

LEGISLATORS V. REGULATORS: THE CASE OF LOW POWER FM RADIO

Thomas W. Hazlett*

Senior Fellow, Manhattan Institute for Policy Research
Senior Research Associate, Columbia Institute for Tele-Information

Bruno E. Viani

Research Associate, Manhattan Institute for Policy Research

July 28, 2003

Abstract

The Federal Communications Commission rule making for low-power FM radio was widely reported as an instance where Congress sharply rebuked a regulatory agency for enacting rules too favorable to entrants. Because rival policy optima are quantifiable in this case, the preferences of Congress and the Commission can be directly evaluated. While policy differences between Congress and the regulatory agency were visible to interest groups, they signified a negligible increment when compared to the efficient policy solution. A financial event study supports this interpretation, as radio broadcasters' equity values were not materially affected by the competitive entry envisioned by the Commission. This suggests that reportedly sharp differences between Congressional and agency political preferences can be trivial in economic terms, as predicted by the Congressional Dominance view of regulation.

* All correspondence to Thomas W. Hazlett: 1615 M Street, NW, Suite 400, Washington, DC 20036. The authors wish to thank Robert Hahn, Ted Rappaport, Rodger Skinner, Pete Tridish and seminar participants at Columbia University and Claremont McKenna College for helpful discussions, but absolve them of any liability for the contents of this paper. Lydia Regopoulos provided valuable research support.

I. Introduction

a. The Delegation Question.

Congress delegates administrative control to regulatory agencies with broad “public interest” mandates. When agents appear to set rules at odds with congressional preferences, however, the question arises: Who controls regulation?

The view that “runaway bureaucrats” pursue their own agendas in defiance of Congress (Dodd and Schott, 1979; Wilson, 1980) was answered by Weingast and Moran (1983), who showed that enforcement actions of the Federal Trade Commission were highly correlated with the political views of Congress, particularly oversight committee chairs. This evidence, and the fact that Congress directly legislates to overturn certain agency initiatives, suggests that Congress controls regulation.

The basic logic of the Congressional Dominance perspective developed by Weingast and Moran (1983) is shown in Figure 1. Regulatory agency actions are characterized in simple, monotonic terms – e.g., the level of antitrust enforcement – on the horizontal axis. Preferences for various enforcement levels generate levels of utility for Congress, given by $U(C)$, and the agency, given by $U(A)$. The optimal levels for Congress and the agency are C^* and A^* , respectively. Administrative procedures incorporated in the regulatory process are designed to reduce congressional monitoring costs and facilitate early discipline of agents (McCubbins, Noll, Weingast 1987; McCubbins, Noll, Weingast 1989; McCubbins and Schwartz 1984), constraining divergence between the rival optima. The procedure for agency appointees, a joint power of the executive and the legislative is also designed to minimize principal-agent conflict

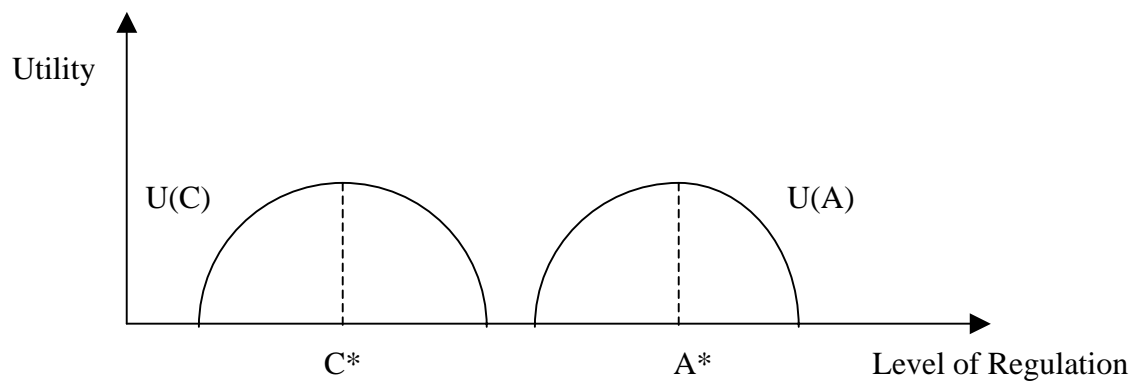


Figure 1. Preferences of Congress and the regulatory agency

(Calvert, McCubbins, Weingast, 1989).¹ But Congress and agency preferences are not static, and monitoring is imperfect; hence, differences appear. When the “gap” is of sufficient size, Congress is motivated to intervene, moving the level of enforcement, A^* , towards C^* .

The transaction costs literature provides a general explanation for the process (Epstein and O’Hallorin, 1999). Agency costs – the costs to Congress of delegating decision-making to an independent regulatory commission – are offset by two factors:

- 1) The expertise of agency officials allows Congress to regulate more widely, and strategically, than otherwise. Agents are employed, despite possible conflicts of interest, due to the net gains associated with specialization.
- 2) When conflicts become substantial, Congress may impose remedies at relatively low cost. Indeed, hearings, legislation, or other corrective actions can be undertaken to the ongoing benefit of committee chairs and their allies who garner support by reigning in “runaway bureaucrats.”

Under this set of constraints, how far do regulators stray? Weingast and Moran (1983) show that, in the 1964-1976 period, the Federal Trade Commission (FTC) was responsive to the changing political demands of congressional members (particularly Senate oversight members). They also note that, pursuant to legislation limiting FTC activities in 1979, agency behavior was brought into conformity with congressional preferences. Using data from seven government agencies, Wood and Waterman (1991)

¹ “There is available to the principal [Congress], however, a large repertoire of mechanisms for reducing agency losses – screening and selection procedures, contract design (including both compensation schedules and sanctions for malfeasance), monitoring and reporting requirements, and institutional checks. These mechanisms are themselves costly to invoke, but the principal can choose the mix of mechanisms that is most effective and least costly” (Kiewiet and McCubbins, 1991:38).

found evidence that agency appointees are an effective mechanism for political control. Yet, neither set of observations calibrates the distance between congressional demands and agency actions (i.e., the magnitude of A^*-C^*). A positive correlation between political changes in Congress and changes in FTC regulatory actions suggests that Congress pulls regulation in its direction (A^* approaches C^*), and statutory constraints demonstrate that discrete policy interventions may be used to eliminate the gap altogether. It remains an open question as to how much leeway independent agencies enjoy.

One recent regulatory episode – the low-power FM radio rule making at the Federal Communications Commission (FCC) – provides a rare opportunity to calibrate this distance. Formally initiated in January 1999, the low-power FM rule making at the FCC culminated in an order creating a new class of low-power stations, to be licensed to non-profit community organizations. Our analysis abstracts from assessing the influence that preferences of the committee members, the legislators, and the president have on the final statutory outcome.² We rather focus on showing that this difference may not be as significant as it is implied in the literature. Congress reacted by enacting legislation in December 2000 that overruled the FCC, reducing the number of slots available for low-power radio stations. Like any case study, generalizations must be accompanied by caveats.³ But what is most promising in this instance is the ability to quantify the policies preferred by the FCC, Congress and consumers. This allows one to observe how far congressional and agency policies differed *relative* to the underlying economic optimum.

² See Steunenberg (1992) for a discussion of this.

b. The Low-power FM Radio Issue.

News media widely reported that when the FCC attempted to allocate radio spectrum for low-power FM licenses, it was sharply rebuked by Congress. As the WASHINGTON POST (Ahrens, May 15, 2000: A1) wrote:

When it became apparent that the usually plodding FCC was on a fast track to license low-power stations, radio stations already on the air became nervous... Under their lobbying group, the National Association of Broadcasters..., existing broadcasters have fought the low-power proposal with everything they've got... The House passed a compromise bill last month that would allow a small percentage of these stations to be licensed after a testing period. But even the watered-down legislation was meant to send [FCC Chairman William E.] Kennard a strong message. "It was clear that the FCC thought all along that they could run roughshod through this without much opposition," [Rep. Michael G. Oxley (R-Ohio)] Oxley said. "We're hoping that the vote will bring them up short until Congress can sort this out."

The FCC continued to slowly advance toward licensing low-power FM stations, however, until "a last minute rider in December's [2000] Senate appropriations bill (which eventually became law) severely handicap[ped] the low-power initiative" (Wildman, 2001).⁴ This gave rise to the consensus view that Congressional action

³ Our study does not attempt to deconstruct policy preferences within Congress, nor between Congress and the Executive, which would constitute a useful, parallel investigation. See Steunenberg (1992).

⁴ Specifically, it required LPFM stations to provide 3rd adjacent channel protection to existing primary service (full power) FM stations (Pub. L. No. 106-553, 106th Congress, Appendix B § 632(Dec. 21, 2000)).

“sharply curtails the ambitious plans of the Federal Communications Commission to issue licenses for low-power FM radio stations.”⁵

This high profile battle between Congress and the FCC yields testable implications for the Congressional Dominance view of regulation. In this paper we identify and measure three rival regulatory optima:

- The FCC’s, calibrated by its proposal to license about *2,300 low-power FM stations*;
- Congress’, which limited licenses to about *1,300 low-power FM stations*;
- Consumer welfare maximization, achieved by fully utilizing the FM band to accommodate non-interfering broadcasters. As conservatively estimated below, this would allow for nearly *100,000 low-power FM stations*.⁶

While the FCC’s allotment of low-power radio licenses differed from that preferred by Congress, both allocations were trivial relative to the level of entry possible.⁷ When combined with other rules imposed on prospective low-power FM station applicants, the distance between Congress and the FCC was inconsequential as a fraction of total FM band capacity. This modest difference, however, was large enough for Congress and the FCC to engage in significant “credit-claiming” and “blame-shifting” (Meyhew, 1974; Fiorina, 1982; McCubbins and Schwartz, 1984), generating gains for

⁵ Labaton, Stephen. 2000. “Congress Severely Curtails Plan For Low-power Radio Stations.” *New York Times* December 19, A1. “Even as the Federal Communications Commission charges ahead with its fast-track licensing drive, powerful forces in Washington, DC are pushing hard to halt this train before it leaves the station. The National Association of Broadcasters and National Public Radio have led the lobbying in favor of separate attempts in the House and Senate to limit low-power stations” (Fisher, Mark. 2000. “Lobbying Against Low-power Radio,” *American Journalism Review* 46).

⁶ This estimate abstracts from possible entry into radio broadcasting due to liberalization elsewhere; e.g., in the AM radio, or UHF TV bands.

⁷ The overly conservative nature of FCC spectrum allocation policy has long been noted. A detailed treatment is given in Hazlett (2001).

incumbent legislators. Hence, the evidence yielded in the low-power FM regulatory episode tends both to support the Congressional Dominance view and to offer texture to the process whereby relative small policy differences stimulate substantial rent-seeking.

II. FM Radio Regulation by the FCC

The FM band is divided into 100 channels, with 200 KHz allocated to each. FCC rules control interference between stations by imposing power and antenna height limits, and geographical and frequency separation. If stations transmit within three channels the FCC imposes minimum distance requirements (CFR, 47 §73.201, subpart B and §73.207, October 1, 1999).

The simple trade-offs are depicted in Figure 2.⁸ In panel (a), radio stations in a local market are separated by three adjacent (idle) channels on either side. In panel (b), stations (with identical power transmission and antenna height as in (a)) are separated by just two adjacent channels, meaning that more broadcasts (and listener choices) are available. The enhanced band utilization, however, raises the probability of harmful interference. With stations packed more densely, broadcaster emissions tend to collide more frequently, degrading signal quality. The marginal value of the loss will just equal the marginal value of increased program choice in an optimal allocation of radio stations.

FM stations are classified as either primary or secondary service stations. Primary stations are granted interference protection from all other stations; secondary stations are granted interference protection only from other secondary stations but not

⁸ The FM band's 100 channels are reduced to twenty channels in Figure 2 for ease of presentation.

FM channels

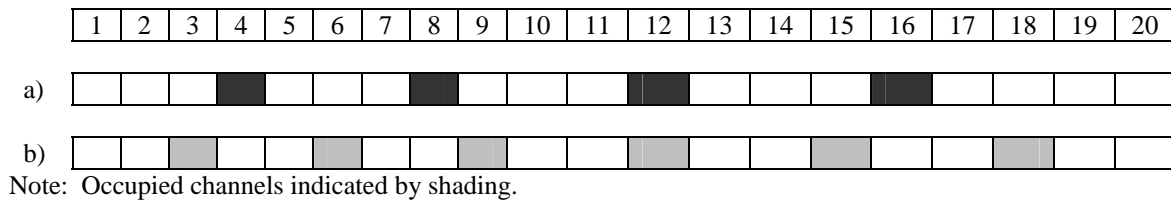


Figure 2. Two alternative channel separation rules

Table 1

CLASSES OF PRIMARY SERVICE FM STATIONS

Class	Distance to 1mV/m signal contour in Km (miles) ^a	Reference HAAT (m)	Maximum ERP (kW)
A	28 (17)	100	6
B1	39 (24)	100	25
B	52 (32)	150	50
C3	39 (24)	100	25
C2	52 (32)	150	50
C1	72 (45)	299	100
C	92 (57)	600	100

Source: *Code of Federal Regulations*, 47 CFR 73.210, 73.211, 73.333 (Oct. 1, 1999).

ERP: Effective radiated power; HAAT: Antenna height above average terrain.

^a By mapping the signal's contour the FCC can find the distance to the 1 millivolt-per-meter (mV/m) contour using the ERP and the HAAT values. The table provides the maximum ERP for each class of station, given a reference antenna height (HAAT). Antenna height and maximum power are referential values for estimating signal contour radius, which is what ultimately determines a station's class. Stations may transmit at a higher ERP than listed on the table if they reduce antenna height. For example WBCT in Grand Rapids (MI) transmits at 320 kW, but has an antenna HAAT of 236 meters – less than half the reference value in the table (which limits Class C stations to 100 kW.)

from primary stations. The FCC classifies primary stations (commercial and noncommercial) in seven categories: Class A, B, B1, C, C1, C2, and C3 (47 CFR 73.211, October, 1, 1999).

This delineation is based on geographic coverage area, which is a function of two variables: (1) effective radiated power; (2) antenna height. Increasing either variable increases signal coverage. See Table 1. By comparison, new low-power FM stations have a maximum power of 0.1 kW, antenna height of 30 m, and signal contour of just 3.5 miles.

Figure 3 illustrates FCC channel separation and minimum distance requirements. Assume an existing Class A station is located at the center of the concentric circles (called signal contours) and a new Class A station is applying for a license in the same area. The new station could transmit on the same channel as the existing station but would locate at least 71 miles away. It could transmit on a 1st adjacent channel and locate 45 miles away. It could transmit on a 2nd or 3rd adjacent channel, with 19 miles of separation. With three or more buffer channels, no distance separation is required.⁹

III. The FCC's Low Power Radio Rule Making

On July 17, 1997, Nickolaus Leggett, Judith Leggett, and Donald Schellhardt petitioned the FCC (RM-9208) to create a new low power radio service. They proposed

⁹ Primary stations also need to comply with distance requirement against Intermediate Frequency Interference (IF) which arises from stations broadcasting 10.6 and 10.8 MHz apart. These distances are typically less than those required to protect stations in 2nd and 3rd adjacent channels. An additional distance requirement applies only to stations in channel 253 to protect TV channel 6 stations (47 CFR 73.207 paragraph (b), October 1, 1999). Finally, another type of distance requirement is to avoid "blanketing interference", which affects all stations geographically located (regardless of frequency) within a radius (R) estimated by: $R = 0.245(P)^{1/2}$; where R is measured in miles, and P is the maximum effective radiated power (ERP) in kilowatts (47 CFR 73.318, October 1, 1999).

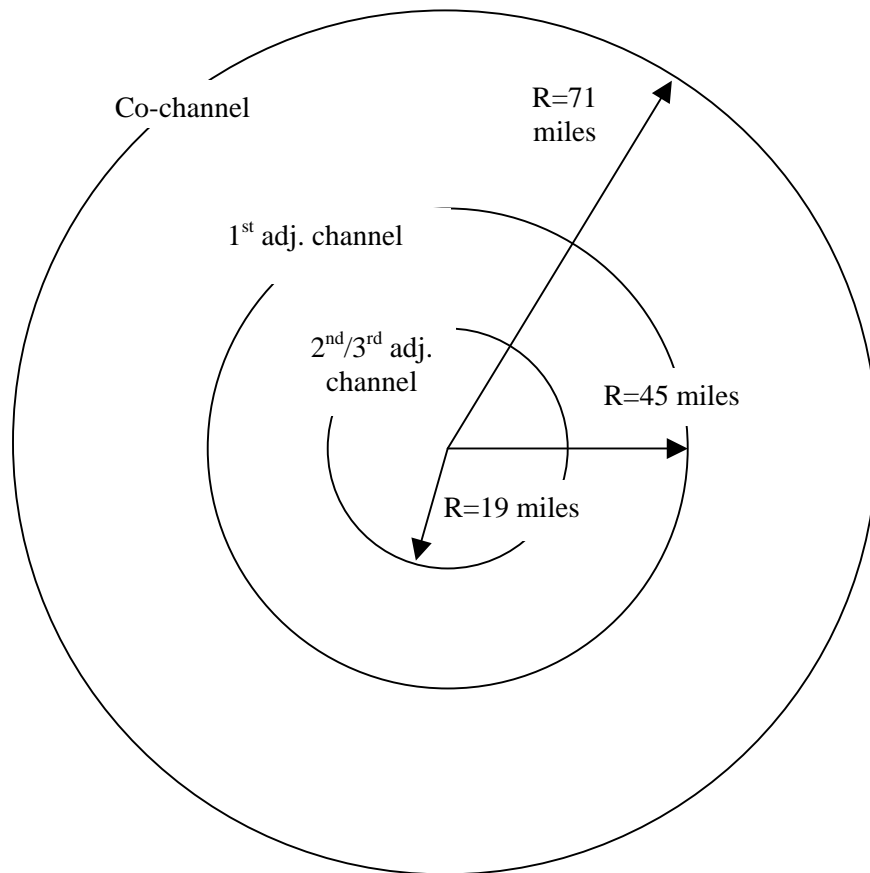


Figure 3: Separation requirements for two Class-A FM stations

that one channel be allocated in both the AM and FM bands to provide a new one-watt micro-radio service (Leggett et al., 1997). On February 20, 1998, another petition (RM-9242) was filed by J. Rodger Skinner, who proposed the creation of three classes of low-power service in the FM band: 1) A primary service with an effective radiated power between 50 and 3,000 watts; 2) a secondary service with an effective radiated power below 50 watts; and 3) a special event service with an effective radiated power under 20 watts, authorizations not to exceed 10 days. The primary service would be required to comply with the existing criteria for co-channel and first adjacent channel separation (Skinner, 1998).

The FCC requested public comment on the petitions,¹⁰ triggering a formal rule making process. Rulings were issued in January 1999, January 2000, and September 2000¹¹ (FCC, 1999; 2000a; 2000b), as outlined in Appendix 1. Restrictions increased from start to finish. Congressional activity likely influenced this outcome, as hearings, legislation, and statements by key committee members (overwhelmingly critical of the FCC for being too liberal, or pro-entry) were frequently reported in the trade press.¹² A summary of the main events in Congress is given in Appendix 2.

In the conventional wisdom, the FCC promoted a liberal allocation of low-power FM licenses, while Congress sharply reduced the agency's allotment. This would raise

¹⁰ Public Notice: Report No. 2254, February 5, 1998; Public Notice: Report No. 2261, March 10, 1998.

¹¹ A final report was adopted by the Commission to incorporate the rules imposed by Congress on low power FM. See *Second Report and Order: In the Matter of Creation of a Low Power Radio Service*, MM Docket No. 99-25, FCC 01-100 (March 22, 2001).

¹² "Our bill says before you run full speed ahead with these licenses, make sure that the interference requirements are adhered to," said Representative Michael G. Oxley..." *House Clears Bill To Curb Plans For FM*, Stephen Labaton, THE NEW YORK TIMES (April 14, 2000); "...Chairman Kennard, wanting this as his legacy, pushed this issue before it was fully and completely tested", said Representative Bill Tauzin..." *Religious groups at odds with G.O.P. on radio licenses*, David Leonhardt, THE NEW YORK TIMES (July 11, 2000).

troubling questions for the Congressional Dominance view of delegation; even as Congress stepped in to constrain the regulatory agency, such a substantial schism would expose a potentially substantial principal-agent problem. Fortuitously, the theory yields testable implications. Before turning to these tests, however, we examine one additional policy detail: the outcome of a low-power FM rule maximizing consumer surplus.

IV. An Estimate of FM Band Low-Power Station Insert Capacity

What is the optimal number of low-power FM radio stations? A simple model can estimate the capacity of the FM band to a first approximation. This model does not predict economic viability; a market test would be necessary to establish how many low-power FM stations listeners, advertisers, or contributors would support. But it does answer a relevant policy question. In the absence of arguments to the contrary, open entry permits a competitive equilibrium to obtain.¹³ Hence, we calibrate a benchmark policy optimum.

We assume that the FM band is fixed, and that one hundred 20-kHz channels are allocated to each FM radio market – i.e., the status quo.¹⁴ We further assume that within

¹³ This is not only the conclusion of welfare economics, but of FCC policy makers. See Rosston and Steinberg (1997:7). Also Owen (1999:59-70), and “Comment of Thirty-Seven Concerned Economists” (2001). Berry and Waldfogel (1999) argue that free entry in broadcasting is not socially optimal due to excessive competitive investment which “cannibalizes” existing audiences. Even if the free entry assumptions were correctly applied to radio broadcasting (which as the low-power FM episode shows, is subject to severe regulatory entry barriers), consumer surplus is still maximized via a policy of open entry.

¹⁴ A first best solution is to allow a market to distribute property rights to spectrum, as discussed in a seminal paper by Ronald Coase (1959). Given the nature of the exercise, however, we refrain from consideration of fundamental policy reform, comparing alternatives within the spectrum allocation system in place. We do note, however, that FM technical standards were set decades ago, prior to the advent of digital tuning devices, that permit stations to broadcast with less separation (thereby creating more listening choices), radio manufacturers would gain the incentive to produce receivers with improved ability to process signals on adjacent frequencies. In assuming such regulatory options away, the estimate of FM station insertion capacity is a conservative one.

each of 269 local markets¹⁵ existing stations continue to enjoy exclusive use of assigned frequencies and (as buffers) the channels bordering either side.¹⁶ New 100-watt low-power FM stations are given co-channel protection such that no station transmits within the coverage area of another low-power FM station.

Our separation standard follows Rappaport et al. (1999),¹⁷ which notes that the 3-channel separation rule was established when older technology made FM radios more susceptible to interfering emissions than modern receivers (Rappaport et al., 1999:3, 6).¹⁸ “The FCC protection ratios were designed to provide simple and conservative spacings to prevent early FM radio receivers from undesired retuning to strong adjacent stations.”¹⁹ The conservative assumptions in the FCC propagation models insure that radio stations are more widely spaced than necessary.²⁰

Indeed, the FCC has tested the one channel FM separation rule used here and found it sufficient to limit interference between full-power stations. In a 1997 FCC

¹⁵ According to Arbitron Radio Market Ranking (Fall 1999) there are 276 metropolitan radio markets in the United States, but seven of these are embedded in larger markets. We combine duplicates to avoid double counting. See: www.arbitron.com/radiosurvey/mm001025.htm. These markets do not exhaustively cover U.S. households; only about one-half of U.S. stations broadcast in designated radio markets. (BIA Financial, The 1999 State of the Industry Radio Report, Executive Summary, 2; www.biacompanies.com/state_radio.htm.) This also implies substantial under-estimation of low-power FM insert capacity in our model.

¹⁶ In other words, each licensee is granted exclusive use of three channels within the local market area. This is a stronger restriction than imposing minimum distance requirements. The rationale for this separation rule is given below.

¹⁷ The principal author, Theodore Rappaport, is an engineering professor and Founder of the Mobile and Portable Radio Research Group at the Bradley Department of Electrical and Computer Engineering at the Virginia Polytechnic Institute. See: <http://www.mprg.ee.vt.edu/people/tsr/rappaport.html>.

¹⁸ Federal Communications Commissions’ radio interference rules have been in place since the 1940s. See Moffet, Larson and Johnson, Inc. “Selection of Receivers for FM Receiver Testing and Analysis of Test Results in Support of the Comments of the National Association of Broadcasters in MM Docket 99-25.” Cited in Rappaport et al. (1999:41).

¹⁹ Rappaport et al (1999: 43).

²⁰ Formally, the FCC seeks to guarantee a minimum signal-to-noise ratio at the edge of the signal contour. These ratios are then used to calculate the required distance separation between stations to avoid interference. Yet, the ratios used by the FCC do not relate to actual signal-to-noise ratios in the field, which are much higher, and thus yield much better audio quality (Rappaport et al., 1999:43-45, 47).

Report and Order (FCC, 1997), the Commission cites a study by the National Association of Broadcasters that estimated a total of 312 FM radio stations broadcast on 2nd or 3rd adjacent channels without adherence to minimum distance standards. These so-called short-spaced commercial stations have operated for decades without complaint or regulatory correction, indicating an absence of harmful interference.²¹ Since 100-watt stations emit far less possible interference than do full-power stations, using this time tested separation rule to estimate capacity for low power stations appears reasonable.

Given the assumptions above, the number of available channels in each market equals $100-3X$, where X is the number of FM stations already operating.²² Because 100-watt stations have a signal contour radius of 3.5 miles,²³ the minimum distance separation between 100-watt stations would be 7 miles. We increase this distance to 8 miles and assume that each 100-watt station would “occupy” a square area of 8x8 miles. Hence, the total number of 100-watt stations the FM band could accommodate per market is: $[100-3X][\text{Area in square miles}/64]$. This estimate, however, excludes the “blanketing” effect of existing FM stations on future low-power FM stations. Blanketing occurs when a nearby FM station’s signal overloads all other signals in the immediate area, including those broadcasting on distant frequencies. The circular blanketing area has been estimated as

²¹ The FCC stated that “The small risk of interference is far outweighed by the improvements in flexibility and improved service.” FCC (1997:par. 29). The FCC ruled in favor of eliminating 2nd and 3rd adjacent channel spacing for grandfathered short-spaced stations authorized prior to 1964 (ibid par. 23).

²² A listing of FM stations by market was obtained from BIA Financial, Radio Yearbook 2000.

²³ According to the FCC a 100-watt station with an antenna height of 98 feet (30m) would produce a 1mv/m (60dBu) signal contour at a distance of 3.5 miles (FCC, 1999; par. 30).

Table 2

LOW-POWER FM STATION INSERT CAPACITY NATIONWIDE AND IN 30 SELECTED MARKETS

Rank	Radio Market ^a	Population (12+) ^a	Area ^b	No. of FM stations ^c	Additional 100-watt slots ^d	Blanketing effect ^e	Net slots after blanketing effect	CAP (Max/1000 pop)	Final No. of 100-watt stations
1	New York, NY	14,449,700	7,796	69	0	0	0	14,500	0
2	Los Angeles, CA	10,347,700	4,850	38	0	0	0	10,348	0
3	Chicago, IL	7,147,300	5,619	46	0	0	0	7,4147	0
4	San Francisco, CA	5,812,200	7,369	62	0	0	0	5,812	0
5	Philadelphia, PA	4,063,000	3,518	19	2,364	817	1,547	4,063	1,547
6	Dallas-Ft. Worth, TX	3,928,600	6,968	32	435	128	307	3,929	307
7	Detroit, MI	3,826,600	4,466	23	2,163	713	1,450	3,827	1,450
8	Boston, MA	3,724,100	3,105	24	1,359	672	687	3,724	687
9	Washington, DC	3,664,600	3,967	29	806	377	429	3,665	429
10	Houston, Galveston, TX	3,613,700	7,107	29	1,444	377	1,067	3,614	1,067
1-10	Large markets total				8,571	3,181	5,487	60,579	5,487
134	Appleton-Oshkosh, WI	289,700	1,399	13	1,333	793	540	290	290
135	Peoria, IL	289,200	1,797	13	1,712	793	919	289	289
136	Biloxi-Gulfport- Pascagoula, MS	286,700	1,785	13	1,701	793	908	287	287
137	Atlantic City-Cape May, NJ	286,600	816	18	587	828	0	287	0
138	Trenton, NJ	284,800	226	5	300	425	0	285	0
139	Stamford-Norwalk, CT	283,300	210	4	289	352	0	283	0
140	Tyler-Longview, TX	272,500	2,101	15	1,806	825	981	273	273
141	Newburgh-Middletown (Mid-Hudson Valley), NY	270,900	816	9	931	657	274	271	271
142	Montgomery, AL	266,400	2,008	10	2,196	700	1,496	266	266
143	Eugene-Springfield, OR	265,200	4,554	9	5,195	657	4,538	265	265
134-143	Mid-size markets total				16,050	6,823	9,656	2,796	1,941

267	Jackson, TN	72,000	557	11	583	737	0	72	0
268	Bangor, ME	71,400	352	12	352	768	0	71	0
269	Beckley, WV	67,800	1,271	6	1,628	492	1,136	68	68
270	Mason City, IA	67,800	1,469	8	1,744	608	1,136	68	68
271	Jonesboro, AR	66,100	711	8	844	608	236	66	66
271	Cheyenne, WY	64,300	2,686	9	3,064	657	2,407	64	64
273	Great Falls, MT	63,300	2,698	5	3,583	425	3,158	63	63
274	Meridian, MS	61,200	1,380	10	1,509	700	809	61	61
275	Brunswick, GA	56,500	1,052	7	1,299	553	746	57	57
276	Casper, WY	50,600	5,340	8	6,341	608	5,733	51	51
267-276	Smallest markets total				20,947	6,156	15,361	641	498
1-276	All markets total	183,127,000	606,292	3,736	488,179		306,805		97,701

Notes: Nassau-Suffolk (NY), Monmouth-Ocean (NJ), Morristown (NJ), and Stamford-Norwalk (CT) included in New York City market; San Jose and Santa Rosa included in San Francisco market; New Bedford-Fall River (MA) included in Providence-Warwick-Pawtucket market; Frederick (MD) included in Washington DC market.

^a Based on Arbitron radio markets. Population age 12 and older.

^b Square miles. Based on Arbitron definition of market areas which follows U.S. Census Bureau Metropolitan Statistical Areas.

^c Data from BIA Research, Inc., Radio Yearbook 2000.

^d Assuming each 100-watt station is located in the center of an 8x8 mile square area.

^e Formula implicitly assumes a blanketing area of 64 square miles.

Sources: Arbitron Radio Market Rankings- Fall 1999. <http://www.arbitron.com/radiosurvey/mm001025.htm>. U.S. Census Bureau, Geographic Resources. http://www.census.gov/population/censusdata/90den_ma.txt. BIA Research, Inc., Radio Yearbook 2000. Investing In Series.

having a radius of 2.5 miles for the most powerful (Class C) FM stations, or 18.9 square miles (Rappaport et al., 1999:21-2). To be conservative, we increase the blanketing area to the same value assumed for the contour area of a 100-watt low-power FM station, or 64 square miles. Adjusting our equation to account for blanketing interference, and summing over 269 radio markets, yields the following equation:

$$Y = \sum_{i=1}^{269} [100 - 3X_i] [(Area_i - 64X_i) / 64]$$

where X_i is the number of existing FM stations in market i and Y is the number of licenses for low-power FM service that can be accommodated on the FM dial. As seen in Table 2, this estimation yields an insert FM band capacity of 306,805 low-power stations. Even when we cap the density of low-power FM stations per market at one per 1,000 population,²⁴ the band maintains an insertion capacity of 97,701 new 100-watt stations. This estimate is very likely a lower bound due to the conservative assumptions applied.²⁵ Moreover, it covers only the 269 metropolitan markets monitored by Arbitron, and these account for just about one-half of existing FM radio stations.

V. Three Policy Optima

We may now compare the revealed policy preferences of Congress (C^*) and the FCC (A^*), and contrast either with the policy of open entry (E^*). See Figure 4. While

²⁴ Since the smaller markets are typically less dense and have fewer radio stations broadcasting, their insertion capacity is greatest. Capping insert capacity limits this fact from skewing results.

²⁵ Note that our estimation does not provide insertion capacity for new low-power FM stations in the top four markets. In practice, such markets allow abundant space for such stations, however, as shown by the FCC's original plan to allocate low-power FM licenses to some of these markets (Federal Communications Commission, Report No. 24760, Broadcast Applications, June 21, 2000. http://www.fcc.gov/Bureaus/Mass_Media/Public_Notices/Brdcst_Applications/ap000621.txt. See also Federal Communications Commission, Report No. 24820, Broadcast Applications, Sept. 15, 2000).

the differences between Congress and the FCC appear large in isolation, putting them in context produces a dramatically different conclusion. Under the rules imposed by Congress, about 1,300 LPFM radio licenses were authorized, while the FCC's pre-statute rules are estimated to have authorized approximately 2,300 new stations (see Appendix 3). Either allocation is trivial compared to open entry. Existing broadcasters would not face substantial marketplace competition no matter which plan were adopted.²⁶

Non-quantifiable regulations strongly reinforce this conclusion. Licensing rules, perhaps more than numerical limits, severely constrained entry by low power stations in the FCC's rule making. These regulatory constraints (outlined in Appendix 1) included:

- a. severe limits on license aggregation, pre-empting important economies of scale realized by broadcast chains;²⁷
- b. prohibition on license ownership by newspapers, for-profit firms, radio or TV stations, pre-empting economies of scope;²⁸

²⁶ "Legislation was meant to send [FCC Chairman William] Kennard a strong message. 'It was clear that the FCC thought all along that they could run roughshod through this without much opposition', [Rep. Michael] Oxley said. 'We're hoping that the vote will bring them up short until Congress can sort this out.'" Frank Ahrens, *Political Static May Block Low-power FM; FCC, Congress Battle Over Radio Plan*, THE WASHINGTON POST, (May 15, 2000:A1); "The FCC has moved without any consideration of the facts,' said Representative John Dingell, Democrat of Michigan. 'This is a reasonable common sense compromise. It will protect the broadcasters, it will protect the licensees, and above all else, it will protect listeners of the FM radio spectrum.'" Stephen Labaton, *House Clears Bill to Curb Plans for FM*, THE NEW YORK TIMES (April 14, 2000:C1).

²⁷ "We will require that for the first two years of LPFM service, any one entity may own only one LPFM station (...). After the first two years, to bring into use whatever low power stations remain available but unapplied for, we will allow one entity to own up to five stations nationally, and after the first three years of service, we will allow an entity to own up to ten stations nationwide" (FCC, 2000a:par. 39).

²⁸ "We will prohibit common ownership of LPFM and any other broadcast station, including translators, and low power television stations, as well as other media subject to our ownership rules (...). This prohibition is national and absolute in nature, unlike our existing cross-media ownership rules. Thus, for example, a newspaper cannot have an attributable interest in any LPFM station, regardless of whether the newspaper and LPFM station are co-located." FCC (2000a: par.29).

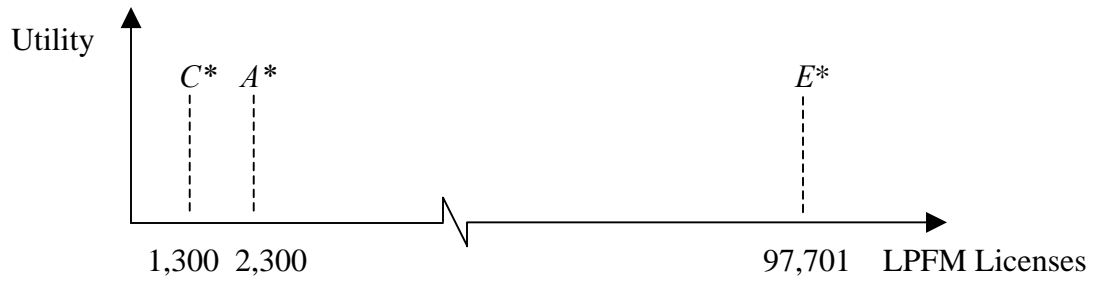


Figure 4. Policy optima for Congress, FCC, and consumer welfare maximization

- c. prohibition of advertising, blocking direct competition in the revenue-generating markets occupied by incumbent broadcasters;²⁹
- d. requirements (through licensing preferences) for eight daily hours of original programming, an imposing burden for small-scale community enterprises;³⁰
- e. prohibition of applicants who had engaged in unlicensed radio broadcasting, excluding those with human capital in owning and operating low-budget community stations;

By themselves, FCC rules ensured that low-power stations would prove expensive to operate and difficult to fund. With congressional pressure, regulatory constraints on entrants intensified. Congress and the agency appeared to reach consensus on these regulatory aspects of low-power FM policy.

VI. Low-power FM Policy: A Market Test

The previous analysis suggests a substantial difference between open entry and either of the policies preferred by Congress or the regulatory agency which, in context, were not substantially different from each other. Nonetheless, the Congress-FCC gap was sufficient to prompt a well publicized political conflict. Was the policy dispute, if small relative to the policy optima, nonetheless material?

²⁹ “We have also decided to prohibit operating agreements in any form, including time brokerage agreements, local marketing or management agreements.” FCC (2000a: par. 29); “We will establish LPFM as a noncommercial educational service.” (Ibid par.17). By establishing low-power FM service as noncommercial educational stations the FCC prohibited them from advertising as stated in the Code of Federal Regulations (47 CFR 73.503 par. (d) October 1, 1999).

³⁰ “Applicants that pledge to originate locally at least eight hours off programming per day will be assigned one point” FCC (2000a: par. 144). The point system developed by the FCC is for the selection of mutually exclusive applications. Applicants with 12 or more hours per day of local programming have preference over those with less local programming.

A way to test its significance is to examine the reaction of capital markets. If Congress battled the FCC for control of low-power FM licensing policy, investors in full-power radio broadcasting stations would predictably react to changes in the expected final regulatory outcome. Conversely, if Congress were seen by investors as having stable preferences and effectively exercising those preferences throughout the policy making process, the asset values of radio stations would not be materially affected by legislative and regulatory events in the low-power FM rule making.

An event study can be used to determine if financial markets anticipated that either FCC rulings or Congressional actions would impact the profitability of existing radio broadcasters. The premise of event studies is that capital markets reveal how new information is anticipated to affect future returns (Fama 1976: 66-70), and is useful in policy analysis because, “If there are specialized resources linked to regulation, such as taxicab medallions or stock exchange seats, the value of these assets can be used to measure some of the effects of regulation” (Schwert 1981: 121).

If investors expect serious consequences for the regulation-specific asset held by radio stations, broadcasting licenses,³¹ then we expect to observe negative returns for radio station owners during windows in which the FCC takes pro-entry actions, and positive share returns with news of congressional intervention to limit entry.

We perform an event study for the period Feb. 2, 1998 – Mar. 8, 2001, examining daily returns to shareholders in relatively “pure” owners of radio stations (full-power AM and FM incumbents). We extend the standard “market model” to include dummy variables to estimate excess 3-day event window returns (Binder, 1985), and use panel

³¹ FM and AM full-power stations could decline in value with the entry of low-power FM stations due to increased competition, harmful interference, or a combination of the two.

data estimation with fixed effects to control for unobserved firm specific characteristics.³²

Our base model regression equation is:

$$r_{it} = \beta_{0i} + \beta_1 M_t + \beta_2 FCC_t + \beta_3 CONG_t + e_{it} \quad (1)$$

where r_{it} = 3-day [t-1 to t+1] percentage change of firm “i” stock return (price change plus dividends) measured at day “t”;

β_{0i} = is the fixed-effect of firm “i”, taken as constant over time;

M_t = 3-day percent change of market index at day “t”;

FCC_t = dummy variable with a value of one if on day “t” occurred a FCC ruling on low-power FM, zero otherwise;

$CONG_t$ = dummy variable with a value of one if on day “t” occurred an event in Congress related to the low-power FM initiative, zero otherwise;

e_{it} = residual term of firm “i” returns at time “t.”

Using our base model we test the hypothesis that a substantial principal-agent problem exists. This implies jointly that: $\beta_2 < 0, \beta_3 > 0$.

Data. Our sample of six publicly listed radio station owners is listed in Table 3.³³

Eleven events in Congress signified potentially substantial developments on the low-power FM initiative. See Table 4. Five FCC developments signaled potential

³² This should reduce problems from omitted explanatory variables (Johnston and DiNardo, 1997:395-8).

³³ Publicly listed firms owning radio broadcast stations were identified by examining the firms listed in the “Broadcasting & Cable TV” sector by Yahoo!Finance. Available at http://biz.yahoo.com/research/indgrp/brdest_radio_tv.html (visited February 6, 2001). Of the 38 firms listed, we selected only those that principally derive company sales from radio broadcasting in the United States, and had sufficient trading data for meaningful analysis.

Table 3

PROFILE OF RADIO BROADCAST FIRMS

Firm	Profile
Cox Radio Inc.	National radio broadcasting co. owns, operates, and develops radio stations in the U.S. As of December 1999, Cox Radio owned and/or operated 83 radio stations in 17 markets. Approximately 73% of net revenues are generated from local radio advertising.
Entercom Communications	Fourth largest radio broadcasting company in the U.S. based on revenues. As of December 1999, the company had 96 radio stations (60 FM and 36 AM) in 17 markets.
Radio One	Radio broadcasting firm primarily targeting African-Americans. The company has approximately 40 radio stations.
Citadel Communications	Owns approximately 136 FM stations and 61 AM stations in 42 mid-sized markets. Virtually all of the company's revenues are generated from the sales of local, regional and national advertising on its radio stations.
Cumulus Media Inc.	The third largest radio broadcasting company in the U.S. based on number of stations. Upon conclusion of pending acquisitions, the firm will own 324 radio stations (228 FM and 96 AM). Virtually all of the firm's revenues are generated from the sale of local, regional and national advertising time on its radio stations.
Hispanic Broadcasting	Spanish-language radio broadcasting company that owns 45 radio stations in 13 U.S. markets. In addition the company operates the HBC Radio Network, a Spanish-language radio broadcast network serving the U.S. market.

Source: http://biz.yahoo.com/research/indgrp/brdcst_radio_tv.html (visited Feb. 6, 2001).

Table 4
 RESPONSE OF STOCK PRICES TO CONGRESSIONAL EVENTS: THREE-DAY (%) CHANGE [$t-1$ to $t+1$]

Date	Events	Nasdaq	CXR	ETM	ROIA	CITC	CMLS	HSP	Median excess return ^a	Mean excess return ^b
Nov 17, 1999	Rep. Oxley introduces HR-3439	3.96	5.07	1.78	-1.71	4.07	8.47	2.46	1.08	1.17
Feb 10, 2000	Sen. Gregg introduces S-2068	-0.72	3.09	-6.40	-5.68	-9.47	-12.99	0.06	-2.25	-1.44
Apr 10, 2000	Commerce Committee Report No. 106-567 on HR-3439	-4.96	3.99	-7.59	-9.81	-7.26	-5.45	-4.93	-6.31	-5.12
Apr 13, 2000	Radio Broadcasting Preservation Act of 2000 passes [Vote:274-110]	-18.11	-11.74	-11.49	-15.48	-8.35	-14.42	-12.84	-2.69	-2.79
May 8, 2000	Sen. McCain introduces S-2518	-3.63	0.41	1.59	-13.65	-3.12	-0.48	-19.78	-1.98	-6.02
Jul 27, 2000	Sen. McCain introduces S-2989	-9.10	2.32	-11.63	-4.28	9.59	1.32	-5.38	2.22	2.36
Sept 7, 2000	Sen. Grams introduces S-3020	-3.98	n.a.	0.36	-12.00	2.21	-4.67	-14.95	-3.84	-4.98
Oct 25, 2000	Rep. Rogers introduces HR-5548.	-5.67	-9.60	-13.69	-3.94	n.a.	-6.17	10.48	-3.93	-2.34
Oct 26, 2000	Conference Rep. No.106-1005 passes [Vote:206-198]	-4.14	-9.64	-9.24	-6.25	n.a.	-10.26	0.23	-7.91	-5.70
Oct 27, 2000	Sen. approves Conference Rep. No. 106-1005	-1.18	0.32	14.91	1.67	n.a.	-1.30	6.58	-0.81	1.96
Feb 27, 2001	Sen. McCain introduces S-404	-4.89	6.84	-3.78	3.90	0.00	-1.23	-1.27	-0.14	1.22
Cumulative return									-26.56	-21.69

Nasdaq = Nasdaq Composite Index; CXR = Cox Radio Inc; ETM = Entercom Communications; ROIA = Radio One Inc; CITC = Citadel Communications; CMLS = Cumulus Media Inc; HSP = Hispanic Broadcasting; n.a. = Not available.

^a Median excess return (%) = Equally-weighted median price change of 6 firms(%) – Market index change(%). We used the Nasdaq index as the market index.

^b Mean excess return (%) = Equally-weighted mean price change of 6 firms(%) – Market index change(%). We used the Nasdaq index as the market index.

Table 5

RESPONSE OF STOCK PRICES TO FCC RULINGS: THREE-DAY (%) CHANGE [$t-1$ to $t+1$]

Date	FCC Ruling	Nasdaq	CXR	ETM	ROIA	CITC	CMLS	HSP	Median excess return ^a	Mean excess return ^b
Feb 5, 1998	Public Notice Report No. 2254	1.68	1.71	n.a.	n.a.	n.a.	n.a.	7.92	3.14	3.14
Mar 10, 1998	Public Notice Report No. 2261	0.19	2.22	n.a.	n.a.	n.a.	n.a.	-3.56	-0.86	-0.86
Jan 28, 1999	Adoption of Notice of Proposed Rule Making	2.98	10.40	n.a.	n.a.	-3.83	3.03	0.27	-1.33	-0.51
Jan 20, 2000	Adoption of Report and Order	2.53	11.67	11.99	-3.79	8.92	8.92	5.34	6.39	4.64
Sept 20, 2000	Adoption of Memorandum Opinion and Order	2.75	-1.05	-8.05	-25.17	-12.58	-4.86	0.00	-9.21	-11.37
Cumulative									-1.87	-4.96

Nasdaq = Nasdaq Composite Index; CXR = Cox Radio Inc; ETM = Entercom Communications; ROIA = Radio One Inc; CITC = Citadel Communications; CMLS = Cumulus Media Inc; HSP = Hispanic Broadcasting; n.a. = Not available.

^a Median excess return (%) = Equally-weighted median price change of 6 firms(%) – Market index change(%). We used the Nasdaq index as the market index.

^b Mean excess return (%) = Equally-weighted mean price change of 6 firms(%) – Market index change(%). We used the Nasdaq index as the market index.

changes in low-power FM rules. See Table 5.³⁴

Regression analysis of policy events. The base model (equation 1) is estimated along with two alternative specifications. The first separates Congressional actions into those that appear to favor incumbents, and those that favor entrants (the McCain bills). The second tests for the possibility that the first three FCC actions were pro-entry, while the last two became hostile after disciplined was exerted by Congress. Thus, we estimate three specifications. In each regression we compute efficient standard errors using the Newey-West robust covariance matrix.³⁵

Results are shown in Table 6. Across all specifications, station owner returns are highly correlated with the NASDAQ market index. In Specification 1 (the base model), incumbent returns lack statistical significance during low-power FM regulatory in Congress and the FCC. Moreover, both estimated dummy coefficients are identically signed (i.e., both are negative). Similar results are obtained using the bootstrap technique. Separating the McCain bills from others in Congress does not alter results

³⁴ We eliminated those observations of events falling within the 3-day period of a stock down or upgrade listed under “Analyst History” on Yahoo!Finance. We extended this criteria to two days before the event [t-2] as the effect of the down or upgrade may extend past one day, or be made after hours. This rule led to the elimination of one observation (Sept. 7, 2000) for Cox Radio Inc (CXR) and three observations (October 27, 26 and 25, 2000) for Citadel Communications Corp. (CITC). On October 25, 2000, five analysts downgraded Citadel Communications Corp. See <http://biz.yahoo.com/c/c/citc.html> (visited on Feb. 15, 2001). We did not find news reports on Yahoo!Finance of any merger or takeover activity involving our firms during event windows.

³⁵ We tested for autocorrelation, heteroskedasticity, and non-normality in the distribution of error terms. The Durbin-Watson test provided evidence of first order autocorrelation while the Breusch-Pagan-Godfrey test indicated heteroskedasticity in error terms. Finally the Chi-square goodness of fit test indicated non normality in the error terms (White, 1997:18-20). These results violate the usual assumptions used in ordinary least square (OLS) regressions. Therefore OLS estimates, although unbiased and consistent, would be inefficient. To correct for inefficient standard errors we used the Newey-West robust covariance matrix that allows for within group (firms in our case) autocorrelation and heteroskedasticity (Newey and West, 1987; Greene, 1997:504-6). The results appear in Table 6 in specifications 1 to 3. For comparative purposes we also include results using the bootstrap method (specifications 4 to 6), which provide efficient estimators when error terms are not normally distributed (Freedman and Peters, 1984; Efron, 1982:35-6; Johnston and DiNardo, 1997:362-8).

Table 6

REGRESSION RESULTS FOR FCC AND CONGRESSIONAL EVENTS.

Dependent variable is 3-day change (%) returns to broadcast station equity owners.

	OLS with Newey-West standard errors			Bootstrap estimates (10,000 iterations)		
	1	2	3	4	5	6
NASDAQ 3- day return (%)	0.717 (16.40)*	0.717 (16.42)*	0.718 (16.42)*	0.716 (21.72)*	0.717 (21.66)*	0.718 (21.59)*
FCC events	-1.587 (0.78)	-1.588 (0.78)		-1.593 (0.84)	-1.549 (0.82)	
Congress events	-0.529 (0.60)			-0.535 (0.49)		
Congress w/o McCain bills		-1.404 (1.46)	-1.404 (1.46)		-1.410 (1.09)	-1.433 (1.11)
McCain Bills		1.625 (0.92)	1.626 (0.92)		1.610 (0.80)	1.590 (0.80)
FCC first 3 events			0.620 (0.38)			0.629 (0.21)
FCC last 2 events			-3.060 (0.98)			-3.067 (1.24)
No. Observations	3901	3901	3901	n.a.	n.a.	n.a.
R-squared	0.112	0.112	0.112	n.a.	n.a.	n.a.
F-test	0.490	1.235	1.050	n.a.	n.a.	n.a.

Panel data estimation with firm specific fixed-effects and Newey-West standard errors corrected for autocorrelation and heteroskedasticity. Absolute value of t-statistics in parentheses. *=99% confidence level; n.a. = not applicable. F-test that all event coefficients equal to zero cannot be rejected with 99% confidence.

(specification 2), coefficients lack significance and both Congressional dummies are of the wrong sign. Specification 3 tests the hypothesis that initial FCC events threatened broadcasters while subsequent FCC events signified an alignment with Congress. The results do not support this hypothesis; again estimated coefficients are insignificant and both FCC dummies are signed the wrong way. The hypothesis that all event coefficients are zero cannot be rejected with 99 percent confidence.

Regression analysis of news stories. Finally, we performed an alternative event study, testing whether news stories about low-power FM regulation in the *Wall Street Journal* or the *New York Times* were associated with abnormal broadcaster returns. There were two news categories: “FCC goes ahead” (presumably negative news for existing FM radio stations); and “Congress prevails” (positive for existing FM stations). We identified eight “FCC goes ahead” articles and eight “Congress prevails.”³⁶ See Table 7. We regressed broadcast radio equity returns against the NASDAQ index and dummies for “FCC goes ahead” news and “Congress prevails” news using a modified version of Equation (1).³⁷ The results show insignificant negative returns across all news events. See Table 8.

We interpret these results as evidence tending to reject the hypothesis that a substantial policy difference was evident between Congress and the regulatory agency. As the FCC’s plan did not threaten equity values, Congress did not visibly bolster them.

³⁶ As before, we eliminate observations of news appearing between the window period of [t-2 to t+1] of a stock down or upgrade listed in “Analyst History” in Yahoo!Finance web site.

³⁷ In other words, we re-estimated Equation (1) using NYT and WSJ news events in place of actual regulatory or legislative events. The dummy variable “FCC goes ahead” takes the value of one if on day “t” such news appeared; else, the dummy has a value of zero. The dummy variable “Congress prevails” is defined in similar way.

Table 7

WSJ and NYT NEWS STORIES ABOUT LOW-POWER FM RULING

News	Date
FCC Goes Ahead	
<i>FCC Offers Low-power FM Stations.</i> Stephen Labaton, NYT page C1.	Jan 29, 1999
<i>FCC is Set to Open Air Waves to Low-power Radio.</i> Kathy Chen, WSJ page B12.	Jan 17, 2000
<i>FCC to Approve Low-power Radio for Wider Access.</i> Stephen Labaton, NYT page A1.	Jan 20, 2000
<i>FCC to Open Airwaves.</i> Stephen Labaton, NYT page 4-2 Week in Review.	Jan 23, 2000
<i>Upstarts in Radio's Land of the Bland.</i> Jesse Walker, NYT page A15 (op-ed).	Jan 29, 2000
<i>FCC Moves Forward on Issuing Low-power FM Licenses.</i> NYT page C8.	Mar 28, 2000
<i>New FCC Rules Could Smooth Way For Low-power Stations.</i> Stephen Labaton, NYT page C2.	Sep 22, 2000
<i>255 Licenses are Awarded for Low-power FM Radio.</i> Stephen Labaton, NYT page C5.	Dec 22, 2000
Congress Prevails	
<i>FCC Gets Static for Promoting Tiny Stations.</i> Mark Wigfield, WSJ page A9.	Feb 22, 2000
<i>Panel Clears Bill to Curb Low-power Radio Stations.</i> WSJ page A8.	Mar 30, 2000
<i>Static Over Low-powered Radio.</i> NYT page A26 Editorial.	Mar 31, 2000
<i>House Clears Bill to Curb Plans for FM.</i> Stephen Labaton, NYT page C1.	Apr 14, 2000
<i>Communications Lobby Puts Full-Court Press on Congress.</i> Stephen Labaton, NYT page A1.	Oct 24, 2000
<i>Congress Severely Curtails Plan for Low-power Radio Stations.</i> Stephen Labaton, NYT page A1.	Dec 19, 2000
<i>US Bill Could Curb FCC Licensing Plans.</i> WSJ page B12.	Dec 20, 2000
<i>Radio Diversity Curtailed.</i> Stephen Labaton, NYT page 4-2.	Dec 24, 2000

Source: THE WALL STREET JOURNAL (WSJ) and THE NEW YORK TIMES (NYT) from Lexis-Nexis database.

Table 8

ESTIMATED EFFECTS OF NEWS STORIES ON RADIO RETURNS.

Dependent variable is 3-day change (%) returns to broadcast station equity owners.

Variables	OLS with Newey-West standard errors	Bootstrap estimates (10,000 iterations)
NASDAQ 3-day return (%)	0.709 (16.64)*	0.708 (21.63)*
News FCC goes ahead with plan	-0.386 (0.25)	-0.420 (0.34)
News Congress prevails	-1.177 (0.93)	-1.163 (0.87)
No. observations	3,894	n.a.
R-squared	0.111	n.a.
F-test	0.464	n.a.

Panel data estimation with firm specific fixed-effects and Newey-West standard errors corrected for autocorrelation and heteroskedasticity. Absolute value of t-statistics in parentheses. *=99% confidence level; n.a. = not applicable. F-test that all news coefficients equal to zero cannot be rejected with 99% confidence.

The fact that news coverage was lax, however, is perhaps more telling.³⁸ It appears that low-power FM became a political or human interest story, and failed to obtain the immediacy associated with an event of economic significance to investors.³⁹

VII. Conclusion

Previous research has developed a general framework in which Congress delegates administrative responsibility to an independent regulatory commission. When conflicts arise, Congress may reclaim jurisdiction by legislating directly. That such action becomes occasionally necessary suggests that the agent may be straying a considerable distance from the preferences of the principal.

Empirical examination of the Congressional Dominance view of regulation has yielded evidence that regulatory agents respond to changing congressional demands. But moving regulators *towards* the congressional position does not necessarily move regulators *to* the congressional position. Hence, the debate may be informed by evidence illuminating the distance separating the positions of the respective parties. Valuable in such an analysis is information regarding the interests of the true principals -- consumers.

In the case of low-power FM radio, policy position metrics are observable and quantifiable. We have found that, even in a regulatory dispute in which the publicly stated differences between Congress and the FCC were large, the regulatory commission

³⁸ Many important developments went unreported entirely. For example, when Rep. Oxley introduced the first bill in Congress opposing the low-power FM initiative no report appeared in either the *Journal* nor the *Times*. The next regulatory event concerning low-power FM in Congress was reported twelve days after the fact.

³⁹ A review of the six firms' Annual Reports submitted to the Securities and Exchange Commission does not provide evidence that the low-power FM initiative was perceived as harmful. Indeed in Hispanic Broadcasting's report the new low-power FM service is not mentioned. In the other five we found a short paragraph stating that they cannot predict in advance how this new low-power FM service will affect their business. See SEC filings, Form 10-K405, year 2000.

chose to locate its policy very close to that selected by Congress when compared to the pro-consumer optimum. A seemingly intense battle was waged over the *two to three percent* of FM band capacity the FCC attempted to open to entry. Even this minimalist approach to entry was offset by extensive barriers imposed by the regulatory agency, severely limiting competitiveness. This interpretation is supported by evidence gleaned from financial markets. Incumbent radio stations did not suffer a loss in value associated with FCC actions to “open” the FM band to low-power stations, nor did they enjoy windfall gains when congressional actions limited the FCC initiative.

The low-power FM regulatory case suggests that despite seemingly divergent policy options, the political fight was over trivial increments of competitive entry.⁴⁰ This modest margin was sufficient to provoke interest group rent-seeking that resulted in Congress supplying new legislation. This created an opportunity for “credit-claiming” and “blame-shifting,” while the underlying regulatory equilibrium was never seriously challenged. In quantifying the distance between the FCC and Congress, and comparing both positions to the pro-consumer optimum, we show that marginal differences (in economic terms) are enough to prompt statute policy making.

⁴⁰ Such flamboyant scuffling over essentially fixed policies has long been a noted feature of FCC broadcast regulation. In words of Prof. Coase (1966: 442) “the regulation of the broadcasting industry by the Federal Communications Commission resembles a professional wrestling match. The grunts and groans resound through the land, but no permanent injury seems to result.” See also Coase (1965).

Appendix 1: Summary of Changes in FCC Low-power FM Rule Making

Issue	Notice of Proposed Rule Making (Jan 1999)	Report and Order (Jan 2000)	Memorandum Opinion & Order (Sep 2000)
Power and type of service	3 classes: 1000-watt: primary 100-watt: secondary 10-watt: secondary to all including 100-watt	2 classes (1000-watt: dismissed): 100-watt: secondary 10-watt: secondary to all including 100-watt	Same as in Report and Order.
Protection required from 100-watt	To all primary service stations: co-channel, 1 st adjacent channel and Intermediate Frequency interference (IF). Receive protection only from other low-power FM stations.	Same as NPRM plus: 2 nd adjacent channel protection, Protect TV channel 6; translators and boosters; class-D; other 100-watt; future primary service stations, and upgrades.	Same as in Report and Order plus protect FM stations providing reading services on 3 rd adjacent channel.
Protection required from 10-watt	Same as 100-watt except IF protection, plus protection to 100-watt, translators and boosters in co-channel and 1 st adjacent channel. Receive protection only from other 10-watt stations.	Same as 10-watt in NPRM, plus protection to 2 nd adjacent channel, IF and TV Channel-6.	Same as in Report and Order plus protect FM stations providing reading services on 3 rd adjacent channel.
Ownership restrictions	Low-power FM licensees cannot: 1) Own full power radio stations. 2) Own another low-power station in same community.	Same as NPRM plus: 1) Max. stations owned per entity nationwide: 5 after two years, 10 after 3 years. 2) Licenses not transferable. 3) No newspaper or other media entity owner. 4) No pirate stations allowed.	Same as in Report and Order plus slightly relaxed restrictions on max. number of licenses nationwide for schools, universities, public safety, transportation, and government orgs.
Advertising	No decision	Not permitted	Same as in Report & Order

Source: FCC (1999; 2000a; 2000b)

Appendix 2: Main Events in Congress

- November 17, 1999. Rep. Michael G. Oxley (R-Ohio), a senior member of the Commerce Committee (with FCC oversight) introduced HR-3439, a bill to prohibit the FCC from establishing low-power FM rules. On February 10, 2000, Senator Judd Gregg (R-NH) introduced an identical bill, S-2068, in the Senate.
- April 10, 2000. The House Commerce Committee issued Report No. 106-567 approving HR-3439 with amendments. The report did not prohibit the FCC from establishing a new low-power FM service, but imposed the same level of protection afforded by full-power FM stations.
- April 13, 2000. The House of Representatives approved the Radio Broadcasting Preservation Act of 2000 (HR-3439), by a vote of 274 – 110.⁴¹
- May 8 and July 27, 2000. Senator John McCain (R-AZ, Chair of the Senate Commerce Committee) introduced S-2518 and S-2989, respectively. The first measure gave the National Academy of Science a key role in determining harmful interference from low-power FM. The second bill re-assigned responsibility to the FCC, while adding a mechanism for compensating incumbent FM stations should harmful interference occur. The measure was seen to advance low-power FM by removing the interference issue from the FCC's rule making process.⁴²

⁴¹ Republicans voted 188 in favor and 3 against; Democrats voted 85 in favor and 106 against. Congress of the U.S., Final vote results for Roll Call 130, April 13, 2000. <http://clerkweb.house.gov/cgi-in/vote.exe?year=2000&rollnumber=130>.

⁴² The National Association of Broadcasters (NAB), the leading trade group for incumbent FM stations responded furiously: “The McCain/Kerry Low-power Radio Act introduced yesterday should be renamed the ‘Interference Assurance Act’ Even though the FCC acknowledges there will be interference on the FM band, both lawmakers prefer that the FCC deal with it after the fact, rather than trying to solve the problem before. . . .” NAB, Statement by NAB President/CEO Eddie Fritts, *RE: McCain/Kerry Low-power FM Bill* (July 28, 2000). www.nab.org/newsroom/pressrel/STATEMENTS/S1500.HTM, visited February 28, 2001.

- September 7, 2000. Senator Rod Grams (R-MN) introduced S-3020, identical to HR-3439.
- October 25, 2000. Rep. Harold Rogers (R-KY) introduced HR-5548, an appropriations bill for the Departments of Commerce, Justice, State, the Judiciary, and related agencies. Section 632 of the bill follows HR-3439. The bill was referred to the Committee on Appropriations.
- October 26, 2000. Conference Report No. 106-1005 containing section 632 was approved 206 to 198.⁴³
- October 27, 2000. The Senate approved the Conference Report, and on December 21, 2000 President Clinton signed the measure that became Public Law No. 106-553.
- February 27, 2001. Senator John McCain (R-AZ) introduces S-404, a bill to facilitate the resolution of interference disputes over new low power service. However, it does not lift the severe restrictions imposed on low-power FM.

⁴³ U.S. Congress, *Bill Summary And Status For The 106th Congress, HR-4942*, <http://thomas.loc.gov/cgi-bin/bdquery/z?d106:HR04942@@@L&summ2=m&>, (visited February 22, 2001). Of the 206 votes in favor, 185 were Republican and 19 Democratic. Of the 198 votes against, 19 were Republican and 178 Democratic.

Appendix 3: Estimate of the No. of Low Power FM Licenses preferred by Congress versus the FCC.

Applicants for low power FM radio licenses were given five FCC filing deadlines. Each filing window encompassed a different set of states and territories.⁴⁴ Importantly, the second window closed September 1, 2000; congressional legislation passed in October 2000, signed into law (December 2000) forced the FCC to revise its list of accepted applicants. This revision allows calibration of both licensing regimes: the *ex ante* FCC rules (Report and Order of 2000) versus the Congress statutes.

The Commission received 1,195 applications in the first two filing windows, which included Alaska, California, Georgia, District of Columbia, Indiana, Louisiana, Maine, Mariana Islands, Maryland, Oklahoma, Rhode Island, Utah (Group 1), Connecticut, Illinois, Kansas, Michigan, Minnesota, Mississippi, Nevada, New Hampshire, Puerto Rico, Virginia, Wyoming (Group 2). The agency identified 255 applicants for low power FM licenses that were uncontested (no competing claims) and which comply with *ex ante* FCC rules and the modifications passed in Congress.⁴⁵

Another group of 127 applications has been deemed in compliance with all statutory modifications but involve conflicting claims. By examining the actual petitions, we were able to eliminate overlapping applications (requests for use of the same frequency as another applicant in a given market), and determine that 57 distinct licenses are possible.⁴⁶ The Commission also released a list of 638 applicants who were

⁴⁴ See Federal Communications Commission. *Low Power FM Radio: An Applicant's Guide*. <http://www.fcc.gov/mb/policy/lpfm/lpfmguide.pdf>.

⁴⁵ Federal Communications Commission. Public Notice. Notice of Acceptance of Low Power FM Broadcast Applications and Notification of Petitions to Deny Deadline. December 21, 2000.

⁴⁶ Note our conservative approach not to include low-power FM stations in the same channel within the same radio market. The FCC's own separation rule (pre-statute) established minimum separation for co-channel use of 24 kilometers.

disqualified by Congress legislation.⁴⁷ These however, were allowed to reapply in a remedial window in late 2002 (FCC 2001). Of these 638, there were 304 applications for licenses that were incompatible with other applications under the *ex ante* FCC rules, while 334 constituted non-competing applications. Finally, 175 applications were eliminated, presumably for non-compliance with Commission *ex ante* rules.⁴⁸

Under the final rules, as modified by Congress, some 426 applications are expected to qualify for a license: 255 plus an estimated 57 licenses to be awarded from 127 competing applications pending, plus 114 applicants that qualified from the remedial window held in late 2002.⁴⁹ Under the FCC *ex ante* rules; 731 applications could have qualified for a license in the first two filing windows. This estimate includes the 255 and 57 expected licenses that comply with both statutory and FCC *ex ante* rules, plus 334 non-competing applications eliminated by statutory rules, plus 85 qualifying applications predicted to result from 304 competing applications. Hence, the ratio of expected licenses under FCC *ex ante* rules to that under Congress' equals 1.716 (731÷426). As the total expected licenses (considering all five filing windows) with Congress status is 1,326 (see table 9), the estimated number of low power FM licenses under the FCC *ex ante* rules is estimated to be 2,275.

⁴⁷ There were 648 applications affected by Congress' restrictions on third adjacent channels. Ten of these had engaged in unlicensed operations in the past, however, disqualifying them according to Commission rules. Thus, a net total of 638 applications were affected by the congressional legislation. FCC (2001: Appendix A, B, and C).

⁴⁸ These are applications that do not appear among the 255 exempt of any dispute, neither among the 634 eliminated by Congress legislation or neither among the 127 competing applications that did not appear in the list of applications eliminated by Congress.

⁴⁹ See Federal Communications Commission. Public Notice. Notice of Acceptance of Low Power FM Broadcast Applications and Notification of Petitions to Deny Deadline. Report No. LPFM-S-7 (Feb. 13, 2003). Federal Communications Commission. Public Notice. Notice of Acceptance of Low Power FM Broadcast Applications and Notification of Petitions to Deny Deadline. Report No. LPFM-S-8 (Apr. 17, 2003).

Table 9

ESTIMATES OF LPFM LICENSES UNDER TWO SETS OF RULES (FCC v. CONGRESS)

	Applications Windows 1&2	Estimated licenses (Congress' rules)	Estimated licenses (FCC's rules)
<i>Data for Windows 1 & 2</i>			
Total applications	1,195		
Applicants with no competing claims and complying with FCC ex ante and statutory rules	255	255	255
Applicants with competing claims and complying with FCC ex ante and statutory rules	127	57	57
Applications eliminated by statutory rules and allowed to re-file in remedy window	638	114	n.a.
Competing applications (of the 638) eliminated by statutory rules = 304	n.a.	n.a.	85
Non-competing applications (of the 638) eliminated by statutory rules = 334	n.a.	n.a.	334
Applications not complying with FCC ex ante rules	175	0	0
<i>Estimated No. of licenses Windows 1 & 2</i>	<i>n.a.</i>	<i>426</i>	<i>731</i>
Ratio of Congress to FCC No. of licenses = 426/731 = 1.716			
<i>Qualifying applications Windows 3</i>	<i>n.a.</i>	<i>232</i>	<i>n.a.</i>
<i>Qualifying applications Windows 4 & 5</i>	<i>n.a.</i>	<i>668</i>	<i>n.a.</i>
<i>Total estimated licenses</i>	<i>n.a.</i>	<i>1,326</i>	<i>2,275</i>

n.a. = not applicable.

Source: Federal Communications Commission. *Public Notice. Notice of Acceptance of Low Power FM Broadcast Applications and Notification of Petitions to Deny Deadline*. December 21, 2000. http://www.fcc.gov/Bureaus/Mass_Media/Public_Notices/FM_Windows/pnmm0084.pdf

Federal Communications Commission, *Second Report and Order: In the Matter of Creation of a Low Power Radio Service*. MM Docket No. 99-25. FCC 01-100 (March 22, 2001). http://www.fcc.gov/Bureaus/Mass_Media/Orders/2001/fcc01100.pdf

Federal Communications Commission. *Report No. 24760. Broadcast Applications* (June 21, 2000). http://www.fcc.gov/Bureaus/Mass_Media/Public_Notices/Brdcst_Applications/ap000621.txt

Federal Communications Commission. *Report No. 24820. Broadcast Applications*. (September 15, 2000). http://www.fcc.gov/Bureaus/Mass_Media/Public_Notices/Brdcst_Applications/ap000915.txt

Federal Communications Commission. *Public Notice. Notice of Acceptance of Low Power FM Broadcast Applications and Notification of Petitions to Deny Deadline.* Report No. LPFM-S-2 (August 16, 2001).

Federal Communications Commission. *Public Notice. Notice of Acceptance of Low Power FM Broadcast Applications and Notification of Petitions to Deny Deadline.* Report No. LPFM-S-3 (March 11, 2002).

Federal Communications Commission. *Public Notice. Notice of Acceptance of Low Power FM Broadcast Applications and Notification of Petitions to Deny Deadline.* Report No. LPFM-S-4 (May 23, 2002).

Federal Communications Commission. *Public Notice. Notice of Acceptance of Low Power FM Broadcast Applications and Notification of Petitions to Deny Deadline.* Report No. LPFM-S-5 (Sep. 6, 2002).

Federal Communications Commission. *Public Notice. Notice of Acceptance of Low Power FM Broadcast Applications and Notification of Petitions to Deny Deadline.* Report No. LPFM-S-6 (Oct. 16, 2002).

Federal Communications Commission. *Public Notice. Notice of Acceptance of Low Power FM Broadcast Applications and Notification of Petitions to Deny Deadline.* Report No. LPFM-S-7 (Feb. 13, 2003).

Federal Communications Commission. *Public Notice. Notice of Acceptance of Low Power FM Broadcast Applications and Notification of Petitions to Deny Deadline.* Report No. LPFM-S-8 (Apr. 17, 2003).

References

- Ahrens, Frank. 2000. "Political Static May Block Low-Power FM; FCC, Congress Battle Over Radio Plan." *Washington Post*, May 15, A1.
- Berry, Steven T., and Joel Waldfogel. 1999 (Autumn). "Free Entry and Social Inefficiency in Radio Broadcasting," 30(3) *Rand Journal of Economics* 397-420.
- BIA Financial. 1999. "The State of the Industry Radio Report: Executive Summary." http://www.biacompanies.com/state_radio.htm.
- Binder, John J. 1985 (Summer). "Measuring the Effects of Regulation with Stock Price Data." 16(2) *Rand Journal of Economics* 167-183.
- Calvert, L. Randall, Mathew D. McCubbins, and Barry R. Weingast. 1989. "A Theory of Political Control and Agency Discretion." 33 (3) *American Journal of Political Science* 588-611.
- Coase, Ronald. 1959. "The Federal Communications Commission". 2 *Journal of Law and Economics* 1-40.
- Coase, Ronald. 1965. "Evaluation of Public Policy Relating to Radio and Television Programming: Social and Economic Issues." 41 *Land Economics* 161-67.
- Coase, Ronald. 1966. "The Economics of Broadcasting and Government Policy." 56 (1/2) *The American Economic Review* 440-447.
- Code of Federal Regulations. October 1, 1999. "Title 47 Telecommunications." <http://www.access.gpo.gov/cgi-bin/cfrassemble.cgi?title=199947>.
- Comments of 37 Concerned Economists. Federal Communications Commission, In the Matter of Promoting Efficient use of Spectrum Through Elimination of Barriers

- to the Development of Secondary Markets, WT Docket No. 00-230 (Feb. 7, 2001).
- Dodd, Lawrence C., and Richard L. Schott. 1979. *Congress and the Administrative State*. New York: Wiley.
- Efron, Bradley. 1982. "The Jackknife, the Bootstrap and Other Resampling Plans." CBMS-NSF Monograph 38. Philadelphia Society of Industrial and Applied Mathematics.
- Epstein, David, and Sharyn O'Halloran. 1999. *Delegating Powers: A Transaction Cost Politics Approach to Policy Making under Separate Powers*. Cambridge: Cambridge University Press.
- Fama, Eugene F. 1976. *Foundations of Finance*. New York: Basic Books.
- Federal Communications Commission. "Report and Order: In the Matter of Grandfathered Short-spaced FM Stations." MM Docket No. 96-120, RM 7651, FCC 97-276 (August 4, 1997).
- _____. "Notice of Proposed Rule Making: In the Matter of Creation of a Low Power Radio Service." MM Docket No. 99-25, FCC 99-6 (January 28, 1999).
- _____. "Report and Order: In the Matter of Creation of a Low Power Radio Service." MM Docket No. 99-25, FCC 00-19 (January 20), 2000a.
- _____. "Memorandum Opinion and Order: In the Matter of Creation of a Low Power Radio Service." MM Docket No. 99-25, FCC 00-349 (September 28), 2000b.
- _____. "Second Report and Order: In the Matter of Creation of a Low Power Radio Service." MM Docket No. 99-25, FCC 01-100 (March 22), 2001.

- Fiorina, Morris P. 1982. "Legislative Choice of Regulatory Forms: Legal Process or Administrative Process?" 39 *Public Choice* 33-66.
- Freedman, David A., and Stephen C. Peters. 1984. "Bootstrapping a Regression Equation: Some Empirical Results." 79 *J. of the American Statis. Assoc.* 97-106.
- Greene, William. 1997. *Econometric Analysis*. 3rd Edition. New Jersey: Prentice Hall.
- Hazlett, Thomas W. "The Wireless Craze, The Unlimited Bandwidth Myth, The Spectrum Auction Faux Pas, and the Punchline to Ronald Coase's Big Joke." *Harvard J. of Law and Technology* 15 (Spring 2001).
- Johnston, Jack, and John DiNardo. 1997. *Econometric Methods*. McGraw-Hill Companies.
- Kiewiet, D. Roderick, and Matthew D. McCubbins. *The Logic of Delegation: Congressional parties and the Appropriations Process*. Chicago: Univ. of Chicago Press, 1991.
- Leggett, Nickolaus, Judith Leggett, and Donald Schellhardt. "Petition for a Microstation Radio Broadcasting Service." Manuscript. (June 26, 1997). http://www.fcc.gov/Bureaus/Mass_Media/filings/rm9208.pdf.
- McCubbins, Mathew D., and Thomas Schwartz. 1984. "Congressional Oversight Overlooked: Police Patrols Versus Fire Alarms." 28 *American J. of Political Science* 165-179.
- McCubbins, Mathew D., Roger G. Noll, and Barry R. Weingast. 1987. "Administrative Procedures as Instruments of Political Control." 3 (2) *Journal of Law, Economics, and Organization* 243-277.

- McCubbins, Mathew D., Roger G. Noll, and Barry R. Weingast. 1989. "Structure and Process, Politics and Policy: Administrative Arrangements and the Political Control of Agencies." *75 Virginia Law Review* 431-482.
- Meyhew, David R. 1974. *Congress. The Electoral Connection*. New Haven: Yale University Press.
- Newey, Whitney K., and Kenneth D. West. May 1987. "A Simple, Positive Semi-Definite, Heteroskedasticity and Autocorrelation Consistent Covariance Matrix." *55 Econometrica* 703-8.
- Owen, Bruce M. 1999. *The Internet Challenge to Television*. Cambridge: Harvard University Press.
- Rappaport, Theodore, Kirk Carter, and Roger Skidmore. "Technical Analysis of the Low Power FM Service." Manuscript. Washington DC: Media Access Project (August 26, 1999).
- Rosston, Gregory, L., and Jeffrey Steinberg. "Using Market-Based Spectrum Policy to Promote the Public Interest." Federal Communications Commission Staff Paper (January 1997).
- Schwert, G. William. "Using Financial Data To Measure Effects of Regulation." *24 Journal of Law and Economics* (April 1981) 121-158.
- Skinner, J. Rodger. "Petition for Rule Making: Proposal for Creation of the Low Power FM (low-power FM) Broadcast Service." Manuscript. (February 28, 1998). http://www.fcc.gov/Bureaus/Mass_Media/filings/rm9242.pdf.
- Steunenberg, Bernard. 1992. "Congress, Bureaucracy, and Regulatory Policy-making." *8 (3) Journal of Law, Economics, and Organization* 673-694.

- Weingast, Barry, and Mark Moran. 1983. "Bureaucratic Discretion or Congressional Control? Regulatory Policymaking by the Federal Trade Commission." 91 *Journal of Political Economy* 765-800.
- White, Kenneth. 1997. *Shazam Econometrics Computer Program*. Irwin/McGraw-Hill.
- Wildman, Sarah. "Mixed Signals: NPR Sells Out." *The New Republic* (Feb. 5, 2001), <http://www.tnr.com/021201/wildman021201.html>.
- Wilson, James Q. 1980. *The Politics of Regulation*. New York: Basic Books.
- Wood, B. Dan, and Richard Waterman. 1991. "The Dynamics of Political Control of the Bureaucracy." 85 (3) *The American Political Science Review* 801-828.