

**Turning the Cables: A Strategic
Analysis of Cable TV Diversification
into Telecommunications**

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TURNING THE CABLES:

A Strategic Analysis of Cable TV Diversification into Telecommunications

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I. THE WALL CRUMBLES

For decades, a wall stood between the cable television and the telephone industries. Telephone companies provided two-way voice and data service to businesses and households while cable companies broadcasted multi-channel, entertainment video to home viewers. Over recent years, that wall has crumbled and today is on the verge of complete collapse. Attempts by local telephone companies to deliver video to the home have been widely publicized. Less well known are the ventures by cable television systems to provide various telephone services.

At an increasing rate, cable television systems (primarily the large MSOs) are *diversifying into selected segments* of the communications industry. Their first target has been the provision of high-capacity non-switched access for large business customers. These same facilities are capable of providing the transmission component required for many local services, most notably Personal Communications Services (PCS). In addition, systems are being developed and tested that interconnect home personal computers and link residential customers to their long distance carriers over cable's coaxial network. More speculative, at least in this country, is the possibility that cable systems will provide person-to-person switched phone service throughout their residential areas.

In its attempt to enter telecommunications markets, the cable industry has experimented with a bewildering variety of *modes of entry*. They have built their own networks, purchased established providers outright, and entered into a wide variety of joint ventures.

The potential benefits of cable entry into telecommunications services could be sizable. By finding new uses for excess cable capacity, existing facilities are more fully utilized. Furthermore, as passage over wall dividing the two sectors becomes easier, carriers will be able to improve network planning and operation. The result will be additional cost savings. As with all new entry, cable's presence will drive down prices in the target markets, directly benefitting residential and business customers. Looking ahead, as new transmission and protocol options appear for interactive and multimedia applications, cable companies will be able to coordinate equipment and software choices across their general purpose networks.

The re-structuring that is underway in these two industries does raise serious policy concerns. Many of these have been aired in the debate over telco entry into video delivery, and translate with little change to this new context. They include the possibility of "cost shifting" where a cable firm could tap its monopoly rents from entertainment video to undercut the competition in communications markets. Anti-competitive behavior could take the form of tying basic cable service to the purchase of communications services, most likely toll access. Finally, there is the possibility that cable diversification is nothing more than uneconomic bypass. Distorted tariffs attract cream skimmers who make wasteful investments in telecom facilities and deploy inefficient technologies.

This paper documents cable's diversification into telecommunications. We find that changes in demand and cost conditions and regulatory policy go a long way to explain these undertakings. An understanding of which cable's chosen mode of entry, however, demands a strategic analysis of diversification. We argue that when diversifying into telecommunications, cable concerns seek to shape the future course of competition in both video and telecommunications markets.

For this reason, it is necessary to examine the consequences of the policies governing the separation of the two industries. This leads us to explore the effects of structural regulations on the form of diversification. We find that restrictions on the avenues available to the cable industry into the communications business can have unintended outcomes. The analysis cautions policy makers to work through the strategic impact on the actual and potential competitors for these services, and for services that will be developed in the future.

II. CABLE VENTURES INTO TELECOMMUNICATIONS

Cable companies have not left a single entry option untested. Frequently, they chose to upgrade their networks or built new ones to supply communications services. These networks may reside either inside or outside of the company's franchise territory. More often than not, cable operators have simply purchased an existing carrier. Acquisition targets have included competitive access providers and other cable companies. On rare occasions, cable companies have bought into telephone and cellular companies.¹

Many times the venture is undertaken unilaterally by a single cable company. Other times it is a cooperative effort with another cable company or a non-cable partner. Sometimes, participants in the venture own an isolated component of the overall network. Other times, the partners hold an undivided stake in sum total of the enterprise's assets.

While cable has been indiscriminate in the mode of entry into telecommunications, it has been quite selective about which services to supply. These services have some distinguishing features. Some are final services sold to businesses and residential customers. More often, cable supplies an intermediate service that combines with other components to form the final product.

¹ Century Communications, an MSO, has a stake in a local telephone and cellular company, Citizens Utilities Co. In another case, Integrated Telecommunications Corp., a Philadelphia cable system, owns half of Rico Telephone, a Colorado phone company.

1. Cable Entry into Alternative Access

The Emergence of CAPs The first major breach of the wall between the two industries was lead by what is now known as the Competitive Access Providers, or CAPs. These new carriers offered dedicated, high-capacity circuits over fiber and microwave systems. Predominantly CAPs deploy "fiber ring" technology. These all-digital, all-fiber networks weave through underground conduits in urban subway tunnels or along water, gas and power lines.

Currently the fastest growing segment of their business is the provision of circuits connecting business users to their long distance carriers' POPs.² This service completely bypasses LEC special access facilities. CAPs also provide intra-company, intra-city communications. Prime customers are found in the financial, real estate and insurance industries. In fact, some of the earliest CAP networks were built and operated by these firms. They are also the sophisticated customers who purchase "dark fiber" from a CAP and supply their own electronics.

Even before the development of fiber rings, cable companies recognized the potential of their coaxial network to deliver two-way services. As far back as 1973, Manhattan Cable's Data Services Division offered private line data services over its New York City coaxial network.³ As cable companies put more fiber into their networks, and migrated toward ring-like architectures, the incremental cost of expanding into dedicated services falls. In the meantime, cable companies have explored numerous routes into the telecom industry.

² In the early years,, the bulk of CAP sales were to national and regional interexchange carriers (IXCs) who purchased transport between their local points of presence (POPs) located in the same city.

³ Not long afterwards, Rogers Cable in Portland Oregon and American Cablevision in Kansas City used their coax cable for telecom purposes. "Cable TV firms eye local telecom markets," Network World, 5:30, p.11-14, July 25, 1988. In the early 1980s, Cox Cable's subsidiary CommLine, Inc. provided private line service in Omaha, NE.

(i) Direct Entry Initially, the standard means of entry was through the creation of a corporate division or a separate subsidiary. Both video and voice transmissions may run on the same cable, or separate cables may simply share the same poles and conduit space. Either way, an arm's length arrangement allows them to steer clear of cross ownership restrictions. When acceptance is doubtful, cable operators have chosen to spin off these entities.

Table 1 lists instances where cable operators entered directly into provision of dedicated access services. Jones Lightwave Ltd., a subsidiary of Jones Intercable, illustrates many of the possibilities. Today, this company owns alternative networks in four cities. The Jones' network in Atlanta is *not* associated with a cable franchise in that city. In Denver, they have entered into a facilities-sharing arrangement with Public Service Company of Colorado, the local power distributor.

(ii) Acquisition A more recent phenomenon has been the purchase of existing CAPs by cable concerns. (See Table 2.) The largest such acquisition was the purchase of Teleport Communications, one of the first and largest of the CAPs. Five cable MSOs--Cox, TCI, Comcast, Continental, and Time-Warner--now own a share in Teleport.⁴ The sale has withstood challenges as a violation of telco-cable cross-ownership rules.⁵

In another case, Indiana Digital Access, owned by Time-Warner's American Television

⁴ In 1991, Cox Enterprises bought 12.5% of Teleport. In February 1992, cable giant Telecommunications Inc (TCI) announced its intentions to purchase 49.9% of Teleport. Immediately Cox choose to exercise its option to buy an additional 37.6%, giving it majority ownership of 50.1%. Later in 1992, Continental Cable and Comcast joined Cox and TCI as owners. Just recently, it was announced that Time-Warner would round out the joint venture, with Cox owning 25.05%, TCI 24.95%, and each of the other three 16%~~s~~%. New York Times, December 2, 1993.

⁵ The USTA had claimed that Teleport meets Ohio's definition of a local exchange company in violation of the cross ownership ban. The NTIA opposed the USTA claim. (Fiber Optics & Communications, 15:6, June 1992.) Eventually the deal won acceptance by the FCC and in the courts. Note that TCI already has a CAP subsidiary, Digital Direct, which operates in Chicago, Dallas, Pittsburgh and Seattle.

& Communications, recently announced its intention to acquire Penn Access.⁶ Penn Access is a CAP that serves the Pittsburgh area and has no cable affiliation.

(iii) Joint Ventures In a few instances, cable companies have joined together to form an alternative carrier. (See Table 3.) In a closely watched case, Continental Cable, Adelphia Communications, MacLean Hunter Cable and Comcast Corporation are forming a CAP to provide access services in several Florida cities.⁷

Cable companies have also teamed up with non-cable partners. (See Table 4.) For instance, TCI and General Communications formed GCI Fibernet to build networks in the Seattle area.⁸ In December 1991, Jones Lightwave Ltd announced a joint venture with the banking concern, The Thurston Group, to build an alternative network in Chicago.

(iv) Facility Sharing Arrangements. A final entry option open to cable companies involves the sharing of transmission facilities. In one form, the cable operator leases unused circuits on its fiber backbone to an outside party who provides high-capacity services. Alternatively, the cable operator may arrange to use facilities of an established carrier, usually a CAP outside of the company's franchise territory. (See Table 5.)

2. Cable Entry Into Local Telephone Service

(i) Personal Communications Services. "Personal communications service" or PCS can be thought of as the next generation of cellular phone networks. It promises to provide two-way mobile service from nearly any location--in public places, in cars, in offices and at home. The

⁶ The CWA opposes the acquisition. The pattern of cable acquisition of CAPs would be reverse should Metropolitan Fiber Systems successfully acquire Digital Direct of Seattle, Inc, a subsidiary of TCI. Reports of this deal are as of yet unconfirmed.

⁷ "Cable surges ahead in alternative access as long-term telecom vision takes hold," Cable-Telco Report, April 1992.

⁸ Presumably, if TCI acquires Digital Direct of Seattle, it will merge operations with GCI Fibernet.

service will compete directly with traditional stationary phone services.

As envisioned, the enormous number of subscribers along with the huge number of base stations, require a large backbone transport system. And this is where cable systems are most likely to contribute to this new service. Existing coax networks are well positioned to provide the so-called "backhaul" needed to transport voice traffic from base site to the switching office. Cable systems pass over 90% of all homes and 70% of office space and have the necessary broadband capacity. If they are at all disadvantaged, it is their lack of switching capacity to switch calls and network intelligence to track users. These shortcomings can be easily rectified by teaming up with a partner. The most likely candidates are cellular providers and interexchange carriers.

Dozens of cable operators' petitions were granted for new use of radio spectrum under the FCC's "pioneer preference" mechanism. In fact, most of those petitions proposed some form of PCS and nearly all of those were joint undertakings with a cellular or IXC partner. The FCC's recent decision governing the licensing of PCS providers opens another avenue for cable entry into telecommunications.⁹

(ii) Plain Old Telephone Services. For its first 40 years, the U.S. cable industry expressed little interest in residential telephony. Its attitude has begun to change. While the potential exists for serving with the residential end user directly is within reason, cable's initial target will again be the lucrative business market. Some activity has already occurred on this front. Recently, for instance, the Illinois Commerce Commission allowed TC Systems-Illinois, Inc. (a subsidiary of cable-owned Teleport Communications) to offer its Chicago area customers a switched "intercom" service.¹⁰ They are also allowed to offer connection to their fiber ring (complete with a digital switch) by reselling Illinois Bell local access.

⁹ Only cellular companies were restricting in bidding for the largest parcels of spectrum because of their current spectrum allotment.

¹⁰ "Phone firms coming on line," Chicago Tribune, September 17, 1992.

Potential exists for cable entry into residential markets as well, though the rates of return will be far less. Here is where cable's extensive residential network will be instrumental. For their part, manufacturers are enthusiastic about the profit potential of this market. As an example, First Pacific Networks Inc. offers a product called "Personal Xchange" that provides switched voice, data, and video service over a coaxial cable. It adopts a *distributed* switching approach that would place rudimentary, low-cost switching equipment on subscribers' premises in cable boxes.

It is instructive that cable provision of basic local phone service is a reality today in parts of the United Kingdom. In 1984, the Cable & Broadcasting Act gave birth to that country's cable industry. In that same year, the Telecommunications Act allowed cable franchisees to provide some telecommunications services in combination with the national carriers, BT and Mercury. Since Mercury does not own local loops, alliances with cable operators were particularly attractive, and the 1991 duopoly review of competition between BT and Mercury removed remaining obstacles to such agreements. For various reasons, cable subscriptions did not commence until 1988.¹¹

The preferred technology for delivering both services is to run a "Siamese cable" that consists of a coax bonded to a second cable containing four twisted copper pairs. Of course, joint provision by a single network makes sense because cable systems are being built from scratch in the U.K. On the other hand U.S. cable companies have been active in the British market.¹² This could give them valuable experience in deploying cable networks that jointly

¹¹ One prediction expects about 100,000 cable subscribers by the end of this year, with sign-ups running at a rate of 10,000 per month. By the end of last year, there were 25,000 customers who had bought local telephone service from their cable companies. "UK cable communications picks up speed," *Telephony*, May 4, 1992. As of mid-1992, 15 of the 21 million UK households are franchised for cable; 16 companies account for 12 million of them, and not one of them was British (Dixon, op. cit.).

¹² TCI currently owns 65% of UAE which owns UA Communications that provides cable and phone service in southern London. Five of the seven Regional Bell Holding companies also took a major stake in the UK cable business.

supply video and telephone services.¹³

3. Cable Entry Into Data Networks

The last segment of the communications market entered by cable concerns is residential data services. These ventures promise to connect personal computers, and eventually, cable converter boxes to provide a variety of two-way data transmissions. These include home banking and transaction processing, electronic mail, on-line videotext, and local area networking and video conferencing for telecommuting. Demand for such services are fueled by growing household ownership of personal computers. Cable operators are in a unique position in having a broadband connection to over 90% of the homes in the U.S. *Importantly, these services can be delivered over their existing coaxial cable networks.*

At least initially, the computer industry led the way toward residential data networking in partnership with cable companies. Digital Equipment Corporation's *Community Multimedia Networking* leases unused capacity on coaxial cable systems, and packs two Ethernet circuits onto four video channels. IBM's *PARIS* (Packetized Automatic Router Integrated System) provides services to business customers by collocating a workstation at a cable headend. Residential applications are being developed through a cooperative trial with Rogers Cable in Toronto Canada.

More recently, Continental Cable teamed up with Performance Systems International to extend Internet access to cable customers in Boston and elsewhere. In a more ambitious effort, Intel and General Instrument have announced plans to offer high-speed data links to residential cable customers to support a wide array of data and video services; Comcast and Viacom are the cable partners.¹⁴

¹³ Barton Crockett, "RHBCs pump big bucks into UK networks," Network World, 7:49, December 3, 1990.

¹⁴ New York Times, December 1, 1993. Hybrid Networks, Inc. will supply the networking hardware.

III. TRADITIONAL EXPLANATIONS FOR CABLE DIVERSIFICATION

Clearly, economic factors are driving the cable industry to search out profit potential in telecommunications services. The incremental cost of adding these new services is falling, the demand for them is outstripping the capacity of incumbent carriers, and the regulatory and legal barriers to these markets have begun to erode.¹⁵

1. Technical Change and Scope Economies

Prior to the early 1980s, cable television systems were built to narrow technical specifications. They deployed coaxial cable in a tree-and-branch architecture well suited for one-way broadcast of the video signals. A small amount of frequency was set aside for upstream communication but almost never used. This was due, in part, to the long chains of directional amplifiers degraded the quality of the reverse channels.

The introduction of fiber optic transmission changed the picture drastically. Gradually cable systems began to replace their trunk cables with fiber optic cables. Not only does this expand the bandwidth on those portions of the network, it also eliminates many noisy amplifiers thereby improved the signal quality and the reliability of the network.¹⁶ As they rebuilt their networks, cable operators logically added more fiber strands than they needed for entertainment video alone. With no additional expense, these strands could be leased for transmission as "dark fiber."

¹⁵ We might ask why cable did not enter telecommunications markets earlier. Regulation created an obstacle at least at the state level. Also it was not until 1980 with the passage of the Pole Attachment Act that cable companies got additional rights of way needed to expand their networks. On the business side, cable operators were preoccupied with meeting their aggressive construction schedules that were usually written into their franchise contracts. This left little of their scarce financial free to undertake two-way provisioning.

¹⁶ In addition, fiber is non-conductive and heat resistant so that it can run along electric power lines, a favorite route of cable network engineers.

Over this same period, advances took place in digital compression and multiplexing techniques that further expanded the capacity of cable's backbone network. While the primary purpose of the additional bandwidth was for delivery of more video channels, a secondary purpose was two-way communications either for interactive television or for voice and data communications.

Another important shared input that was not fully utilized were the rights of ways over which the cable network travels. These include zoning easements for cable headends, lease space in underground conduits and utility pole attachment rights.¹⁷ The resulting scope economies between the two services allows a cable company to provide certain telephone services at low incremental cost.¹⁸

2. Regulatory Developments

Regulatory constraints on both video and communications services condition the relative attractiveness of these market for the cable industry. Current regulatory practice bars cable operators from providing traditional switched voice service. While state and local authorities have never welcomed cable delivery of telecommunications services, on occasion they have permitted cable companies (and electric power utilities) to supply two-way services, e.g., data transmission and local private line.¹⁹

¹⁷ Other cable resources shared between video and telephony include customer lists, customer loyalty and name recognition, billing and marketing overhead and other administrative activities.

¹⁸ Demand-side scope economies do not factor into this decision. Zero cross-price elasticities between entertainment video and telephone service eliminate the possibility of cannibalization cause by diversification. Residential customers may benefit if cable and telecom services were bundled (e.g., a single monthly bill). Any cost savings, however, could be captured through a joint marketing arrangement.

¹⁹ Electric power companies have encountered at least as much resistance. Apparently, state regulatory commissions find cross subsidization of competitive operations by power companies more likely and/or more damaging than for cable companies.

(i) Cross-Ownership Ban. The principal legal impediments to cable entry into interstate telephony are the cable-telco cross-ownership restrictions--first articulated by the FCC and later codified in the 1984 and 1992 Cable Acts. These restrictions are almost exclusively designed to keep telcos out of video delivery. The FCC defers to the states to police cable transgressions. Certification of CAP operations as common carriers has triggered challenges on the grounds of violating cross-ownership restrictions. More often than not, the CAP is allowed because it is judged to be a *nondominant* carrier in its franchise territory. Where state restrictions have had some bite, the cable industry petitioned the FCC to preempt but it has always backed down.²⁰

It is important to note that in the last round of the cross-ownership saga, the FCC concluded that an IXC is not a local telephone company, and so that it could own cable company.²¹ Whether this allows an IXC to go so far as to purchase a cable company and use its coaxial network for local access has not been tested.

(ii) Expanded Interconnection. In a significant development, the FCC decided to force LECs to extend "physical collocation" to CAPs for both special access and switched transport, and to restructure access and transport tariffs.²² CAPs are now be able to connect their fibers at the LEC central office for an interconnection charge. In return, LECs will gain some flexibility to set *interstate* special access tariffs at the exchange level--though these will be based on cost and not on the degree of competition.

²⁰ Cox Cable Communications Inc, 102 FCC 2d 110 (1985), vacated, and United Cable Television of Colorado, Inc, 1 FCC Rcd 555 (1986).

²¹ FCC Docket 87-266, "Telephone company-cable television cross-ownership rules." The First Report and Order of this docket interprets Section 613 of the 1984 Cable Act to exclude IXCs from the ownership ban.

²² FCC News, September 17, 1992, regarding Docket 91-141, "Expanded interconnection with local telephone company facilities" (released June 6, 1991). Recently, the provisions have been applied with little change to switched access.

(iii) Pricing of Dedicated Services CAP services compete directly with access services provided by LECs. Certainly excessively high tariffs imposed by regulatory authorities are an invitation to entrants to "cream skim." Such price distortions may be obsolete now that the FCC has adopted price cap regulation for the LECs.²³ Pricing flexibility remains severely limited, however, since annual changes for DS1 and DS3 special access (the services targeted by the CAPs) are bounded above and below by five percent--unless convincing cost support can be provided.

CAPs, in contrast, need not file tariffs, and so they escape the scrutiny and delay of traditional rate hearings. They do not have to average rates by geographic area; they do not have to adhere to slow depreciation schedules. CAPs quote fairly simple price schedules which stay roughly 10-15% below LEC rates.²⁴ A year and a half ago, the FCC implemented a system of price caps for LEC interstate services.

(iv) Cable Reregulation. Prior to 1986, cable rates were regulated by local franchising authorities. In that year the 1984 Cable Act deregulated the vast majority of cable systems. With the passage of the 1992 Cable Act, the pendulum has swung back again. Now municipal authorities are able to set basic cable services provided they adhere to an FCC benchmark pricing formula.²⁵ Assuming that the new scheme will put downward pressure on basic service rates, cable operators will look elsewhere for higher returns on their embedded investment. Besides premium and enhanced video services, communications services are prime candidates.

(v) New Wireless Services.

²³ FCC Docket 87-313, Supplemental NPRM, March 8, 1990.

²⁴ Connecticut Research Reports, Alternate local transport: a total industry report, February 1991.

²⁵ Also important are the new "must carry" provisions governing carriage of over-the-air channels, and local broadcasters ability to charge for retransmission consent.

To sum up, we have seen that major technological innovations have opened up telecommunications markets to cable TV companies. The contribution by regulators has been more mixed. Certainly the FCC and key states have given impetus to cable's diversification efforts. Neither technological developments nor regulatory policies have had a significant bearing on the mode of entry chosen by cable operators. Here is where strategic analysis is needed.

IV. STRATEGIC EXPLANATIONS FOR ENTRY MODE

Once a cable operator recognizes the potential of telecommunications, it faces a series of decisions. It must decide which services to supply and in which cities. It must also choose a mode to enter those markets. We concentrate on this latter decision, recognizing that these decisions are all made jointly.²⁶ Even then we cannot hope to derive general predictions since that would depend on the preferred entry mode on specific local conditions. It will matter whether the cable operator is a large MSO with national coverage or a small one-city operation. The target market also matters as they vary in population density, availability of rights of way, regulation of telecommunications services.

1. The Strategic Landscape

We first list the various strategic players in the telecom markets. To begin with there are a number of incumbent providers in the host markets when we consider all of cable's diversification options. A single local exchange carrier provides the full range of services to business and residential customers. Two cellular providers also sell mobile services in each metropolitan market. These markets may also be served by any number of CAPs.

²⁶ Another neglected aspect is the timing of the diversification decision. Riordan (1992) investigates a strategic timing game in which a single cable firm and a single telephone company decide when to deploy a new technology that provides both cable and telephone services.

Besides the presence of one or more cable operators in an area, there is a host of other potential entrants. Foremost among these are the long distance carriers, especially the three major IXCs. Since its PCS decision, the FCC has decided to open up local markets to up to seven licensees. Finally, there are startup companies.

Each of these firms is not only a potential competitor to the cable business, it is also a potential partner in a joint venture. As we saw, cable operators have formed dozens of alliances among themselves and with non-cable concerns. Other prime possibilities include the established CAPs, long distance carriers, cellular providers, the local exchange company, private corporate networks and eventually, winners of the PCS auctions.

Cable operators possess an long list of assets that command strategic value when entering telecom markets. First of all, they own an embedded network of cable headends, coaxial and fiber cable, and electronic equipment including cable boxes and inside wiring. Importantly, investment in these facilities are sunk. Since their use incurs low avoidable costs, any threats to deploy them in communications services is made more credible.

Second, cable operators also own certain intangible properties that are essential to the provision of telecom services. These include zoning variances for headends, utility pole attachment rights, conduit lease space and satellite transponder leases. In many cities, these property rights are available in limited supply and cable often has more than it uses for the cable business.

When considering if and how to enter telecom markets, cable companies must select which services and evaluate each of the available options:

- lease-out excess capacity,
- lease and resell capacity of an established carrier,
- build new facilities, or expand existing ones,
- purchase an established carrier,
- negotiate a joint venture agreement,

- stay out altogether.

They do so aware that other potential entrants are considering these same options. In addition, incumbents will be evaluating the consequences of the various alternatives seeking to adjust their pre-entry actions to minimize the competitive impacts. This evaluation affects the incumbents' willingness to negotiate for lease or sale of its facilities or to enter into a joint agreement.

2. Strategic Conditions Favoring Acquisition²⁷

The key consideration when a cable operator evaluates this option, is the purchase price of the existing carrier. This price is the product of a negotiations between the two firms and outside bids from other suitors. The target firm will usually accept the highest bid. Willingness to bid for a firm will be proportionate to the amount of profit the new entity can generate. Available surplus will depend, among other factors, upon the match between the assets held by the target firm and those held by the acquiring cable company.

In negotiations over how to share this surplus, a cable company possesses a strong bargaining position if it can credibly exercise a threat to enter the market in some other way, either directly or through an alliance with other firms. The threat becomes more *credible* when, for instance, any initial entry costs it bears are small. The threat becomes more *effective* when alternative entry modes impose sizable losses on the target firm. In the case of cable diversification, when an operator supplies telecom that require facilities it already owns and that investment is sunk (e.g., dark fiber in its backbone network), then the threat to enter directly is both credible and effective. The result will be an attractive purchase price.

In some extreme cases, purchase of established carrier may be the only option available to a cable company. This happens if the incumbent owns rights to all of some essential, scarce resource such as radio spectrum or rights of way.

²⁷ See Gilbert and Newbery (1992).

Because many of the needed resources already exist, acquisition holds great promise for a cable company eager to enter new markets. On the hand, the purchase may require a huge one-time payment. This may drive the acquiring firm, especially if it is small, to turn to external financing. When it does, this may very well result in disclosure of sensitive information to competitors. In comparison, it may be possible to finance a construction project out of operating profits because of the protracted payment schedule.

3. Strategic Conditions Favoring Direct Entry

When weighing the merits of direct entry, cable operators must forecast the impact their entry will have on competition. Early on, this will depend upon how fiercely the incumbent providers respond to the interloper. Further down the road, the likelihood of additional new entrants to the market becomes a major consideration.

Naturally direct entry by building new facilities becomes more attractive when the out-of-pocket costs are low, startup time is not too long, and existing facilities are not suitable. At one extreme, there is no established carrier in the target market. This happens, for instance, when no CAP has entered a particular metropolitan market. Less extreme is the case in which the incumbents have very similar facilities. For instance they may all adhere to the same route structure dictated by available rights of way.

In general, direct entry affords cable companies freedom to choose the location and routing their networks, and the technical standards they implement. Substantial costs can be incurred when attempting to conform to another carriers service and technology choices. Whether a new owner will inherit the high wages and restrictive work rules of the target's unionized work force is unclear.

Direct entry will also be more attractive, at least initially, if cable companies foresee continued entry into these same markets in the future. In that event, their investment will grow

in value as subsequent entrants bid up the value of their properties.²⁸

4. Strategic Conditions Favoring Joint Ventures

A major challenge facing a cable company in its effort to diversify is to build or piece together a communications network starting from a network optimized for the delivery of traditional video services. Adding fiber is one step in this direction, but it does not change the fact that cable companies are restricted to their franchise territories. Unless they are content with limited access to telecom markets, cable operators must knit together disjoint franchise areas. For instance, franchises populated with large users in the central city and outlying suburbs must interconnect with those located in the central city encompassing major IXCs' points of presence. Here is where strategic alliances among cable and non-cable partners are attractive.

In the case of CAP services, for instance, it is generally not true that a cable operator's franchise area includes the points of presence of all three major carriers. Nor have cable networks been laid out to minimize the distance to LEC serving offices, a feature that will be advantageous once collocation becomes widespread. A complex set of inter-franchise agreements is an alternative, albeit a costly one. Instead, there are convincing reasons for cable companies to form alliances with long distance carriers in attacking the business access markets.

Despite the feuding between local exchange and cable industries, there are sound reasons for them to join forces. LECs often lack broadband facilities, especially to the home. Cable companies lack switching and other network facilities. The first signs of growing partnership between the two industries have appeared. Southwestern Bell has purchased Hauser Cable, a large franchise outside of Washington DC. US West has taken a huge stake in Time Warner. Bell Atlantic and TCI plan to merge.

²⁸ See Gilbert and Newbery (1992).

V. POLICY IMPLICATIONS

To sum up, cable's ability to enter into telecommunications is the product of technical breakthroughs in fiber optics, digital transmission and compression technology. The entry mode chosen by cable companies seeking to realize this potential, on the other hand, is a strategic decision. For their part, regulators exercised forbearance when confronted with forays by cable into telecom services.

Large portions of the wall erected between cable and telephone industries over the years still remain, however. In addition to state and federal restrictions on ownership and certification of new facilities, prosecution of antitrust laws governing horizontal mergers between actual and potential competitors and the formation of cooperative production and research joint ventures stand in the way of cable diversification. Assuming these barriers will not fall all at once, policy makers should be informed about the economic consequences of they have for the movement of resources between these two industries.

As a general proposition, we can say that a barrier to a mode of entry alters the viability of entry through the remaining entry options. Take, for instance, entry by acquisition. The likelihood of this occurring depended on the acquirer having a credible threat to enter directly. If the latter option is removed, possibly because of fears about duplicate facilities or crowding of public rights of way, then it is possible that entry will not occur even by acquisition. The policy will be viewed as a success because, as intended, it prevented the duplication of facilities. However, it also squelched entry by acquisition which would not have involved significant new investment. Instead, the competitive pressures that takeovers exert on the management of incumbent franchise holders were defused in the process.

This brings us to a misconception that underlies much of the debate over cable-telco competition: It is not necessarily the case that "one pipe is better than two." There are distinct advantages to having both a coaxial cable and a twisted copper pair, or for that matter two

fibers, running to each home.

First of all, there are direct benefits to having multiple access media. There is the increased capacity that comes from additional lines, plus the improved reliability to respond to failure of one line. And then there is the consumer benefits of price competition that will ensue. We can also expect lower administrative costs from reduced need for regulatory oversight.

It is important to remember that the cable and telco networks are technologically different regardless of the much-heralded trend toward convergence. Cable is still primarily a one-way, analog, unswitched, broadband network. In comparison, the telephone network is two-way, digital, switched and narrowband. The differences will remain for years to come. In the meantime, technologies are bound to be developed that will exploit the comparative advantages of each type of facility.

Regulatory policy itself can speed up or slow down the introduction of new technologies, but it cannot anticipate the direction of research outcomes. Such technological change is only indirectly affected by day-to-day regulatory policy. Instead causation tends to flow in the opposite direction: regulatory policy reacts to technical change, it does not cause it. Cable assets deployed for the provision of telecom services may very well find a new, unanticipated use in subsequent years. Neither regulators nor cable companies can foresee these uses. It is incumbent upon regulators, however, to foresee the allocative implications of their structural policies. This paper sought to gain a better understanding of that connection.

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