter three to compare behavior of a competing television station to behavior of a television trade association which can only control number of commercials of member stations.

If a trade association only controls number of commercials, television stations compete with use of the other inputs to commercial exposures. However, under reasonable assumptions, stations do not compete away all potential monopoly profit. Thus, stations gain profit even when a television trade association only controls number of commercials shown by stations. An additional implication of the mathematical model is that a trade association sets different limits on number of commercials when the audience changes, and sets different limits for stations with different program cost.

Predictions about behavior of a television trade association are tested in chapter six. Lobbying efforts by the NAB have delayed introduction of new low power television stations, delayed development of cable television, and are delaying introduction of the various subscription television options. Though not a result of NAB efforts, the table of station assignments produced by the Federal Communications Commission in 1952 allowed fewer commercial television stations in many areas than were technically possible. Provisions of the Television Code of the NAB restrict number of commercials of member stations. Separate restrictions apply to network stations and to independent stations since the two kinds of stations have different program production cost. Separate commercial restrictions for prime-time viewing hours have also been

established in the code. Provisions in the code also prevent stations from secretly evading code commercial restrictions. In the last section of chapter six, regression analysis is used to show that television station profit is higher in markets where a high proportion of stations are members of the code. Such a result is consistent with predictions if stations use code membership to communicate and enforce restrictions on number of commercials shown in local markets.

The ability of the National Association of Broadcasters to increase member station profit depends in large part on regulatory decisions made by the Federal Communications Commission (FCC). The first parts of chapter seven give a history and description of the FCC. The next sections of the chapter introduce a theory of government regulation. The theory asserts regulators act to maximize political support. A regulator like the FCC responds to preferences of each powerful political interest group. Because preferences of interest groups often conflict, regulations will not consistently favor one group. Thus, the NAB cannot rely on consistent favorable regulation from the FCC, though the NAB must use its political power if it hopes to gain any favorable regulation. The theory of regulation helps explain why in 1964 the NAB rejected an FCC proposal to adopt the Television Code as an FCC regulation.

Television stations broadcast television programs to attract viewers. Television stations then sell to advertisers the right to show commercials to viewers of the television programs. Television programs are a pervasive force in American culture, yet these programs are only a byproduct in the market for advertising. Examination of behavior of the National Association of Broadcasters provides an interesting insight into an industry whose most visible activity, program production, is not the product firms in the industry produce.

CHAPTER TWO

COMMERCIAL TELEVISION BROADCASTING

For readers unfamiliar with the television industry, the first two sections of this chapter provide a brief history of television, a description of the current system of program distribution, and an introduction to television advertising. The third section of this chapter shows why television commercial time is not the product advertisers buy and stations sell. Since advertisers buy commercial time to show advertisements to viewers, an advertiser is buying the exposure of viewers to a commercial, not just commercial time. The term commercial exposure is defined as one viewer watching one commercial. Television stations sell commercial exposures to advertisers.

Advertisers are interested both in the number of times each television viewer sees a particular advertisement and the number of viewers of a particular advertisement. As the fourth section of this chapter shows, however, television stations cannot separate advertiser purchases of new and repeat commercial exposures so a station must produce and sell commercial exposures for a single price rather than setting separate prices for each of the two types.

History of Commercial Television

The first full-scale experiments in broadcast television began in 1928 when radio station W2XAD of Schenectady, New York, owned by the General Electric Corporation, began broadcasting television signals on an experimental basis[1] and NBC started operating the experimental television station W2XBS in New York City. Both stations were licensed to conduct these experiments by the Federal Radio Commission.[2]

These first broadcast television experiments followed years of research into the problem of persuading radio signals to form pictures. A radio signal is a stream or continuous line of data and must somehow scan over an area to form a picture. Early experiments used various mechanical devices to create the illusion of a picture. One experimental television screen, developed in the Bell Labs, was simply a grid with twenty-five hundred small light bulbs. A mechanical device lit the bulbs in turn to create a picture. The two 1928 television experiments employed a system developed in 1882 by a German, Paul Nipkow. Nipkow's television had a wheel pierced by a series of spirally

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[1]General Electric used its radio station WGY to transmit sound for the experimental broadcasts. Erik Barnow, A History of Broadcasting in the United States, 3 vols. (New York: The Oxford Press, 1970), vol. 1: A Tower in Babel, p. 231.

[2]U.S., Federal Radio Commission, Third Annual Report (Washington, D.C.: U.S. Government Printing Office, 1929), pp. 55-6.

positioned holes. One revolution of the disc meant one scan of a picture.

Rather than utilizing some mechanical device, signals sent from later experimental television stations were designed for television sets which magnetically aimed a beam of electrons at a screen. The screen was coated with a substance which glowed when struck by the scanning beam of electrons.[3] Modern televisions use this same kind of scanning electron beam and glowing screen to convert a radio signal to a picture.

Though experimental broadcast television began in 1928, no stations were licensed by the newly established Federal Communications Commission to operate commercially until 1941.[4] Not surprisingly, exigencies of the Second World War almost immediately stopped private sale of electronic equipment and prevented growth of commercial television. Post-war development of television was slowed by shortages of equipment and difficulties caused by the initial allocation of channels and stations by the Federal Communications Commission.

By the first years of the 1950s equipment shortages were not a problem and the FCC had sorted out its channel

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[3]For a more complete presentation of the history of television broadcast research see Sydney W. Head, _Broadcasting in America_, 2d ed. (Boston: Houghton Mifflin, 1972), pp. 185-94.

[4]Ibid., p. 192.

allocations. The United States then experienced explosive
growth in the number of television stations and receivers.
The number of stations authorized to broadcast grew from 108
in 1952 to 609 in 1956. In 1981, nearly thirty years later,
the number of stations had increased by only about 240.[5]
By 1956 nearly seventy-three percent of homes were equipped
with television sets. Currently about ninety-eight percent
of homes have television sets.[6]

Commercial Television Stations

Commercial television stations are owned by
individuals, by corporations, or by one of the television
networks.[7] Stations receive income from selling
advertising time on programs they broadcast. In addition,
stations which are affiliated with a network receive payment
from the network for broadcasting network programs.

About seventy percent of stations are affiliated with
one of three major television networks.[8] Each network

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[5]U.S., Federal Communications Commission, 46th Annual
Report: Fiscal Year 1980 (Washington, D.C.: U.S. Government
Printing Office, 1981), p. 91.

[6]Television Digest, Inc., Television Factbook,
no. 48, 2 vols., (Washington, D.C., 1979), vol.1: Services
Volume, p. 108A.

[7]Federal Communications Commission regulations allow
an individual or organization to own a maximum of seven
television stations, no more than five of which may have the
more powerful channels two through thirteen; 47 C.F.R., sec.
73.636.

[8]Broadcasting Publications, Inc., Broadcasting-Cable
Yearbook: 1981 (Washington, D.C., 1981), p. D-24.

transmits programs over a complex system of land lines and microwave relays to affiliated stations. An affiliate may broadcast a network program, refuse a program, or, if permitted by the network, record a program for later broadcast. A program transmitted by a network contains some national advertising which the network has already sold and some blank space into which an affiliate station inserts commercials, announcements, and station identification. Affiliate stations are paid by the network to broadcast network programs. The amount of the fee paid to the station by the network depends on population in the affiliate's area and the program's popularity. Fees paid by networks range from thirty dollars per hour for a less popular program shown by an affiliate with a small audience to three thousand dollars per hour for a popular program shown by an affiliate with a large audience.[9]

Stations affiliated with a network receive about eighty percent of daily programming from the network.[10] Most remaining programs come to network affiliates from syndicators or are produced by the station. Syndicators sell or rent copies of programs on video tape or film for stations to broadcast. The majority of syndicated programs

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[9]Frank Donegan, "How Dare They Dump 'Mork and Mindy' for World War II?" TV Guide, 9 January 1982, p. 13.

[10]Peter M. Sandman, David M. Rubin, and David B. Sachsman, Media: An Introductory Analysis of American Mass Communications (Englewood Cliffs, N.J.: Prentice-Hall, 1972), p. 250.

are old movies or old network series, though some first-run
programs have been syndicated. The series "Mary Hartman,
Mary Hartman" was a pioneer in successful first-run
syndication. Independent stations (so named because they
are not affiliated with a network) obtain the bulk of their
programs from syndicators. Both network and independent
stations produce some programs for themselves. Local news
programs are the most obvious example of station program
production. Stations also produce public affairs programs,
documentaries, children's programs, and special features.

While not a large source of programs, stations receive
public service or promotional programs from various sources
without charge. Government agencies often have public
service material which stations use without charge.
Corporations and service organizations also distribute free
promotional material.

An advertiser wishing to show commercials on a
television station can do so in several ways. The first
method is to buy sponsorship of all or a portion of a
network program. Sponsorship means the advertiser is
allowed to show a certain number of commercials on the
sponsored program and can announce that "this portion of the
program has been brought to you by . . ." or a similar
announcement. An advertiser can also buy a spot
announcement on a network program. A spot announcement is
simply a thirty or sixty second commercial inserted in a

break before, during, or after a program. For a television viewer there is, of course, little difference between a sponsored advertisement and a spot advertisement.

Rather than purchasing commercial time from a network, an advertiser can also purchase commercial time from stations directly or can purchase commercial time through an agent representing a number of stations. Advertisers in local markets typically negotiate directly with the sales department of a station. An advertiser wishing to cover selected regions or cities most often uses an agent representing a number of stations.

Syndicators often distribute programs to stations with some commercials already included. A station uses the program without paying the syndicator and inserts additional commercials. This advertising method, called bartering, has become increasingly popular in recent years.

Finally, a television station sometimes sells an entire program period to a sponsor; the sponsor chooses the program or commercials shown during that period. Religious organizations often purchase entire program periods in which to show their programs.[11]

Prices for the different kinds of advertising offered by television stations vary. Prices for sponsored segments or spot announcements depend largely on how many viewers are expected for a program. Price is typically lower if the

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[11]Donegan, "How Dare They," p. 13.

advertiser makes a long-term commitment or purchases a large number of spot announcements. Price also depends on whether the station has the right to preempt the advertisement. If the station can replace or shorten an advertisement with little notice to the advertiser, the advertiser pays a lower price. Prices for purchasing entire program periods depend on time of day and week and on number of viewers expected.[12]

Sale of Commercial Exposures

When an advertiser purchases commercial time from a television station, the advertiser wants people to see its commercial. An advertiser believes consumers respond to commercial messages in a way that increases advertiser profit. Call one viewer watching one commercial a commercial exposure.[13] The advertiser actually wishes to

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[12]See the monthly publication, Standard Rate and Data Service, Inc., Spot Television Rates and Data.

[13]The definition of commercial exposures used in this paper is different from the definition commonly used in the marketing literature. In marketing, "exposures" is number of times a particular commercial seen by to a person or household. Marketing sometimes uses the term "impressions" in the same way this paper uses exposures. Kathryn Christensen, "Levi takes the art of thwarting truck hijackers to great lengths," Wall Street Journal, 1 April 1981, p. 29. Marketing has terms to describe a number of similar concepts. "Reach" is the share of the target audience which sees a commercial at least once. "Frequency" is the average number of times a commercial is seen by those who see it one or more times. "Gross rating point" is the product of reach and frequency. See Cornelis A. de Kluyver and Moshe M. Givon, "Characteristics of Optimal, Simulated, Spot TV Advertising Schedules," Institute for Research in the Behavioral, Economic, and Management Sciences, Krannert Graduate School of Management, Purdue University, discussion paper no. 755 (February 1981), p. 1. This paper uses the

buy commercial exposures rather than just commercial time from a television station. Unless it results in commercial exposures, a commercial has no value to an advertiser.

There is substantial evidence that advertisers are concerned with commercial exposures. For example, the Television Bureau of Advertisers, a widely recognized market research organization, publishes an annual guide to advertising rates in major market areas.[14] Data are quoted in "price per thousand viewers." Another example of advertiser interest in commercial exposures is advertising contracts between networks and advertisers. These contracts typically contain provision for refunds to advertisers if a particular program does not attract the expected number of viewers.[15]

New and Repeat Commercial Exposures

A new commercial exposure is a commercial viewed by an individual for the first time. A repeat commercial exposure is a commercial viewed for a second or subsequent time by an individual. An advertiser obtains new commercial exposures

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term exposures because it is used by Beales in the paper from which the formal model in the next chapter is derived. Howard Beales, "Television Program Quality and Restrictions on the Number of Commercials," Federal Trade Commission Working Papers, no. 30 (June 1980).

[14]Television Bureau of Advertising, Inc., 11th Annual Spot Television Planning Guide: 1980-81 (New York: Television Bureau of Advertising, n.d.).

[15]"Closed Circuit; Labor Costs," Broadcasting, 27 October 1980, p. 7.

in a particular program period by purchasing commercial time on additional television stations. Additional stations can be in the same city or, for a regional or national advertiser, can be in additional cities. An advertiser obtains repeat commercial exposures during a particular program period by purchasing additional commercial time during that program period. Though an advertiser can increase the number of new and repeat commercial exposures by purchasing commercial time during different program periods, this paper concentrates on decisions by advertisers and television stations during a single program period.

An advertiser purchases the number of new and repeat commercial exposures which maximizes net revenue from the advertising campaign. Considerable advertiser attention is devoted to calculating the "desirable" number of times a commercial should be viewed by each consumer for each kind of product.[16] To an advertiser, new and repeat commercial exposures are inputs to production of consumer advertising response. That is, consumers respond both to new advertisements and to repeat advertisements. Cost minimization implies an advertiser equates marginal rate of substitution of new commercial exposures for repeat commercial exposures to the ratio of prices for the two

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[16]"Desirable" typically means maximizing some measure like reach or gross rating points given a fixed budget. See for example, de Kluyver and Givon, "Optimal Advertising," and R.C. Grass and W.H. Wallace, "Satiation Effects of TV Commercials," Journal of Advertising 9 (September 1971):3-8.

kinds of commercial exposures. Advertiser demand functions for new commercial exposures and for repeat commercial exposures are derived from this cost minimization.

Although advertisers can choose between new and repeat commercial exposures, television stations are unable to sell new and repeat commercial exposures separately. A network affiliate station cannot control advertisements purchased directly from the network. Neither network nor independent stations can control advertisements purchased through spot advertising agents or advertisements on sponsored or bartered programs. Even in selling commercial time to local advertisers, a station's ability to charge different prices for new and repeat commercial exposures is restricted because of competition from other local stations. If it operates in a competitive market for commercial exposures, a television station takes price of commercial exposures as given and acts to maximize station profit. Market price of commercial exposures is a decreasing function of both total number of new commercial exposures and total number of repeat commercial exposures offered in the market.[17]

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[17]Any relationship between type of program and product preferences of viewers is of interest to an advertiser also. If men who like to drink beer tend to watch football, it is easy to guess which advertisers sponsor football games. Intensity of response by viewers is also important to an advertiser. Some viewers may respond to advertisements by purchasing more of an advertised product than other viewers. This response is of special interest to advertisers if responsive viewers have particular program preferences. Thus some commercial exposures may be worth more to a station than other exposures. As is shown later,

Summary

In addition to an overview of the history and current operation of television broadcasting, this chapter explains two important characteristics of the market in which television stations operate. First, the product produced and sold by television stations is commercial exposures. Commercial time on a program is of no value to an advertiser unless someone is watching a program and is exposed to the commercial. Second, though advertisers choose a mix of new and repeat commercial to maximize the value of the advertising campaign, television stations are unable to sell new and repeat commercial exposures separately. Market price of commercial exposures is thus some function of new and repeat commercials produced. The next chapter shows how commercial exposures are produced by a television station and presents a formal model of station profit maximization.

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differences in the value of commercial exposures are easily accounted for.

CHAPTER THREE

COMPETITIVE BROADCASTING MODEL

To understand behavior of a television trade association it is necessary to understand behavior of a television station competing in a market without a trade association. The objective of this chapter is to present a mathematical model of behavior of a competing television station. In chapter five, the model of a competing television station presented here will be compared to a model of a television trade association.

A television station seeks to maximize profit from production and sale of commercial exposures. The first four sections of this chapter explain the inputs used by a station to produce commercial exposures. The fifth section of this chapter presents a mathematical model of station profit maximization from production and sale of commercial exposures using these three inputs.

Inputs to Production of Commercial Exposures

A television station can increase the number of commercial exposures it produces during a program by increasing the number of commercials shown during the program or by acting to increase the number of viewers of its program. The number of viewers of a program is

influenced both by actions which change the characteristics of the given program and by actions which change characteristics of programs offered by that station at other times of the day. Characteristics of other programs offered by the station affect a given program's audience in part because viewers tend not to change channels during daytime or evening blocks of time.' Audience size for a station's program is also affected by programs offered by other stations.

Each station must consider the effect on its audience of a whole set of programs during the day. However, this complication does not change the nature of the three kinds of actions a station takes to alter the number of commercial exposures produced during a particular program. First, of course, a station chooses the number of commercials it wishes to broadcast. Second, a station takes actions which increase the number of viewers but also increase program cost. Third, a station takes actions which change the number of viewers but do not affect program cost. For this paper, costly actions which alter the number of viewers are called program quality and costless actions which alter the number of viewers are called program type.[2]

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[1] Bruce M. Owen, Jack H. Beebe, and Willard G. Manning, Jr., Television Economics (Lexington, Mass.: D.C. Heath and Co., 1974), p. 18.

[2] These actions may do more than increase the number of viewers of a program. These actions may also increase the motivation of each viewer to purchase advertised

Thus, there are three inputs to production of commercial exposures, three decision variables which affect output: number of commercials, program quality, and program type. Under competition, a station chooses amounts of these three inputs to maximize profit from sale of commercial exposures given market price of commercial exposures, audience characteristics, and programs produced by other stations. The next three sections of this paper consider each input to production of commercial exposures in detail.

Inputs to Commercial Exposures--Number of Commercials

Ceteris paribus, one more commercial increases the number of commercial exposures by the number of viewers. If commercials have no cost, station profit increases by the number of viewers multiplied by the price of each commercial exposure.

For this model the direct cost of a commercial is assumed to be independent of the number of commercials broadcast. Typically, a television station receives tapes of commercials from advertisers, or commercials are included with program material received by a station. In either case, a station is not involved in producing commercials. The only out-of-pocket expense to a station of a commercial is the cost of negotiating with a local advertiser and the

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products, thus making each viewer more valuable to advertisers and to the station. However, increasing the value of each viewer is equivalent to increasing the number of viewers.

cost of broadcasting the commercial. It is reasonable to assume negotiating cost is independent of the number of commercials broadcast since negotiation cost largely represents the overhead expense of maintaining a sales staff. The cost of broadcasting a commercial is also assumed to be independent of the number of commercials. Since a station broadcasts program material if the station is not broadcasting commercials, the only cost of an additional commercial is the cost of switching one videotape for another. There is no additional cost at all for commercials included with program material received by the station.

There is, however, an opportunity cost to each commercial. A commercial takes up broadcast time which can be used for the regular programs which attract an audience. When there is less program material, fewer people watch the program. It is of course possible that additional commercials attract viewers over some range. However, to maximize profit the station adds commercials until the positive marginal effect on number of commercial exposures is equated to what must be a negative marginal effect on number of viewers. Thus, commercials are available to the station with no out-of-pocket cost, but the station operates where the opportunity cost of an additional commercial is a reduction in audience size.

Inputs to Commercial Exposures--Program Quality

Program quality represents all actions a station takes which increase the number of viewers and increase production cost. A station can increase its signal strength or make equipment changes for example, both of which increase the number of viewers and increase program cost. A station can also spend resources to make the program itself more desirable to viewers. In this sense quality is some aspect of a program which all viewers can judge and all viewers consider valuable. Program quality can be·some characteristic of acting, writing, or editing or perhaps clarity of sound and picture. For example, a program which includes celebrities has higher quality than a similar program without celebrities. A "celebrity" version of a game show or a celebrity sporting event is an example of a program which is more attractive to viewers, and more costly to produce, but is not a different type of program than the the non-celebrity version.

This paper defines program quality as any costly action a station takes which increases the number of viewers. This definition has at least two advantages. First, the definition is operationally useful since data on tower height and power output, for example, are readily available. Second, the definition used here conforms to the notion that actions of individual consumers are the appropriate measure of a product's value to those consumers.

If consumers value a program, they watch it. If program quality improves, more people watch the program.

Inputs to Commercial Exposures--Program Type

In this paper, aspects of a program which do not affect production cost but do change the number of viewers are called program type. A station takes two kinds of actions to change program type. First a station chooses the geographic location of its transmitter, clearly influencing the number of potential viewers. It is costly to move a transmitter once built, but initial construction cost is largely independent of location. Geographic distribution of viewers and location of other stations influence a station's decision about transmitter location. If other stations locate near a population center, a station locating near that center only attracts a share of the audience in the population center. By moving away from the population center, the station gives up some of that share but gains new viewers in areas which could not previously receive a clear signal. To maximize potential audience, a station places its transmitter where the marginal loss of viewers by moving away from the population center is equal to the marginal gain of previously neglected viewers.

A second action a station can take to increase number of viewers without changing production cost is to alter the mix of characteristics which make up a program. A station can produce a western or a contemporary crime drama using

the same production resources. Since a virtually infinite
variety of characteristics constitute a particular program,
a station can make a wide variety of changes in a program
without changing program cost.[3] The process of choosing
the desirable mix of program characteristics is virtually
identical to the process of choosing transmitter location.
In choosing program characteristics, however, viewer
preferences are distributed in characteristics space rather
than viewers being distributed in geographic space. A
station chooses program location in characteristics space
given viewer preferences and characteristics of programs of
other stations. If it changes its program, a station gains
viewers who chose not to watch its previous type of program
and the station loses viewers who choose not to watch its
new program. To maximize audience, the station shows the
type of program which equates marginal gain and marginal
loss of viewers from changing the program type.[4]

Single Station Mathematical Model

In order to confirm that a television trade
association can increase member profit by controlling some
inputs to production of commercial exposures, it is

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[3]Though stations actually produce few of their own
programs, they shop from sources which provide a variety of
alternatives.

[4]Elements of both the spacial location and product
selection literature are used here. They share common
origin in Harold Hotelling, "Stability in Competition,"
Economic Journal 34 (March 1929):41.

necessary to compare trade association decisions to decisions by stations competing in a market with no trade association. This section presents a mathematical model of television station profit maximization which will later be compared to a trade association profit maximization model.

A television station takes distribution of viewer preferences, viewer response to programs, programs of other stations, and price of commercial exposures as given and chooses program type, program quality, and number of commercials for a given program to maximize profit from sale of commercial exposures.[5]

Formally the station maximizes:

(1) $R = pnA(n,q,v,w,r) - C(q,s)$

with respect to n, q, and v

Where   R = station profit
        p = price per commercial exposure
        n = number of commercials shown by
          the station
        A = size of audience for the station's program
        q = program quality
        v = program type
        w = program type of adjacent station
        r = shift parameter for audience size
        C = program cost of quality
        s = shift parameter for program cost

The model assumes:

$\delta A/\delta q > 0$

$\delta A/\delta n < 0$ in relevant range, see first
          order conditions

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[5]The source for essential elements of this mathematical model is Beales, "Program Quality."

Price per commercial exposure is not observed in the market. Price per commercial exposure is derived from price paid for advertising time on a program divided by number of viewers of that program. A commercial is some fixed time period devoted to advertising. Program quality is some costly aspect of a program which increases number of viewers. Changes in program type v represent movements from left to right along a spectrum of possible program types. As units of measure for v increase, density of viewers on the spectrum is assumed also to increase. Movement is assumed to be up the left tail of a distribution of viewer preferences. Though viewer density increases for higher values of v, the number of viewers of program v does not always increase for higher values of v. Whether number of viewers of program v increases depends on location of nearby stations and reaction of viewers to changes in the program.

The shift parameter r increases audience at each point on the distribution by a constant percentage. Shift parameter s increases marginal cost of each unit of quality by some constant.

Signs for derivatives of the A and C functions are clear. If quality goes up so does number of viewers, this being the definition of quality. An increase in number of commercials can increase or decrease number of viewers, though first order conditions show that a station operates where additional commercials reduce number of viewers. As

quality increases, cost increases, again by the definition of quality.

First order conditions for profit maximization are:[a]

(2) $R_n = npA_n + pA = 0$

(3) $R_q = npA_q - C_q = 0$

(4) $R_v = npA_v = 0$

The first term in each condition represents change in revenue produced by a change in number of viewers. The term measures change in number of commercial exposures (number of commercials n multiplied by change in number of viewers (A_n, A_q, or A_v) multiplied by price of commercial exposures p.

Equation (2) shows that the station equates revenue from an additional commercial (first term) with marginal cost of a commercial (second term). Marginal cost of a commercial is number of commercials n multiplied by price of commercial exposures p multiplied by the change in viewers because of an additional commercial A_n. This derivative A_n must be negative for the equality to hold. Thus an interior solution requires the station to operate where an additional commercial reduces audience size: $A_n < 0$.

In equation (3), the first term is additional revenue produced by an increase in quality. Marginal revenue must be equated with marginal cost of quality (second term).

Equation (4) shows that the station chooses program type where marginal revenue from a change in program type is

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[a]Subscripts denote partial derivatives.

zero. Specifically, the station chooses a program which maximizes audience size by operating where the marginal change in audience size because of a change in program type is equal to zero. Dividing both sides of equation (4) by np, we see that the station chooses program type to maximize audience size. Choosing program type to maximize audience is a costless way to increase station profit.

If one station is located at the mean of the distribution of viewers, the other two stations locate their programs at symmetric points on the tails. Since stations on the tails face the same conditions, they act identically. The station at the mean cannot gain by making any change in program type. Thus a competitive market is described by the actions of one of the stations on the tails of the distribution.

CHAPTER FOUR

A BROADCAST TELEVISION TRADE ASSOCIATION

A television trade association like the National Association of Broadcasters (NAB) would not exist unless it made member stations better off. The objective of this chapter is to show what a television trade association does to make member stations better off. For readers unfamiliar with the NAB, the first section of this chapter provides a brief history and description of the NAB. The specific objectives of a television trade association like the NAB are defined in the second section. In particular, the association is assumed to seek television industry profit maximization by lobbying to prevent entry and by controlling price of commercial exposures. The third section of this chapter considers in more detail the desire by an association to restrict entry both by alternatives to broadcast commercial television and by new commercial stations.

The fourth section of this chapter shows why a television trade association cannot control price or output of commercial exposures and thus why the association must try to control inputs to production of commercial exposures. The next three sections of this chapter consider in turn

trade association control of each of the three inputs to production of commercial exposures. These sections show that the difficulty of measurement make association control of program type and program quality unlikely. By contrast, the relative ease of measurement makes number of commercials a likely object of association control.

The last section of this chapter considers tools available to a television trade association to encourage station membership. Since outright coercion is impossible, the association offers member stations valuable services at prices below what non-members pay. Behavior of members is monitored and cheaters and non-members are revealed to all stations, thus encouraging station participation.

The National Association of Broadcasters

Before the Federal Communications Commission was born, even before the first television station was built, the National Association of Broadcasters was a veteran lobby in Washington. In fact, when the first commercial television stations were licensed, the NAB was a mature eighteen years old. The National Association of Broadcasters was organized in 1923 to oppose efforts by the American Society of Composers, Authors, and Publishers (ASCAP) to obtain royalty fees for composers and musicians whose music was played on radio programs. ASCAP had been pressuring individual radio stations to enter into music licensing agreements with ASCAP. Broadcasters hoped a trade association could present

a united front to oppose ASCAP in its negotiations with stations.[1]

Very few years passed after it was organized before the NAB began enforcing standards of behavior for members. The first NAB Code of Ethics was ratified in 1929.[2] Television stations were admitted to the NAB from the start of commercial television broadcasting. A separate code of behavior for television stations became effective in 1952.[3]

The National Association of Broadcasters continues to serve both television and radio stations. The NAB is directed by a Joint Board of Directors formed from the Radio Board of Directors and the Television Board of Directors.[4] Day to day operation of the NAB is supervised by the NAB President. The NAB President is elected by the Board of Directors of the NAB. The President oversees various activities designed to assist member stations including engineering and legal services, broadcast research, a news bureau, a library, and a variety of publications. The

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[1]These first NAB efforts were somewhat successful, though radio stations did eventually agree to pay royalties to ASCAP. See Barnow, History, vol. 1: Tower in Babel, pp. 120-1.

[2]National Association of Broadcasters, NAB Code of Ethics and NAB Standards of Commercial Practice (25 March 1929).

[3]National Association of Radio and Television Broadcasters, The Television Code (1 March 1952).

[4]National Association of Broadcasters, Organizational Chart (11 December 1979, rev. 30 June 1980).

President administers an annual NAB budget of seven million
dollars funded by membership fees, sales of publications,
and attendance fees from NAB conventions and seminars.[5]
About ten percent of the NAB budget supports lobbying before
the FCC and Congress.[6]

The National Association of Broadcasters has
established codes of behavior for television and radio
stations which are enforced through two Code Boards and a
combined Code Authority.[7] The Television Code Board
administers the Television Code and the Radio Code board
administers the Radio Code. Each Code Board updates its
code and makes decisions when its code needs
interpretation.[8] A senior vice-president and a general
manager of the Code Authority enforce the two codes through
offices in Washington, D.C., New York, and Hollywood.[9] The
Code Authority monitors programs of member stations to
ensure compliance with the codes and checks commercials,

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[5]"High cost of holding off spectrum expansion push
NAB into budgetary red," Broadcasting, 2 February 1981,
p. 27.

[6]"A time for fine tuning within NAB," Broadcasting,
28 January 1980, p. 30.

[7]National Association of Broadcasters, Bylaws
(effective 30 June 1981), art. VI, sec. 8C(4).

[8]Interpretations of the codes are published through
the National Association of Broadcasters, Code Authority,
Code News.

[9]National Association of Broadcasters, Organizational
Chart.

particularly commercials for children's toys, for compliance with code standards.

Objectives of a Broadcast Television Trade Association

This paper assumes the objective of a television trade association is to increase the sum of industry profit, where all current commercial broadcasters are members of the industry. To attain this objective the association applies the combined political power of member stations to influence government agencies. The association seeks to restrict entry of new television stations and entry of competing sources of commercial exposures. The association also wants to control output, and thus price, of commercial exposures by commercial television stations.

Lobbying before Congress, before the Federal Communications Commission, and before other government agencies is an activity which increases station profit but which involves an external effect produced by each station. If a station spends money on lobbying, all stations may benefit. If a station chooses not to spend money on lobbying, all stations lose those lobbying services. When it purchases lobbying services, a station ignores this external effect on other stations.[10] All stations gain if their trade association can persuade each station to support

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[10]This particular external effect can also be described as the free rider problem of producing public goods. For an early treatment see Paul A. Samuelson, "Pure

commercial television lobbying. The next several sections
of this chapter consider in detail goals of industry
lobbying, other actions a television trade association takes
to increase member station profit, and methods an
association uses to encourage station support of industry
lobbying and support of those other association activities.

Entry Restrictions

Entry to the television industry takes two forms:
entry by new commercial television stations and entry by
alternatives to commercial broadcast television.
Alternatives to commercial broadcast television mainly
include the various cable and pay television systems. The
pay and cable systems reduce revenue to existing broadcast
stations by reducing the number of viewers of each broadcast
station. Cable and pay systems also can reduce station
revenue by producing additional commercial exposures, thus
reducing market price of commercial exposures. A television
trade association will oppose entry by alternatives to
commercial broadcast television.

When existing firms in an industry with no restriction
on entry manage to earn profit, new firms enter the
industry. Production by new firms reduces price and profit
to all firms. Firms continue to enter the industry until an
entering firm earns no profit. However, entry will not

Theory of Public Expenditures," Review of Economics and
Statistics 36 (November 1954):3.

eliminate all profit to those existing firms which have
lower production cost than entering firms. Existing firms
would like to prevent entry in this kind of market since
doing so assures continued profit. If all entry cannot be
prevented, existing firms with low production cost wish to
prevent entry by any new firms which also have low
production cost.

New firms may both have higher cost and choose lower
output than existing firms.[11] If new firms have a small
output relative to existing firms, existing firms need pay
even less attention to the threat of entry. Low-output
firms become a tiny fringe of producers which existing major
firms ignore when making decisions.[12]

To increase profit to existing stations, a television
trade association wishes to restrict entry of new stations.
As the remainder of this section shows, however, cost of
producing a television signal increases as the channel
number increases. In particular, the cost of producing a
signal with a channel in the UHF frequency range (channels
greater than number thirteen) is dramatically greater than

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[11]High cost and low output are not unrelated of
course. A firm likely chooses a low output because of high
cost of production.

[12]The role of the costly fringe is discussed in F.M.
Scherer, Industrial Market Structure and Economic
Performance, 2d ed. (Chicago: Rand McNally, 1980), p. 200.
Another strategy for existing firms is limit pricing. Price
is set high enough to earn some profit for existing firms
but low enough to prevent entry, ibid., pp. 233-52.
Implications of the theory here are not affected.

the cost of producing a signal with a channel in the VHF frequency range (channels two through thirteen). Thus, if it cannot prevent all entry, a television trade association wishes at least to prevent entry by those stations with channels in the VHF frequency range. Preventing entry by stations with VHF channels at least assures profit to those existing stations with VHF channels.

Because of the nature of signal propagation, a television station with a higher channel number has higher cost of production. Cost is dramatically higher for stations with UHF channels. Higher numbered channels have higher frequencies and higher frequencies are more prone to interference from terrain features, buildings, trees, weather, et cetera. In an experiment in New York conducted by the FCC, effective transmission range of three stations was compared.[13] In order to get approximately the same range, channel two used 41 kilowatts (kw) of radiated power, channel seven used 110 kw, and channel thirty-one used nearly 900 kw.[14] Even with 900 kw, channel thirty-one could not produce as clear a signal as the other two stations.

Not only must higher numbered channels use more power to produce the same signal than lower numbered channels,

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[13]Range is measured by distance from the transmitter which can still receive a signal of a certain intensity.

[14]U.S., Federal Communications Communications Commission, UHF Comparability Task Force, Office of Plans and Policy, Comparability for UHF Television: Final Report (Washington, D.C., September 1980), p. 18.

higher numbered channels must use equipment which is more expensive, uses power less efficiently, and which wears out sooner than equipment used by lower numbered channels. The FCC estimates the present discounted cost for a station with a low VHF channel (channels 2-6) over a 15 year life to be about $900,000. The present discounted cost for a station with a UHF channel using the maximum allowable power output is $4.8 million.[15]

Because the first stations in an area use the low numbered channels, new entrants must apply for higher numbered channels. The cost of operation for these entrants is higher than for existing stations. Thus, even if entry is not prevented, a trade association can protect some member profit when the association increases price of commercial exposures, since all profit of existing stations is not dissipated by entry of new stations with higher numbered channels.

Control of Price and Output

A television trade association wants to help stations coordinate their activities in the same way a multiplant monopoly coordinates activities of its plants. To increase profit, a multiplant monopoly controls output (and thus price) of products of its plants. If it is unable to control output, a monopolist controls inputs to products of

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[15]Ibid., p. 133.

its plants. Likewise, a television trade association wishes stations to coordinate output (and thus control price) of commercial exposures. If stations are unable to coordinate output, the trade association seeks to have stations control inputs to production of commercial exposures.

In standard economic analysis[16] a cartel or multi-plant monopoly controls product price, or controls output quotas, or controls both. However, a television trade association faces serious difficulty if it tries to control price or output of commercial exposures even setting aside the potential for anti-trust violations. First of all, price of commercial exposures is not observed in the market. Market transactions are for commercial messages. Price of commercial exposures is derived from prices of commercial messages, number of commercials, and number of viewers of a program. Calculating price of commercial exposures requires detailed and accurate measurement of advertising transactions and audience viewing habits. Such measurements are costly and difficult.

Even if price of commercial exposures is controlled successfully, a television trade association is not earning for its members all potential monopoly profit. A television trade association also helps stations if it controls program types produced by stations. When a station changes its

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[16]Jack Hirshleifer, Price Theory and Applications (Englewood Cliffs, N.J.: Prentice-Hall, 1976), pp. 296-300, 396-9.

program to increase the number of its viewers, some of the
viewers the station gains are attracted from programs of
other stations. Price controls do not alter this external
effect and the potential profit to stations by internalizing
it.

If it tries to control output of commercial exposures,
a television trade association faces the same problems as if
it tries to control price. Commercial exposures are not
traded explicitly, so quantity must be derived from number
of viewers and number of commercials, a costly process.
Finally, even with output restrictions, a television trade
association still foregoes potential gains from controlling
program types of member stations.

A television trade association can make stations
better off by controlling either price or quantity of
commercial exposures but is unable to do so because of the
complexity of any standards and difficulty in measuring
output.

An alternate method of restricting output of
commercial exposures is to control all inputs to production
of commercial exposures. If inputs are properly controlled,
a television trade association earns for its members the
same profit as if output is controlled plus it gains profit
from controlling program type not captured when output is
controlled. The next sections of this chapter consider in
turn trade association control of each input to production

of commercial exposures: program type, program quality, and number of commercials.

Input Controls--Program Type

Exactly how can a television trade association gain by controlling program type? Consider a station's decision about where to put its transmitting facilities. A station places its tower to maximize its own audience.[17] As it moves toward the area in the market which has greatest viewer density, a station gives up viewers in fringe areas and gains some share of viewers of stations which have transmitters located in the area with high viewer density. A television trade association increases the total number of viewers of all stations by internalizing the effect one station's location has on the audience of other stations. The trade association wishes to increase total audience by spreading broadcast facilities over a larger area than competing stations would choose. Station production cost is not affected by using a wider distribution of transmitters, so industry profit increases.

By the same reasoning, a television trade association can increase total audience size without increasing station production cost by altering the types of programs stations produce. A television trade association wishes members to

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[17]The station actually maximizes profit. However as a consequence of profit maximization the station maximizes audience given choices of other inputs.

produce programs that appeal to a wider range of viewer types than the range of viewer types which would be served by competing stations. A set of programs which appeals to a wider distribution of viewers means more total viewers to stations in an area and no increase in production cost. Industry profit increases.

Several factors combine to make trade association control of program type unlikely, however. The first obstacle to effective control of program type is the fact that there are so many characteristics which constitute a program and which would have to be controlled by the association. Even trying to describe all dimensions of a program is difficult. A second and related difficulty in controlling program type is the problem of measuring and enforcing standards on any particular program characteristic. While most observers will agree that violence is one characteristic of a program, none will likely agree on an appropriate measure of violence in a television program or be able to determine an industry profit maximizing standard for violence for a variety of different television programs. As a further complication, desired choice of program characteristics likely changes when audience characteristics change during different times of day, week, or year. If desired values for program characteristics change when the audience changes, any

standards are that much more difficult to determine and administer.

Perhaps the most compelling reason why a television trade association is unable to enforce standards on program type is because some stations are made worse off by conforming to association standards. If it is made worse off by joining the association, a station will not join. A television trade association wishes members to alter program type by increasing geographic dispersion of transmitters or by changing program characteristics to appeal to more diverse audience groups than stations would choose under competition. If some stations move their transmitters away from population centers, stations that stay near the center of viewer distributions gain viewers. The total number of viewers of all stations increases. However, stations which move away from population centers lose viewers and are worse off because of the television trade association agreement. Under such circumstances, it is unlikely a television trade association could persuade stations to move their transmitters. Likewise, those stations which are asked by the association to produce programs which appeal to fringe viewer groups lose viewers, though the total number of viewers of all stations increases. A station is unwilling

to give up viewers and profit to make the industry better off.[18]

The problem of persuading a station to alter program type would disappear if a government agency like the Federal Communications Commission adopted the distribution of transmitter locations and the distribution of program characteristics favored by a television trade association. The FCC does have legal authority to decide where station transmitters are located. Enforcement of program characteristics would be no less difficult for the FCC than for a television trade association, however, and, as later discussion shows, the FCC has a different objective than to make enforcement decisions solely to please a television trade association. The FCC is inclined to choose different inputs to production of commercial exposures than a television trade association. Nevertheless, the goal of association lobbying before the FCC will be to encourage a wider distribution of station transmitter locations and program characteristics than would occur under competition, though the association may not support all FCC decisions which also imply a wider distribution of stations.

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[18]If some means is found for those stations which lose viewers because of transmitter relocation to receive side payments from stations which gain viewers, the problem of persuading stations to change is greatly reduced. However, no such scheme occurs in the television industry today, in part because of the potential for prosecution by anti-trust authorities.

Input Controls--Program Quality

Program quality is all actions a station takes which increase both number of viewers and program cost. When it increases program quality, a station gains some viewers who previously did not watch any program and gains some viewers of programs produced by other stations. Because of an increase in quality, the number of commercial exposures produced also increases, so price of commercial exposures faced by all stations falls. Under competition, a station equates the value of the marginal gain in its own audience with the marginal cost of program quality. A station ignores reductions in audience for programs produced by other stations and ignores the effect its actions have on price of commercial exposures faced by other stations. A television trade association can make all stations better off by controlling program quality. Each station is required to equate its marginal gain in audience with its marginal cost of quality and the marginal loss of audience for other stations. The effect of an increase in quality on the number and price of commercial exposures is also considered by the association. A television trade association chooses lower program quality than competing stations would choose.

While all stations gain if program quality is controlled by a television trade association, the difficulty of measuring and enforcing quality standards makes program

quality an unlikely object of association control. Some
aspects of program quality can be measured. Costly
transmission equipment and station power output can be
monitored. Signal clarity is also measurable to some
degree. It is possible, though difficult, to measure
program expenditures and compare them to some desired
benchmark. If novelty is valuable to viewers, the number of
program reruns is an inverse measure of program quality.[19]
Unfortunately, most of the myriad of other aspects of
television quality are not readily measurable, so
association control is unlikely. The difficulty of
measuring quality is similar to the difficulty of measuring
program type. Observers likely agree that costume design is
an aspect of program quality. However, determining an
appropriate measure of costume quality is difficult, and
enforcing a standard on costume quality is impossible. In
addition, like program type, the desired amount of quality
changes as the audience changes, requiring even more
complicated standards.

Input Controls--Number of Commercials

A television station maximizes profit by showing the
number of commercials which equates marginal revenue of an
additional commercial with marginal loss in audience due to
the reduction in program material because of the commercial.

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[19]Owen et al., Television Economics, p. 107.

Competing stations ignore the effect an additional commercial has on the price of commercial exposures faced by all stations. An increase in number of commercials increases number of commercial exposures and decreases price of commercial exposures. When it shows more commercials, a station makes all other stations worse off because price of commercial exposures falls. A television trade association includes this effect in its decision about the number of commercials each member sells. The association requires each station to sell fewer commercials than competing stations would choose to sell.

Of the three inputs to production of commercial exposures, number of commercials is by far the most likely candidate for control by a television trade association. Commercial messages are an easily measured input to production of commercial exposures. The trade association need only watch programs and count commercials. In fact, the association need only monitor a sample of programs and perhaps give special treatment to stations about which other stations have complained. In addition, when changes in viewer characteristics mean a change in desired inputs, commercial standards are relatively easy for a television trade association to modify. A trade association chooses to add a separate commercial standard for a different time of day, week, or year depending on the cost and benefit of doing so. Given difficulties in measuring and setting

standards for price, output, and other inputs to commercial exposures, a television trade association is likely to try to control number of commercial messages of member stations.

Encouraging Station Participation

The previous sections of this chapter show how a television trade association can make its members better off by controlling each of the three inputs to production of commercial exposures. The difficulty of measuring and controlling program type and program quality mean these two inputs are unlikely candidates for trade association enforcement. By contrast, the relative ease of measuring number of commercials makes it a likely candidate for association enforcement. Though it is an easy input to measure, number of commercials shares with the other two inputs to commercial exposures the problem of encouraging stations to become association members and comply with association standards.

If most stations comply with association standards, those stations which do not comply earn higher profit than those who do comply. For example, if most stations join the television trade association and reduce the number of commercials shown, the price of commercial exposures rises for both member and non-member stations. Stations which do not reduce number of commercials earn more profit than stations which reduce number of commercials. Thus, a station is inclined to reject trade association membership

in hopes of exploiting membership by other stations.
Similarly, a member station of the association is tempted to
secretly cheat on association standards in an effort to
increase the station's own profit. A television trade
association must both encourage membership and overcome the
temptation by members to cheat on association standards.

Although a television trade association cannot legally
force stations to become association members, the
association has more tools than simple good will to
encourage station membership. Offering valuable services
only to association members at prices lower than non-members
must pay is one way a television trade association
encourages stations to become members. Olson[20] uses state
farm bureaus as an example of an industry trade association
which encourages membership by offering low-cost services to
members only. The association is able to offer these
services at a price lower than the prevailing market price
of the services because the association has lower production
cost. Prices to members are set enough above association
cost to cover the cost of association activities for which
fees are not or cannot be charged. Higher fees charged to
non-members also help support association activities.

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[20]Mancur Olson, Jr., The Logic of Collective Action:
Public Goods and the Theory of Groups (Cambridge, Mass.:
Harvard University Press, 1965), pp. 145, 153-5. The
association produces services at lower cost than other
producers because of economies of scale or because the
association has access to unique sources of information or
expertise.

Controlling inputs to production of commercial exposures is one objective of a broadcast trade association. To control inputs to exposures, the association must deal with the temptation by stations to evade association standards or to ignore association standards by choosing not to join the association. Another tool to encourage stations to comply with trade association standards is to disclose membership (and non-membership) in the association to all stations. A station is more likely to become a member and remain a member of the association if membership is common knowledge among all stations. A station cannot secretly reject association membership if membership is not secret. To prevent secret cheating by member stations, a broadcast trade association monitors station behavior and makes public any violation of association standards. All stations know which stations cheat.

The problem of encouraging stations to support a broadcast trade association is complicated somewhat by differences between activities in which the association wishes members to engage. The association wishes stations to restrict inputs to commercial exposures and to support industry lobbying. Each of these two activities has different enforcement characteristics. For example, a station which becomes an association member and then cheats on input restrictions requires a much different response from the association than a station which simply chooses not

to support association industry lobbying. Strict
requirements for inputs to exposures should not discourage
stations from supporting association lobbying. A simple
solution to the problem of having two sets of trade
association activities is to have two separate trade
associations, or two divisions within one association. One
division of the association deals with controlling inputs to
production of commercial exposures, the other division deals
with encouraging stations to support industry lobbying.
Stations are free to join either or both of the divisions,
though all stations gain profit if each station joins both.

Summary--Implications

A television trade association seeks to increase
profit to existing stations. A television trade association
achieves this objective by lobbying before government
agencies to restrict entry of alternatives to broadcast
commercial television like the various pay and cable viewing
systems. The association also lobbies to restrict entry of
new television stations. Because stations with channels in
the VHF range have significantly lower cost, restricting
entry by stations with VHF channels is of particular
importance to the association.

A television trade association wishes to restrict
output and increase price of commercial exposures. Because
of the difficulty of measurement, a television trade
association cannot directly control price or output of

commercial exposures nor can an association control two of the inputs to production of commercial exposures: program type and program quality. The only practical target for association control is the number of commercials shown during a program period. Number of commercials is relatively easy to measure and standards on number of commercials can be changed with relative ease.

Since a television trade association cannot legally coerce a station to overcome its inclination not to join the association, the association offers valuable products to members at prices below those paid by non-members to induce stations to join. To encourage membership, the association also makes membership lists known to all stations. To discourage cheating on standards, the association monitors and reports member behavior. The association may use separate organizations to enforce the two association functions: lobbying and control of inputs to production of commercial exposures.

CHAPTER FIVE

FORMAL TELEVISION TRADE ASSOCIATION MODEL

This short chapter uses the mathematical model introduced in chapter three to confirm that a television trade association which is only able to control number of commercials can still increase station profit. Each station takes its assigned number of commercials as given and chooses other inputs to maximize its own profit. As the model shows, however, use by stations of uncontrolled inputs does not dissipate all profit.

The model assumes a television trade association that only controls number of commercials of member stations still tries to maximize total member profit. Member stations compete in use of uncontrolled inputs to production of commercial exposures. A television trade association sets a standard for number of commercials. Each station takes the standard and maximizes individual profit by choosing values for the other two inputs. Competition between stations results in market equilibrium price and quantity of commercial exposures and market equilibrium inputs to production of commercial exposures.

For simplicity, the model considers a market area with only three television stations. The program of one station

is located at the mean of a symmetric distribution of viewers on the spectrum of possible program types. Programs of the other two stations are located on each tail the distribution. The station on one tail is mimicked by a station on the other tail of the distribution. Since the station at the mean of the distribution cannot gain by changing its program, and because of the symmetric location of programs on the tails, the model need only consider the program type produced by the station on one tail. Because of the symmetric behavior of the stations on the tails, the model need only consider program quality produced by the station at the mean and by one of the stations on the tails. Call the station at the mean station w and the station on one tail station v. The letters w and v are also used to represent program types produced by the respective stations.

The trade association picks number of commercials for each station n^v, n^w. Each station takes number of commercials and price of commercial exposures as given and maximizes profit. Station v chooses program type v and program quality Q^v. Station w need only choose program quality Q^w since no change in program type w would increase its audience.

Station profit maximization given number of commercials thus creates three implicit functions which the trade association uses to increase the sum of station profit. In each function, the independent variable is

number of commercials selected by the television trade association. The dependent variable for the first function is program quality of station v: $Q^V = Q^V(n^V)$. For the second function the dependent variable is program type for station v: $V = V(n^V)$. The third function's dependent variable is program quality for station w: $Q^W = Q^W(n^W)$.[1]

A television trade association includes these implicit functional relationships in its maximization decision. A television trade association maximizes profit from sale of commercial exposures by the two stations, but can only directly control number of commercials of stations. Each input which the television trade association does not control is replaced by a function giving the equilibrium value for the input given that individual stations compete in using the input. Formally, a television trade association maximizes:

(5) $R = pn^V A^V + pn^W A^W - C^V - C^W$ w.r.t. n^V and n^W

Where:

(6) $A^V = A^V(n^V, Q^V, v)$ $A^W = A^W(n^W, Q^W, v)$

(7) $C^V = C^V(Q^V)$ $C^W = C^W(Q^W)$

(8) $Q^V = Q^V(n^V)$ $Q^W = Q^W(n^W)$

(9) $V = V(n^V)$

(10) $p = P(E) = P(n^V A^V + n^W A^W)$

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[1] Remember a third station exists on the tail of the distribution of viewers types opposite station v. This opposite station responds in a symmetric manner to station v.

R = television trade association total profit
p = market price, function of commercial exposures
E = total market commercial exposures
v = program of and station on tail
w = station at mean of distribution

n^v_v, n^w_w = number of commercials of v and w
Q^v_v, Q^w_w = program quality of v and w
A^v_v, A^w_w = number of viewers of v and w
C^v, C^w = program cost of quality for v and w

ε = own price elasticity of demand for
commercial exposures: $\varepsilon < 0$

First order conditions for television trade
association profit maximization are:

$$(11)\quad \frac{\delta R_v}{\delta n} = p(1 + 1/\varepsilon)(A^V + n^V A^V_n)$$

$$+ \frac{\delta Q^v_v}{\delta n} [p(1 + 1/\varepsilon)n^V A^V_q - C^v_q]$$

$$+ \frac{\delta V_v}{\delta n} p(1 + 1/\varepsilon)n^V A^V = 0$$

$$(12)\quad \frac{\delta R_w}{\delta n} = p(1 + 1/\varepsilon)(A^W + n^W A^W_n)$$

$$+ \frac{\delta Q^w_w}{\delta n} [p(1 + 1/\varepsilon)n^W A^W_q - C^w_q] = 0$$

The first result from these conditions is that a
television trade association chooses a different number of
commercials for each station than would occur under
competition. Each of the lines in equations (11) and (12)
differ from the first order conditions (2), (3), and (4) for
a competing station because of a term which includes
elasticity of demand ε.[2] A trade association considers the

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[2]A third line in equation (12) corresponding to first
order condition (4) is not included since station w does not

effect additional commercial exposures have on price of commercial exposures. Revenue to the trade association is affected by elasticity of demand. In addition, the association considers the response of stations to changes in the required number of commercials. The second line in equations (11) and (12) include a term reflecting the effect on station choice of program quality of a change in the required number of commercials (derivatives of Q^v and Q^w). The third line in equation (11) shows how a trade association considers the effect a change in number of commercials has on choice of program type by station v (derivative of V function).

A television trade association chooses a different number of commercials than would be chosen by competing stations. The only circumstance where an association would choose the same number of commercials as would occur under competition is in the unlikely event that the elasticity of demand was equal to (minus) infinity and if changes in number of commercials have no effect on station behavior, so the partial derivative terms on the functions Q^w, Q^v, and V are equal to one.

Because a television trade association chooses a different number of commercials than competing stations, profit to the association (and thus to its member stations)

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change program type in response to a change in the commercial standard.

must be higher than under competition. If it could not
increase member profit, the association would not choose a
different number of commercials. Member stations do not
dissipate all profit by use of other inputs to production of
commercial exposures when a television trade association is
only able to control number of commercials.

The second important result derived from the first
order conditions is that a television trade association is
likely to adopt separate standards for each station and
separate standards if audience differs for different times
of day or week. As long as there are any differences in
audience functions or differences in program cost of the two
stations, optimal values for number of commercials are
different for each station.

CHAPTER SIX

IMPLICATIONS

The previous two chapters make a number of predictions about behavior of a television trade association like the National Association of Broadcasters. Each section of this chapter takes a prediction from the previous chapters and shows how NAB behavior conforms to the prediction. The first section of this chapter considers NAB efforts to restrict Entry by Substitutes to Broadcast Television. The various current alternatives to commercial broadcast television and NAB lobbying reactions are listed. As an illustration of NAB efforts, the section shows how NAB lobbying delayed development of cable television, especially during the first ten years of cable development. NAB efforts to restrict Entry by New Commercial Stations are examined in the second section of this chapter. A report which accompanies the Federal Communication Commission's 1952 table of television station assignments shows that fewer commercial station were assigned to markets than could have been assigned without signal interference. NAB reaction to the recent FCC proposal to add low-power stations to some markets is also examined.

The model in the previous two chapters shows how a television trade association gains by controlling inputs to production of commercial exposures. The fourth section of this chapter shows how the Geographic Location of stations is not the same as would have occurred under competition, in part due to NAB efforts. The Television Code of the National Association of Broadcasters is used in the fifth section of this paper as evidence of NAB efforts to Control Number of Commercials and in the sixth section as evidence of NAB efforts to prevent stations from Evading Commercial Standards.

Two sections of this chapter deal with membership in a television trade association. Since the NAB engages in two kinds of activities, two organizations are used. The NAB itself supports industry lobbying. The Television Code of the NAB controls number of commercials. Because stations cannot legally be forced to join the organizations, support for lobbying must be obtained by Encouraging Membership in the NAB and support for commercial standards must be obtained by Encouraging Membership in the Television Code. Each organization offers low-cost services only to members and makes membership known to all stations to encourage station participation.

If the NAB is successful in controlling inputs to production of commercial exposures, station profit increases. The last section of this chapter uses regression

analysis to show a positive relationship between Code
Membership and Station Profit.

Entry by Substitutes to Broadcast Television

A television trade association protects member profit
by preventing entry by alternatives to broadcast commercial
television, alternatives which either reduce the number of
viewers of broadcast commercial television or which increase
output and thus reduce price of commercial exposures. The
National Association of Broadcasters consistently opposes
introduction of new commercial viewing options. Chief among
these options of course is cable television. The history of
FCC regulation of cable systems and NAB efforts to influence
that regulation is presented shortly. As that material
shows, each regulation favoring cable has been vigorously
opposed by the NAB, and each regulation limiting growth of
cable has been just as vigorously supported by the NAB.

Subscription television is the other significant
alternative to commercial broadcast television. The term
subscription television refers to television systems which
charge viewers a fee to watch a television program. Several
subscription television systems have been proposed or are
operating. In one system, signals are sent by a standard
broadcast station but can only be received by a television
set with a special unscrambler. Currently seven television
stations operate part or full-time using such a subscription
system. Cable systems also typically use a form of

subscription television with their special feature or movie
channels. Another subscription television option is called
multipoint distribution. Multipoint distribution systems
(MDS) use low power microwave transmitters to link the
broadcast station and subscribing television sets. A final
subscription television option being considered is direct
broadcast satellites which send a subscription program to a
special antenna mounted at the subscriber's home.

The NAB opposes all subscription television options.
NAB opposition to subscription options has increased in
recent years as the cost of decoding equipment and billing
equipment for subscription television systems has fallen and
the number of proposed or actual subscription systems has
increased. Rather than detailing NAB reaction to
subscription television systems, the remainder of this
section illustrates the extent to which NAB efforts have
affected development of cable television. Needless to say,
NAB efforts to oppose cable television are similar to
efforts opposing the subscription television systems.

Astoria, Oregon is credited with establishing the
first cable television system in 1949.[1] Community Antenna
Television (CATV), as it was labelled,[2] developed first in

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[1]Mary Alice Mayer Phillips, CATV: A History of
Community Antenna Television (Evanston: Northwestern
University Press, 1974), p. 14.

[2]CATV was named by E. Stratford Smith an FCC lawyer.
Ibid., p. 19.

cities which had no television stations because of the FCC television station license freeze of 1948. Cable operators installed equipment to receive signals from stations in other cities and then allowed subscribers to hook up to the receiving equipment.

The FCC was aware of cable systems as soon as they first appeared. An FCC lawyer inspected a number of systems during the early years of cable and circulated a memo suggesting the FCC regulate CATV systems as common carriers.[3] However, the FCC was under no pressure to regulate cable. Existing stations had no objection to early cable systems since existing stations could only gain from the increase in their effective range. The FCC chose to ignore cable television.

After the end of the television license freeze in 1952, commercial broadcasters became more sensitive to the growth of cable. Cable systems appeared in cities which already had commercial stations or where commercial stations were being built. Now cable was attracting viewers away from local programs by using signals from other cities. Any signals imported to an area reduced audience size of local stations. In addition, no regulation required cable systems to pay program royalties and cable systems could import a program to a market even when a local station had been granted exclusive right to show that program to the program

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[3]Ibid., p. 19.

producer. To further enrage local stations, in the early cable systems, a cable subscriber could not choose to watch local stations unless signals from local stations were received by the cable system. Thus, local stations often had to compete for viewers with cable systems which offered the same programs as local stations but used better quality pictures from stations outside the area.[4]

In 1955, 150,000 households subscribed to cable.[5] In 1958 the FCC denied a request by commercial broadcasters and the NAB to assert control over cable.[6] By 1960, 650,000 households were cable subscribers.[7] Finally the FCC responded to the ever louder pleas of broadcasters. In a 1962 decision,[8] upheld by the Supreme Court,[9] the FCC denied permission for Carter Mountain Cable Company to use a microwave repeater. In its decision, the FCC cited the

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[4]Of course some stations gain from widespread use of cable. Large non-network stations can export their signal to enough other markets to increase the non-network station's total audience. Network stations and most local stations surely lose in this case because of audience fragmentation. See Rolla Edward Park, "The Growth of Cable TV and its Probable Impact on Over-the-Air Broadcasting," American Economic Review (May 1971), p. 69.

[5]Owen et al., Television Economics, p. 142.

[6]Frontier Broadcasting Co. v. Collier, 24 F.C.C. 251 (1958).

[7]Owen et al., Television Economics, p. 142.

[8]32 F.C.C. 459 (1962).

[9]Carter Mountain Transmission Corp. v. F.C.C., 375 U.S. 951 (1963).

economic damage a cable system would do to local stations.
The FCC action reduced but did not stop the rate of growth
of cable systems. By 1965, 1.28 million households were
cable subscribers.[10]

The FCC in 1966 issued its first comprehensive set of
cable regulations.[11] The regulations required cable systems
to carry all local television signals and forbade cable
systems from importing a signal which duplicated a local
station. Cable operators were also forbidden to carry
syndicated material which duplicated a local station within
fifteen days of the time the local station showed the
program.

In 1968, responding to NAB lobbying efforts, the FCC
went a step farther and forbade importation of a signal
without permission of the originating station.[12] The 1968
decision discouraged expansion of cable systems since
permission from the originating station was often not

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[10]Owen et al., Television Economics, p. 142.

[11]Cable systems with microwave relays were covered in
38 F.C.C. 638 (1965). Other cable systems were given
similar regulation in 2 F.C.C. 2d 725 (1966). The FCC's
right to regulate cable was affirmed in U.S., et
al. v. Southwestern Cable Co., et al., 392 U.S. 157 (1968).
A note here. The model predicts both the FCC and the NAB
eschew exact duplication of programs. Duplication increases
fixed cost without increasing number of viewers. Total
station profit falls. Consumers are no better off so the
regulator sacrifices both consumer and industry political
support by allowing exact duplication.

[12]15 F.C.C. 417 (1968). This has become known as the
"cable freeze."

forthcoming. The decision also represented the limit of FCC restriction of cable television.

By 1970, 4.5 million households subscribed to cable[13] and the political power of cable television interests could no longer be ignored by the FCC. In 1972 the FCC revised its regulations, again allowing cable systems to use the signal of a station without that station's permission.[14]

In 1980 the number of cable subscribers had grown to nearly thirteen million. Political power of cable television interests was so great that the FCC discarded rules which required cable systems to import certain signals and discarded rules which prevented cable systems from importing programs to which local stations had been given exclusive right.[15] The FCC decision was made despite an unprecedented effort by local broadcasters and the NAB. The NAB budget for 1980 included $656,000 for government activities, nearly ten percent of the total NAB budget.[16] A substantial portion of the money for government activities was committed to stopping the growth of cable television. As of May 1981, twenty million households subscribe to cable, representing about twenty-five percent of television

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[13]Owen et al., _Television Economics_, p. 142.

[14]36 F.C.C. 2d 1 (1972).

[15]79 F.C.C. 2d 663 (1980).

[16]_Broadcasting_, 28 January 1980, p. 30.

viewers.[17] In the years up to 1972, NAB lobbying efforts delayed expansion of cable systems. Relaxation of FCC regulations in the years since 1972 owes more to the relative growth of political power by cable systems than to failure of NAB efforts.

Entry by New Commercial Stations

The maximum potential number of television stations and channel numbers for those stations in each market were decided by the Federal Communications Commission in 1952. The 1952 table of assignments was a complete set of channel allocations, covering all of the United States. Communities were given station channel allocations whether or not channels had been applied for. Thus a community might only have two stations operating, but have three or more channels allocated to it by the FCC. The table of assignments provided at least one station signal to each community. Larger communities were given more channels.

The FCC decision to develop a complete table of assignments, rather than adding assignments as applications were made, is sensible. A complete system deals with the external effects associated with co-channel and adjacent channel interference. A complete system also means the FCC is assured its desired density of stations and channels

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[17]"Penetration Figures from Nielsen," Broadcasting, 1 June 1981, pp. 92-93.

throughout the nation, except perhaps, if the FCC does not anticipate changes in population over time.

A substantial portion of the 1952 FCC station allocation report is devoted to the variety of appeals and petitions brought by organizations suggesting changes in channel allocations. In the majority of cases, organizations sought an additional commercial station in an area which already contained at least one commercial station. Often the petition requested conversion of an educational station to a commercial station. Thus, no technical condition prevented another commercial station from operating in that market. Networks and existing stations opposed allowing additional commercial stations. In virtually all of the cases, the FCC supported the networks and existing stations.[18] Potential entry by new commercial stations was therefore effectively restricted by the FCC table of station assignments.

The National Association of Broadcasters was silent during the FCC hearings on channel allocations, and made no recorded comments when the 1952 table of assignments was released by the FCC. In general, the NAB was not particularly active in the early years of television. The

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[18]See for example in U.S., Federal Communications Commission, Sixth Report and Order, for Urbana, Illinois, par. 528; St. Louis, par. 569; Duluth, par. 579h; San Antonio, par. 658g; Amarillo, par. 669; Seattle, par. 879j.

NAB's inactivity does not mean objectives of a broadcast trade association were not being pursued, however.

During the television freeze, few stations operated and entry of new stations was severely restricted by the FCC. There were 50 television stations operating when the freeze started in 1948 and 108 stations operating when the freeze ended in 1952. Additional stations granted during the freeze were from applications pending at the time of the freeze. A few conditional licenses were also granted during the freeze. The freeze did restrict entry, however. By the end of 1953, the first year after the end of the freeze, the FCC had granted an additional 815 licenses and countless more applications were pending.[19] Thus, during the freeze, a trade association's desire to restrict entry was amply served and the NAB did not have to provide this function.

Lobbying activities in which the NAB might have engaged during the early years of television were effectively provided by the relatively few existing stations and the three major networks. As Olson[20] suggests, an individual member of a relatively small interest group has incentive to provide group goods because such a member typically benefits more by doing so than does a member of a

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[19]"The First 50 Years of Broadcasting: 1953," Broadcasting, 23 March 1981, p. 101.

[20]Olson, Collective Action, p. 22.

large group. Small groups also find tacit agreements easier to arrange and enforce.

One indication that powerful individual stations and networks were providing the lobbying that is currently provided by the NAB is contained in interviews reported by Broadcasting magazine shortly after the 1952 FCC table of assignments was released.[21] The magazine sought opinions about the table of assignments from prominent figures in broadcasting. Presidents of stations in the largest markets and network officials were interviewed. No representative from the NAB was interviewed. When current television broadcast issues are considered, Broadcasting consistently consults representatives of the NAB.[22]

Existing commercial stations and the NAB currently face the first significant threat of entry by new commercial stations since the 1952 table of station assignments set limits on number of stations in each community. The FCC is pursuing a proposal that allows low power stations to "drop in" to areas which currently receive signals from standard commercial stations. Use of low power transmitters is intended to prevent interference with signals of nearby commercial stations. In the first year after the low power

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[21]"TV Thaw Comments," Broadcasting, 21 April 1952, pp. 70, 89.

[22]See for example the issue of low-power drop in stations. Broadcasting, 15 September 1980, pp. 29-30 and Broadcasting, 2 February 1981, p. 28.

proposal was made the FCC received five thousand applications for the planned one hundred and forty new stations. Potential entrants obviously perceive significant profit to existing stations which can be tapped by owning a low power station.

The low power proposal provides an excellent example of arguments the NAB uses to oppose entry. The FCC began accepting applications for low power stations in late 1980.[23] The NAB responded by asserting that significant interference with existing stations would occur and that low power stations would have trouble covering costs.[24] The NAB petitioned the FCC to abandon its proposal because the rules were arbitrary and discriminatory since they put limits on ownership of low power stations by networks, radio stations, and local television stations.[25] The most recent NAB appeal asks the FCC at least to allow local stations to own low power stations.[26] Both the large number of applications and NAB lobbying efforts are resulting in considerable delay in processing the low power station applications. In fact, the first low power station plan was introduced before 1975. NAB efforts have kept the FCC even from inviting

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[23]82 F.C.C. 2d 47 (1980).

[24]Broadcasting, 15 September 1980, pp. 29-30.

[25]Broadcasting, 10 November 1980, p. 32.

[26]Broadcasting, 2 February 1981, p. 28.

applications for low power stations for a substantial length
of time.

Control of Program Type--Geographic Location

A television trade association increases total member
profit by distributing station transmitters more widely than
would occur under competition. As this section shows,
station transmitters are distributed more widely than under
competition, but the distribution was chosen more to
increase political support to the FCC than to fulfill the
wishes of a television trade association.

Evidence that the 1952 table of station allocations is
not the same as if there had been an unregulated market is
easy to find. During hearings before the FCC on the
proposed table of assignments, one major alternative was
presented. The DuMont Television Network presented a table
of assignments which gave more VHF channels to large cities,
fewer channels to educational television and to small
communities, and allowed educational stations to be
purchased and operated as commercial stations. DuMont felt
that without additional VHF assignments in large cities and
without more total VHF stations available, DuMont could not
obtain enough affiliates to become a financially viable
network.[27] DuMont was not making an idle threat. The FCC
rejected DuMont's plan and by 1955 DuMont was only

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[27]U.S., Federal Communications Commission, Sixth
Report and Order, pars. 70-80.

distributing one regular program.[28] Shortly thereafter the
DuMont Television Network faded into history. DuMont was
proposing an increase in the number of commercial VHF
stations in large cities and a decrease in VHF allocations
to smaller communities. The FCC rejected DuMont's plan not
because of any technical restriction, but because adopting
DuMont's plan would have sacrificed too much political
support from existing stations and from areas which would
have lost television signals entirely. The FCC gains more
votes by providing a signal to an area which currently
receives none than it gains by providing a signal to an area
which already receives at least one signal. The first
signal is more valuable to voters than second or subsequent
signals.[29]

Additional evidence that the FCC station allocation
scheme is not the same transmitter distribution that would
have occurred under competition is the fact that in large
cities all FCC channel allocations are being used by
operating stations, but, in many smaller communities, some
allocations are not currently being used. This is readily
apparent in examining any issue of Broadcasting Yearbook,
which includes the FCC table of station assignments and the

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[28]"The First 50 Years of Broadcasting: 1955,"
Broadcasting, 6 April 1981, p. 149.

[29]Roger Noll, Merton Peck, and John McGowen, Economic
Aspects of Television Regulation (Washington, D.C.:
Brookings Institute, 1973), p. 119.

number of stations currently broadcasting.[30] Without the
current FCC table of assignments, more stations would choose
to operate in large cities. The FCC is allowing fewer
stations in large cities than would occur with competitive
entry.

Control of Number of Commercials

A television trade association can increase member
profit by restricting the number of commercials broadcast by
member stations. As this section shows, the Television Code
of the National Association of Broadcasters is that
organization's effort to control number of commercials.
Some parts of the code set maximum number of commercial
messages permitted during a program for different stations
and different times of day. The remainder of this section
reviews these provisions of the code and considers whether
they are consistent with the model of a broadcast trade
association.

The Television Code is divided into two parts of
approximately equal length. The first part contains program
standards. Standards address children's programs, the
family viewing period, violence, drugs, anti-social
behavior, news, public issues, religious programs, and
others. With the exception of the family viewing period,

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[30]Broadcasting Publications, Inc., Yearbook.
Typically this information is contained in section B.

program standards are very general and include no quantitative restrictions.

The second part of the Television Code contains advertising standards. One section of the advertising standards prohibits advertising hard liquor, occultism, some personal products, some gambling, guns, ammunition, and other products. Another section prohibits various deceptive advertising practices. Of interest to this work, however, are those sections of the advertising standards which set limits on number of commercials.

The code puts limits on non-program material. Non-program material "includes billboards, commercials and promotional announcements."[31] The code allows no more than nine minutes, thirty seconds of non-program material in a sixty minute period for network-affiliated stations during prime time. For other programs, network stations are limited to sixteen minutes of non-program material per sixty minute program.[32]

Stations not affiliated with a network also have time standards in the code. Time standards are more generous for independent stations during prime time. In prime time, non-program material is limited to fourteen minutes per sixty minute program for independent stations. Like network

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[31]National Association of Broadcasters, The Television Code, 22d ed. (July 1981), art. XIV, sec. 1, p. 18.

[32]Ibid., art. XIV, secs. 2A, 2B, 2C, pp. 19-20.

stations, the limit for non-program material broadcast by independent stations during other than prime time is sixteen minutes per sixty minute program.

The commercial time standards in the Television Code are consistent with the model of a broadcast trade association. The model shows that a broadcast trade association sets different commercial standards when the audience function changes and sets different commercial standards for stations with different program production cost. Audience size is larger and audience composition is different during prime time viewing hours than at other times of day. Independent stations have higher program cost than stations affiliated with a network because the cost of obtaining program material through the syndication market is higher than the cost of using a network relay system. Independent stations also usually occupy costlier, higher numbered channels. Owen[33] shows how programs obtained from syndicators are more expensive to distribute and broadcast than network material. An independent station must have program films or tapes physically delivered and must return them to the distributor who checks for damage before releasing them to another station.

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[33]Owen et al., Television Economics, p. 41-2.

Evading Commercial Standards

The Television Code also contains provisions clearly designed to prevent code members from evading commercial limits. The model shows how members have incentive to evade any standards but gain if all members are prevented from evading commercial limits by the trade association. Code provisions which prevent evasion of commercial limits are thus consistent with the model.

The code forbids program credits in excess of thirty seconds for programs of ninety minutes in length or less.[34] Longer programs are allowed more time for credits. Program credits are of course a way to advertise organizations and individuals who are involved in program production. Credits often include information about which airline provided transportation for cast and crew or which tailor arranged clothing for program participants. Game shows typically end with credits listing companies which provide prizes. Clearly a station can increase its commercial time by increasing the length of time given to program credits. The code even has a special limit on time given to prize identification.[35]

The code contains three other provisions designed to prevent broadcasters from hiding commercials in a program.

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[34]National Association of Broadcasters, Code, 22d ed., art. XIV, secs. 1A, 1B, pp. 18-9.

[35]Ibid., art. XIV, part G, pp. 21-22.

The first provision tells broadcasters to avoid "gratuitous references" in a program to a non-sponsor's product.[36] The second provision requires that any film excerpts from current movies that are designed to urge members to attend the movie be counted against a program's commercial time limit.[37] The last provision discourages use of backdrops which show a product slogan or trademark.[38]

The Code Authority of the NAB also publishes a monthly newsletter[39] which includes interpretations and revisions of both the Television and Radio Codes. A recent issue included interpretation of the general advertising standards as they apply to advertisements for escort services.[40] Publication of Code News is certainly consistent with behavior of a broadcast trade association which needs some tool to communicate changes in policy to members.

Encouraging Membership in the NAB

Because it provides two major kinds of services to members, the NAB has established two organizations. The National Association of Broadcasters provides lobbying and information services to members. The Code Authority of the

[36]Ibid., art. XIV, sec. 8, p. 22.

[37]Ibid., art. XIV, sec. 9, p. 22.

[38]Ibid., art. XIV, sec. 10, p. 22.

[39]National Association of Broadcasters Code Authority, Code News.

[40]Ibid., January 1981, p. 2.

NAB establishes and enforces the Television and Radio Codes.
A television station can choose to be members of either or
both the NAB and the Television Code. Each organization
provides different services, has different enforcement
tools, and a different optimal number of members. In
addition, the NAB provides lobbying services only at the
national level, while the Code Authority enforces standards
which are used in local, regional, and national advertising
markets.

A television trade association must persuade stations
to participate in activities which benefit all members but
which each member is tempted to avoid. A television trade
association uses three methods to enforce its wishes. The
trade association offers valuable services to members for a
price below what non-members pay. The trade association
uses available powers of moral suasion. The trade
association takes steps to advertise compliance and non-
compliance to its standards so that each station is aware of
actions of other stations.

The most important product produced by the National
Association of Broadcasters is lobbying before Congress and
the FCC. When the NAB provides lobbying which benefits all
stations, there is no way to prevent stations which are not
NAB members to gain from these lobbying activities. To
overcome this problem, the NAB provides valuable services to
members below the price charged to non-members. Stations

thus have incentive to join the association voluntarily and support NAB lobbying efforts.

There is a long list of items offered to NAB members at a lower price than to non-members. Among these reduced cost items is the three-day annual convention of the NAB. Members of the NAB pay one-third the fee charged non-members.[41] The NAB convention is by far the largest and most important television trade convention. The television trade magazine Broadcasting, which is not related to the NAB, devotes a substantial part of three to four weekly issues to convention matters. The annual cable television convention, the next most widely covered convention, receives considerably less space in Broadcasting.[42] The NAB also offers a number of regional conventions, workshops, and seminars. These meetings include legal workshops, license renewal seminars, management seminars, directional antenna seminars, engineering seminars, and a variety of other special conferences. In each case, price to NAB members is lower than to non-members.

The NAB offers publications to its members typically at one-third the price charged non-members. A number of these publications, including periodicals and newsletters,

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[41]National Association of Broadcasters, NAB Directions, pamphlet for the 59th Annual Convention and International Exposition, 12-15 April 1981.

[42]This is the author's estimate based on reading three years of Broadcasting magazine.

are offered to members only.[43] Some NAB publications are
accepted as basic source material throughout the industry.
NAB Legal Guide and Engineering Handbook are examples.

NAB members also have access to several free services.
Members can use the NAB legal department and management and
engineering consultants. The NAB also supports market
research, the results of which are available to members
only.

The NAB provides unique and valuable products to its
members at low cost. These products clearly provide
incentive to join the NAB and thus contribute to NAB
lobbying services.

The second method a trade association uses to persuade
stations to become members is moral suasion. The NAB uses
advertising to encourage stations to join. The NAB
circulates a number of pamphlets designed to inform
potential members about its activities.[44] The NAB annual
convention and other public activities provide a vehicle for
advertising the benefits of NAB membership. The NAB
advertises in trade publications including Broadcasting
magazine.

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[43]National Association of Broadcasters, Publications
Department, Publications Catalog, 2d ed. (January 1980).

[44]For example: Okay...What have you done for me
lately, NAB?; Membership: An investment in the future; and
Broadcasters Working Together: Benefits of Membership in the
National Association of Broadcasters.

The third technique the NAB uses to encourage stations to become members is to let each station know which other stations are members. Member stations find out who free riders are, and can apply direct or indirect pressure to encourage membership.

The NAB makes no membership lists available to the public. However membership in the NAB is included in the popular trade periodical Spot Television Rates and Data.[45] Members of the NAB are also listed in Broadcasting-Cable Yearbook, a widely used annual reference periodical.[46] Listing NAB members in these popular industry publications assures each station's awareness of free riders.

Encouraging Membership in the Television Code

As mentioned earlier, the NAB uses a separate organization to handle inputs to commercial exposures. The Code Authority of the National Association of Broadcasters is empowered "to enact, amend and promulgate Television Standards of Practice or Codes, . . . and to establish such other procedures and methods to secure observance thereof as it may deem advisable".[47] The Code Authority faces the same sort of problems in encouraging compliance with the

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[45]Standard Rate and Data Service, Inc., Spot Television Rates and Data.

[46]Broadcasting Publications, Inc., Broadcasting-Cable Yearbook: 1981 (Washington, D.C., 1981).

[47]National Association of Broadcasters, Bylaws (effective 30 June 1981), art. IV, sec. 8C(4).

Television Code that the NAB faces in encouraging stations
to become members. All stations gain by complying with the
Television Code but each station also gains by cheating on
the code. The Code Authority wants stations to produce
fewer commercial exposures than would occur under
competition. In local advertising markets, stations more
easily recognize the gain from coordinated action and can
use some tacit enforcement. In regional and national
markets, voluntary compliance with code standards is less
likely. Each station feels it only has a small effect on
regional and national markets and is thus less inclined to
comply with the code.

To encourage participation in the Television Code, the
Code Authority uses the same three tools used by the NAB to
encourage membership. The Code Authority offers valuable
services to members at low cost, applies moral suasion, and
provides information about which stations are complying with
the code.

Subscribers[48] to the Television Code of the NAB
receive several valuable services not available to non-
members. First, code subscribers obtain services of an
expert national monitoring and enforcement organization. It
is costly for a station to monitor programs and commercials
of all other stations in a local market. A station wishes

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[48]Formally a station which pays a fee and complies
with code standards "subscribes" to the Television Code.

to ensure that other stations comply with commercial
restrictions in local markets. If stations subscribe to the
code, commercials are monitored by the Code Authority. The
Code Authority monitors as many as 61,000 hours of
television in a year.[49] Because there are likely economies
of scale in program monitoring and certainly gains from
specializing in this activity, the Code Authority can
monitor station programs at lower cost than stations can
monitor each other. Use of the Code Authority also avoids
duplication of monitoring effort.

The Code Authority also provides members a low-cost
means to determine and agree upon a complicated set of input
standards. By providing a set of national standards, the
Code Authority saves members of each local market the cost
of negotiating a joint profit maximizing standard on number
of commercials.

In addition, the Code Authority reviews commercials
for code subscribers. The Authority reviews commercials
either as part of its regular program monitoring or at the
request of stations or networks.[50] Commercials are checked
for compliance with code commercial standards and FCC and

This paper uses the terms "subscriber" and "member"
interchangeably.

[49]National Association of Broadcasters, Code
Authority, Function and Procedures of the Code Offices,
(mimeographed,

[50]Ibid., p. 3.

FTC requirements. It is clearly valuable for stations to rely on the Code Authority to clear commercials for broadcast.[51] The total cost of clearing is reduced if each station no longer needs to clear each commercial. There are also economies of scale in monitoring commercials and gains from specializing in this activity. The Code Authority provides this service at lower cost than could an individual station.

Stations which choose to become subscribers to the Television Code gain low-cost enforcement, a means to reduce cost of determining local input standards, and services of a commercial clearing organization. These valuable services are provided only to subscribing stations for a single fixed fee. The cost of obtaining these services is much higher for a station which chooses not to subscribe to the code.

The Code Authority also uses moral suasion and membership information to encourage subscription to the code in the same way the NAB uses these methods to encourage membership. The same publications which advertise the NAB are used to advertise the Television Code. Code membership is also included in publications which list NAB membership. In addition, code subscribers are allowed to display the NAB

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[51] Clearing simply means authorizing the use of a program or commercial. A commercial might be cleared in turn by an advertising agency, by the FTC, by the Code Authority, by a national network, and by a local station.

Television Seal of Good Practice.[52] The seal can be displayed on the air during station breaks or as part of a station publication. Further information on subscription to the code is provided in the periodical Code News. The periodical lists new subscribers and stations which have stopped subscribing.

Behavior of the NAB is consistent with the model of television trade association behavior. The NAB uses two organizations to provide the two main functions of a television trade association. The NAB and the Code Authority provide valuable services to member stations at a price lower than non-members must pay in order to encourage voluntary support of activities for which it is impossible to exclude free riders or where coercion is impossible. The two organizations also use moral suasion and information on membership to encourage voluntary station participation.

Code Membership and Station Profit

The television code provides a convenient standard for output of commercials in local, regional, and national advertising markets. However, the importance of the television code in regional and national advertising markets is impossible to measure with available data. While products are often only sold in certain regions, and advertising of particular products is often restricted to

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[52]National Association of Broadcasters, The Television Code--Regulations and Procedures, part III, sec. 2, p. 25.

certain regions, there are no well-defined boundaries for regional advertising markets. Without some market boundaries, statistical analysis of success of the television code is impossible. Even if regions were well-defined, however, the code is less likely to be successful in regional markets than in local markets. If a television station chooses not to comply with code standards, the station has much less effect on price of commercial exposures in a regional market than in a local advertising market because there are so many more sources of commercial exposures in regional markets than in a local market. Cheating is more likely where there are many suppliers than when there are few suppliers, the classic problem of cartel enforcement.[53] In the national advertising market the effect of one station ignoring code standards is also very small, and thus the incentive to ignore the code in the national market is greater than in both regional and local advertising markets.[54] In addition, available data make analysis of the effect of the code on the national market impossible. For regressions, potential success of the code in enforcing an output restriction must be measured against

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[53]Scherer, Industrial Structure, p. 200.

[54]The three major television networks produce much of the programming used by network stations. This small number of program producers makes a collusive agreement among all network stations easier. The three networks are members of the television code. However, a network station need not comply with the code even while using network programs. A

some benchmark. Since all television stations are affected by success or failure of the code in the national market, there is no such benchmark using available data.

Unlike regional and national markets, territories for local advertising markets are usually well defined. One or more stations are grouped within a metropolitan area which has fairly clear boundaries. Federal Communication Commission channel allocations were originally made to cities, and stations are required to serve the cities to which their channels are assigned. Membership in the television code serves to reduce cost of negotiating and policing restrictions on output of commercial exposures in these local markets. A station can advertise its code membership and code members are checked for compliance with the code by the Television Code Authority.

Because local advertising markets are well defined, it is possible to use regression analysis to show whether the television code is an effective tool in enforcing commercial restrictions. The model shows that profit to all stations increases if all stations reduce number of commercials shown. If stations communicate their output restriction by joining the television code, a high proportion of code members in an area means greater profit to stations in that area. Regression analysis should show a positive

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station can add or subtract commercials by adjusting public
service announcements and station identification.

relationship between proportion of code membership in an
area and station profit.

A station in a local advertising market chooses to
become a member of the code, and thus restrict its output of
commercial exposures, if reduction in exposures results in
enough of an increase in price of exposures to cause an
increase in station profit.[55] A station in a local
advertising market chooses to ignore code standards if the
increase in its sale of exposures makes up for the fall in
price of exposures because more exposures are produced.
When a station chooses to subscribe or not subscribe to the
code, the station considers potential reaction by other
stations in that area.

A station choosing to become a member of the code in a
local market faces the difficulties of a firm in an
oligopolistic industry. Economic theory is largely unable
to make predictions about behavior of firms in oligopoly.
For this reason, regression analysis may or may not show a
relationship between station profit and code membership,
even though there will be higher profit when the proportion
of member stations in a market is high.

Station profit is affected by other factors as well.
Since a station sells commercial exposures, the number of

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[55]Reduction in number of commercials increases the
number of viewers of a program and partly offsets the
reduction in exposures from reducing commercials. The
increase in viewers caused by reducing commercials in small,
however, by assumptions in the model.

viewers of a station directly affects station revenue and thus profit. Stations with more viewers in the market area should have higher profit. Stations affiliated with a television network receive programs at lower cost than independent stations. The cost advantage of network membership may be extracted by the networks through affiliation contracts, however, depending on the extent to which networks compete for affiliates. Thus regression analysis may or may not show a positive relationship between network membership and station profit. Stations with VHF channels (two through thirteen) operate at lower cost and have clearer signals than stations with UHF channels. Regression analysis should show a positive relationship between having a VHF channel and station profit.

The above considerations imply a regression equation of the form:

$$PROFIT_i = \beta_1 + \beta_2 A_i + \beta_3 VHF_i + \beta_4 NET_i + \beta_5 X_i + \beta_6 CODE_i + e_i$$

Where $PROFIT_i$ = some measure of station profit

A_i = some measure of audience size for station i

VHF_i = 1 if station i has a VHF channel

NET_i = 1 if station i is a network affiliate

X_i = some measure of collusion success

$CODE_i$ = 1 if station i is a member of the code

We expect $\beta_2 > 0$, $\beta_3 > 0$, $\beta_4 > 0$, and $\beta_5 > 0$

Regression coefficients are calculated using the following data:

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    PRICE = sales price of a station in
            in millions of dollars; a measure
            of station profit
      NUM = number of television stations in a
            market area
   VHFNUM = number of television stations with
            channels numbered two through
            thirteen in a market area
   HOUSES = number of television households in
            a market area in thousands
      VHF = dummy variable set to one if a
            station has a VHF channel
  COLLUDE = VHFNUM/CODENUM times M
  CODENUM = number of stations who are
            VHF stations and code members
        M = 1 for multi-station markets
     CODE = 1 when the station is a code member
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The model suggests an equation with station profit as dependent variable and as independent variables the number of viewers for each station, the proportion of stations in multi-station markets which are code subscribers, code membership, network membership, and having a VHF channel.

As is often the case, exact measures of data in the model are not available and substitute measures must be used.[56] Sales price of stations in millions of dollars is substituted for station profit. Since data on number of viewers for each station is not readily available, number of VHF stations in an area is divided by number of television households (in thousands). Number of VHF stations is used rather than total number of stations because VHF stations typically attract a much larger audience than UHF stations.

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[56]For sources of data used here see appendix A.

Number of viewers per VHF station is inverted because some markets have no VHF stations. The uninverted fraction is undefined when there are no VHF stations in the market. Extent of collusion in each market is measured by number of VHF stations which are code members divided by total number of VHF stations in the market. This fraction is multiplied by a dummy variable set to zero when the market only has one station. UHF stations are not included in the proportion because they represent a fringe of costly stations with few viewers ignored by dominant VHF stations. A dummy variable is used for single station markets since single stations do not collude with other stations and thus do not need the code's assistance in enforcing a collusive agreement. Separate dummy variables are used for stations with VHF channels, network membership, and code membership. Regression results are summarized in figure 1.

With minor exception, results are consistent with predictions. The sign of the coefficient on VHFNUM/HOUSES is negative, meaning an increase in viewers increases station profit. The value of the coefficient on VHFNUM/HOUSES implies that when a station with 100,000 households gains 10,000 households, sales price increases by $500,000, all else held constant. The sign of the coefficient on VHF is positive meaning stations with VHF channels are more profitable than UHF stations. A VHF station sells for about twelve million dollars more than a UHF station. The sign of

FIGURE 1

REGRESSION ANALYSIS OF COLLUSION SUCCESS
(t values in parentheses)

Dependent Variable is PRICE. Sample size = 55.

	Con-stant	VHFNUM/HOUSES	VHF	COLLUDE	NTWORK	CODE	R^2
(a)coefficient	5.01 * (1.8)*	-512.7 * (-5.16)*	11.93 * (5.56)*	4.03 * (1.70)*	2.94 (1.08)	-0.96 (-.47)	0.50
(b)coefficient	4.99 * (1.8)*	-501.0 * (-5.25)*	11.92 * (5.60)*	3.52 * (1.68)*	2.42 (0.98)	– –	0.50
(c)coefficient	7.05 * (3.3)*	-499.6 * (-5.06)*	12.61 * (6.15)*	2.81 ** (1.35)**	– –	-0.07 (-.04)	0.49
(d)coefficient	7.02 * (3.7)*	-498.7 * (-5.23)*	12.60 * (6.27)*	2.78 ** (1.43)**	– –	– –	0.49

*Significant at 0.05 one-tail test.

**Significant at 0.10 one-tail test.

the coefficient on COLLUDE is positive, meaning a high proportion of code members in an area increases station profit. The value of the coefficient implies that a station in a market where all stations are members sells for about three million dollars more than a station in a market where no stations are members of the code. In equations (c) and (d) coefficients on COLLUDE are only significant at 0.10. For equations (a) and (b), coefficients on NTWORK are positive, as expected, but not statistically significant.

Apparently networks use affiliation contracts to extract most of the benefit of network membership. The value of the coefficient on NTWORK implies a network station sells for about $12.5 million more than a non-network station.

Coefficients for CODE membership in equations (a) and (d) are very small, and not statistically significant. Code membership itself appears not to affect station profit. This result is not surprising. The code is used to show compliance with commercial restrictions and is only valuable when other stations are also code members. By itself, the code has little value. In addition, the code membership fee extracts any systematic differences in the value of the code beyond its value in encouraging output restrictions.

Membership fees for the Television Code are indexed to total advertising revenue of the station's market area.[57] The Code Authority uses advertising revenue rankings produced annually by the Federal Communications Commission to calculate the index.[58] Stations in markets with more advertising revenue are required to pay higher fees to join the code. In addition, code membership fees are set higher for stations which are members of one of the three television networks and higher for stations with VHF

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[57]Data on membership fees come from an interview with Patty Johnson, Membership Department, National Association of Broadcasters, Washington, D.C., 26 February 1982.

[58]U.S., Federal Communications Commission, 46th Annual Report, pp. 105-6.

channels. A network station with a VHF channel in the
largest market, New York, pays $433.00 per month in
membership fees. A non-network UHF station in a market with
little advertising revenue pays as little as $12.00 per
month for code membership. The value to stations of code
membership itself is extracted by the membership fee system
so regression analysis shows no relationship between code
membership and station profit.

To summarize. Station profit increases when a station
has more viewers, has a VHF channel, and is a member of a
network. Code membership itself does not affect profit.
Most important, the television code helps stations increase
profit by reducing the cost of colluding to reduce output of
commercial exposures. A high proportion of code members in
a market means higher profit to stations in the market.

Summary

The National Association of Broadcasters acts in a
manner consistent with the theory of a television trade
association seeking to maximize profit of member stations.
The NAB lobbies to prevent entry by alternatives to
commercial broadcast television and entry by new commercial
broadcast television stations. Although not completely as a
result of NAB efforts, station transmitters are more widely
distributed than transmitter locations which would have
occurred under competition. The Television Code of the
National Association of Broadcasters places limits on the

number of commercials broadcast by member stations.
Separate standards are set for stations with different
production cost and for different times of day and week.
Provisions of the code prevent stations from secretely
evading code commercial limits.

A television trade association provides lobbying for
member stations and enforces restrictions on inputs to
production of commercial exposures. The NAB provides these
two functions by using separate organizations. The NAB
provides lobbying and the Television Code of the NAB
restricts number of commercials. Neither organization can
force stations to join, so both organizations offer services
to member stations at lower cost than to non-members, use
advertising to make stations aware of available services,
and make member stations known to all stations to encourage
membership.

When television stations reduce number of commercials
shown, station profit increases. If stations use code
membership to communicate reductions in number of
commercials, profit will be higher to all stations in
markets where a large proportion of stations are code
subscribers. Regression analysis confirms this prediction.

CHAPTER SEVEN

THE FEDERAL COMMUNICATIONS COMMISSION

The ability of the National Association of
Broadcasters to increase member station profit depends in
large part on regulatory decision made by the Federal
Communications Commission. The objective of this chapter is
to show that the NAB increases member profit by using its
political power to influence FCC regulatory decisions.
However, the NAB cannot rely on consistent favorable
regulation because the FCC also responds to the political
power of voters and the political power of other television
interest groups.

The first and second sections of this chapter provide
a history of the FCC and an introduction to the process of
creating television regulations. The third section of this
chapter introduces a theory of government regulation. The
theory assumes the objective of a government regulator is to
maximize political support. A regulator responds to
interests of all politically powerful groups and so enforces
regulations which only partially reflect preferences of each
interest group. The fourth section of this chapter lists
some of the large number of interest groups which vie for
favorable regulation from the FCC.

The NAB must exercise its political power if it hopes to obtain favorable regulation from the FCC but cannot assume FCC regulation will consistently favor interests of commercial broadcast television stations. As an illustration of NAB hesitation to rely on favorable FCC regulation, the last section of this chapter reviews NAB reaction to a 1964 FCC proposal to adopt as a regulation the Television Code of the NAB. The NAB rejected this opportunity to obtain FCC enforcement of NAB commercial restrictions because FCC policy could subsequently change in a way unfavorable to broadcasters and because FCC rules could not adapt quickly to changes in desired NAB commercial limits. In addition, if the FCC enforced commercial limits, stations in local markets could not choose to reject FCC commercial limits when such rejection resulted in an increase in profit to all stations in the local market.

The Federal Communications Commission

The Federal Communications Commission traces its lineage from the Radio Act of 1912.[1] The 1912 act gave the Secretary of Commerce and Labor authority to issue licenses to broadcast stations and to allocate radio frequencies to broadcasters. Unfortunately, the courts interpreted the law to mean that the Secretary could not reject a station's

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[1]Radio Act of 1912, Public Law no. 264, 62d Congress (1912).

license application[2] and that the Secretary could not enforce radio frequency assignments.[3] The courts had stripped the Radio Act of 1912 of its regulatory power.

In short order, chaos reigned in radio broadcasting. Radio stations changed frequencies freely, interfered with one another, and behaved in a manner consistent with an industry exploiting a valuable resource over which no property rights are defined. Sale of radio receivers actually declined in this period because of consumer frustration with the confused state of radio broadcasting.[4]

In response to the confusion, and with full support from radio stations, Congress passed the Radio Act of 1927.[5] The 1927 act empowered a Federal Radio Commission to assign frequencies to stations, to license stations, and create whatever regulations it felt were in the "public interest, convenience and necessity."[6] Unlike the 1912 act, wording of the new law prevented misinterpretation by the courts.

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[2]229 Ops. Atty. Gen. 579 (22 November 1912).

[3]Hoover, Secretary of Commerce v. Intercity Radio Co., Inc., 286 F. 1003 (1923) and U.S. v. Zenith Radio Corp., 12 F. 2d 614 (1926).

[4]Head, Broadcasting in America, p. 158.

[5]Radio Act of 1927, Public Law no. 632, 69th Congress (1927).

[6]The phrase appears throughout the act.

In 1934 Congress chose to extend authority of the Federal Radio Commission. The Communications Act of 1934[7] included most provisions of the Radio Act of 1927 and added sections dealing with all wire and wireless communication. The Federal Radio Commission was renamed the Federal Communications Commission.

Each of the seven members of the Federal Communications Commission is appointed to a seven year term by the President of the United States. The President also designates one commission member as chairman.[8] The commission in turn has established two major bureaus to deal with the two areas of communication included in the 1934 act. The Common Carrier Bureau is responsible for telephone service and other communication by wire, microwave link, and satellite. The Broadcast Bureau is responsible for regulating virtually all aspects of television and radio. Other boards, divisions, and bureaus have been established by the commission, each responsible for a category of communication or broadcasting, or designed to support other commission activities.[9]

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[7]Communications Act of 1934, Public Law no. 416, 73d Congress (1934).

[8]47 C.F.R., sec. 0.

[9]For a more complete presentation of FCC organization see U.S., Federal Communications Commission, 46th Annual Report, p. 121.

Television Industry Regulation

Several routes are travelled to arrive at any particular television broadcast regulation. As shown, Congress changes broadcast regulation by enacting legislation. Passage of the Communications Act of 1934 is only one example.[10] More recently, Congress required television sets to be equipped with a tuner to receive channels in the UHF range (channels fourteen and above).[11]

The courts also affect television regulation, usually by upholding or overturning an FCC regulation or decision. For example, an FCC decision to repeal restrictions on what broadcast television signals cable television systems can use is being challenged in court by television stations.[12]

Of the routes travelled to arrive at television regulation, those used by the FCC are the most tortuous and confusing. First, the FCC can issue regulations which become part of Title 47 of the Code of Federal Regulations.[13] Though regulations issued by the FCC are

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[10]Acts of Congress dealing with communications are incorporated in Title 47 of the U.S. Code. The U.S. Code is designed to organize and classify laws by subject. Provisions of the Communications Act of 1934, for example, are spread throughout Title 47 depending on the particular area of communication each part of the act addresses.

[11]47 U.S.C., sec. 330.

[12]Malrite Television of New York v. FCC (2d Cir. 1980), case no. 80-4120.

[13]The Code of Federal Regulations organizes rules issued by federal agencies in the same way the U.S. Code organizes acts of Congress.

often simple to read, the process of issuing them is far
from simple. The FCC issues a regulation only after a
lengthy series of hearings and after various versions of a
proposed regulation are considered. The Sixth Report and
Order,[14] which set up the current table of television
station assignments, required four years of deliberation by
the FCC and literally thousands of pages of testimony.

A second way the FCC regulates television is through
decisions reached during adversary proceedings which
resemble court trials. Stations in violation of FCC
regulations are brought before the full commission or an FCC
hearing examiner to determine FCC response to the violation.
A violating station is allowed legal representation.
Hearing examiners are also used to make a decision when more
than one organization applies for a license to use the same
station allocation. In ruling on cases, the FCC establishes
a pattern of enforcement. Television stations and
communications lawyers pay attention to this pattern in the
same way that lawyers pay attention to legal precedents
established by the courts. Thus the pattern of FCC
decisions in its hearing proceedings is another form of
television regulation.

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[14]U.S., Federal Communications Commission, Sixth
Report and Order, 41 F.C.C. 148 (11 April 1952). The report
itself has about five hundred pages, only a fraction of
which were used to set up the table of station assignments.
Most of the remainder of the report explains the FCC
decision.

The last method of FCC television regulation is
through guidelines, statements, and "primers" issued from
time to time by the commission. An excellent example of the
latter is the "Ascertainment Primer." FCC regulations
require commercial television stations to ascertain
community needs and provide programs to fulfill these
needs.[15] However, wording of the regulation does not tell
stations what constitutes ascertainment. To clarify the
ascertainment regulation, the FCC issued its Primer on
Ascertainment of Community Problems.[16] The primer provides
guidelines about survey methods stations can use to satisfy
the regulation. Although the primer is not a formal set of
regulations, the primer becomes an indirect kind of
television regulation if stations feel compelled to follow
it.

A Theory of Government Regulation

A substantial fraction of the resources of a
television trade association are used trying to influence
decisions by Congress, the Federal Communications

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[15]47 C.F.R., sec. 73.3526, and U.S., Federal
Communications Commission, Station Application Form, form
no. 301, sec. IV-A.

[16]U.S., Federal Communications Commission, Primer on
Part 1, Section IV-A and IV-B of Application Forms
Concerning Ascertainment of Community Problems and Broadcast
Matter to Deal With Those Problems, 27 FCC 2d 650 (1971);
reissued as, Primer on Ascertainment of Community Problems,
FCC mimeo no. 71-176 (23 February 1971); amended by 33 FCC
2d 394 (1972).

Commission, and other government agencies. Of these, the Federal Communications Commission is by far of greatest interest to broadcasters. This section adapts a theory of government regulation to activities of the Federal Communications Commission, and shows that FCC choices are influenced by a politically powerful organization like the NAB but that the FCC chooses values for inputs to production of commercial exposures which are different from inputs which a television trade association most prefers.

The model of Federal Communications Commission behavior used in this section is an application of Peltzman's theory of regulation.[17] Peltzman's paper is an important contribution to regulation theory, and application of his theory to broadcast regulation yields interesting implications about behavior of the Federal Communications Commission and television broadcasters.

Peltzman assumes the objective of a government regulator is to maximize political support. Political support comes to the regulator as votes or campaign contributions. The simplest case has two groups in the economy, consumers and the regulated industry. When a government regulator controls price of the regulated product, the regulator gets political support from consumers by reducing price of the regulated industry's product. A

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[17]Sam Peltzman, "Toward a More General Theory of Regulation," *Journal of Law and Economics* 19 (August 1976):211-40.

government regulator gets political support from the regulated industry by increasing price of the regulated industry's product, and thus increasing profit to the regulated industry.

Peltzman makes predictions about a regulator who controls product price. The theory can also be used to predict behavior of a regulator controlling inputs to production of a product, in this case inputs to production of commercial exposures. Figure 2 shows choice of number of commercials by a government regulator, by a television trade association, and by competing stations. The horizontal axis measures number of commercials during a given program period. A regulator chooses number of commercials n to maximize political support $M(n, \pi)$ subject to a profit constraint $\pi = f(n, c)$. Consumers prefer fewer commercial interruptions, and increase political support to a regulator if the number of commercials is reduced. The industry gains profit from selling commercial time. As the number of commercials increases, profit to the industry first increases as more commercial exposures are sold, and then decreases when price of commercial exposures falls enough.

Competition in number of commercials results in an increase in number of commercials (point D).[18] Stations sell commercial time to increase profit. Each station

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[18]An increase in number of commercials because of competition may not result in zero profit to stations, as the previous section of this chapter shows.

PROFIT

M(n,π)

π=f(n,c)

A   B   C   D
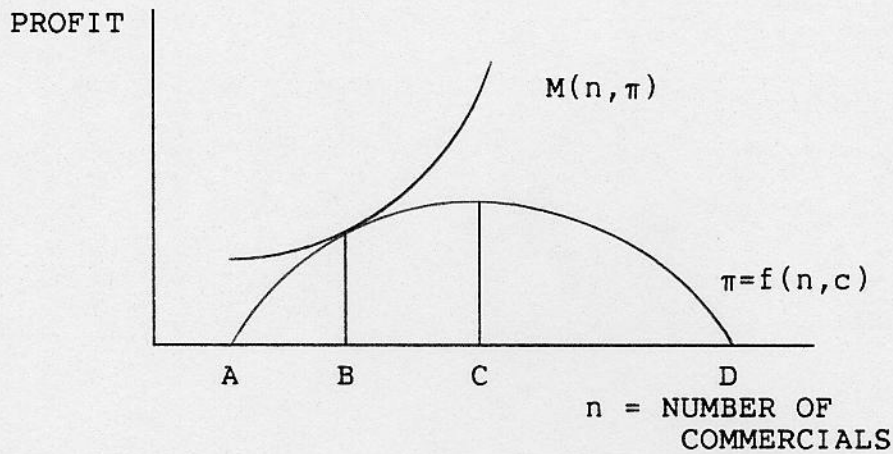
n = NUMBER OF
    COMMERCIALS

Figure 2. Regulator Maximization with Number
           of Commercials.

ignores the effect additional commercials have on price of

commercial exposures faced by all stations. A broadcast

trade association internalizes this external effect and

reduces the number of commercials (point C) to maximize

industry profit. To maximize political support, a broadcast

regulator (point B) wishes stations to show fewer

commercials than would be chosen by a broadcast trade

association (point C) and fewer than would occur under

competition (point D). The regulator does not require the

number of commercials which consumers most prefer (point A)

since doing so sacrifices too much political support from

the industry. The regulator does not permit the number of

commercials preferred by a television trade association

since doing so sacrifices too much political support from

the industry. The regulator does not allow the number of

commercials which would occur under competition since doing

so sacrifices political support from both industry and consumers.[19] When there are two competing interest groups, like the NAB and television viewers, the FCC chooses regulations which only partially favor each group. The NAB must exercise its political power but cannot expect to obtain all desired regulations from the FCC.

Competing Claims to FCC Regulation

The Communications Act of 1934[20] established the FCC and empowered it to regulate the entire electromagnetic spectrum and all interstate communication by wire. The only guidelines provided by Congress to the FCC were that regulations be "consistent with the public interest, convenience, and necessity . . .",[21] ". . . taking into account the unique needs of national defense and security."[22] The FCC must deal with a variety of groups who are involved in television in one way or another. Since so many groups vie for favorable regulation, the FCC does not

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[19]The FCC has no formal regulations on number of commercials. As shown earlier, regulation by the Federal Communications Communications Commission of number of commercials is costly and difficult. The FCC chooses only to place general limits on number of commercials because of the cost of regulating commercials. The National Association of Broadcasters is allowed some freedom in industry self-regulation as long as industry standards do not exceed general guidelines established by the FCC.

[20]Communications Act of 1934, Public Law no. 416, 73d Cong. (1934).

[21]Ibid., title II, part I, sec. 302(a).

[22]Ibid., title II, part I, sec. 302(b).

consistently favor one group. The theory of regulation shows how a regulator does not ignore preferences of groups with political power. The remainder of this section summarizes some of the variety of groups which demand favorable FCC regulation and the causes which these groups sponsor.

In July of 1980, the FCC repealed two major restrictions on cable broadcasters: distant signal and syndicated exclusivity rules.[23] Various television broadcasters have gone to court to block the FCC. The court case is supported by the NAB and opposed by the National Cable Television Association, the most powerful of the cable trade associations.[24]

Children's programming is the subject of proposed rulemaking by the FCC, supported by Action for Children's Television, the Council on Children's Media, and Merchandising, and other lobbying groups. One proposal supported by these groups requires stations to broadcast a certain minimum number of children's programs.

The FCC is trying to respond to proposals by the Communications Satellite Corporation to establish a direct broadcast satellite pay television system. The system would

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[23]79 F.C.C. 2d 663 (1980).

[24]Except where noted, material in this section comes from "Where Things Stand," Broadcasting, 6 July 1981 pp. 10-16, 68. "Where Things Stand" is a monthly feature of the magazine.

broadcast directly to homes equipped with special antennas. The FCC decision is complicated by the need to negotiate satellite orbit locations at the 1983 Regional Administrative Radio Conference, and deal with satellite technical standards including compatibility with a high-resolution television system proposed by CBS.

Under pressure from public broadcasters, the FCC is reducing restrictions on the way public stations solicit funds and recognize donations before and after programs. New rules allow public stations to include a sponsoring corporation's logo in credits at the beginning and end of a program.

The FCC is trying to deal with complications created when it proposed allowing 140 new low power stations to "drop in" to the existing table of station allocations. Nearly 5000 applications for low power stations were received before the FCC stopped accepting them. Objections to the FCC proposal have come from the Association of Maximum Service Telecasters and the NAB who claim the application process is illegal and prevents existing local stations from owning low power stations. The Corporation for Public Broadcasting feels the application process unfairly discriminates against noncommercial stations.

The paragraphs above are not an exhaustive list of matters before the FCC. The FCC is also charged with regulating common carriers like phone companies, regulating

both AM and FM radio stations, and regulating private radio
communication. Clearly some commercial radio regulations
affect television. Radio stations are a competing source of
commercial exposures.

A number of organizations currently seek favorable
regulation from the FCC. It is not surprising that the
National Association of Broadcasters does not consistently
obtain favorable regulation from the FCC.

The 1964 FCC Proposal

In early 1964 the FCC proposed a rule which would
adopt NAB Television and Radio Code standards on number of
commercials as a regulation. On the face of it this seems
like a perfect opportunity for the NAB to have its standards
adopted and enforced by government. However, the NAB and an
overwhelming majority of stations opposed FCC commercial
regulation. The NAB and television stations opposed any
formal FCC regulation of commercials and supported continued
industry self-regulation.

The fact that the NAB and stations opposed adoption of
the code as regulation is not surprising, however.
Examination of competing claims to FCC regulation shows that
no single interest group can count on consistently favorable
regulation. Once a standard is adopted by the FCC, there is
every chance that a change in political power will cause an
undesirable change in FCC regulation of commercials.

The NAB also opposes FCC adoption of the Television
Code because the provisions of the code are difficult to
change once adopted by the FCC. Changes in FCC regulations
come very slowly. Witness for one the four year freeze on
new station applications in the 1950's. The FCC had first
expected the freeze to last no more than six months.
Changes in television markets come rapidly, however, and a
television trade association would like to change its
standards as the market changes. In the twenty-eight years
of its existence, twenty-one editions of the Television Code
have been issued, half of which contain changes in
commercial time standards.

Adoption of the Television Code by the FCC also means
stations which choose not to subscribe to the code cannot
choose a different number of commercials. If stations in
local markets are successfully colluding without the code,
forcing code standards on these stations makes them worse
off. Stations in single station markets also may gain by
not adopting the code and thus will oppose FCC regulation.

Finally, as the theory of regulation shows, the NAB
wishes a different level of inputs than the FCC would
choose. The FCC chooses inputs to maximize political
support and so extracts part of station profit to mitigate
political opposition from consumer and other groups. The
FCC would eventually force broadcasters to show a different
number of commercials than a trade association prefers.

BIBLIOGRAPHY

"A time for fine tuning within NAB." Broadcasting, 28
    January 1980, p. 30.

Abel, John D.; Clift, Charles; and Weiss, Fredric A.
    "Station License Revocations and Denials of Renewal,
    1934-1969." Journal of Broadcasting 14 (Fall
    1970):411-21.

Barnow, Erik. A History of Broadcasting in the United
    States. New York: The Oxford Press, 1970. Vol. 1: A
    Tower in Babel. Vol. 2: The Golden Web. Vol. 3: The
    Image Empire.

Beales, Howard. "Television Program Quality and Restrictions
    on the Number of Commercials." Federal Trade
    Commission Working Papers, no. 30 (June 1980).

Beebe, Jack H. "Institutional Structure and Program Choices
    in Television Markets." Quarterly Journal of Economics
    91 (February 1977):15-37.

Broadcasting, 7 October 1974, p. 7.

Broadcasting, 28 January 1980, p. 30.

Broadcasting, 15 September 1980, pp. 29-30.

Broadcasting, 10 November 1980, p. 32.

Broadcasting, 2 February 1981, p. 28.

Broadcasting Publications, Inc. Broadcasting-Cable Yearbook:
    1981. Washington, D.C.

Carter Mountain Transmission Corp. v. F.C.C. 375 U.S. 951
    (1963).

Christensen, Kathryn. "Levi takes the art of thwarting truck
    hijackers to great lengths." Wall Street Journal, 1
    April 1981, p. 29.

"Closed Circuit; Labor Costs." Broadcasting, 27 October
    1980, p. 7.

Communications Act of 1934. Public Law no. 416. 73d
        Cong. (1934).

de Kluyver, Cornelis A. and Givon, Moshe M.
        "Characteristics of Optimal, Simulated, Spot TV
        Advertising Schedules." Institute for Research in the
        Behavioral, Economic, and Management
        Sciences. Krannert Graduate School of
        Management. Purdue University. Discussion paper
        no. 755 (February 1981).

Donegan, Frank. "How Dare They Dump 'Mork and Mindy' for
        World War II?" TV Guide, 9 January 1982, pp. 12-15.

"The First 50 Years of Broadcasting." Broadcasting, 13
        October 1980 to 12 October 1981.

Frontier Broadcasting Co. v. Collier. 24 F.C.C. 251 (1958).

Grass, R.C. and Wallace, W.H. "Satiation Effects of TV
        Commercials." Journal of Advertising 9 (September
        1971):3-8.

Head, Sydney W. Broadcasting in America. 2d ed. Boston:
        Houghton Mifflin, 1972.

"High cost of holding off spectrum expansion push NAB into
        budgetary red." Broadcasting, 2 February 1981, p. 27.

Hirshleifer, Jack. Price Theory and Applications. Englewood
        Cliffs, N.J.: Prentice-Hall, 1976.

Hoover, Secretary of Commerce v. Intercity Radio Co.,
        Inc. 286 F. 1003 (1923).

Hotelling, Harold. "Stability in Competition." Economic
        Journal 34 (March 1929):41-57.

Hull, Brooks. "American Commercial Television: Duplication,
        Diversity, and Quality." Unpublished, 2 August 1980.

Johnson, Patty. Membership Department, National Association
        of Broadcasters, Washington, D.C. Interview, 26
        February 1982.

Lancaster, Kelvin. "Monopolistic Competition with a Non-
        Uniform Distribution of Consumers." Columbia
        University, Department of Economics. Discussion paper
        no. 15 (July 1979).

_____. "Socially Optimal Product Differentiation."
        American Economic Review 65 (September 1975):567-85.

_____. *Variety Equity and Efficiency*. New York: Columbia University Press, 1979. Chapter two and appendix A.

Malrite Television of New York v. FCC. 2d Cir. Case no. 80-4120 (1980).

National Association of Broadcasters. *Ascertainment of Community Needs: Suggestions for the Survey of the General Public*. Booklet, n.d.

_____. *Broadcasters Working Together: Benefits of Membership in the National Association of Broadcasters*. Pamphlet, n.d.

_____. *Bylaws*. Effective 30 June 1981.

_____. *Membership: An investment in the future*. Pamphlet, n.d.

_____. *NAB Code of Ethics and NAB Standards of Commercial Practice*. Effective 25 March 1929.

_____. *NAB Directions*. Pamphlet for the 59th Annual Convention and International Exposition, 12-15 April 1981.

_____. *Okay...What have you done for me lately, NAB?*. Pamphlet, n.d.

_____. *Organizational Chart*. 11 December 1979, rev. 30 June 1980.

_____. *The Television Code*. 22d ed. July 1981.

_____. Code Authority. *Code News*, January 1981, p. 2.

_____. Code Authority. *Function and Procedures of the Code Offices*. Rev. 29 June 1980 (mimeographed).

_____. Publications Department. *Publications Catalog*. 2d ed. January 1980.

National Association of Radio and Television Broadcasters. *The Television Code*. Effective 1 March 1952.

Noll, Roger; Peck, Merton; and McGowen, John. *Economic Aspects of Television Regulation*. Washington, D.C.: Brookings Institute, 1973.

Olson, Mancur, Jr. *The Logic of Collective Action: Public Goods and the Theory of Groups*. Cambridge, Mass.: Harvard University Press, 1965.

Owen, Bruce M.; Beebe, Jack H.; and Manning, Willard G.,
    Jr. Television Economics. Lexington, Mass.: D.C. Heath
    and Co., 1974.

Park, Rolla Edward. "The Growth of Cable TV and its Probable
    Impact on Over-the-Air Broadcasting. American Economic
    Review 61 (May 1971):69-73.

Peltzman, Sam. "Toward a More General Theory of
    Regulation." Journal of Law and Economics 19 (August
    1976):211-40.

"Penetration Figures from Nielsen." Broadcasting, 1 June
    1981, pp. 92-93.

Phillips, Mary Alice Mayer. CATV: A History of Community
    Antenna Television. Evanston: Northwestern University
    Press, 1974.

Radio Act of 1912. Public Law no. 264. 62d Congress (1912).

Radio Act of 1927. Public Law no. 632. 69th Congress (1927).

Rao, Potluri and Miller, Roger LeRoy. Applied
    Econometrics. Belmont, California: Wadsworth
    Publishing Company, Inc., 1971.

Samuelson, Paul A. "Pure Theory of Public Expenditures."
    Review of Economics and Statistics 36 (November
    1954):378-389.

Sandman, Peter M.; Rubin, David M.; and Sachsman, David
    B. Media: An Introductory Analysis of American Mass
    Communications. Englewood Cliffs, N.J.: Prentice-Hall,
    1972.

Scherer, F.M. Industrial Market Structure and Economic
    Performance. 2d ed. Chicago: Rand McNally, 1980.

Simon, Julian L. Issues in the Economics of Advertising.
    Chicago: University of Illinois Press, 1970.

Spence, Michael and Owen, Bruce. "Television Programming,
    Monopolistic Competition and Welfare." Quarterly
    Journal of Economics 91 (February 1977):103-26.

Standard Rate and Data Service, Inc. Spot Television Rates
    and Data.

Steiner, Peter O. "Program Patterns and Preferences, the
    Workability of Competition in Radio Broadcasting."
    Quarterly Journal of Economics 66 (May 1952):194-223.

Stigler, George J. The Organization of Industry. Homewood, Ill.: Richard D. Irwin, Inc., 1965, pp. 23-38.

Television Bureau of Advertising, Inc. 11th Annual Spot Television Planning Guide: 1980-81. New York: Television Bureau of Advertising.

Television Digest, Inc. Television Factbook, no. 48. 2 vols. Washington, D.C., 1979.

"TV Thaw Comments." Broadcasting, 21 April 1952, pp. 70, 89.

U.S. Code, vol. 47, sec. 330.

U.S. Code of Federal Regulations, vol. 43, secs. 0, 1, 2, 5, 13, 17, 18, 19, 25, 73, 74, 76, 78.

U.S., et al. v. Southwestern Cable Co., et al. 392 U.S. 157 (1968).

U.S. Federal Communications Commission. Primer on Ascertainment of Community Problems. F.C.C. mimeo no. 71-176 (23 February 1971). Amended by 33 F.C.C. 2d 394 (1972).

_____. Sixth Report and Order. 41 F.C.C. 148 (11 April 1952).

_____. Reports, vol. 15, p. 417 (1968).

_____. Reports, vol. 32, p. 459 (1962).

_____. Reports, vol. 38, p. 638 (1965).

_____. Reports, 2d series, vol. 2, p. 725 (1966).

_____. Reports, 2d series, vol. 36, p. 1 (1972).

_____. Reports, 2d series, vol. 79, p. 663 (1980).

_____. Reports, 2d series, vol. 82, p. 47 (1980).

_____. Station Application Form. Form no. 301.

_____. 46th Annual Report: Fiscal Year 1980. Washington, D.C.: U.S. Government Printing Office, 1981.

_____. UHF Comparability Task Force. Office of Plans and Policy. Comparability for UHF Television: Final Report. Washington, D.C., September 1980.

U.S. Federal Radio Commission. _Third Annual Report_.
  Washington, D.C.: U.S. Government Printing Office,
  1929.

U.S. _Federal Register_, vol. 13, p. 586 (1948).

U.S. _Federal Register_, vol. 13, p. 2629 (1948).

U.S. _Federal Register_, vol. 41, p. 20170 (1976).

U.S. _Opinions of the Attorney General_, vol. 2229, p. 579 (22
  November 1912).

Watkins, Bruce. Department of Communications, University of
  Michigan. Interview, 21 April 1982.

"Where Things Stand." _Broadcasting_, 6 July 1981, pp. 10-16,
  68.

"Where Things Stand." _Broadcasting_, 5 October 1981, p. 17.

Worcester, Dean A, Jr. "Pecuniary and Technical Externality,
  Factor Rents and Social Costs." _American Economic
  Review_ (December 1969), p. 873.

APPENDIX A

SOURCES FOR STATISTICAL DATA

The model of television station behavior asserts
stations choose number of commercials, program type, and
program quality to maximize profit from sale of commercial
exposures. Cost of station operation is a function of
program quality. Program quality is defined as any costly
action which increases number of viewers of a program, and
includes actions like increasing signal power and clarity or
making a given type of program more appealing to viewers.
The model also shows that a television trade association
increases station profit by controlling number of commercial
messages, one input to commercial exposures.

The model thus suggests a regression equation with
station profit as dependent variable. Independent variables
are price of exposures, number of commercials, number of
viewers, type of program, program quality, program cost, and
some measure of trade association success. Determining the
signs of all regression coefficients for this ideal
regression is impossible. Program quality, for example,
affects revenue by affecting audience size and affects
program cost, so the influence on profit of a increase in
program quality is ambiguous. A change in program type may

increase or decrease audience size, and thus profit,
depending on audience characteristics and on programs
offered by other stations. In addition, program
characteristics are difficult to define for statistical
measurement.

Other relationships to station profit are clear,
however. An increase in trade association success increases
station profit. Profit also increases if program cost
decreases for given quality or if audience size increases
for given number of commercials and program quality. These
three relationships are used in the regression analysis in
figure 1 of chapter.

To calculate regression coefficients for figure 1,
statistical measures of station profit, trade association
success and factors which shift cost or audience size are
needed. The Federal Communications Commission compiles
financial data, including accounting profit, from annual
reports submitted by television stations. The FCC only
releases this data in aggregate form, however.[1] Though
stations keep financial data as part of the public file
required by the FCC, compiling such data is beyond the scope
of this research. In addition, station accounting
information may not provide an accurate measure of economic
profit.

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[1]U.S., Federal Communications Commission, 46th Annual
Report, p. 105-6.

Because a direct measure of station profit is not available, station sales price is used in this paper to measure station profit. A television station is a valuable asset which yields a stream of profit over time. The purchase price of a station is the present value of the anticipated stream of profit from a station. From 1979 through the first half of 1981, one hundred and ten television stations changed hands. Of these, complete information is available for fifty-five transactions. Stations are omitted from the data base for a variety of reasons. Some transactions include assets besides the station, so a separate price for the station is not available. Some stations are purchased for conversion to subscription television, so price does not measure value of the station for standard commercial operation. For some transactions, quoted selling price differs from different sources.

No measure of number of viewers of each station is readily available. Most stations use market survey organizations to compile audience statistics, but stations do not make this data available to the public. For regressions in this chapter, an estimate of audience size is used. The market area of a station used in the regressions is called area of dominant influence and is defined as "all counties in which home market stations receive a

preponderance of viewing."[2] Areas of dominant influence
are a widely used measure of market area developed by
Arbitron, a market survey organization. Some stations are
omitted from regression analysis because area of dominant
influence is not defined, or because two areas of dominant
influence overlap in a way which prevents either separate or
combined measurement.

Figure 1 uses a measure of audience size with
television households in the area of dominant influence as
denominator. The numerator is number of television stations
with VHF channels (two through thirteen). Rather than
including all stations, only stations with VHF channels
appear in this variable because VHF stations have lower cost
and attract more viewers than UHF channel stations. UHF
stations represent a costly fringe of stations, with few
viewers, largely ignored by VHF channel stations in each
area. Data compiled by Noll, Peck, and McGowen confirm that
UHF channel stations attract far fewer viewers than VHF
stations.[3] These authors note that sixteen of thirty-seven
independent stations in the fifty most populous markets
attract less than two percent of viewers in their home
county, and that four of twenty network UHF channel stations
in the fifty most populous markets attract less than three
percent of viewers in their home county. A UHF independent

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[2]Broadcasting Publications, Yearbook, p. B1.

[3]Noll et al., Television Economics, pp. 94, 181.

station, competing with three VHF network stations has an average audience share of only 2.9 percent in its home market. UHF stations operate at a decided disadvantage.

Data used for regressions in figure 1 come from three sources. The monthly publication Spot Television Rates and Data[4] is a comprehensive source of station advertising data. Listed for each station is channel number, network affiliation, NAB membership, and television code membership. Also included for each station, though not used in this chapter, are station advertising rate cards, advertising contract information and economic information about market areas.

The second source of data used in figure 1 is Broadcasting magazine. Broadcasting is a widely read weekly industry publication. Regular features in the magazine contain information on sales of stations. Sales information includes price, network affiliation, and channel number. Other data on station characteristics, not used in the regressions, also appear in the magazine.[5]

The organization which publishes Broadcasting also publishes the annual Broadcast Cable Yearbook. This voluminous publication has maps of all areas of dominant influence in the nation, stations in each area, station channel numbers, network affiliation, and number of

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[4]Standard Rate and Data Service, Television Rates.

[5]"For the Record" and "Changing Hands," Broadcasting.

television households in each area. Another section of the
yearbook has a history of all television station sales
including price and station characteristics.[6]

Occasionally data provided by the three sources
conflict. In cases where the conflict is significant, the
station is omitted from regressions.

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[6]Broadcasting Publications, "The ADI Market Atlas"
and "TV Ownership Transfers," Yearbook, pp. B-1, B-157.