Why is There So Little Competition in the Provision of Local Telecommunications Services?

An Examination of Alternative Approaches to End-User Access

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Abstract

The 1996 Telecommunications Act has failed to promote competition in the provision of local telecommunication services. Is the solution to promote alternative approaches to end-user access, revert to the traditional model of natural monopoly regulation, or continue with the current hybrid regulation which regulates ILECs while simultaneously trying to promote competition through the entrance of CLECs? This paper argues that existing proposals to promote competition in local service, through alternative approaches to end-user access, are not panaceas, and that public policy will continue to need to rely upon a heavy dose of traditional regulation of ILECs for the foreseeable future.

1 Introduction and Historical Background

The Telecommunications Act of 1996 was supposed to lead to a plethora of alternatives in telecommunication services. Although one could argue that a number of different services have been developed (e.g., wireless technologies, broadband internet services, extensive long-distance alternatives, etc) there is little evidence that competition has significantly increased in the provision of local telecommunications services -- both for residential and business

customers.[1] The ILECs still dominate the provision of local services, and this should give cause for concern as to why competition has not significantly increased. At the end of 2001, CLECs served only 10.2% of switched access lines -- and only 6.6% of the residential and small business market for local telecommunication services.[2]

The slow rate at which rivalry has developed is somewhat surprising when one compares the past six years with the first competitive era in the United States. For example, between 1894 an 1902, the entrants captured approximately two-thirds of the market in Ohio, Indiana, and Illinois. The rapid development of rivalry occurred despite a number of laws that impeded competition and the absence of any regulatory body charged with the responsibility of promoting a competitive market.[3]

Rapid entry occurred at the start of the twentieth century largely because of the incumbent s poor service, high prices, and the failure of AT&T to develop the rural and residential markets.[4]

Today s entrants face different challenges from those faced by entrants at the turn of the century. The residential and rural markets have high rates of penetration, and State Commissions and the FCC have regulated rates and the voice quality of service. The data market was clearly underserved fifteen years ago, but this void was already being addressed prior to the passage of the Act.[5]

Today s entrants inability to obtain substantial market share puts them at a sizeable cost disadvantage. In this paper I identify some of the factors that impede the development of competition, and explore alternative approaches to end-user access that might enhance competition.

Ideally, customers would have various forms of connectivity (or end-user access) to provide a platform that could be used for different applications and services. However, significant economies of scale and high customer acquisition costs inhibit the development of competing facility-based providers. Therefore we must consider alternative methods of making connectivity less of a bottleneck.

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[1] Prior to the passage of the 1996 Act, there was essentially no competition in the residential market and limited competition in the business market. Firms called competitive access providers (CAPs) served the large business market in metropolitan areas. Subsequent to the passage of the Act, there has been an increase in the level of competition, but the impact of the Act is hardly dramatic. Some customers do substitute wireline for wireless service. But at this point in time, the quality of service on a wireless network is so inferior to wireline service that the competitive impact of wireless service is limited.

[2] Local Telephone Competition: Status as of December 31, 2001, Industry Analysis and Technology Division, Wireline Competition Bureau, Federal Communications Commission, July 2002, Tables 1 and 2.
http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/IAD/lcom0702.pdf

[3] David Gabel. "Competition in a Network Industry: The Telephone Industry, 1894-1910," Journal of Economic History, vol. 54, September 1994, pp. 543-572.

[4] Id. AT&T was able to finance its predatory price war through the profits earned in markets where regulation blocked entry.

[5] David Gabel. Divestiture, Spin-Offs, and Technological Change in the Telecommunications Industry -- A Property Rights Analysis, Harvard Journal of Law and Technology (1990), Pages 75-102.

Policy makers must answer the question that if competition in the loop is not going to flourish, are there alternatives for achieving an open platform to end users which will lead to widespread connectivity to a network which provides a wide variety of services?

In this paper, I examine the following three alternatives for improving competition and overcoming any existing economies of scale in the provision of local telecommunications service:

1. Customer acquisition of local loops (including analysis of customer acquisition costs);

2. Alternative Distribution Companies (ADCos) which are wholesale-only companies serving carriers; and

3. LoopCo programs under which local loops would be split from the incumbent local exchange companies (ILECs).

Regardless of the alternative chosen, it must be emphasized that there are problems with any attempt at structural separation of facilities for providers that are NOT vertically integrated, and for this reason I am not optimistic that competition in local provision of telecommunications services can be easily promoted. Entry costs are not insignificant for the non-integrated provider. Moreover, the historical evolution of the telecommunications industry suggests that vertical integration is conducive to the widespread implementation of new services.[6] As argued below, vertical integration appears to be the optimal structure in the local telecommunications market since it reduces uncertainty in market contracting.

2 Economies of Scale

Before addressing each of the alternatives noted above, it is useful to first briefly address the issue of the economies of scale in the provision of local telecommunications services that favor the ILECs. This is important since large economies of scale limit the number of companies that can profitably provide local telecommunication services.

There are at least three important sources of economies of scale. First, there are the traditional economies of scale associated with installing facilities —such as putting up poles, digging trenches, or laying conduit. These economies of scale exist because of the high capital and construction costs that require at least a minimum scale, and, furthermore, are an additional barrier-to-entry because the fixed costs are also sunk once the facilities are built.[7] For example,

[6] A new service is a product that offers a fundamentally new function to end-users and therefore is not a repackaging of an existing product. I make this distinction because the vertically integrated Bell System had a poor record of introducing services that were only marginally different from existing products.

[7] Sunk or irreversible costs deter entry because they increase the risk associated with entry. Incumbent firms have a strategic advantage if the entrant must incur costs that are not part of the forward-looking opportunity costs of the incumbent. These additional costs create a barrier to entry because the incumbent firm s opportunity costs are lower than the entrants are and, therefore, he will be able to underprice his potential rival. W. Baumol, J. Panzar, and J. Willig, Contestable Markets and the Theory of Industry Structure (1982), at Page 282.

the cost structure of the local loop involves both fixed[8] and sunk[9] costs and consequently is the most difficult facility for any potential competitive local exchange carrier to profitably replicate.[10]

A second source of economies of scale is the back-office fixed cost of setting up a billing and operational support system. For example, Time Warner estimated that its operational support system for its telecommunications operations would cost approximately $50m.[11] This quasi-fixed cost must be recovered from a small share of the market relative to the operations of the incumbent telephone companies.

A third source is customer acquisition costs. The economies of scale exist because any company incurs certain minimum expenses that are largely independent of the number of customers served (e.g., developing an advertising and marketing campaign for a particular geographic area). For example, a large entrant in the United Kingdom market reported that its advertising expenditures in 1997 were $25.9m pounds, or approximately $41.5m.[12]

In order to illustrate why economies of scale are a barrier-to-entry, I focus on only one of these three forms of economies of scale — the economies of scale associated with facilities installation. Table 1 below, illustrates the cost advantage of the incumbent:[13]

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[8] Federal Communications Commission, First Report and Order, 96-325 at Paragraphs 11, 169, 232, 316, 340, and 679.

[9] Most loop installations involve the use of technology for which the recoverable value of the facilities is quite low. Much of the cost of installation is associated with the actual labor effort and the machinery that is used to install the copper or fiber cable. For example, Pacific Telephone estimates that 59% of the loop costs are sunk. Decision of the Administrative Law Judge, Decided May 10, 1999, Rulemaking 93-04-003, Rulemaking on the Commission s Own Motion To Govern Open Access to Bottleneck Services and Establish A Framework for Network Architecture Development of Dominant Carrier Networks, Public Utilities Commission of California, at footnote 20.

[10] In the Matter of the Pricing Proceeding for Interconnection, Unbundled Elements, Transport and Termination and Resale, Washington Utilities and Transportation Commission, Docket No. UT-960369, April 16, 1998, at Paragraph 13.

[11] Time Warner Telecom LLC, 10-k filing for fiscal year ending December 31, 1998, p. 22.

[12] TELEWEST Communications PLC, 10-K, March 31, 1998, Page 218.

[13] The cost data was obtained from Federal Communications Commission, In the Matter of Federal-State Joint Board on Universal Service CC Docket No. 96-45 and Forward-Looking Mechanism for High Cost Support for Non-Rural LECs CC Docket No. 97-160. Tenth Report and Order, (Inputs Order) released November 2, 1999, Appendix A, tabs 24dstr and normal. It is assumed that 60% of the 200 pair cable pairs are revenue producing when one of the firms serve 100% of the market Even if the incumbent enters with a 100 pair cable, it will operate with a significant cost disadvantage until its market share reaches 40%.

Table 1 -- Comparison of Incumbent and Entrant Monthly Costs per Loop**

Incumbent's Market Share	Entrant's Market Share	Entrant's Unit Cost / Incumbent's Unit Cost
98%	2%	4800%
92%	8%	1050%
90%	10%	800%
80%	20%	300%
70%	30%	133%
60%	40%	50%
50%	50%	0%

** Estimates are based on the cost of a 250 pair buried copper cable in density zones of 850 to 2,550 lines per square mile,

The data in Table 1 illustrate that entrants incur prohibitive fixed costs that makes it uneconomical for them to compete with ILECs. With a 10% market share, new entrants face unit costs 9 times those of ILECs, while with a 20% market share, new entrants face monthly costs 4 times those of the incumbents. As an example of the difficulty for new companies to gain market share, RCN, a facility-based entrant, currently serves approximately 10.8% of the voice lines in the market covered by its network.[14]

Only at 50% market share are new entrants competitive with ILECs[15] -- but in the real world it is impossible for a new entrant to gain 50% market share upon entry due to the associated risks entailed, and the natural reluctance of consumers to switch to an unknown and new provider from which service might not be reliable. Consequently, the cost differential, and the existence of large sunk costs and economies of scale, makes a competitive market unlikely in the provision of local telecommunication services.

3 Building Market Share

The last section illustrated that economies of scale (such as those related to loop constuction and back-office fixed costs for operational support) impede entry by reducing the entrants potential to make a profit. Entry costs are also high because it is expensive to acquire customers. In the next section I argue that this additional barrier-to-entry explains in part why some firms have paid a premium to acquire the customers of incumbent local exchange companies.

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[14] Merrill Lynch, Report on RCN, February 11, 2002. This market share figure reflects the assumption that each household has 1.2 lines.

The Company also markets video and data services and therefore it is able to recover its network costs from products other than voice telephony. On the other hand, the cost of building a network that can provide all three products is greater than the cost of a network that is only used to provide data and voice services. On balance, RCN s cost disadvantage is not as great as suggested by Table One.

[15] These estimates are based on the assumption that both the incumbent and the entrant are providing the same services, which need not necessarily be the case since firms can provide voice, data, and video services.

3.1 Customer Acquisition Costs

Empirical evidence on customer acquisition costs shows that the ILECs have a built-in cost advantage on sales and marketing which is translated into lower customer acquisition costs.

> A CLEC s cost position is further eroded by the need to promote its services. Without an established brand name or clear technical advantages, CLECs must spend much more on sales and marketing. Customer acquisition costs for CLECs, on average, have been $390 per net line added, more than twice the $185 spent by ILECs.[16]

Customer acquisition costs are an especially important issue in the residential market since they are very high relative to monthly residential charges. Consequently, it takes many months for the company to recover its customer acquisition costs -- and this is a very risky business proposition in a market renowned for its fickle customer loyalty. For CLECs, the risk is even higher than for ILECs since the risk is spread over a much smaller customer base.

Based on current estimates of customer acquisition costs, suppose it costs $300 for a typical CLEC to acquire a customer, and that the monthly profit margin for a residential customer is $5. It would take the CLEC 60 months, or five years, just to earn back its customer acquisition costs. If 10% of the local customers change local service each year (i.e., the churn rate is 10%)[17], then the average customer would remain 5.5 years.[18] The company would lose money under this

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[16] Rob Fisher. Rescuing the CLECs, Communication News, June 6, 2001 http://www.comnews.com/stories/articles/c0601guest.htm

Another estimate of wireline customer acquisition costs puts the range between $300 to $600 per customer acquisition for sales support, marketing, and commissions. See Page 96 of Testimony of Lee L. Selwyn before the Maryland Public Service Commission on behalf of the Maryland Office of People s Counsel, In the Matter of Review of the Commission of Verizon Maryland s s Compliance with 47 U.S.C. Section 201 (c), July 29, 2002.

Wireless is also increasingly perceived as a substitute for wireline service. Customer acquisition costs for wireless customers (in the form of advertising, promotions, and discounts) range from $250 to $300 according to one estimate, and $350 to $475 according to a second source.

Lisa Pierce. What the Cost of Customer Churn Means to You, Network World, November 12, 2001 http://www.nwfusion.com/columnists/2001/1112eye.html

Chaos, Confusion and Perks Bedevil Wireless Customers , The Wall Street Journal, April 17, 2002. http://online.wsj.com/article/0,,SB1018991847208768640.djm,00.html

[17] Although we do not have estimates of churn on US domestic local service, churn on NTL s domestic service in the UK is as low as 10%. See "NTL Inc. (NTLI.O): Leaders in Innovation" European Investment Research, Morgan Stanley Dean Witter, April 9, 1999.

[18] Assume the company starts with ten customers. Each year it loses one of these customers with a 10% churn rate. At the end of ten years, the original customers have all moved on —assuming that the oldest customers leave first. Of the ten original customers they would stay for 1, 2, 3,,,, 10 years, respectively, for an average of 5.5 years per customer. Note that the assumption that the oldest customers leave first is not essential —it just makes the example easier to understand. If some customers stayed longer than 10 years, on average, this would be offset by the larger number of customers staying fewer years —so long as the overall churn rate is constant. Mathematically, the average length of tenure of the original customers is equal to (1 + (1/churn rate))/2.

scenario since customer acquisition costs would not be recovered.[19] If the turnover rate, or churn, was 20%, then the CLEC would only just recover customer acquisition costs -- assuming a zero discount rate. . Clearly, the long-term payback period associated with such hgh customer acquition costs and churn is incompatible with the advice of many consultants and advisors to the telecommunications industry. For example, PriceWaterhouseCoopers contends that a successful CLEC must try to recover its customer acquisition costs in six months to a year.[20]

Pursuing the argument, if there was a high degree of competition in the provision of local service with high customer turnover each year (e.g., more than 20%) the high customer acquisition costs would effectively reduce competition. In the long-run, the high customer acquisition costs would cause many companies to go out of business. A vicious cycle ensues whereby customer acquisition costs can only be recovered in a market with low customer turnover -- i.e., a non-competitive market with high barriers to entry.[21]

Confronted with the high customer acquisition costs and the economies of scale in network operations, some firms have determined that acquisition is a more profitable entry strategy then building a new network. Indeed one of the best ways to ascertain the difficulty for *de nouveau* entry is by observing recent transactions in the market for local telecommunications services. If companies are paying high prices to buy and acquire existing companies this implies one simple fact -- it is cheaper to buy existing networks and their customers than to build new networks to lure these customers away.

There are many recent examples of incumbents selling off some of their customers for multiples of their embedded investment.[22] The case of Arkansas is illustrative. In 1999, GTE sold 213,651

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[19] Assuming $5 as the monthly profit margin, this yields $60 in gross profit per year over the 5.5 year period or $330. The Present Value of this stream would be $261 over a six-year period assuming a discount rate of 10% -- we use six years by rounding up the average length of customer tenure of 5.5 years to 6. With customer acquisition costs of $300 per customer, this translates to a Net Present Value of -$39. Clearly, with the risk of turnover and long payback periods, the negative NPV will not induce CLECs to engage in customer acquisition. Only with a fairly low discount rate of 5.5% (or lower) would the NPV be positive with a churn rate of 10% and net monthly profit margins of $5.

[20] Mark Spragg and Okan Ozmak, Lessons From the Trenches, Page 20 in PriceWaterhouseCoopers, Infocomm Review, Vol. 7, No. 3, 2002.

[21] At 100% retention, the payback period is five years -- assuming a zero discount rate for simplicity. However, with a 20% turnover the a*verage* customer remains only 3 years so that customer acquisition costs are not covered. In mathematical terms, if the average length of tenure of a customer ((1 + (1/churn rate))/2) is less than the number of years required to achieve payback, then payback can not be achieved and there can be no competition. In our example with a five-year payback, customer acquisition costs are not recovered so long as the churn rate is more than 11.1% -- again using a zero discount rate for simplicity since the break-even churn rate would be even lower with a positive discount rate.

[22] The following examples of local telecommunication services selling for above their book value are presented, but not discussed in detail.

- In 1998, a merger of SNET and SBC had an implied market value of $3.305 billion for SNET s intrastate assets —or 2.2 times the book value of its intrastate assets (David Gabel and David Rosenbaum, Who's Taking Whom: Some Comments and Evidence on the Constitutionality of TELRIC, August ,1999);

domestic access lines in Arkansas to CenturyTel for $843.3 million -- $3,947 per line —which was 2.6 times the book value based on a total 1998 net plant in service investment (i.e., booked investment net of depreciation) of $327.5 million, or $1,533 per line.[23] For the Arkansas lines 80% were residential, 19% business, and 1% pay phones, and the following profile of the wirecenters that GTE sold to CenturyTel. Average family income for this area was $28,609 while these wirecenters had a total of 3,750 businesses 89% of which were firms with 1 to 19 employees. Furthermore, the rates for basic telephone service are not particularly high. For example, the price of residential and business service are in the range of $13 to $21 and $22 to $42 respectively.[24]

It must be emphaszied that the premium paid by CenturyTel can not be attributed to the Company s belief that they would receive increased access or universal support relative to the level of support that had been provided to GTE. The FCC rules state that the buyer will not receive any more support from these sources than the original owner.[25]

The above numbers hardly represent the types of economic and demographic characteristics one would typically imagine to be highly sought after -- yet, CenturyTel paid a premium for the right to serve (or perhaps more accurately lock-in) this largely residential and small-business customer base. In fact, these demographic and business figures imply that GTE sold wirecenters to CenturyTel for a premium despite the fact that the end-users were apparently not heavy telecommunications users. Evidently CenturyTel felt that even with these demographics it was worthwhile to pay a premium for these lines, which illustrates that these types of wirecenters, comprised primarily of small business and residential users, are profitable, not subsidized,[26] and

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- In 1999, dba Communications purchased 519,176 lines in New Mexico, Oklahoma, and Texas from GTE with the total value the property estimated at $1.7 billion -- $3,269 per line —which would yield an implied market value for New Mexico (with 91,904 lines) of $300 million which exceeds the net investment made by GTE for the company (which was approximately $197 million) by a ratio of 1.5 (Bob Vandewater, GTE State Service Sold, The Oklahoman, October 27, 1999. "http://www.oklahoman.com/cgi-bin/shart?ID=395037&TP=getbusiness and New Mexico State Corporation Commission, In the Matter of the Consideration of the Adoption of a Rule Concerning Costing Methodologies, 96-310-TC, July 1998, paragraph 312);

[23] David Gabel and David Rosenbaum. Who's Taking Whom: Some Comments and Evidence on the Constitutionality of TELRIC, Federal Communications Law Journal, March 2000, pp. 239-271.

[24] CenturyTel of Central Arkansas LLC, Arkansas General Exchange Tariff, Section 6, Original Sheet No. 4; and CenturyTel of Northwest Arkansas, Arkansas General Exchange Tariff, Section 4, Original Sheet No. 8. Included in the price is the federal subscriber line charge.

[25] Section 54.305(a) of the FCC s rukes states that "A carrier that acquires telephone exchanges from an unaffiliated carrier shall receive universal service support for the acquired exchanges at the same per-line support levels for which those exchanges were eligible prior to the transfer of the exchanges."
http://frwebgate.access.gpo.gov/cgi-bin/get-cfr.cgi?TITLE=47&PART=54&SECTION=305&YEAR=2001&TYPE=TEXT

[26] The fact that many local telephone service companies have sold for above their book values suggests that residential service is not subsidized. Yet, some economists argue that competition in residential telephone service is limited because the service is subsidized -- the argument being that the returns are too low so that new firms are discouraged from entering. If residential service is subsidized and unprofitable then why have we seen companies buying residential customers at a premium in recent years as shown above?

also characterized by sufficient economies of scale and high enough customer acquisition costs that it is worth paying a premium to buy an existing network instead of building a new one.

3.2 Uncertainty of Demand — Implications from the Firm s Perspective

One of the reasons for vertical and horizontal integration is to reduce risk associated with the myriad of technological options rather than any standardized technology. The investor today must consider multiple technologies, whether it is an ILEC, CLEC, new entrant or customer-financed firm. These technologies include ATM, frame-relay, fiber, hybrid fiber-coaxial, SONET, compression, fiber, multiplexer, coaxial cables, power sources, and set-top boxes. The prudent investor must spread the risk of employing the appropriate combination of these technologies, and try to make a reasonable forecast of future technologies.[27]

One of the biggest impediments to investments in telecommunications infrastructure is the uncertain demand for new services. Firms are reluctant to invest in infrastructure modernization because of the uncertainty regarding consumer interest in the new products that can be sold through the technology. The value of many forthcoming services (e.g., video-on-demand and extensive home shopping) is speculative, and in some cases their differences with services currently delivered by cable television is subtle, to put it charitably.

An early adopter wants to avoid making a commitment to a technology that will not be compatible with other communications technologies or that will be expensive relative to facilities that can be deployed in the near future. Established suppliers are having a difficult time determining the elements of a sensible network architecture, and thus it would be even harder for new entrants to accurately forecast future market trends and evaluate the comparative advantages of the different technologies. Consequently, the risks involved for the investor in such a dynamic setting are more easily borne by fewer large companies since they are more likely to be diversified (implying lower risk). In addition, because there are fixed costs of evaluating new technologies with uncertain results, the large firm can spread this cost over a large number of units.

The historical record in the provision of long-distance and local service provides an interesting parallel. When a new product is introduced, there may be a need to have common ownership -- as was the case with long-distance and local service at the turn of the century -- in order to realize economies of scale and efficiency in network development and operation. Just as today reengineering of networks must be done in an economic and consumer climate characterized by demand uncertainty, telephone service at the turn of the century had to do the same with regard

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The word subsidy has a very clear meaning -- a service is subsidized if it is priced below its incremental cost of service. Economic cost data, derived either from state TELRIC proceedings, or the FCC s cost model, strongly suggest that residential service is not subsidized. See, for example, Comments of National Association of State Utility Consumer Advocates (NASUCA). In the Matter of Cost Review Proceeding for Residential and Single-Line Business Subscriber Line Charge (SLC) Caps, Access Charge Reform Price Cap Performance Review for Local Exchange Carriers, and Federal-State Joint Board on Universal Service, CC Docket No. 96-262, 94-1, and 96-45, January 17, 2002.

[27] See, for example, Michael Lafferty, Bridging the Gap, CED, May 2001, http://www.cedmagazine.com/ced/2001/0501/id3.htm.

to provision of long-distance service. However, once the demand and market for a new product becomes more certain, there is less of a need for common ownership.[28]

The case of cable companies in the United Kingdom also indicates that entry for a non-integrated firm is very difficult when it does not own any product content which is of value to the existing integrated supplier -- making customer cost acquisition costs for new entrants implicitly prohibitive. The cable companies experienced first hand how an integrated rival and supplier can apply a prize squeeze to their operations. The primary supplier of entertainment services to the cable companies was BSkyB which also sold satellite services directly to end-users. The Cable Companies claimed that BSkyB put the "squeeze" on them by offering discount packages to residential customers who own satellites; however, BSkyB did not offer similar discounts to the cable companies. Due to the limited number of entertainment products that customers are interested in buying, this price advantage for satellite TV seriously harmed the financial prospects of cable companies. Thus, if the entrants (be they in cable services or local telecommunications service) are unable to provide some unique product which the integrated firm does not, their potential long-term market share is likely to be seriously harmed due to the high costs of acquiring customers.[29]

3.3 Uncertainty of Demand — Implications from the Consumer s Perspective

If it is unrealistic to expect firms to engage in improving local telecommunication services, then surely it is unrealistic to expect consumers to finance on their own initiative any part of the infrastructure needed to support advanced services that do not yet exist. It is unlikely that consumers would assume the risk of financing advanced services in such a highly dynamic market. A more detailed discussion follows.

If significant numbers of consumers want something new and better from their access lines, is it reasonable to expect an increasingly heterogeneous and competitive market for telecommunications channels to provide them with improved access, or must they invest in equipment themselves? If end-users want higher-speed access to the Internet is building it themselves a practical alternative? Or is it better for consumers to wait and hope that entrepreneurs will develop alternative access technologies, such as satellite-based Internet access, cable modems, Integrated Services Digital Networks (ISDN), or a new wireless service in the Personal Communication Service (PCS) band?

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[28] David Gabel. Divestiture, Spin-Offs, and Technological Change in the Telecommunications Industry -- A Property Rights Analysis, Harvard Journal of Law and Technology (1990), Pages 75-102.

A major reason for the development of a tightly controlled vertically integrated market at the turn of the century was because of AT&T s desire to coordinate functions that would allow it to build its long distance network. In order to introduce a new product, long distance service, AT&T found it necessary to become tightly vertically integrated. AT&T increased its control of the operating companies once the operating companies did not fully cooperate with the rollout of long distance service. However, the independents, who saw the need for long-distance service because AT&T had shown that there was keen interest in the product, did not become as centrally controlled. They were able to work out standards and traffic agreements without consolidating into one company.

[29] David Gabel and William Pollard. Privatization, Deregulation, and Competition: Learning from the Cases of Telecommunications in New Zealand and the United Kingdom. The National Regulatory Research Institute, The Ohio State University, January 1995.

A less risky approach for consumers is to invest in increasingly powerful and sophisticated on-premises equipment (CPE -- computers, modems, consumer electronics). Such investments may provide the data compression capabilities to expand bandwidth, or permit consumers to use radio or infrared transmission to bypass the bottleneck of the local access line. A combination of service provision by competitors and improvements in CPE investments is more likely to be optimal for consumers than taking over the last mile since the degree of uncertainty and heterogeneity is much greater for access facilities than for CPE.

Consumers obtain information about CPE from magazines, friends, and associates at work. All of these information sources are inexpensive relative to the cost of assessing the merits of different customer access technologies. Due to this high cost of information, there are few early adopters of customer access facilities, and this suppresses facilities-based competition. CPE equipment, on the other hand, provides the consumer with more flexibility than investment in the last mile. For example, different modems can be connected to a computer depending on whether satellite, cable, wireless, or telephone access to the Internet is selected; and the service provider might even supply modems. Consequently, the consumer has a flexibility that does not exist over the last mile. Customer investments are less asset specific when they are made on the edge rather than in the network, and this makes investments in access comparatively unattractive to end-users.

Companies make investments based on what they believe users want, but until the users actually have to pay for the service for a significant period, their real utility function cannot be discerned. In a user-driven network, there is much less of a communication gap between the investment and the value. Users make specific investments (e.g., an improved modem) to achieve specific results. While they may make errors or can be disappointed with the results, the risk of loss is much smaller than when such a decision is made on the scale of an entire city, state, or nation.

The importance of end-user investments as part of the discovery process that defines and develops the market can hardly be overstated. End-user investments are more fungible and can better respond to highly variable levels of demand than investments made by large-scale, capital-intensive carriers. Whereas the latter must worry about the common denominator of demand in a neighborhood and how an in that neighborhood would be recovered from *aggregate* usage patterns, a consumer only has to worry about his/her *own* needs. Consequently, it is unrealistic that consumers would collectively assume the risk that many firms are reluctant to assume — especially in today s telecommunication market which is characterized by retraction of investment and interest.[30] Since the consumers are unlikely to self-finance access facilities, the last mile bottleneck problem persists.

3.4 Capitalization and Recovery of Customer Investment Costs

A firm does not always know what price customers are willing to pay for new products, and it is always challenging to estimate what people are willing to pay for a new product.[31] In the case of local provision of telecommunications services, perhaps this challenge could be overcome by having customers make investments just as they do for other home improvements.

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[30] One estimate shows that the market value of CLECs declined precipitously by 84% from March 2000 to May 2001 — see James K. Glassman and William H. Lehr. Competition in Telecommunications and Economic Growth, unpublished manuscript, July 16, 2001.

[31] Kent B. Monroe, Pricing: Making Profitable Decisions, McGraw-Hill, 1990, second edition

Unfortunately, this is not practical. Although one could argue that customer-financing of local networks would be capitalized into property values like other non-portable home improvements, this ignores that a person buying an existing home might not want the same quality, scope, and provision of local telecommunication services as the seller had chosen. Given this uncertainty (which is surely higher than other more familiar home improvements like upgraded heating systems), the homeowner (i.e., all local telecommunications customers) has less incentive to undertake the telecommunications investments due to the higher risk of not recovering investment costs.

The more mobile the society, the even less likely the homeowner will want to undertake any investment given this risk, and America is a highly, and increasingly, mobile society where 16% of the population moves annually.[32] By the same reasoning, landlords would have little incentive to undertake such investment, and this is significant in a housing market like America s where 1/3 of the population lives in rental housing[33].

4 Alternative Distribution Companies (ADCos)

4.1 Integration Factors

Because new entry is unprofitable for most CLECs, here we explore new alternatives which proponents believe would enhance competition by overcoming economies of scale, high customer acquisition costs, demand uncertainty and other barriers to entry which generally favor vertical integration in the telecommunications industry.

A recent paper argued that given the formidable barriers to entry into the local telecommunications market, CLECs should rely on an Alternative Distribution Company or ADCo , which is a wholesale-only carriers -carrier for the proverbial last mile. One of the arguments made in favor of the ADCo approach is that the ADCo would be a non-integrated company (unlike the ILECs) which would be exclusively wholesale in nature as a distribution company among carriers. Consequently, it would not have the same predatory incentives that an ILEC might have, and the downstream provision of retail services (e.g., advanced telecommunication services) would/could be served by many providers who would benefit from the existence of a non-integrated provider of wholesale services.[34]

Proponents of Alternative Distribution Companies (ADCos) argue that:

> if economies of scale are sufficiently large, reaching a scale of operation that allows the entrant to compete with the ILEC may be best achieved through the entry of an Alternative Distribution Company. [35]

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[32] Department of Census, US Census Bureau, Geographic Mobility, March 1999 to March 2000 http://www.census.gov/population/www/socdemo/migrate/p20-538.html

[33] Department of Census, Annual Statistics 2001, Table 13, Homeownership by State http://www.census.gov/hhes/www/housing/hvs/annual01/ann01t13.html

[34] T. Randolph Beard, George S. Ford, and Lawrence J. Spiwak. Why ADCo? Why Now? An Economic Exploration into the Future of Industry Structure for the Last Mile in Local Telecommunications Markets. The Phoenix Center for Advanced Legal and Economic Pubic Policy Studies, Phoenix Center Policy Paper Number 12, November 2001, Washington DC.

[35] Ibid.

The ADCo would be helpful in reducing some of the cost advantages of ILECs for the provision of local telecommunications services which we have already seen are several orders of magnitude depending on the level of market penetration of competitors (Table 1). ADCos would also reduce the fixed costs associated with operational support systems (OSS) and customer acquisition. However, a nagging question remains -- where should the integration end?

It would make sense to have the ADCo also handle most of the OSS functions since these functions should be integrated with the plant. Where OSS is independent of the facilities, however, there is still the economies of scale hurdle that suggests that these costs should be shared. Customer acquisition costs are also another fixed cost but firms need to differentiate themselves so this cost should not be shared. Still, the issue remains, if the CLECs share their facilities and OSS, and as noted in the introduction, CLECs today have only 8.5% of the market, they still are at a severe cost disadvantage as illustrated in Table 1.

Furthermore, it might be hard to convince those companies that have already acquired OSS or built their own networks, that these facilities should become part of the ADCo. It could be hard because once a CLECs existing facilities becomes integrated into the ADCo, their ties with existing customers are weakened because other users of the ADCo can say to customers that they can offer the same network services.

4.2 Demand Uncertainty and Network Design Issues

Another drawback is that under the ADCos approach who would decide which type of network to provide and how would the risk be spread? Creation of a wholesale-only company such as an ADCo would have implications for the design of the network. Under the current approach of regulating one integrated firm (the ILEC), the risk is internal to the firm. When an ILEC decides to upgrade its network, it decides if it will be upgraded to provide voice and data, or voice, data, and video. Given the plethora of technological alternatives available, how would the ADCo select the appropriate technologies to meet consumer demands in a dynamic market.

Networks are, and should be, designed differently depending on the nature of the products and services that the firm wishes to sell. A customer could be located anywhere from 4 to 100 kft from the electronics. For example, in a voice only network, no one would be more than 100kft from the electronics, whereas if ADSL services are the driving factor in network design, then customers should be no more than 12 kft from the electronics.[36] However, if an ILEC and ADCo were operating in parallel, there is no guarantee that the proper network design would be achieved for providing customer services — e.g., if the ADCo (or LoopCo as described in thenext section) is not engaged in retail operations it is hard to imagine that it would have the proper incentives for upgrading the network to provide advanced telecommunications services.

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[36] The distance requirements are 18kft for SDSL (symmetric digital subscriber line), 12kft for ADSL (asymmetric digital subscriber line), and 5kft for VDSL (very high-speed digital subscriber line), respectively. Merrill Lynch, Broadband Access, May 15, 2001.

For a more complete discussion of network design issues see Chapter 8 (pages 83-109) of the Comments of the National Association of State Utility Consumer Advocates (NASUCA). In the Matter of Cost Review Proceeding for Residential and Single-Line Business Subscriber Line Charge (SLC) Caps, Access Charge Reform Price Cap Performance Review for Local Exchange Carriers, and Federal-State Joint Board on Universal Service, CC Docket No. 96-262, 94-1, and 96-45, January 17, 2002.

We are thus highly skeptical that ADCos would achieve the stated purpose of promoting competition in provision of local telecommunication services for two reasons. First, a vertically integrated market structure may naturally emerge.[37] Given the high degree of uncertainty and asset specificity which currently characterizes the telecommunication industry, it seems that a vertically integrated firm can more easily bear the risks and uncertainty of providing local telecommunications service than a non-integrated firm, and better ensure proper network design. Secondly, the high sunk costs associated with networks can only be recovered through the economies of scale of large operations, regardless of the extent of vertical integration.

5 LoopCo Programs

Under the LoopCo approach, existing ILECs would be broken up into many companies through structural separation of the ILECs network facilities and marketing operations. The local loops would be regulated while the local exchange company would be a lightly regulated utility.[38] It is thus qualitatively different than an ADCo since it uses regulation to break up the ILEC, rather than creating a new competitor to it which focuses only on wholesale activities.

The LoopCo plan would spin off the following into separate, unaffiliated LoopCo companies:[39]

- unbundled local loops (including all interconnecting equipment in the Central Office (CO). Main Distribution Frame (MDF), and connections/wiring at the customer premises);
- local central office building structures which serve those unbundled local loops (LoopCo would lease collocation space in those wire centers to the ILEC for the ILEC's central office and tandem switches and its transmission equipment at the same recurring and nonrecurring charges, and on the same terms and conditions, that LoopCo offers collocation to the CLECs);
- 911 services for connection to Public Safety Agency Operators (PSAPs) -- including the connections to the PSAPs and the 911 router(s) in each LATA;
- white pages publication (which would involve publishing generic white pages for the area served by the LoopCo); and
- tandem transit service (i.e., a switch for exchanging traffic only between the various local exchange carriers, including new entrants, at a uniform rate).

There are at least two problems with this proposal. First, there is the demand uncertainty issue discussed above for ADCos, along with the issue of how to design a loop that is not being designed by one firm. Secondly, should the ILEC s retail operations inherit all of its customers?

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[37] Production is more likely to be internalized within the firm, rather than through the market, when there is a large amount of uncertainty and asset specificity associated with a transaction. Oliver E. Williamson, The Modern Corporation: Origins, Evolution, Attributes, Journal of Economic Literature 19 (December 1981): 1537-1568.

[38] Roy L. Morris. A Proposal to Promote Telephone Competition: The LoopCo Plan (http://members.aol.com/RoyM11/LoopCo)

[39] Roy L. Morris. A Proposal to Promote Telephone Competition: The LoopCo Plan (http://members.aol.com/RoyM11/LoopCo)

5.1 What would Happen to the ILEC s Customers?

Under the LoopCo plan there will be two structurally separated firms -- the Loopco (the wholesaler) and the company operating the retail operations of the former ILEC (the retailer). How can policy makers be sure that the LoopCo will treat this retailer created out of the ILEC and any competing CLECs equally? The retail company which remains after the ILEC is broken up into LoopCos will surely want to inherit all of its existing customers in order to exploit the major economies of scale.

The only way to eliminate this advantage which the newly created retailer would inherit is to:

(i) prohibit the newly created retailer from having retail operations; or
(ii) have a customer ballot whereby customers would select their retail service providers.

The former is politically inexpedient and unlikely, and would move policy away from the relaxation of the line of business restrictions that appear to be favored by many in Congress, as illustrated by the Tauzin-Dingell bill. In addition, it would require the revocation of all existing long-term contracts signed by the ILEC with its customers since the ILEC would effectively seek to exist as a retail operator. Clearly, the ILEC s existing customers would not support this.

Another customer related problem is what would be the appropriate policy response regarding the unprofitable customers of the ILEC who have low usage. Currently the ILEC is the carrier of last resort, but who should takes these customers in a structurally separated world? In all likelihood, the rates for these customers would increase dramatically in much the same way that low usage toll customers have to pay a much higher per minute rate for toll service. No doubt, this would not be a popular public policy outcome since none of the retail firms would be considered dominant, and therefore they would not be regulated. Finally, what would be the basis for assigning these customers? They could be assigned on the basis of the percentage of customers that went to each CLEC during balloting. However, that still leaves the problem that these customers end up with much higher rates.

5.2 Customer Ballot Initiatives

With regard to customer ballot initiatives, they are neither popular nor simple, and would likely require several months to years to properly design and carry out. In 1997, SNET proposed to have structural separation, and the Connecticut Department of Public Utilities Control (DPUC) accepted SNET s proposal on the condition that there would be a customer ballot in 1998 or 1999.[40] Devising the balloting procedure was an arduous process that took the better part of a year in order to address concerns raised by the various parties to the procedure. Among other things the DPUC had to ensure that there was a process in place that would adequately explain the balloting procedures to residential and small business customers, that the CLECs were on board to support the readiness of the balloting process and that all OSS and UNE issues were resolved before the structural separation actually took place.[41] However, the biggest obstacle in the path of the DPUC s balloting initiative was the impact of the federal CPNI (customer proprietary network information) rules.

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[40] State of Connecticut, Department of Public Utility Control. DPUC Investigation of the Southern New England Telephone Company Affiliate Matters Associated with the Implementation of Public Act 94-83, Docket No. 94-10-05, Decisions of June 25, 1997, December 22, 1997, May 27, 1998, and December 9, 1998.

[41] Ibid.

Section 222 [47 U.S.C. 222] of the federal Telecommunications Communication Act provides strict rules regarding the dissemination and use of CPNI by a customer s telecommunications carrier. These rules forbid the exchange of customer proprietary network information without the express authorization of the customer except under three extremely limited circumstances, none of which covered the balloting scenario contemplated by the DPUC. This left the DPUC in a bind. Any customer not returning a signed ballot could not be said to have authorized the release of CPNI. Without this express authorization the DPUC would not be able to allocate customers from the Telco s former retail operations to the Loopco and/or the CLECs, thereby frustrating the intent of the separations process. The only recourse open to the DPUC was to petition the FCC for a waiver from the CPNI rules for the limited purpose of balloting, which the DPUC did on July 16, 1998.[42]

At the start of the 1999 legislative year in Connecticut the FCC had still not acted on the DPUC s petition. By this time certain legislators were getting nervous about the possible political fallout of having customers from the Telco s former retail operations being forcibly allocated, without their consent, to the Loopco or a CLEC. For this reason, and due to the many other aforementioned difficulties, the state legislature eventually voted to prohibit the DPUCs proposed balloting process.[43]

The efficacy of LoopCos is thus suspect. From the perspective of network engineering, there are sound economic arguments to allow vertical integration in an industry which is likely to broaden its service offerings. Furthermore, there is the delicate issue of how to handle the retail operations of the former ILEC in a way that both promotes competition and is politically acceptable and realistic, we believe that LoopCos are not a viable alternative to existing regulatory arrangements.

6 Conclusion and Recommendations

In light of the failure of alternative approaches to end-user access to promote viable competition of provision of local telecommunication services at both the residential and business levels, the question arises — what is a sensible approach to public policy?

The only sensible approach to public policy in light of the lack of competition evolving in the provision of local telecommunication services is to continue the current regime under which local services are regulated by the FCC and state commissions. Unfortunately, the last six years since passage of the 1996 act have not led to widespread competition in this aspect of telecommunications services like it has in provision of long-distance service and wireless and other technologies. The fact that companies pay a premium above book value to acquire networks and customers, while new entrants are simultaneously failing at a high rate, suggests that the trend towards consolidation in the provision of local telecommunications services is likely to continue, and that the associated economies of scale in local operations are not insignificant.

Policy-makers should not seek structural separation through simplistic panaceas such as customer-financed networks, ADCos, or LoopCos to achieve a policy goal of competition. This will fail to promote competition due to the dynamic problems of how to engineer the networks,

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[42] Federal Communications Commission, In the Matter of Petition of the Connecticut Department of Public Utility Control For Waiver of the Customer Proprietary Network Rules by the Federal Communications Commission, July 16, 1998.

[43] See Section 3 of Connecticut Public Act 99-222.

and the public policy issues associated with splitting the existing customer base. More time is needed to allow the telecommunications industry to evolve before clear-cut decisions concerning competition policy can be made. Until then, the current policy of tight regulation of local provision of telecommunication services is the only sound one. Simplistic deregulatory approaches run the risk of creating problems similar to those in California where the energy sector was deregulated too quickly and at the behest of companies who did not have the public interest foremost in mind -- and we believe that no one would like to see local telephone service suffer a similar fate.

Finally, I am cognizant that the claim that vertical integration in the local telecommunications market is somewhat natural was the same line of argument used by the Bell System during the 1982 anti-trust case. I believe that the developments subsequent to the divestiture of the Bell System support the proposition that a firm does not have to be vertically integrated to the degree of the old Bell System. For example, despite the reduction in the line-of-business restriction on the manufacturing telephone equipment,[44] the Regional Bell Operating Companies have chosen to not manufacture equipment or collaborate with others to any significant degree. Furthermore, AT&T spun-off its manufacturing operations. On the other hand, in order to exploit the economies of scale and scope that exists in the industry, reduce uncertainty, and circumvent contracting problems, we observe firms merging and becoming vertically integrated in the local telecommunications market.

Why do we observe different organization structures in manufacturing and the local telecommunications market? While this issue merits further analysis, here is my initial proposition. Manufacturing was initially undertaken by AT&T in part in order to insure that equipment met system standards.[45] Today s ILECs find that they can obtain satisfactory equipment by either writing out engineering specifications in a request for a proposal or by relying on existing standards. On the other hand, vertical integration between AT&T Long Lines and its operating companies occurred so that the vision of deploying a new product, long-distance service, could be realized. The introduction of a new product inherently involves a great deal of uncertainty. This uncertainty cannot easily be addressed through contracts since the contracts cannot adequately address all of the possible contingencies. The theory of the firm teaches us that we are most likely to observe vertically integrated firms in an industry where there is a great deal of uncertainty —and therefore alternative approaches to end-user access in telecommunications which are based on structural separation are likely to fail since they would increase rather than reduce uncertainty.

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[44] See /273 of the 1996 Telecommunications Act.

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