

CATV: THE IMPACT OF DEREGULATION AND THE EMERGING TECHNOLOGY

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1. Introduction

At age forty, the cable television industry has developed into something quite different from what it was as an infant or an adolescent. A once awkward and fledgling augment or of off-air broadcasters, relegated to the mountainous and remote regions of America, and restricted by law from offering what scant program services existed in the important consumer markets, Community Antenna Television (CATV) has experienced enormous economic growth in the past decade and a half. Today, more than half of all American households subscribe to cable¹ paying an average monthly bill of over \$25.00, giving the industry annual revenues of about \$14 billion.² The revenues of just one cable operator, Telecommunications, Inc.,³ now exceed those of the three broadcast television networks combined.

But while the economic viability and influence of cable have flowered, the basic design of cable distribution has remained unchanged. An electronic video signal is “poured” into a cable, traveling downstream through a major artery, then into smaller canals, and finally into an individualized inlet at the subscriber’s property (note that these “tributaries” flow out from the main channel, just the reverse of water flow). One standardized product is sent — the video programming menu — and received at each end-receiver downriver. With only incremental adjustments (including improvements in transmission quality, reliability, and the amount of programming delivered), cable has grown from weak telecommunications step-child to industry giant.

Along the way, the world has been both hostile and kind to cable, in that order. To

focus on the regulatory climate, it was the express mission of the Federal Communications Commission, circa 1965, to suppress cablecasters so as to provide more fertile markets for federally licensed TV broadcasters. The rationale was that, since the FCC desired stations to perform certain costly tasks in the public interest, the government could pro-actively create and protect monopoly rents attached to broadcast licenses; such rents, in essence, pay for “localism” and other requirements of public trusteeship. Ironically, the same sort of entry barriers that were used to thwart cable early on proved an impetus to success soon thereafter. As regulations against CATV firms were dropped beginning in the early 1970s, the strategic parsimony with which the FCC issued broadcast licenses created a less elastic demand curve for cable companies to exploit.

While CATV is today seen by market analysts as an industry resistant to stock market swings and macroeconomic fluctuations, the perception of cable as a low-risk business is a recent phenomenon. From decade to decade, the history of the business is one of large variance, with technological advances and regulatory institutions interacting to create a high degree of uncertainty. This is evidenced in the industry’s curiously mixed feelings: it continues to achieve dizzying new heights of prosperity, yet is haunted by portents of disaster.⁴ The dark lining is both technological and economic. The troublesome technology is fiber optics; the troublesome economic issue is competition (direct and head-to-head). The two problems meet in the form of a telephone company (local exchange company).⁵ As the FCC has recently issued notice of its intent to drop the telephone company/cable cross-ownership ban, a maelstrom of controversy has engulfed trade gatherings. For an industry doing so well, its leaders claim to have a disproportionately large number of unpleasant dreams.

The purpose of this paper is to review the development of cable television as an industry, with emphasis on its current state of economic health; to examine the likely impact of fiber optic technology on the distribution of video services and the cable television industry; to discuss the public policy questions inherently part of the fiber revolution; and to offer some tentative conjectures about the likely shape of technical and regulatory issues related to cable and fiber optics in the near to medium term.

2. The CATV Market Today

The cable television industry is growing robustly in virtually (but not quite) all dimensions: the number of basic subscribers; the average channel capacity; revenue per subscriber; the number of satellite networks; viewership share versus broadcast channels; and the market value of cable systems have all increased dramatically over the past decade.⁶ (See Table 1 for summary data.)

As recently as the early 1970s, cable was little more than a five dollar per month antenna service and systems could be purchased for a couple of hundred dollars per subscriber. As services were added and revenues increased, market values increased

Table 1.
Summary Growth Statistics for CATV Industry: 1955 – 1988

<u>Year</u>	<u>Number of Subscribers</u>	<u>United States Penetration</u>	<u>Number of Pay Subs</u>	<u>Rev/Sub/Yr</u>
1955	150,000	.5%	0	n.a.
1960	650,000	1.4%	0	n.a.
1965	1,200,000	2.3%	0	n.a.
1970	3,900,000	6.6%	0	\$67.65
1975	8,000,000	12.4%	305,000	\$82.04
1980	15,200,000	19.8%	7,438,000	\$139.20
1985	38,000,000	44.6%	35,440,000	\$233.28
1988	45,000,000	51.1%	n.a.	\$308.40

Sources: NTIA 1988, p. 10; Kagan 1985, p. 15; Kagan 1988c, p. 10.

at compound rates of over 15% annually in the period from 1977 to 1988. By the end of 1988, typical cable systems were selling for over \$2,000 per subscriber, on the strength of anticipated operating margins in the 50% range (See Table 2).⁷ The profitability of the industry is indisputable as systems routinely are valued at over three times capital cost. Indeed, using \$350 per home passed (HP) as the standard industry

Table 2.
Cable Television System Market Values

<u>Year</u>	<u>Number of Sales</u>	<u>Number of Subs</u>	<u>Price/Sub</u>	<u>Price/HP</u>
1977	n.a.	n.a.	\$375	n.a.
1980	n.a.	n.a.	\$675	n.a.
1984	250	2,900,000	\$960	n.a.
1985, January – August	192	4,503,616	\$1018	\$540
1986, January – August	268	3,087,052	\$1299	\$676
1987, January – August	264	4,157,838	\$1619	\$886
1988, January – August	262	5,949,527	\$2020	\$1157
1988, August	25	985,595	\$2368	\$1333

Sources: Kagan 1985, pp. 183-4; Kagan 1988a, p. 2

cost figure (Kagan 1988b, 2) and given that the typical system is valued at \$1333 per HP (as of August 1988), the industry enjoys a Tobin q ratio of approximately 3.8.⁸ As a value of unity is associated with a normal (market) profit situation, and as firms on Wall Street generally have value/asset ratios slightly lower than one, the cable industry can be seen as capturing an extremely high rate of return on invested capital.

As noted, however, it was not always so. In the beginning, cable was a sleepy business which simply extended off-air television broadcasts into regions where they could not otherwise go. Hence, their market involvement was politically benign. The business was so innocuous that in 1959 the Federal Communications Commission explicitly rejected a suggestion to regulate cable on a common carrier basis (Powe 1987, 219). By the mid-1960s, though, cable signals were starting to be imported into markets possessing decent quality roof-top reception and television broadcasters began to feel threatened by an encroaching competitor (Pool 1983, 157). Thus began a long campaign by television station owners to enlist the assistance of federal regulators in preventing CATV operators from stealing audience share.

The protectionist campaign was successful for a decade. During this period, the FCC severely restricted the ability of cable operators to offer consumers in the major television markets any product worth paying for. Entry was not expressly forbidden, of course, but rules and regulations made it largely uneconomic.⁹ This discouraged entry, barring special circumstances. The Commission determined that the public interest was served by fostering large monopoly profits and engaging in "rent-sharing" through the licensing process.¹⁰

A deregulatory movement in the mid-1970s utilized important court decisions, FCC rule-makings, and finally 1984 congressional passage of the Cable Communications Policy Act to lift first federal, and then local government controls on cable operators. In today's marketplace, private owners of local cable systems (there are some 9,900 systems nationwide) are free to price and to select video menus virtually without regulatory constraint.¹¹ While consumers are enjoying more video services than ever before¹² the medium operates largely as an unregulated monopoly. In only about 50 local markets does head-to-head rivalry between CATV operators take place (Kagan 1988c lists 32 "current overbuilds" and 19 "partial overbuilds"). In the overwhelming majority of the hundreds or thousands of remaining markets, monopoly is not only in effect, it is enforced. That is, the licensing policy of local governments routinely protects incumbent operators, unregulated as they may be, from competitive entrants.¹³

The CATV industry presently finds itself in these paradoxical circumstances. After so many years as the second-class citizen of telecommunications, shunned and oppressed by federal law, it has emerged as a privileged medium, exempt not only from price or product quality controls, but from direct competition as well. Its reversal of fortune is reflected in its profitability. If success is the best revenge, cable is currently enjoying sweet vindication.

3. Is Cable Ready for a High-fiber Diet?

Fiber optic technology — as a transmission medium and as a competitive weapon — was far and away the most hotly debated topic¹⁴

The cable industry is focused like a laser on the application of fiber optic technology. There is a preoccupation with fiber both for its efficiency and as a preemptive device to be used against competitors. The industry consensus is that it is crucial that this technical advance not fall into the wrong hands. There is nothing that makes a cable executive squirm more than the thought of being overbuilt by a technologically superior telephone company. Cable has both positive and negative reinforcement spurring its entry into fiber optics.

What can fiber do for cable? From an engineering perspective, fiber optic transmission of video signals has the following advantages:

- expanded channel capacity: a single 250 micron fiber has 16 times the bandwidth capacity of a typical copper coaxial wire;
- greater reliability;
- ability to virtually eliminate the need for amplification (fiber can transmit for twenty miles without repeaters), thus economizing on both capital and labor costs;
- enhanced signal quality.¹⁵

To translate these factors into a realistic CATV solution, one must introduce the relevant economic factors. The good news (pro fiber) is that costs for fiber conduit are now roughly equal to costs for copper, about \$3,000 per mile. What is uneconomic is the idea of delivering fiber to the home. Fiber can easily deliver a signal to the end user but translation of the laser signal into each television feed is not economical. To decode the signal requires translating equipment costing about \$1,000 per channel. Industry sources believe that when a laser converter box can be produced for \$100, then 100% fiber optic cable will be the odds-on choice as a transmission medium. How long you think it will be before such a system arrives on the market depends upon which visionary you trust.

Despite the fact that fiber to the home is not yet a reality, the new technology is being deployed by cable firms in ways that are strategically sound from both an engineering and cost perspective. The use of fiber in video delivery is already economic for trunk distribution, links between CATV systems (when service is provided by a distant head-end), and for high density telecommunications traffic beyond the capacity of coaxial broadband (in intense business use). While the last application is of greater interest to

Table 3. Current Opinions on CATV Fiber to the Home	
CATV Expert	Prediction: When Will Fiber to the Home Arrive?
Irving Kahn, <i>President & CEO, Choice Cable</i>	2 – 3 years
Various telcos (see Pepper 1988, page 7)	2 – 5 years
Jim Hood, <i>President and CEO of Catel Communications</i>	4 years
Brian James, <i>Director of Engineering, NCTA</i>	5 – 10 years
Glenn Jones, <i>CEO, Jones Intercable</i>	10+ years
Israel Switzer, <i>international engineering consultant</i>	20 years
Walter Huff, <i>technical CATV executive, US West</i>	maybe never
Sources: Laurence Swasey, "Cost-Effective FO Systems Still years Away: Experts," <i>Multichannel News</i> (October 17, 1988), p. 46, Switzer 1987, Tom Kerver, "What Lies Ahead for Cable?" <i>Cable Television Business</i> (October 1, 1988), p. 22.	

office park developers and telephone companies, CATV firms are beginning to employ fiber in the former two capacities.

The substitution of fiber supertrunks for microwave transmission between hubs — distances typically of eight to ten miles — is prompting Telecommunications, Inc. (TCI), the largest multiple system operator, to invest in fiber optics.¹⁶ TCI systems in Dallas, Washington, D.C., and San Francisco are scheduled to be the first in line. A somewhat more involved delivery system is being designed and tested by the nation's second largest Multiple Service Operator (MSO), American Television & Communications, Corp. Described as a "fiber backbone," the system will run optical fibers in parallel with existing coaxial cables. A laser will then shoot along the trunks straight to several receivers (called "nodes" by Chiddix and Pangrac 1988) where it will be fed onto the existing coaxial distribution loop to the home. "[T]he effect of this approach is to break the existing tree-and-branch coaxial plant into many small tree-and-branch systems, with each fiber node feeding anywhere from a few homes to a few thousand homes" (Chiddix and Pangrac 1988). This hybrid system is currently in place in ATC's Orlando system, is soon to be installed in ATC's Oahu, Hawaii system, and is being adopted for the first time on a systemwide basis by Jones Intercable, in its Broward County, Florida rebuild.¹⁷

The advantages of such technology are manifest:

- up to 90% of existing amplifiers can be removed, thus lowering capital and operating costs;

- 35 channel systems can be upgraded to 80 channel capacity;
- signal quality improves;
- system reliability improves.

The most attractive aspect of the fiber backboning is that it is cheap: under \$60 per subscriber.¹⁸ Under most scenarios, this is a competitive price to pay for a better than 100% upgrade in channel capacity, particularly when additional cost savings and service enhancements come in the bargain. But beyond these short-run economies, there may be strategic reasons pushing CATV firms to invest in fiber optics.

The first is high definition television (HDTV). While the standards are unclear, it is apparent that even a partial fiber system as just described would "pave the way for accommodating high definition television."¹⁹ Getting out in front of the consumer demand curve would appear a very prudent thing to do, given that other providers might be in a position to move between the CATV suppliers and their video customers. James Chiddix argues for partial fiber on just such grounds: "I don't believe that a fiber-equipped telephone industry spells disaster to cable, but I do believe there will be strong activity from a number of sources, including telephone companies, MMDS, and DBS."²⁰

Preempting the local telephone companies into video fiber is the other strategic issue, as Mr. Chiddix suggests. The cable firms are motivated by both their hopes and their fears. If they perceive the telephone companies as Herculean competitors who seek to engage the CATVs in a battle royal for the telecommunications wire to the home,²¹ they will move to fiber in their desperation to get this huge video delivery capacity installed first. Yet, from the reverse perspective, CATV firms are discovering their bona fide advantages in fiber deployment: most importantly, their existing broadband to the home which provides a significant head start. Telephone company costs in bringing a fiber to the home, in new developments, range between \$1100 and \$1500 per subscriber, based upon the assumption that new technologies become economical within two to five years (Pepper 1988, 10).²² By linking fiber to neighborhood nodes, the cable firms can enter the next generation of telecommunications technology at a much lower cost, with ample bandwidth to handle all currently foreseeable household demands for non-switched services. In the process they can position themselves to move quickly into the telephone business (i.e., switched voice and data transmission) as soon as the technical problems with fiber switching are economically solved.²³

Given this double motivation to move to fiber optics, it is now being predicted that "the AM fiber optic hub will become a fixture in cable plants within five years."²⁴ It may well be a competitive race with the telephone companies (in line with Schumpeter's competition for the market²⁵) for Robert Pepper forecasts that "technical and economic advantages shortly will result in fiber replacing copper in residential networks for

virtually all new construction such as new housing developments and planned communities” (1988, 6).²⁶ Despite the fact that federal regulations generally forbid head-to-head video rivalry between telephone companies and CATVs, the fiber war looks as if it may have begun.

4. The Political Economy of the New Technology

Two recent government position papers have seized upon the emerging technology as a rare opportunity to solve two old monopoly problems with a couple of new fibers. In the June 1988 NTIA study of the video distribution market, the conclusion was reached that competitive forces in cable television could be substantially enhanced by inviting telephone company entry on a common carrier basis. Such a solution for video has several attractive features. As the common carrier would be competing with an established cable supplier (who also has the ability to package and market), market forces could be made more viable. This scenario would presumably allow telephone company economies of scope to be realized in the most monopolistic stage of the video distribution business, transmission to the home without spilling over into less monopolistic segments. This would conform to the separations achieved, more or less, in the AT&T divestiture, while relying primarily on market competition rather than complex regulatory oversight to achieve its pro-consumer goals. For these reasons, economists and policy makers have been considering such cable/common carrier rivalry in video for some years.²⁷

The Federal Communications Commission has gone a step further than this in issuing a proposed rulemaking²⁸ dropping telephone company/cable cross-ownership restrictions, and asking for federal policy changes—including a relaxation of the Modification of Final Judgement and repeal of a section of the 1984 Cable Act—to permit “open entry by telephone companies [into cable markets]...subject to safeguards”²⁹. The possibility is that telephone companies may either be allowed to operate stand-alone cable systems (technically similar to current CATV) or to provide video services along new broadband networks on a common carrier arrangement.³⁰ The downside of this approach is that where significant scope economies reign, limiting telephone companies from directly supplying video will chill competitive forces. There appear to be important packaging economics in multichannel video, making this concern vital.³¹ What appears clear is that federal policy makers do not intend to allow telephone company entry into video through the acquisition of existing cable systems: “If local exchange carrier entry into the information/content business merely means acquiring existing cable systems...then competition would not be advanced” (Pepper 1988, 61).³²

The real opportunity from a public policy perspective is to juxtapose two telecommunications giants in earnest rivalry in local markets. The two-wires-to-the-home policy has not meant much in the way of robust competition so long as the wires delivered very different sorts of products: narrowband versus broadband, switched versus tree-and-branch. But the evolution of the technology means that the separation

of video service providers and voice and data transmission suppliers will become increasingly archaic. As in other areas of communications (Pool 1983), convergence of distribution modes forces a reassessment of the separation of distribution functions. The world cannot help but notice the opportunity thereby created: "for now, our goal should be the development of at least two broadband networks" (Dennis 1988, 9).

This is the fundamental reality which animates cable industry concern regarding fiber optics and the new broadband networks. Cable, after a three decade stumble out of the starting block, has sprinted into an exceptionally warm destination in the communication marketplace. CATV firms deliver a popular product, projected to become even more popular as consumer familiarity and better programming continue to carve out new niches,³³ and do so in the environment of an essentially unregulated franchise monopoly. The separation of media has finally proven very profitable to CATV and the transition to vigorous inter-media competition predictably fails to entice.

But CATV interests can clearly see convergence in the form of a lightwave owned by the telephone company. What would a telephone company want to do with all that bandwidth when existing narrowband copper supplies voice and data services to the residential customer in configurations thought sufficient to handle current demands? Owning the only broadband in town is comfortable, even when it represents a rather primitive, non-switched technology. CATV enjoys a division of the spoils in which they provide the big clumsy "bus" and the telephone company struggles with more complicated switched services. In the bargain, cable achieves monthly revenues of about \$25 per household versus \$16 for the LEC residential customer. This cozy cable arrangement instantly gives way to nervousness with the appearance of a more sophisticated technology with superior and otherwise excessive bandwidth. Cable companies believe that they are vulnerable, no matter what current rules or predictions say, should they passively watch the telephone companies mature into all-fiber, all-digital, all-switched networks. They assume, on the basis of historical experience, that function will follow capacity.

If the cost to cable firms of such technical convergence is obvious, there are offsetting benefits; cable companies may cross into telephony. While the idea of jumping from a \$14 billion a year business to a \$100 billion a year business may look intriguing at first blush, the cable industry has shown little enthusiasm for such a proposition. First, although cable companies are currently allowed to enter the market for various voice and data transmission services, they have been slow to do so. Second, it is an expensive proposition to enter a fundamentally different business: full speed local loop competition is not simply a matter of fiber installation. Further, economical fiber switching technology is at least a few years away. And third, becoming a common carrier would place cable in the regulated public utility category. This is not the way cable desires to do business; they are doing quite well in an essentially unregulated, First Amendment-protected marketplace.³⁴

The CATV industry is keener to protect current rents rather than speculating on additional sources of competitive profit. This has resulted in a scramble to align politically against the duopolistic entry by telephone companies into the video market-

place, whether as common carriers or as cable providers. "Telco Threat Called Cable's Main Issue,"³⁵ is now a typical trade show headline in the cable business. An enormous expenditure of legal talent and executive time is being devoted to the FCC's cross-ownership policy inquiry, and new interest group coalitions are being pursued. These coalitions give observers an opportunity to gauge some of the political dynamics at work.

Perhaps the most fascinating coalition involves the active bidding by both telephone companies and CATV operators for political alliance with municipal cable regulators. Long a political backwater,³⁶ and nearly left for dead after the National Cable Television Association's major triumph in the 1984 Cable Act, the National Association of Telecommunications Officers and Advisors (NATOA) is now being strongly courted by the two powerful industry rivals.³⁷ The National League of Cities, aligned with NATOA, has recently made its decision to support telephone company entry, upon certain conditions (including local control via the franchising process), thus abandoning efforts to reach a compromise agreement with the National Cable Television Association. In relentlessly pursuing a deregulatory strategy over the past several years, the NCTA has been highly successful in its policy goals, but now finds that it has lost all of its friends. In a sense, it has overpriced its product or, conversely, offered allies too little in the bargain, and must increasingly go it alone in the political arena.³⁸

5. Fiber: A Technological Dare

Beyond the obvious challenges which fiber presents to the cable industry in the near term, (is it economic to install today?) and the medium term, (will telephone company fiber create mortal inter-media rivalry?), history shows that cable policy strategists are likely to be very concerned about appearances. In communication regulation, appearances matter very much. Ithiel de Sola Pool observed that the newness of more technologically advanced media has brought them under entirely distinct regulatory regimes largely because they looked very different than the older forms of communication. Lucas A. Powe, Jr. has explained the landmark *Red Lion* broadcast regulation precedent as the product of mistaken identity: "The justices deciding the case in 1969 were all raised during the era of the crystal set; many were born before the invention of the vacuum tube. For them, radio was as novel as Pac Man was for many of us. Because radio was different, they created a new theory to comprehend its differences" (1987, 44).

Because the new laser networks have not yet emerged, we do not know what they will look like, nor do we know how the new institutions will be perceived by judges and policy makers. The FCC and the NTIA believe that they have glimpsed the future and spotted new competitive-looking media (a coming "battle of the network stars," as it has been called). But others may look at cable's new fiber broadband as just another telephone wire. That would either make it ripe for common carrier regulation or make

it entirely redundant. Neither scenario looks particularly enticing from the current vantage point of the major cable operators.

But the trepidation apparent in the cable industry today about converting to a telephone-like technology is irrelevant; cable's mandate is clearly to embrace the new fiber optics quickly and preemptively. As one industry engineering executive puts it: "We're moving fast in fiber. As far as I'm concerned, the race is over. We're already in the home with broadband. The telephone companies don't have it. They're starting from the barn."³⁹

Such bravado should certainly be discounted; telephone company adoption of fiber is proceeding apace. The CATV leadership is painfully aware of this fact and haunted by the idea of direct telephone company competition. Indeed, one of the first and most important policy decisions leading to the financial success of cable was the 1970 FCC decision⁴⁰ to ban telephone company/cable cross-ownership within the LEC's own operating territory. It was this ruling which gave cable firms access to the telephone poles and conduits which telephone companies, despite operating as common carriers, had an interest in making less available than they might otherwise have been. This history is remembered, primarily because the conflicting economic interests which gave rise to the confrontation have become intensified in the intervening two decades as cable has become more lucrative and as technology has made telephone company video entry more economically efficient.

Cable adoption of fiber raises a number of long-term strategic problems, but one question is particularly troublesome: what business do we want to be in? CATV has come to enjoy being a plain old video supplier and may not think it a promotion to be elevated to the status of integrated telecommunications competitor. Great challenges dominate that turf; it may not be worth abandoning such comfortable quarters to travel there. Yet, in the near term, the industry has little choice but to be driven by the economic and technological advantages obtained by installing fiber optics in plant trunks. Cable will, by informed industry estimates, be heavily into hybrid fiber/coax systems in the next five years, regardless of long-term global considerations. In the short run, they can hear the footsteps of the ponderous telephone companies and see preemptive fiber installation as the obvious way to stay one step ahead in the game.

Of course, the cable industry would appreciate political assistance in shoring up their video market. The federal agencies, and even Congress, do not appear eager to help. The municipal cable franchise, which prevents entry by second video suppliers, is the one piece of their regulation-laden past that the cable industry has been careful to hang on to. Yet its value as an entry deterrent may be diminished because of the industry's tight-fistedness in sharing its rents with the enforcers of the local franchise barriers. Cable has simply won too much, too fast, in the deregulatory process, and must now grapple with reforging a coalition with local franchising authorities — agencies which still have it in their power to exclude competitors such as the telephone company from the incumbent cable operator's marketplace.⁴¹ It is evident that the way to re-establish such ties will be for cable franchises, or the NCTA, to put something back on the table

for municipal officials; an industry effort to beef up public access subsidies, for instance, would be a straightforward way to reward municipalities interested in procuring such payments and to strengthen the public interest rationale for exclusive franchise protection.

In short, cable companies will greet the new technology by installing it, as economically feasible; vilifying telephone company employment of "excess" broadband capacity; and cuddling up to municipalities which retain power to exclude those newly (or soon to be) equipped competitors threatening to challenge CATV dominance in local video markets.

Notes

The author is very grateful to Robert Bramson, Arthur Havenner, Phil Jarvis, Richard Kramer, John Mansell, and Robert Pepper for valuable discussions and references.

1. According to Nielsen Media Research, 53.8% of all U.S. television households subscribed to cable as of November, 1988. "Cable Penetration at 53.8%: Nielsen," *Multichannel News*, December 12, 1988, p. 9.
2. Kagan 1988c, p.10.
3. TCI currently accounts for approximately 20% of the national cable market.
4. While cable executives are busy celebrating record levels of market value, the trade press regularly features such counter-intuitive articles as, "The Sky is Not Falling: Jones"; a guest editorial by Chairman and CEO of Jones Intercable, Glenn R. Jones, *Multichannel News*, December 5, 1988, p. 140.
5. Glenn Jones links the two issues directly, tracing industry pessimism to the June, 1988, recommendation by the National Telecommunications and Information Administration that dropping the telephone company/cable cross ownership prohibitions would be in the public interest, and then immediately attacking the "myth that telcos have sole ownership of fiber optic technology...", op. cit.
6. The "virtually but not quite" caveat does not apply to the entire past decade (which has demonstrated uniform explosiveness for the industry), but refers to those cable variables no longer showing dramatic growth. These include pay (or premium) channel subscription rates (due to competition from VCRs and other sources), and the number of homes passed by cable (due to industry maturation; about 92% of the country is now wired for cable, with most of the residual in sparsely populated regions or downtown business districts relatively costly to cable).
7. Recent industry cash flow (or operating) margins (equal revenues minus operating costs) averaged about 37% in 1987, highest among nine communications industries and 12 points above the second highest. See Robert O'Brien, "1987 Banner Year for Cable Industry," *Multichannel News*, December 5, 1988, p. 19. Analysts, however, routinely evaluate system sales by assuming 50% margins. Paul Kagan & Associates, in fact, give a range between 45% and 60%. See *Cable Television Investor*, April 28, 1988, p. 5.

8. Alternatively, using the national average penetration ratio (basic subscribers as a percentage of homes passed by cable) of 58%, capital costs of \$603 per subscriber are obtained; dividing into the value-per-sub figure of \$2368 yields a q ratio of 3.9. Shooshan and Jackson (1987) found an industry average q ratio of 2.8. The disparity is due entirely to the fact that cable values have increased since their December, 1986, estimate of \$1732 per subscriber. Indeed, Shooshan and Jackson derive an average cost per subscriber of \$519, 14% lower than my estimate. Smiley (1986) deduced an average capital cost of \$592, using penetration equals .58, and density equals 92 hp/mile (also the approximate industry average).
9. Gerald Faulhaber (1987, 159-63) has a delightful discussion about the way in which regulation establishes entry barriers via circuitous bureaucratic means.
10. This interesting period of FCC protectionism is detailed at length in several places, including (Besen and Crandall 1981), (Pool 1983, Chapter 7), (Fogarty and Spielholz 1985), (Powe 1987, Chapter 12), (NTIA 1988, Appendix C), and (Hazlett 1989).
11. Price controls are still exercised, at the option of localities, in jurisdictions not having access to at least three FCC-defined B-grade off-air television contours. The average television viewer can receive seven signals off-air, and only 3% of current cable subscribers are thought to reside in regions receiving less than three. While municipal governments may not dictate what entertainment or information channels a cable operator chooses to offer to customers, they still commonly mandate that some public access/local origination channels be offered as terms of the franchise. Courts are split on the constitutionality of such requirements. While one important federal case has recently declared this regulation a violation of the cable operator's First Amendment rights as an electronic publisher (Palto Alto 1988), the other decisions have upheld the regulation.
12. Over 90% of subscribers in 1987 received more than 20 channels, with 54 channel systems now routinely state of the art (NTIA 1988, 11).
13. For an analysis of this curious policy see (Hazlett 1986), (NTIA 1988), and (Pepper 1988).
14. Chuck Moozakis, "The Coming of Fiber Optics," *Cable Television Business*, January 1, 1989, p. 30, reporting on the Western Cable Show held in Anaheim, California, the previous month.
15. As Chiddix and Pangrac (1988, 4) state the case for fiber: "The medium's great bandwidth, ruggedness, exceedingly low loss, and light weight make it a worthy candidate for use in any high-capacity physical transmission system."
16. "TCI To Install Fiber Trunk," *Multichannel News*, November 28, 1988, pp. 1, 42. John Egan, president of Anixter, the firm supplying the laser technology to TCI, noted that "it does not make economic sense now for cable operators to consider using fiber for any application other than to replace microwave links and for use in supertrunks" (op. cit.).
17. Jeannine Aversa, "ATC Engineer Touts 'Fiber Backbone' for Ops," *Multichannel News*, October 12, 1988, p. 50.
18. ATC's vice-president of engineering, Walter Ciciora, estimates \$30-\$60 per subscriber. See Aversa, op. cit. Even lower estimates are made; see Mercelle Seale, "Cost of Partial FO System Put at \$27 a Subscriber," *Multichannel News*, June 27, 1988, p. 10. The economical

aspect of the hybrid system is its heavy reliance on the existing copper wire system already in place. James Chiddix notes that, "I just don't believe there is any reason to go all-fiber. Coax still has a long way to go before (the cable industry) uses all its capability" (Moozakis, op. cit.).

19. Walter Ciciora, in Aversa, op. cit.
20. Chuck Moozakis, ibid.
21. Former FCC Chair Richard Wiley recently added fuel to this fire by noting that telephone companies and cable operators were positioning themselves for "the ultimate struggle." As described in *Cable Television Business*, Wiley defined the struggle as the conflict over who would provide HDTV to the home and he suggested that fiber optic technology will hold the key to finding the eventual answer to that question. Tom Kerver, "Titanic Struggle Pending?" *Cable Television Business*, January 1, 1989, p. 11.
22. Broadband switching equipment must become available before such fiber will deliver video on demand; however, this is not included in the prognosis of new technology coming to market in two to five years.
23. Cable industry leaders have most recently moved towards a position that fiber is highly profitable in its own right. The logic is that as its cost drops, it can cheaply extend cable system capacity to 200 channels. This would allow intensive exploitation of pay-per-view demand, as scores of channels could be employed to air first-run movies at staggered starting times, as well as specialty programs with low, but highly inelastic, demand. See Gary Kim, "Malone Gives Nod to Fiber," *Multichannel News*, December 3, 1990, pp. 1, 75.
24. Laurence Swasey, "AM Fiber Optic Hubs Seen as New Standard," *Multichannel News*, November 7, 1988, p. 36 (comments of James Chiddix).
25. Joseph Schumpeter hypothesized that the primary engine of industrial advance (and hence of consumer satisfaction) was the incessant rivalry between large firms for successive positions of transient monopoly, a process neatly summarized as "creative destruction" (Schumpeter 1942, 81-106).
26. This will not give telcos immediate broadband capabilities.
27. See particularly, (Noam 1982, 209) and (Nadel 1983). Noam explains the motivation behind the concept in straightforward terms: "The proposal, in brief, is to cease treating cable television and telephone services as two different media carefully kept apart, and instead to permit each to enter into the other's market as a competitor."
28. In the Matter of Telephone Company-Cable Television Cross- ownership Rules, Sections 63.54-63.58, CC Docket No. 87-266.
29. Paragraph 10.
30. The Commission left either option open, while Commissioner Patricia Diaz Dennis announced support only for the later.
31. Historically, the early involvement of AT&T in radio is instructive. The company purchased several radio stations in the pre-1926 period, planning to lease airtime as a common carrier. Little demand developed until AT&T began programming its own airtime, thereby creating an audience which independent producers would pay to reach.

32. The author observes, in a footnote omitted from the quotation, that some have proposed this form of entry for telephone companies, and points out elsewhere (pp. 81-2) that some cable firms, including industry leader TCI, do not oppose telephone company entry into information/content outside their LEC territories. This last point is troublesome as it is unlikely that incumbent cable operators would favor entry as a competitive force, and highly likely that they would favor the sort of entry which bids up monopoly rents. One interesting implication of outlawing telephone company/incumbent CATV mergers, via antitrust or other legal constraint, is that predatory behavior (a prime issue in telephone company entry) is virtually eliminated as a plausible strategy, in that the target of the predation is sunk — under whatever owners — as a separate, competitive entity in the market. Even should predation force bankruptcy, the physical assets to operate video services would, barring telephone company mergers, remain in independent hands. Hence, the plausible opportunity for predation — ruining the market in the short run so as to better exploit the demand curve in the long run — is blunted.

33. High growth rates in revenues are projected and are obviously driving current capital values. See, Robert O'Brien, "Study Sees Ops', Basic Nets' Margins Swelling," *Multichannel News*, November 18, 1988, p. 45.

34. One measure is that despite having much lower capital costs and a much simpler transmission system, cable values per subscriber are thought to be about equal to residential telephone values. When Centel, the one major telco with out-of-region CATV operations (allowed by virtue of its non-BOC status), was the subject of a takeover fight in 1988, its telephone customers and cable subscribers were both valued at \$2000 each by market analysts at Paul Kagan & Associates (Kagan 1988, 6).

35. Mercelle Seale, "Telco Threat Called Cable's Main Issue," *Multichannel News*, October 24, 1988, p. 47. Reciprocity was in order: "Telco Convention Focuses on Cable Entry" was the title of Larry Jaffee's article on a telephone company trade show the week before in the same publication, October 17, 1988 p. 16.

36. As a force in national policy making, at any rate. Regulators still exercise political clout within their own communities.

37. At their fall convention in Miami Beach, the sudden rise of the local cable administrator being aggressively hustled by the warring combatants created a "bizarre backdrop," according to *Broadcasting*, October 3, 1988, p. 60.

38. Specifically, the NLC rejected an NCTA offer to support legislation in Congress granting municipalities immunity from First Amendment lawsuits challenging the franchising process (as in Palo Alto) in exchange for the NLC's support on prohibiting telephone company entry. The baldness of the NCTA position was that it was only prepared to support damages immunity from First Amendment suits involving second entrants (overbuilders), but not from incumbents involved in litigation with city officials over franchise compliance; hence, the offer contained, essentially, no consideration. The damages immunity the NCTA offered to support would have improved incumbent market positions as a stand-alone proposition. See letter to James P. Mooney, NCTA President, from Thomas J. Volgy, Chair of NLC Transportation and Communications Steering Committee and Mayor of Tucson, October 21, 1988 [on file with the author].

39. In Glenn R. Jones, op. cit.

40. 47 CFR 63.54(a). See also, Applications of Telephone Common Carriers for Section 214 Certificates for Channel Facilities Furnished to Affiliated Community Antenna Television Systems (Final Report and Order), 21 FCC 2d 307, recon. in part, 22 FCC 2d 746 (1970), aff'd., *General Telephone Co. of S.W. v. United States*, 449 F. 2d 846 (5th Cir. 1971).

41. Assuming the First Amendment precedents such as Palo Alto are still several years away from general authority, if indeed they hold. It will likely take a Supreme Court ruling on the matter to decide the law. The NTIA study notes that "[t]he Supreme Court and several other Federal courts have indicated that the First Amendment may limit, if not eliminate, the discretion a municipality may exercise in awarding a cable franchise...no one knows how the courts will finally resolve this conflict between the cable franchising process and the First Amendment," (NTIA 1988, 19, footnotes omitted).

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