

CATV: The Impact of Deregulation  
and the Emerging Technology

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## INTRODUCTION

At age 40, the cable television industry has developed into something quite different than it was as an infant or an adolescent. A once awkward and fledging augmentor of off-air broadcasters relegated to the mountainous and/or remote regions of America, restricted by law from offering what scant program services existed in the important consumer markets, CATV has exploded in economic importance in the past decade and a half. Today, more than half of all American households subscribe to cable,<sup>2</sup> paying an average monthly bill of over \$25.00, giving the industry annual revenues of about \$14 billion.<sup>3</sup> The revenues of just one cable operator, Telecommunications, Inc.,<sup>4</sup> 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 steady. An electronic video signal is "poured" into a cable, which travels 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 natural water flows). One standardized product is sent -- the video programming menu -- and received at each end receiver down river. With only

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<sup>2</sup> 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).

<sup>3</sup> Kagan 1988c, p. 10.

<sup>4</sup> TCI currently accounts for approximately 20% of the national cable market.

incremental adjustments (including improvements in transmission quality, reliability, and size of the video package sent), 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 had an interest in actively creating and protecting monopoly rents attached to broadcast licenses. (Such rents, in essence, paying for "localism" and other requirements of public trusteeship.) But, ironically, the same sort of entry barriers that were used to thwart cable early on were a primary impetus to competitive CATV success soon thereafter. As regulations against CATV firms were dropped (beginning in the early 1970s), the strategic parsimoniousness of FCC broadcast license issuance (also to protect incumbent broadcaster rents) 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, 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 advance 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.<sup>5</sup> The perceived dark lining is both technological and economic. The troublesome technology is *fiber optics*; the troublesome economics is *competition* (direct and head-to-head). And the two problems meet in the form of a telco (local exchange company, specifically).<sup>6</sup> As the FCC has recently issued notice of its intent to drop the telco/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 (Section I); to examine the likely impact of fiber optic technology on the distribution of video services and the cable television industry (Section II); to discuss the public policy questions inherently part of the fiber revolution (Section III); and to offer some tentative conjectures about the likely shape of technical and regulatory issues related to cable and fiber optics to develop in the near to medium term (Section IV).

## I. THE CATV MARKET TODAY

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<sup>5</sup> 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," (Guest Editorial by Chairman & CEO of Jones Intercable, Glenn R. Jones, *Multichannel News* [December 5, 1988], p. 140).

<sup>6</sup> 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 telco-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.*).



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, the viewership of cable v. broadcast channels, and the market value of cable systems have all increased dramatically over the past decade.<sup>7</sup> (See Table 1 for summary data.)

**{Insert Table 1 Here}**

As recently as the early 1970s, cable was little more than a \$5 a 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 at compound rates of over 15% annually, 1977-88. By the end of 1988, typical cable systems were selling for over \$2,000 per sub, on the strength of anticipated operating margins in the 50% range<sup>8</sup> (see Table 2). The profitability of the industry is indisputable, as systems routinely are valued for over three times capital cost. Indeed, using \$350 per home passed as the standard industry cost figure (Kagan 1988b, p. 2), and the datum that the typical cable system is valued at \$1333 per HP (as of August 1988), the

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<sup>7</sup> The "virtually (but not quite)" *caveat* applies not over the entire timespan of the past decade (which has demonstrated uniform explosiveness for the industry), but refers to those cable variables *no longer* showing dramatic growth, which include pay (or premium) channel subscription rates (due to competition from VCRs and other sources), and number of homes passed by cable (due to industry maturation; *i.e.*, about 83% 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).

<sup>8</sup> Recent industry cash flow (or operating) margins (= revenues - operating costs) averaged about 37% in 1987 -- highest among nine communications industries and 12 points above the second highest (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 of between 45% and 60% (*Cable Television Investor* [April 28, 1988], p. 5).

industry enjoys a Tobin q ratio of approximately 3.8.<sup>9</sup> 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.

**{Insert Table 2 Here}**

As noted, however, it wasn't always so. In the beginning, cable was a sleepy business which simply extended off-air TV broadcasts into regions where they would not otherwise go. Hence, their market involvement was politically benign. (So innocuous was the business, that in 1957-8 the Federal Communications Commission explicitly rejected a suggestion to regulate cable on a common carrier basis [Powe 1987, p. 219].) By the mid 1960s, though, cabled signals were starting to be imported into markets possessing decent quality roof-top reception, and the broadcasters became threatened by an encroaching competitor (Pool 1983, p. 157). Thus began a long campaign by broadcast station owners to enlist the assistance of federal regulators in preventing CATV operators from "stealing" audience share.

The protectionist campaign was successful for, essentially, 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,

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<sup>9</sup> 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 & Jackson (1987) found an industry average q ratio of 2.8; the disparity is due more than entirely to the fact that cable values have increased since their December 1986 estimate of \$1732 per subscriber. Indeed, Shooshan & Jackson derive an average cost per subscriber of \$519, 14% lower than my estimate. Smiley (1986) deduces an average capital cost of \$592, using  $\text{pen} = .58$ , and  $\text{density} = 92 \text{ hp/mi}$  (also the approximate industry average).

but made conditional on rules and regulations which made it largely uneconomic.<sup>10</sup> This discouraged entry altogether, barring special circumstances. The Commission determined that the public interest was served, in fact, by fostering large monopoly profits, and engaging in "rent-sharing" through the licensing process.<sup>11</sup>

A deregulatory movement from the mid 1970s, however, 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 7,000 systems nationwide) are free to price and to select video menus virtually without regulatory constraint.<sup>12</sup> So while consumers are enjoying more video services than ever before (over 90% of subscribers in 1987 received more than 20 channels [NTIA 1988, p. 11] with 54 channel systems now routinely state-of-the-art), the medium operates largely as an unregulated local monopoly. In only about 50 local markets does head-to-head rivalry between CATV operators currently take place (Kagan 1988c lists 32 "current overbuilds" and 19 "partial overbuilds"); in the overwhelm-

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**10** Gerald Faulhaber (1987) has a delightful discussion of the ways in which regulation establishes entry barriers via circuitous bureaucratic means (see, for instance, pp. 159-63).

**11** This interesting period of FCC protectionism (of broadcasters) is detailed at length in several places, including Besen & Crandall (1981), Pool (1983; Chapter 7), Fogarty & Spielholz (1985), Powe (1987; Chapter 12), NTIA (1988, Appendix C), and Hazlett (1989).

**12** 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 TV viewer can receive seven signals off-air, and less than 10 percent of current cable subscribers are thought to reside regions receiving less than three. Also, while municipal governments may not dictate what entertainment or informational 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. (Although one important federal case has recently declared this regulation a violation of the cable operator's first amendment rights as an electronic publisher [*Palo Alto*, 1988].)

ing 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.<sup>13</sup>

It is in these paradoxical circumstances that the CATV industry now finds itself. 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. It's profitability reflects the rebound. If success is the best revenge, cable is currently enjoying a very sweet vindication.

## II. IS CABLE HUNGRY FOR A HIGH FIBER DIET?

*Fiber optic technology -- transmission medium and as a competitive weapon -- was far and away the most hotly debated topic ....<sup>14</sup>*

The cable industry is focused, like a laser, on the application of fiber optic technology. There is a pre-occupation with fiber both as an efficiency in its own right and as a pre-emptive device to be used against competitors. Above all, 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. With both positive motivation and negative re-inforcement, then, the CATVs are jumping into fiber optics.

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<sup>13</sup> For analysis of this curious policy see Hazlett (1986), NTIA (1988), and Pepper (1988).

<sup>14</sup> 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.

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

- (1) expanded channel capacity (a single 250 micron fiber has 16 times the bandwidth capacity of a typical copper coaxial wire);*
- (2) greater reliability;*
- (3) ability to virtually eliminate amplification (fiber can transmit for twenty miles without repeaters), thus economizing on both capital and labor (used frequently to service amplifiers) costs;*
- (4) enhanced signal quality.<sup>15</sup>*

To translate these factors into a realistic CATV solution, one must, of course, introduce the relevant economic factors. The good (pro-fiber) news is that costs for fiber conduit are now roughly level with costs for copper: about \$3,000 per mile. What is currently *uneconomic* about fiber in cable, according to all industry perspectives available to the author, is to take it all the way to the home. The fiber can easily deliver a signal up to the end user, but translation of the laser into an each television feed is not now practical. 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. How long such might take to arrive on the market depends upon which visionary you trust:

**{Insert Table 3 Here}**

Yet, no matter the emergence of total fiber optics, the new technology is being deployed in strategic (speaking in an engineering sense mostly, and in an economic sense, partly) ways. The use of fiber in video delivery is already economic for trunkline distribution, links between CATV

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<sup>15</sup> As Chiddix and Pangrac 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" (1988, p. 4).

systems (as when service is provided by a distant head-end), and for very high density telecommunications beyond the capacity of coaxial broadband (as in intense office business use). While the latter proposition is of greater interest to office park developers and telcos, CATV firms are beginning to employ fiber in the former two capacities.

The substitution of fiber supertrunks for microwave transmissions between hubs, distances typically of 8-10 miles, is prompting Telecommunications, Inc., the largest multiple system operator, to invest in fiber optics.<sup>16</sup> TCI systems in Dallas, Washington, D.C., and San Francisco are scheduled to be the first in line. A somewhat more involved fiber delivery system is being designed and tested by the nation's second largest MSO, American Television & Communications, Corp. Described as a "fiber backbone," the system will run fiber optic wires parallel to existing coaxial trunk cables. A laser will then shoot straight to several receivers along the trunks (called "nodes" by Chiddix & Pangrac 1988), where it will be fed onto the existing coax 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" (*Ibid.*). 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 system-wide basis by Jones Intercable, in its Broward County, Florida rebuild.<sup>17</sup>

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<sup>16</sup> "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.*).

<sup>17</sup> Jeannine Aversa, "ATC Engineer Touts 'Fiber Backbone' for Ops," *Multichannel News* (October 12, 1988), p. 50.

The advantages of such currently available technology are manifest:

- (1) up to 90% of existing amplifiers can be removed, thus lowering capital and operating costs;
- (2) 35 channel systems can be upgraded to 80 channels of capacity;
- (3) signal quality improves;
- (4) system reliability improves.

The most attractive aspect of the fiber backboning is that it's cheap: under \$60 per subscriber.<sup>18</sup> 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 there may be strategic reasons even above the short-run economies 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 accomodating high definition television."<sup>19</sup> Getting out in front of the consumer's 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. Indeed James Chiddix argues for partial fiber on just such market positioning 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 telcos, MMDS, and DBS" (in Moozakis, *op. cit.*).

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<sup>18</sup> ATC's vice-president of engineering, Walter Ciciora, estimates \$30-60 per sub. 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.*).

<sup>19</sup> Walter Ciciora, in Aversa, *op. cit.*

Pre-empting the local telephone companies into video fiber is the other strategic issue, as Mr. Chiddix suggests. Again, the cable firms are motivated by both their hopes and their fears. If they model the telcos as virtually invincible competitors who will one day engage the CATVs in a battle royale for the telecommunications wire to the home,<sup>20</sup> they are panicked into fiber by virtue of their desperate desire to get this huge video delivery capacity sunk first. Yet, from the reverse angle, the CATV firms discover their bona fide advantages in fiber deployment; most importantly, their existing broadband to the home. This may provide a significant headstart, as telco costs in bringing a fiber to the home (in new developments) range between \$1100 and \$1500 per subscriber, based upon new technologies becoming economical within two to five years (Pepper 1988, p. 10).<sup>21</sup> By linking fiber to neighborhood nodes, the cable firms very cheaply enter the next generation of telecommunications technology with ample bandwidth to handle all currently foreseeable household demands for non-switched services, and 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.

Given 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."<sup>22</sup> It may well be a

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<sup>20</sup> Former FCC Chair Richard Wiley recently fueled such a view by noting that telcos and cable operators were positioning themselves for "the ultimate struggle." As described by the article 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.

<sup>21</sup> 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 2-5 years.

<sup>22</sup> Laurence Swasey, "AM Fiber Optic Hubs Seen as New Standard," *Multichannel News* (November 7, 1988), p. 36, comments of James Chiddix.



competitive race (a la Schumpeter's competition *for* the market<sup>23</sup>) with the telcos, 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, p. 6).<sup>24</sup> Despite the fact that federal regulations generally declare head-to-head video rivalry between telcos and CATVs verboten, the fiber war looks as if it may have begun.

### III. THE POLITICAL ECONOMY OF THE NEW TECHNOLOGY

Two recent government position papers have seized upon the emerging technology as a rare opportunity to, essentially, 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 telco entry on a common carrier basis. Such a video common carriage solution has several attractive features: as the common carrier would be (generally) competing with an established cable supplier (which also has the ability to package and market), market forces could presumably only be made *more* viable; allowing the telephone company economies of scope to be realized in the (presumably) most monopolistic stage of the video distribution business (*i.e.*, actual transmission to the home) without spilling over into less monopolistic segments conforms with natural separations as have been achieved, more or less, in the AT&T divestiture; it appears to rely primarily on market

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<sup>23</sup> Joseph Schumpeter hypothesized that the primary engine of industrial advance and of consumer satisfaction, in a very dynamic real world, was the incessant rivalry between large firms for successive positions of transient monopoly, a process neatly summarized as "creative destruction" (Schumpeter 1942, pp. 81-106).

<sup>24</sup> This will not, however, give telcos immediate broadband capabilities.

competition, rather than complex regulatory oversight, to achieve its proconsumer goals. For these reasons, economists and policymakers have been considering such cable-common carrier rivalry in video for some years<sup>25</sup> (see particularly: Noam 1982; Nadel 1983).

The Federal Communications Commission, however, has gone a step further than this in issuing a proposed rule-making<sup>26</sup> dropping telco-cable cross ownership restrictions, and asking for federal policy changes (including a relaxation of the Modified Final Judgment and repeal of a section of the 1984 Cable Act), to permit "open entry by telephone companies [into cable markets] ... subject to safeguards" (para. 10). The possibility is that telcos 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. (The Commission left open either, while Commissioner Patricia Diaz Dennis announced support only for the latter.) What appears clear, however, is that federal policymakers do not intend to allow telco entry into video by 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, p. 61<sup>27</sup>).

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**25** See particularly, Noam (1982) 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" (p. 209).

**26** In the Matter of Telephone Company-Cable Television Cross-Ownership Rules, Sections 63.54-63.58, CC Docket No. 87-266.

**27** The author observes, in a footnote omitted from the quotation, that some have proposed just this form of entry for telcos, and points out elsewhere (pp. 81-2) that some cable firms, including industry leader TCI, do not oppose telco entry into information/content outside their LEC territories. This latter is a troublesome position, 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 bid up monopoly rents. One interesting implication of outlawing telco-incumbent CATV mergers, via antitrust or other legal constraint, is that predatory behavior (a prime issue in telco entry) is virtually eliminated as a plausible strategy, in that the target of the predation is sunk

The real opportunity from a public policy perspective is to juxtapose two telecommunications giants in earnest rivalry in local markets (as in Noam 1982). The two-wires-to-the-home policy has not meant much in the way of robust competition so long the wires delivered very different sorts of products (narrowband v. broadband; switched vs. tree-and branch). But the evolution of the technology means that the separation of video service providers and common carrier voice and data transmission suppliers will become increasingly archaic. As in important other areas of communications (see Pool [1983]), convergence of distribution modes forces a re-assessment of the separation of distribution functions. The world cannot help but notice the opportunity thereby created: "[F]or now, our goal should be the development of at least two broadband networks" (Dennis 1988, p. 9).

This is the fundamental reality which animates cable industry concern regarding fiber optics and the new broadband networks. Cable, after a very rough (three decade) start, has arrived at an exceptionally warm destination in the communications 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,<sup>28</sup> and do so in the environment of, 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.

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(under whatever owners) as a separate, competitive entity in the market. Even should predation force bankruptcy, the physical assets to operate video services would (again barring telco merger) remain in independent hands. Hence, the plausible opportunity to predate -- ruining the market in the short run so as to better exploit the demand curve in the long run -- is blunted.

<sup>28</sup> 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.

But CATV interests can clearly see convergence in the form of a lightwave owned by the phone company. What would a telco 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 all 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 phone company struggles with the eminently more complicated switching services. (In the bargain, cable achieves monthly revenues of about \$25 per household vs. \$16 for the LEC residential customer.) This cozy cable arrangement instantly gives way to nervousness when pressed by the appearance of a more sophisticated technology *with equivalent and otherwise excessive bandwidth*. Cable companies cannot believe that they are not fundamentally vulnerable, no matter current rules or predictions, should they passively watch the telcos mature into all-fiber, all-digital, all-switched networks. The impression, based on historical experience, is that function will follow capacity, meaning that integration will follow the technology.

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 underwhelming enthusiasm for such a proposition. First, it is currently allowed to enter various voice and data transmission services, and has 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 (most importantly, economical

switching technology is at least a few years away). And thirdly, getting into common carrier type service of the regulated public utility category is not the way cable desires to do business; they are doing quite well in an unregulated, first amendment-protected marketplace.<sup>29</sup>

It appears that the current mood of the CATV industry is to protect current rents rather to speculate on additional sources of competitive profit. For the industry, this has produced a near-panic in the scramble to politically align against duopolistic entry by telcos in video, as common carriers or as cable providers. "Telco Threat Called Cable's Main Issue,"<sup>30</sup> 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 give observers an opportunity to gauge some of the political dynamics at work.

Perhaps the most fascinating coalition building involves the active bidding by both telcos and CATV operators for political alliance with the municipal cable regulators. Long a backwater politically,<sup>31</sup> 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

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<sup>29</sup> One measure of how well is that, despite having much lower capital costs (and a much simpler -- non-switched transmission -- problem), 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, p. 6).

<sup>30</sup> Merselle 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 telco trade show the week before in the same publication (October 17, p. 16).

<sup>31</sup> As a force in national policymaking, at any rate. Regulators still exercise formidable political clout within their own communities.

Administrators is now being strongly courted by the two powerful industry rivals.<sup>32</sup> The National League of Cities (closely aligned with NATOA), however, has recently made its decision to support telco entry, upon certain conditions (including local control via the franchising process), thusly 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 over-priced its product (or, conversely, offered allies too little in the bargain), and must increasingly go it alone in the political arena.<sup>33</sup>

#### IV. FIBER: A TECHNOLOGICAL DARE

Beyond the obvious challenges which fiber presents cablers in the near term (is it economic to install today?), and the medium term (will telco fiber create mortal inter-media rivalry?), the industry's history must force cable policy strategists to be very concerned about appearances. In communications regulation, appearances matter very much. As Ithiel de Sola Pool observed that the "newness" of more technologically advanced media have brought them

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<sup>32</sup> 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.

<sup>33</sup> 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 telco entry. The baldness of the NCTA position, however, 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].)

under distinct regulatory regimes larger because they simply 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 a novel as Pac-Man was for many of us. Because radio was different, they created a new theory to comprehend its differences" (1987, p. 44).

Because the new laser networks have not yet emerged, we not only do not know what they will look like, we do not know how the new institutions will be perceived by judges and policymakers. 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 simply 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 in converting to a telephone-like technology, while apparent in the cable industry today, is by and large irrelevant: cable's mandate is clearly to embrace the new fiber optics quickly and pre-emptively. 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 telcos don't have it. They're starting from the barn."<sup>34</sup>

Such bravado should certainly be discounted; the question regarding telco adoption of fiber is not "if" but "when." The CATV leadership is painfully aware of this fact, and haunted by the

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<sup>34</sup> In Glenn R. Jones, *op. cit.*

idea of direct telco competition. Indeed, one of the first and most fundamentally important policy decisions springing CATV towards long-awaited financial success was the 1970 FCC decision<sup>35</sup> to ban telco/cable cross-ownership within an LEC's operating territory. It was this ruling which allowed cable firms easier access to the telephone poles and conduits which telcos, despite operating as common carriers, had had an interest in making less available than they might otherwise be. This history of "bad blood" is very much remembered, primarily because the conflicting economic interests which gave rise to the confrontation have, if anything, become intensified in the intervening two decades (as cable has become more lucrative, and as technology has made telco video entry predictably easier).

Cable adoption of the fiber channel, then, is fraught with peril for long-run strategic reasons, including the most basic issues involving the question: What kind of a company do you want to be? CATV has come to enjoy being a plain old video supplier (POVS?), and may not think it a promotion to be "elevated" to the status of integrated telecommunications competitor. A lot comes with that latter bargain that may not be worth abandoning such comfortable quarters to obtain. Yet, in the near-term, the industry has little choice but to be driven by cost and technology factors pushing fiber optics into plant trunks. Cable will, by informed industry estimates, be heavily into hybrid fiber/coax systems in the next five years, no matter its long-run global considerations. In the very short run, they can hear the footsteps of the ponderous telcos, and see pre-emptive fiber wiring as a fast way to stay ahead.

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<sup>35</sup> 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. os S.W. v. United States*, 449 F. 2d 846 (5th Cir. 1971).



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, preventing entry by second video suppliers, is the one piece of their regulation-laden past that the cable industry has been careful to hang onto. Yet its reliability as an entry deterrent may be diminished due to cable industry 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 phone company from the incumbent cable operator's marketplace.<sup>36</sup> It is evident that the way to re-establish such ties will be for cable franchisees (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 politically (if not legally) strengthen a "public interest" rationale for exclusive franchising.

In short, cable companies will greet the new technology by, (a) installing it, as economically feasible; (b) villifying telco employment of "excess" broadband capacity; (c) 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.

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<sup>36</sup> Assuming the First Amendment precedents such as *Palo Alto* are still several years away from general authority (it will likely take a Supreme Court ruling on the matter to decide the law), if indeed they hold. The NTIA study notes that "The Supreme Court and several lower 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," (1988, p. 19; footnotes omitted).

**Table 1**  
**Summary Growth Statistics for CATV Industry: 1955-1988**

<i>Year</i>	<i>No. of subscribers</i>	<i>US penetration</i>	<i>No. pay subs</i>	<i>Rev/sub/yr</i>
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	8,500,000	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; and Kagan 1985, p. 15; Kagan 1988c, p. 10.

**Table 2**  
**Cable Television System Market Values**

<i>Year</i>	<i>No. of sales</i>	<i>No. of subs</i>	<i>Price/sub</i>	<i>Price/HP</i>
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, Jan-Aug	192	4,503,616	\$1018	\$540
1986, Jan-Aug	268	3,087,052	\$1299	\$676
1987, Jan-Aug	264	4,157,838	\$1619	\$886
1988, Jan-Aug	262	5,949,527	\$2020	\$1157
1988, August	25	985,595	\$2368	\$1333

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

**Table 3**  
**Current Opinions on CATV Fiber to the Home**

<i>CATV Expert</i>	<i>Prediction: When Will Fiber to the Home Arrive?</i>
<i>Irving Kahn, Pres. &amp; CEO, Choice Cable</i>	2-3 years
Various telcos (see Pepper 1988, p. 7)	2-5 years
<b>Jim Hood, Pres. &amp; CEO of Catel Telecommunications</b>	4 years
<b>Brian James, Director of Engineering, NCTA</b>	5-10 years
<b>Glenn Jones, CEO, Jones Intercable</b>	10+ years
<b>Israel Switzer, international engineering consultant</b>	20 years
<b>Walter Huff, technical CATV exec, US West</b>	maybe never

Sources: Laurence Swasey, "Cost-Effective FO Systems Still Years Away: Experts," *Multichannel News* (October 17, 1988), p. 46, Switzer 1987, Tom Kerver, "What Lies Ahead for Cable?" *Cable Television Business* (October 1, 1988), p. 22.

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