

TELECOMMUNICATIONS IN TRANSITION: UNBUNDLING, REINTEGRATION, AND COMPETITION[†]

David J. Teece*

Cite As: David J. Teece, *Telecommunications in Transition: Unbundling, Reintegration, and Competition*,
1 MICH. TELECOMM. TECH. L. REV. 47 (1995)
available at <<http://www.mttl.org/volone/teece.pdf>>

I. INTRODUCTION

The world economy is experiencing a technological revolution, fueled by rapid advances in microelectronics, optics, and computer science, that in the 1990s and beyond will dramatically change the way people everywhere communicate, learn, and access information and entertainment. This technological revolution has been underway for about a decade. The emergence of a fully-interactive communications network, sometimes referred to as the “Information Superhighway,” is now upon us. This highway, made possible by fiber optics and the convergence of several different technologies, is capable of delivering a plethora of new interactive entertainment, informational, and instructional services that are powerful and user-friendly. The transition from analog to digital technologies, the expanding bandwidth of the enabling platform, and the shift from regulated to competitive environments have all served to make the 1990s the decade in which the Information Superhighway will be built and used. A true revolution in the delivery of entertainment, information, transactions, and telecommunications services is at hand.

This paper outlines these technological changes and explores their implications for competition policy, industry structure, and business organization. Part I introduces competition as an organizational model and discusses the existing structure of the telecommunications industry in the United States. Part II describes recent technological advances that change the conditions underlying the current regulatory structure of the

[†] Presented at The University of Michigan Conference on Competition and the Information Superhighway, Ann Arbor, Michigan, September 30, 1994.

* Mitsubishi Bank Professor, Haas School of Business, University of California, Berkeley. The author would like to acknowledge useful discussions with Robert G. Harris and Gregory L. Rosston, who have been co-authors on related work.

telecommunications industry and challenges the effectiveness and validity of the current regulatory scheme. Part III discusses how innovation impacts what has been considered the natural monopoly of local exchange. Part IV advances five principles that should guide policy modification. Part V explores how eliminating the line-of-business restrictions created by the Modification of the Final Judgment¹ between the government and American Telephone and Telegraph Co. will accelerate competition and stimulate the development of the Information Superhighway. Ameritech's Customer First Plan is presented as a viable means to enhance competition, avoid redundant investment, and increase service innovations and technological advances. Part VI discusses the impact of removing interLATA restrictions.

The organizational model most capable of delivering advanced services universally and at low cost is one that relies on competition and cooperation.² Competition will ensure that incentives exist to provide new services at low cost. Cooperation, governed by antitrust laws, will ensure that the various networks based on copper wires, coaxial cables, fiber optic cables, and airwaves are knit together into a "network of networks." In combination, competition and cooperation will ensure that vestigial elements of any remaining essential facilities in the local exchange business are accessible in a non-discriminatory fashion and that people can communicate anytime, anywhere, to anyone.

The United States has already moved quite some distance toward implementing this model. Since the late 1970s, the government has embraced competition as a matter of public policy for the telecommunications industry.³ Moreover, "the genie of competition has been set loose from the bottle and is unlikely ever to be squeezed back in."⁴ Nor should it. In the United States, if not everywhere, competition

1. *United States v. Western Elec. Co. (American Tele. & Tele. Co.)*, 552 F. Supp. 131, (D.D.C. 1982) *aff'd sub nom. Maryland v. United States*, 460 U.S. 1001 (1983) [hereinafter *U.S. v. AT&T*]. Although the case is commonly referred to as the MFJ, the decision actually modified and approved the MFJ which is appended to the opinion at 552 F. Supp. at 226.

2. 2 IACOCCA INSTITUTE, LEHIGH UNIVERSITY, 21ST CENTURY MANUFACTURING ENTERPRISE STRATEGY, at Foreword (1991) (concluding that an organizational model in which companies and industries learn to work together to build an infrastructure even while competing in products and services is the key component to America's future success in the global economy).

3. The model in the United States from 1913, when AT&T promulgated the "Kingsbury Commitment" to, inter alia, interconnect the independent telephone companies with AT&T, until the late 1970s was one that relied essentially on regulated monopoly. See Gerald W. Brock, *THE TELECOMMUNICATIONS INDUSTRY* 155-56 (1981); See generally HERITAGE FOUNDATION, *ISSUE BULLETIN* No. 191, *A GUIDE TO TELECOMMUNICATIONS DEREGULATION LEGISLATION*, (June 3, 1993).

4. G. Noll, *Telecommunications Regulation in the 1990s*, in *NEW DIRECTIONS IN TELECOMMUNICATION POLICY*, 11, 47 (P. Newberg ed., 1989).

is far and away the most promising route for efficiently bringing forward the advanced telecommunications services needed to enhance global competitiveness in the decades ahead. However, the existing structure prevents realization of the benefits of integration. The predivestiture Bell companies, whatever their faults, did bring forward network innovation that kept the United States second to none in the efficient provision of telecommunications services for decades. The benefits of the former integrated system can be available today. Many of the problems of the existing system, such as, declining investment, slow rates of new product innovation, and limited network innovation, can be addressed if the embargo under which the Regional Bell Operating Companies (RBOCs)⁵ are operating is lifted. When coupled with unbundling of the local exchange, removal of the interLATA restriction⁶ will create a framework that allows market forces to determine whether services are offered by an integrated or a nonintegrated entity and how different services are priced. This will leave federal and state regulators more focused on monitoring safeguards and championing innovation rather than simply standing in innovation's way. Also, inefficient investments that have sprung up purely as artifacts of regulation will fade away, as they should. Scarce investment dollars can then be steered where they need to go: not into the unnecessary duplication of facilities, but rather, into the building of advanced digital intelligent networks.

This model based on competition is by no means a pipe dream. It is the logical conclusion of the trend selected in the late 1970s and early 1980s to increasingly rely on competition rather than regulation to organize the market.⁷ The model already finds full expression in New Zealand, where the Post and Telegraph Office (PTO) provider was privatized and the market was opened to competition.⁸ The "Kiwi share" set a price cap on residential rates that moves with the rate of inflation and New Zealand's antitrust laws safeguard the interconnection rights of new entrants. Tremendous productivity improvements followed privatization and deregulation bringing New Zealand to a leadership position in the modernization of telecommunications infrastructure.

5. The MFJ spawned seven regional Bell Operating Companies: Ameritech, Bell Atlantic, Bell South, Nynex, Pacific Telesis, SBC Communications (previously Southwestern Bell), and US West. *See United States v. Western Elec. Co.*, 990 F. 2d 283, 290 n.3 (per curiam), *cert. denied*, 111 S. Ct. 283 (1990).

6. InterLATA restrictions prohibit the RBOCs from providing long-distance transmissions between Local Access Transport Areas. *See U.S. v. AT&T supra* note 1, at 141 n.39.

7. *See, e.g.*, Robert W. Crandall, *AFTER THE BREAKUP: U.S. TELECOMMUNICATIONS IN A MORE COMPETITIVE ERA* (1991).

8. *See generally* L. Evans et al., *Economy-Wide Reform: The Case of New Zealand*, J. ECON. LITERATURE (forthcoming 1996).

II. ENABLING TECHNOLOGIES

The continued rapid evolution of a number of key technologies facilitates the development and deployment of advanced broadband telecommunications services in the United States and abroad. These technologies enable voice, data, and images to be created, processed, stored, and delivered using a variety of wired and wireless technologies that were little known only a few years ago. Interactive multimedia, for instance, mixes and combines a variety of communication methods, sound, graphics, still photos, motion video, and the written and spoken word, in a computer-controlled environment. The familiar functions of the computer (manipulating data bases) and the TV set (displaying pictures) now combine to give us an expanded concept of multimedia, drawing on advanced software developments and protocols and powerful microprocessor architectures.

Some key technologies that provide the enabling platform for these new telecommunications services are:

1. *Bandwidth Explosion.* The conversion to digital systems permits expansion in the number of channels carried by a transmission media. Optical fiber also permits a dramatic increase in the bandwidth that can be transported from point to point.⁹
2. *Enhanced Microprocessor Power.* New RISC-based microprocessors and digital signal processors permit faster, more efficient, and thus lower cost switching, data access, and digital compression.¹⁰
3. *Reductions in Memory Cost.* In recent years, the unit cost of memory has fallen dramatically,¹¹ thus allowing cost-effective storage and retrieval of large libraries of digital context.
4. *Software Breakthroughs.* Software developments are permitting quick, low-cost programming, access to large data

9. Fiber is generally considered to have nearly unlimited bandwidth potential. Larry Lannon, *Is Short-haul Microwave's Future, Well, Short?*, TELEPHONY, Oct. 1993, at 67.

10. Reduced Instruction Set Chips (RISC) represent an advance in microprocessing. Conventional Instruction Set Chips (CISC) will have hundreds of instructions that are directly recognized. RISC microprocessors recognize only the 20–30% of these instructions that are used most often. A smaller instruction set means the RISC microprocessors can do “less” but much faster than CISC microprocessors. Mark Alpert, *Why It's a RISC Worth Taking*, FORTUNE, Oct. 10, 1988, at 112.

11. Robert L. Fike, *Analog or Digital—The Debate Continues, Transport Facilities*, TELEPHONY, Oct. 17, 1994, at 35.

bases, and inter-operability, which facilitate the integration of different types of media into multimedia products. Stored program control has dramatically improved the versatility of telecommunications products. Software breakthroughs are also permitting seamless, user-friendly operation.

5. *Wireless Modulation.* Techniques such as trunking¹² have been developed and are now being deployed that dramatically increase the capacity of the radio spectrum for voice and data.

Many of these technological developments change the conditions that form the basis of the current regulatory structure of telecommunications, making many of those regulations obsolete. Recognizing this, regulators and courts have begun to promote competition as the underlying principle for the organization of the telecommunications industry. Some regulatory changes include additional spectrum allocations for new services such as Personal Communication Servers (PCS)¹³ and Enhanced SMR,¹⁴ Federal Communication Commission (FCC) co-location and open network architecture (ONA)¹⁵ policies, the lifting of information-services content restrictions on the RBOCs in July 1991,¹⁶ and a July 1992 FCC ruling permitting local exchange carrier deployment of

12. A trunked system is one in which a central computer assigns the first available channel to the user. *See, e.g., Motorola May Finance California Comms System*, NEWS BYTE NEWS NETWORK, Dec. 14, 1995.

13. Personal Communications Servers are “microcells” on microwave frequencies with low power, digital transmitters that provide mobile service over small areas, such as an office building or a neighborhood. MICHAEL K. KELLOGG ET AL., FEDERAL COMMUNICATIONS LAW, 860–61 (1992).

14. Enhanced SMR stands for Enhanced Specialized Mobile Radio which is digital radio service capable of providing mobile telephone service. Communications analysts believe enhanced SMR telephone service may be competitive with cellular telephone service within a few years. Andrew Ramirez *A Challenge to Cellular’s Foothold*, N.Y. TIMES, April 1, 1993, at D1.

15. Open network architecture policies of the Federal Communications Commission encourage the RBOCs to deploy technologies that give outside communications companies the same access to their switching networks as the RBOCs themselves enjoy. Edmund Andrews, *Business Technology: Opening Nation’s Phone Networks*, N.Y. TIMES, Jan. 16, 1991, at D5. A similar policy already governs long-distance phone service, where customers can select AT&T or any of its competitors to handle their long distance calls without having to press a score of numbers on their phones. Bruce Keppel, *FCC Lets Phone Companies Offer Wide Range of Services*, L.A. TIMES, Nov. 18, 1988, at 4.2. The FCC first proposed open network architecture in 1985. Edmund Andrews, *FCC Moves to Expand Phone Service Choices*, N.Y. TIMES, Nov. 22, 1991, at D2.

16. *United States v. Western Elec. Co.*, 714 F. Supp. 1 (D.D.C. 1988), *aff’d*, 900 F. 2d 283 (2d Cir. 1990).

video dialtone.¹⁷ Without these and other regulatory changes, the Information Superhighway would be just a dream.

Indeed, it is well to recognize that the United States no longer holds a commanding lead in telecommunications. As one observer has noted:

The rate of network improvement in other countries is more rapid than in the United States and we are in serious danger of falling behind. For example, both Europe and Japan have plans to have a universal broadband service available by the year 2015, with fiber connections to every subscriber.¹⁸

In addition, cable telephony is offered in Great Britain.¹⁹ Combinations of U.S. telephone companies, including Nynex and Southwestern Bell, British cable companies, and U.S. cable companies, including Cox, Comcast, and Tele-Communications Inc. (TCI), have begun to offer cable telephone services in competition with British Telecom.²⁰ The success of these ventures has resulted in lower prices for local and long distance telephone services in Great Britain and an increase in the quality and variety of services offered.²¹

In order to capture the benefits associated with these technological developments and facilitate their deployment in the private sector, regulatory policies and competition policy must rapidly evolve. Because of the speed of technological change, radical changes in regulatory policy and industry structure are needed. Technological innovation makes increasing competition in telecommunications both possible and inevitable. For example, the application of microwave technology to telecommunications made possible the entry of MCI, Sprint, and others into the long distance market. Today, dramatic breakthroughs in radio communications technologies are sharpening competition between wireless and wireline. Public policies are often slow to recognize the opportunities afforded by the new technologies, and regulatory and public policies often delay and distort competitive dynamics. In the United States, it is often the incumbent regulated firms that are most

17. Telephone Co.-Cable Television Cross Ownership Rules, 7 F.C.C.R. 5781 (1992) (second report and order, recommendation to Congress and second further notice of proposed rulemaking).

18. Aziz Lakhani, Video Dialtone, (1992) (unpublished manuscript, on file with author). Another observer notes that "the U.S. already lags [behind] many countries in digitization, SS7 implementation, and fiber deployment." W. Davidson et al., *Telecommunications Infrastructure Policy and Performance: A Global Perspective* 5-38 (Jan. 6, 1993) (on file with *Center for Telecommunications Management*, University of Southern California).

19. Larry J. Yokell, *Cable TV Moves Into Telecom Markets*, BUS. COMM. REV., Nov. 1994, at 43.

20. *Id.*

21. *Id.*

ensnared in policies that prevent new technologies from being rapidly embraced. This often impairs the ability of established firms to contribute to the investment needed to bring forth new services. The existing regulatory environment inhibits the most qualified providers of enhanced services to the obvious detriment of the nation.

III. THE IMPACT OF INNOVATION ON THE LOCAL EXCHANGE “NATURAL MONOPOLY”

John Maynard Keynes remarked over half a century ago “in the field of economic and political philosophy there are not many who are influenced by new theories . . . so that the ideas which civil servants and politicians and even agitators apply . . . are not likely to be the newest.”²² Civil servants, politicians, agitators, and even some economists have been far too quick to see the local exchange as a natural monopoly. “The defining characteristic of natural monopoly is the necessity to have production done by a single enterprise if costs are to be minimized.”²³ To the extent that the regulation of the local exchange has any grounding in economic theory, it is the theory of natural monopoly. According to this theory, society should accept the existence of a natural monopolist and regulate to prevent monopoly pricing in industries where cost conditions and market demand are such as to make it inefficient for all but one supplier (the natural monopolist) to install facilities of optimal scale. In such a situation, society theoretically is better off minimizing industrial costs.²⁴

The traditional case for regulation assumed the existence of a natural monopoly: a situation where economies of scale persist over all relevant ranges of demand so that a single firm can serve the market at lower cost than two or more firms. Textbook treatments then typically use electric power, gas distribution, local telephone service, rail transport between small and medium city pairs, and the long distance pipeline transport of petroleum and gasoline as examples of natural monopolies.²⁵ It was often assumed, because detailed analysis was rarely reported or even performed, that regulation was necessary in such instances to protect consumers from the monopoly pricing behavior that

22. JOHN MAYNARD KEYNES, *THE GENERAL THEORY OF EMPLOYMENT, INTEREST, AND MONEY* 384 (First Harvest/HBJ ed. 1964) (1936).

23. R. SCHMANLENSEE, *THE CONTROL OF NATURAL MONOPOLIES* 143 (1979).

24. *Id.*

25. *See, e.g.*, F.M. SCHERER, *INDUSTRIAL MARKET STRUCTURE AND ECONOMIC PERFORMANCE* (1980).

was supposedly virtually inevitable when scale economies were achieved.

Recently, however, scholarly work has begun to recognize that natural monopolies are not only extremely rare, but also do not necessarily have to be regulated.²⁶ The theory of contestable markets demonstrates that the presence of a large number of actively producing firms is not necessary to produce efficient outcomes.²⁷ Where costless, reversible entry, sometimes referred to as "hit and run" entry, is possible, firms that are characterized by economies of scale will still price at efficient levels. Put differently, the threat of potential competition can, under certain conditions, produce efficient outcomes even in markets where there is only one supplier or where a single supplier holds a substantial market share. However, the argument here is not that markets characterized by natural monopolies do not need to be regulated, although in some circumstances that is true. Rather, the proposition is advanced that the local exchange is not a natural monopoly anymore, if it ever was.

Almost since the beginning of the telephone business, local telephone service has been provided by a copper pair of wires strung to each house. Because the major cost of providing local phone service was the cost of the wire and the wire was sufficient to carry the calls of each customer, it was significantly cheaper to have a single provider of local services. The cost savings from a single provider led to the widespread belief that a natural monopoly existed.

For the past 20 years, technological change has transformed competitive conditions in the local exchange business. Technology is not only making the local exchange more susceptible to competition but also blurring the distinction between interexchange and intraexchange services.²⁸ The actual regulatory distinction between categories of service affects technical choice and network design and therefore may, itself, be an important factor in determining the direction of innovation and the nature of competition. For example, the introduction of fiber optics into the telephone networks has significantly reduced the cost of transport so that the cost of calls is very insensitive to distance.²⁹ As a result, depending on the amount of switching, the real resource cost of a 10 mile "local" call may not be very different from the cost of a 100 or

26. See, e.g., W. J. BAUMOL ET AL., *CONTESTABLE MARKETS AND THE THEORY OF INDUSTRIAL STRUCTURE*, (2nd ed. 1988).

27. *Id.*

28. Interexchange service is the carriage of voice or data traffic across LATA boundaries, the connection between "exchanges." Intraexchange service remains within a LATA. KELLOGG ET AL., *supra* note 13, at 856.

29. T.R. Reid, *21st Century Promises Marriage of Telephone, Computer*, WASH. POST, Sept. 15, 1986, at F23.

1,000 mile “long distance” call. However, because of regulation and imbedded subsidies, the prices charged for these calls remain different. In response to these price-cost discrepancies, many companies have been able to arbitrage the difference and route calls through the lowest priced jurisdiction even if it is not the least resource cost routing. This results from the implicit subsidies as well as the decrease in the cost of call transport.

The implementation of fiber optic technology is not the only change that is affecting the economics of local communications. There are a variety of technological advances that have changed the nature and lowered the costs of local exchange. Which in turn threaten the natural monopoly and reduce the difference between long distance and local telephone calls.³⁰

New enabling technologies have lead and will continue to lead to alternative and enhanced provision of telephone service. The advance of technology has come in many different arenas and from many different enterprises in response to several different regulatory regimes. Especially pertinent to the discussion of “local” telephony are the impact of radio based technology, the introduction of fiber optics, the significant advances in microelectronics and computing power, and the continued decrease in the cost of computers and microelectronics.

A. Radio-Based Technology

Radio-based technologies are rapidly increasing quality and capacity and decreasing costs of wireless telephone service. The combination of these three factors makes radio-based local loops a competitive threat to the traditional wireline based local natural monopoly.

Radio has gone through a series of advances since it was first introduced. These advances are currently most evident in the explosion of cellular phone usage that has occurred over the last ten years. More cellular phone “lines” than new local exchange lines are activated each year.³¹ Despite this growth and predictions that cellular might one day

30. A variety of authors have investigated the impact of alternative technology. *E.g.*, D. REED, RESIDENTIAL FIBER OPTIC NETWORKS: AN ENGINEERING AND ECONOMIC ANALYSIS (1992); G. CALHOUN, WIRELESS ACCESS AND THE LOCAL TELEPHONE NETWORK (1992); P. HUBER ET AL., THE GEODESIC NETWORK II: 1993 REPORT ON COMPETITION IN THE TELEPHONE INDUSTRY (1992); D. Reed, *Putting it all Together: The Cost Structure of Personal Communications Services*, FCC Office of Plans and Policy Working Paper No. 28 (Nov. 1992); E. DeSurvire, *Lightwave Communications: The Fifth Generation*, SCIENTIFIC AMERICAN, Jan. 1992, at 114; B. EGAN, INFORMATION SUPERHIGHWAYS: THE ECONOMICS OF ADVANCED PUBLIC COMMUNICATION NETWORKS (1991).

31. Andrew Adonis, *Survey of Mobile Communications*, FINANCIAL TIMES, Sept. 5, 1994, at 1.

compete with landline service, cellular has not yet provided significant price competition with landline service. In some respects, this may be due to capacity limitations and the inability of providers to price discriminate between mobile and fixed services. The first problem, capacity constraints, is in the process of being rectified for the majority of the country with the conversion to digital signaling. Digital cellular transmission is expected to bring an immediate threefold increase capacity.³² System capacity at that level will be sufficient to provide a competitive alternative to wireline service in all but the very largest areas of the country.

Although cellular is currently providing only modest competition to landline service, several factors are likely to reduce cellular prices in the near future and make it more of a competitive alternative to landline service. Cellular is likely to face price competition from two sides in the near future. Nextel recently began operation of its digital, cellular SMR service in Los Angeles.³³ It is expected that Nextel will be able to provide cellular quality service with advanced technology.³⁴ The addition of a third high quality mobile service provider will expand capacity further and put downward pressure on prices. Other SMR operators also appear to have plans to introduce digital cellular technology to their networks.

In addition, future wireless competition will put pressure on both cellular and landline service. PCS is expected to provide mobile communications and to add significantly to wireless capacity. Because the higher PCS frequencies have limited effective ranges, the handsets will be smaller than comparable cellular phones. However, these systems will require significantly more cells which may limit mobility. This limited mobility will cause them to charge lower prices than cellular systems and serve as competitors to portable and wireline phones in addition to many portable cellular phones.

The additional capacity offered by the introduction of digital signaling and the increase in spectrum available for mobile communications will eliminate capacity constraints in most areas. At that time, service prices should be based on the cost of installing the infrastructure and maintaining the system. In many cases, these costs will be comparable to or lower than the costs faced by a traditional wireline company. Wireline costs diminish, the available spectrum widens, and cell sitting becomes less expensive as you move further away

32. Sarah Curtis, *Beyond Cellular*, MACLEAN'S, Jan. 23, 1995, at 46.

33. *Nextel Installs All Digital Integrated Wireless Communications in Los Angeles*, RBOC UPDATE, Sept. 1994.

34. *Id.*

from dense urban areas. As a result, the wireless technologies are much more competitive with wireline service in rural areas.

One additional future radio-based technology is the Iridium project proposed by Motorola. This project proposes a worldwide satellite network so that users can communicate anywhere throughout the world.³⁵ The signal will be directed to a satellite from the handset and then back to the other handset or local network. Although this is expected to be a relatively expensive service, it is another wireless technology that may someday turn “local” communications into global communications.

B. *Fiber Optics*

Fiber optics have dramatically changed the nature of competition in communications. Because fiber is so much more efficient than microwave technology, the cost of transmission of calls is much less sensitive to distance than it was at the time of the forced divestiture. Because of negligible cost differences, it is hard to determine why a 10 mile call should be “local” and a 100 mile call should be “long distance.” The decline in transmission costs will lead to the substitution of fiber for switching. It will become more cost effective to circuitously route calls over fiber networks in order to minimize switching costs if the cost of transmission decreases relative to the cost of switching.³⁶

Fiber has not only affected the cost structure of the interLATA carriers but also become an integral part of local exchange. Local telephone and cable companies are racing to introduce fiber into their networks. Just as Bell and the other telephone companies competed to wire networks, these two competitors are racing to be the first to have a high capacity two-way network and to reap the benefits of early adoption. There are many issues to be resolved about the introduction of fiber: whether it will be fiber to the home, fiber to the curb, or fiber to the neighborhood, for example. But it is clear that fiber and its carrying capacity have had, and will continue to have, a strong impact on the nature and cost structure of communications.

The development of fiber optic technology has led to the first competitive alternative to Local Exchange Carriers: Competitive Access Providers (CAPs). CAPs have deployed fiber optic networks through dense downtown areas. In addition to the arguments that they are able to avoid the subsidies embedded in LEC access rates, the CAPs claim that

35. Mike Holderness, *Computer: And Thou Beside Me in the Wilderness*, THE GUARDIAN, Aug. 19, 1993, at 19.

36. Note that both technologies have been experiencing significant decreases in cost, but if transmission costs decrease more rapidly than switching costs, system designers will substitute transmission for switching at the margin. See Huber, *supra* note 30, at 3.37.

they are satisfying a need for high capacity, high quality, high speed data transmission links. Without the transmission quality of fiber, CAPs would not be able to fill this need and therefore might not be able to exist and bring competitive pressure on LEC rates.

Cheap transmission has a significant impact on the economics of information services. Many information services rely on accessing databases. With cheap transmission it becomes economical to have a single version of a database and allow users from a wide area to access the single database. In this way, the provider does not have to duplicate the facilities to run the database, updates to the database are simplified, and all users accessing the database receive consistent information.

The preceding two sections show the complementary nature of the competitive effects of fiber and wireless technologies. Fiber is being introduced by CAPs and cable companies in dense urban areas to provide high capacity service. In these areas the costs of wiring per telephone is relatively low since the density is high. Also, in these areas spectrum is relatively scarce and expensive. Construction and operation of a high quality cellular-like system would be expensive because of the opportunity cost of the spectrum, the high price of the land rental for cell sites, and the need for a large number of cell sites. On the other hand, in suburban and rural areas it is more expensive to string wires, spectrum is less intensely used, and there are more options for cell sites. As can be seen, technology is challenging the existence of the natural monopoly in areas of both high and low population density.

C. Equipment Costs

The relentless advance in power and decrease in price of microelectronics and computing technology has had a large impact on the price and performance of customer premise equipment (CPE)³⁷ as well as central office switching equipment. For example, the total cost of cellular service has decreased as handsets have become significantly cheaper and operators have paid lower prices for incremental switching capacity. Because switching and controller costs have decreased, the costs to provide alternative forms of local access also have decreased. Cable, CAPs, and radio-based carriers will benefit from these lower costs as they begin to compete with LECs.

The decline in microelectronics prices will make it easier for cable companies to compete with LECs. For example, if the cable version of a

37. CPE is used on the customer's premises "to originate, route, or terminate telecommunications." U.S. v. AT&T, *supra* note 1, at 228. Examples of CPE are telephone sets and answering machines.

telecommunications provision is a 500 channel interactive broadband network, the cost of the CPE to link into that network will be significantly cheaper and more sophisticated than it would have been only a few years ago. As a result, even if the cable and telco networks are significantly different, the competition on a variety of features ensures that the reductions in cost for cable telephony will make them more competitive with LECs.³⁸

The pace of electronics advance has blurred the distinction between transmission and switching as well as between central office equipment and CPE. For example, advancement in central office technology has allowed the offering of advanced voice messaging systems. Although these systems may offer more features than standard home answering machines, they nonetheless directly compete with home machines. PBXs³⁹ are another example of an advance outside the central office that has increased competition between central office services, Centrex,⁴⁰ and CPE. PBXs not only provide competition for central office services but also provide switching services, allowing users to reduce their use of loops and pay for fewer lines.

The next section analyzes the effect of these technologies on the entry strategies of potential entrants into the local exchange.

D. Entry

Entry can be divided into two broad categories: entrants using existing local distribution technology and entrants using new technologies. This discussion will also consider entry in the context of an unbundled network⁴¹ like the one proposed in Ameritech's Customers First Plan for Illinois.⁴² This analysis seems to be applicable for other regions as well

38. R. HARTMAN ET AL., *Assessing Market Power in Regimes of Rapid Technological Change*, in *INDUSTRIAL AND CORPORATE CHANGE*, 318, 321 (1993) (discussion of the impacts of competition on a variety of features in addition to price).

39. A Private Branch Exchange (PBX) is a customer provided switch that automatically transfers, or switches calls between the customer's private telephone station and other locations. Carolyn Whitman Malanga, Note, *California v. Federal Communications Commission: Continuing the Struggle Between § 151 and 152 of the Communications Act*, 40 *CATH. U.L. REV.* 893, 918 (1991).

40. Centrex provides remote switching service with customer-tailored capabilities such as four digit dialing for business and institutional customers. See KELLOGG ET AL., *supra* note 13, at 852.

41. An unbundled network, in theory, provides independent information service providers with more complete information about network features and allows them to choose the specific features they need. See, e.g., *United States v. Western Electric Co, Inc.*, 767 F. Supp. 308, 319 (D.D.C. 1991).

42. Ameritech filed its Customer First Plan with the FCC in 1993 and also filed a request with the Department of Justice for a long distance waiver in Illinois. Jim Dilorenzo, *AT&T Challenges Ameritech in Opening Local Competition*, *TELEPHONY*, Apr. 18, 1994, at

because the FCC has steadily been decreasing the size of the "bottleneck" and allowing more competition. Recent switched and special access orders⁴³ and expanded interconnection have opened traffic on the local exchange network to competition just outside the local switch.

1. Entry Using New Technology

a. Cable Company Entry

Cable companies are positioning themselves to provide local exchange services. Cable companies have capacity to provide transport from LEC end offices to the points of presence (POP) of interexchange providers.⁴⁴ They are also interconnecting their headends, the originating points of cable television signals, with fiber cable to offer advertisers the ability to reach region-wide audiences. One indirect, but non-trivial result of interconnection is the creation of capacity for the transport of telephone calls. Cable companies are also putting fiber further into their networks, giving them the ability to provide end-to-end voice and video service. In several instances, they are linking up with LECs to accelerate the introduction of new services. In one cable and RBOC joint effort, Time Warner and US West recently made a presentation disclosing that they intend to upgrade their physical plant to begin the provision of telephone service by the end of 1994.⁴⁵ Their proposed service seeks to target residences and both small and large businesses. Further, they can be expected to charge rates that will undercut LEC rates. The partners are both well-financed, experienced companies. Time Warner claimed in its presentation that it has been very successful competing against British Telecom in England.⁴⁶ Time Warner's success comes without the benefit of the unbundling and switch integration proposed in Ameritech's Plan. Thus, despite the assertion of opponents to Ameritech's CFP, the distinct possibility of exclusionary practices in England has not yet prevented competition.

6. Since the presentation of this article, the Department of Justice had filed a motion in support of Ameritech's CFP. *See infra* notes 104–107 and accompanying text.

43. Carriers offer switching service by allowing users to change the end point of a circuit in a similar fashion to how individuals do when dialing a voice phone number. *A Wan Communications Glossary*, NETWORK COMPUTING, January 1, 1993, at 76.

44. According to TCI's President and CEO, Dr. John Malone, in 1992 TCI became the largest single buyer of fiber in the world, based on mileage. Charles F. Mason, *AT&T Takes Center Stage at National Cable T.V. Convention*, TELEPHONY, May 11, 1992, at 6. Time Warner already offers local connections to long-distance carriers in Indianapolis and Kansas City. *Time Warner, Baby Bell May Compete in San Diego*, WALL ST. J., June 24, 1993, at B7.

45. *US West Bets on Cable with Time Warner*, TELEPHONE WEEK, May 24, 1993.

46. *Id.*

Time Warner's Orlando, Florida trial is another example of cable competing for local service. Set to be completed next year, the system as envisioned will be based on a fiber optic backbone, copper to the home architecture, digital compression technology and digital storage and switching systems.⁴⁷ The network will give the cable company the ability to offer, among other things, voice and data transmission services and PCS.⁴⁸ Jones InterCable recently announced a test of telephone service over its cable system.⁴⁹ With the help of MCI and Scientific Atlanta, Jones InterCable will be able to allow users to bypass the LEC and receive faxes while using the phone and to have access to interactive games.

Comcast is also poised to begin telephone service.⁵⁰ The *New York Times* reported that Comcast had continuing talks with both AT&T and MCI, indicating their interest in telephone service.⁵¹ Comcast also is one of the owners of Nextel, a specialized mobile radio company that recently received FCC approval to provide cellular-like service in a number of major cities.⁵² Furthermore, Comcast offers cable and telephone service in Britain. In the United States, Brian Roberts, President of Comcast says, "Long term, the cable companies want to look like the phone companies with ubiquitous coverage. We've wired up nearly all the homes, but not the businesses. So that's why we're investing in Teleport."⁵³

Once these ventures and others begin offering services to consumers, a significant marketing advantage will emerge. A cable company can package its programming and phone service, offering the customer the convenience of one stop shopping, and possibly adjust the prices of the individual services to convince the customer to subscribe. Such bundling has proven highly successful in the U.K. As one example,

47. Randall M. Sukow & Rich Brown, *Time Warner Unveils "Full Service" TV*, BROADCASTING, Feb. 1, 1993, at 6. Time Warner is also seeking regulatory approval to offer telecommunications services in San Diego. The services, which are scheduled to begin in 1995, would compete directly with Pacific Bell for business customers. Time Warner plans to connect local businesses with long-distance carriers and link the offices of area companies by building a fiber-optic network. *Time Warner, Baby Bell May Compete in San Diego*, *supra* note 44, at B7.

48. Don Clark, *New Visions of Communications: 'Data Highways' Lure Billions in Investment*, S.F. CHRON., Nov. 23, 1992, at B1.

49. *Id.*

50. Anthony Ramirez, *Head Start on Data Superhighway*, N.Y. TIMES, Sept. 8, 1993, at D13. Comcast is not only the third largest cable company but also the fifth largest independent cellular telephone provider, giving them a significant presence as a local service provider. *Id.*

51. *Id.*

52. *Id.*

53. *Id.*

Cable and Wireless, a British concern, is now signing-up close to 15,000 residential customers per month through the local cable companies.⁵⁴ There is no reason not to expect similar inroads here in the United States, especially with an interconnected network of networks.

b. Wireless Entry

Wireless carriers provide both immediate and future competitive entry alternatives for local exchange service. AT&T's multi-billion dollar purchase of McCaw Cellular will position wireless technology as a direct competitor to the RBOCs' local telephone business.⁵⁵ The company's brand name, marketing prowess, and financial resources eliminate any doubt that an AT&T backed cellular venture could quickly become a nationwide player in the local telecommunications services area. Furthermore, the merger places AT&T in the enviable position of being able to offer its subscribers a complete package of local, cellular, and long-distance calling.

"Nonwireline" cellular carriers provide nearly ubiquitous service throughout the country. While their "loops" may not currently provide a complete, competitive alternative to LEC loops, they are positioned to do so easily. Cellular carriers have sophisticated switches and, in some cases, fully-functional networks and office support in place that will allow them to use spectrum for "fixed" loops and to provide competitive local service. Cellular carriers also possess a select list of customers with a high demand for telecommunications services. Cellular and other wireless carriers appear well-situated to provide future competition for the local loop, especially in relatively high-cost areas. Spectrum is used less intensively in rural areas than in major metropolitan areas. Therefore, providing competitive loops in these areas would not divert spectrum from a relatively more valuable use.

In the future, the combination of leased wireline access and wireless access may give the cellular carriers a unique advantage in marketing to customers. If they succeed in their drive to receive PCS licenses, wireless carriers would provide customers with three options for "loops." Under one example, the cellular provider can position a cell site directly adjacent to a wireless PBX serving a large corporate complex. The cellular carrier could handle local mobile traffic and serve as the local carrier for all interLATA traffic originating and terminating at the PBX. Although the coverage for the cellular portion of the traffic would be more limited than for wireline traffic, the volume of traffic, combined

54. Cable and Wireless, 1993 Report and Accounts 12 (1994).

55. Edmond L. Andrews, *The AT&T Deal's Big Losers*, N.Y. TIMES, Aug. 25, 1993, at C1.

with the absence of interconnect charges for the cellular carrier, would offset at least some of the gap.⁵⁶

With the imminent conversion to digital signaling for cellular, there are a number of cellular operators that will have significant excess capacity.⁵⁷ They can market this capacity for use as simple local service. In fact, products are being developed to allow cellular operators to sell service to wireline customers that is transparent to the user. Other implementations could include selling “loops” to serve as connections for alarms that need only infrequent access.

c. Amalgamations and Alliances

Given the infrastructure of cable companies, CAPs, and cellular carriers, and the emergence of alliances among them,⁵⁸ a possible future competitive alternative would be a combination with CAPs providing loops for downtown areas, cable companies providing loops for suburban and residential customers, and cellular companies providing loops for rural areas. Combinations of the various technologies also lead to greater geographic coverage. An entry strategy using a combination of the assets of these companies would enable pervasive entry at multiple nodes.

Another group of potentially formidable competitors moving closer to actual entry with each passing month are the LECs from other regions. The RBOCs and GTE are all large, financially sound carriers with the requisite technical engineering, marketing, and billing capabilities to provide local exchange services. As already noted, US West, with Time Warner, intends to enter other regions and will soon begin providing local exchange service.⁵⁹ Entry by the other LECs is just as likely. Both Sprint and GTE have local exchange operations⁶⁰ and it would be logical for them to expand their service areas through a combination of resale and facilities construction. Most RBOCs have cellular operations in areas outside their local exchange territories. The market presence of these companies provides a natural springboard for the extension of the scope of their services into the local exchange. Such a strategy could be accomplished via their own facilities or by a pooling

56. See discussion of Telular Inc.’s “magic box” in John J. Keller, *Telecommunications: A ‘Magic Box’ Turns Wired into Wireless*, WALL ST. J., Oct. 1, 1993, at B1.

57. *Telecommunications Expected to Grow Steadily in 1992, Commerce Says*, COMMON CARRIER WEEK, Jan. 6, 1992, at 1.

58. E.g., Yokell, *supra* note 19.

59. See *US West Bets on Cable with Time Warner*, *supra* note 44.

60. Daniel W. Edwards et al., *Telecommunications Services*, U.S. INDUSTRIAL OUTLOOK, Jan. 1994, at 29.

of talents and resources with the other potential entrants other than the Interexchange Carriers (IXCs) who are restricted by the MFJ.

2. Entry Using Existing Technology

Competitors using existing technology, depending on their specific capabilities, are poised to compete for either the entire market or for distinct subsets of customers. Because each potential competitor has different competitive advantages, the range of customers benefiting from new entry and expanded competition nearly spans the gamut of local exchange customers. In addition, the ability to enter with minimal investment and to act as a reseller in an unbundled local network gives an entrant complete market presence with little risk.

a. Interexchange Carriers

The most likely source of immediate and influential entry into local service will be the IXCs, especially the large, nation-wide carriers like AT&T, MCI, and Sprint.⁶¹ AT&T has itself advanced the case for seamless end-to-end integration through its Megacom service and private networks.⁶² The McCaw acquisition is the epitome of a company positioning itself to provide end-to-end service. AT&T's purchase shows the obvious synergies existing between the two businesses in addition to the expected future possibilities. Indeed, AT&T's public statements suggest that the company's strategy is to provide their customers with end-to-end service.⁶³

61. Sprint has formed an alliance with TCI, Cox, and Comcast to target local markets. Edmund Andrews, *Ameritech Forcefully Stays Home*, N.Y. TIMES, Nov. 22, 1994, at D1. AT&T, despite its protestations to the contrary, will also enter the local service business with its imminent acquisition of McCaw Cellular. Jerry A. Goldstone, *Wireless Market Nears Boiling Point*, BUS. COMM. REV., Nov. 1994, at 4.

62. Gregory F. Borton & Fred S. Knight, *Seeds of Change in CTI*, BUS. COMM. REV., Mar. 1994, at 35.

63. For example, Bob Stanzione, AT&T Vice President of transmission systems, recently acknowledged that for AT&T to compete in the delivery of multimedia communications services, the company will "have to have alliances of some sort with the companies that provide the last-mile access to the home." John Eckhouse, *Cable Television's Growing Pains*, S.F. CHRON., June 7, 1993, at E1. These statements diminish the credibility of AT&T's public pronouncements that its acquisition of McCaw does not make it a local phone company. Earlier this year, Arno Penzias, vice president of research at AT&T's Bell Laboratories, touted AT&T's vertical integration as being "a far greater asset than it's ever been in the past." The article went on to say that the "ability to merge all the elements—the fiber, the chips and the software to run them—is what makes [a] network valuable" in today's marketplace. Gary Slutsker, *The Tortoise and The Hare*, FORBES, Feb. 1, 1993, at 67.

MCI, through its subsidiary Access Transmission Services, has filed for a permit to begin competitive access service provision in Indiana.⁶⁴ MCI also recently announced the planned test of cable telephony with Jones InterCable discussed above.⁶⁵ Sprint is already an active participant in local exchange telephony.⁶⁶ MCI and Sprint may have additional incentive to add end offices if prospective changes to switched and special access transport pricing make the IXCs more sensitive to the location of their switches. MCI and Sprint will then have incentives to provide their own links from high volume end offices to their POPs. This will create excess capacity and position them to take advantage of the unbundling and switch integration plan.

All three companies have the ability to self-supply transport. Once the necessary construction and right-of-way expenses are incurred, the incremental cost to add traffic will be quite small.⁶⁷ Specifically, once the IXCs have successfully developed the transport segment of their network, they will be able to sign up additional subscribers at little added cost in an unbundled environment since they can rent loops from the LEC and transport traffic to their own switches. In addition, as a major manufacturer of switches, AT&T will be able to obtain switching at a lower cost than any of its competitors and could easily position switches for local service.⁶⁸

Because IXCs enjoy their highest margins in the small and mid-size business segment, they are likely to pursue these customers first for their provision of end-to-end service. AT&T, as well as other large IXCs, could compete by installing switches (or using excess capacity on its existing switches) to supply dial tone and usage services and routing the traffic to any of their many existing POPs. This could be economical even in an area with a small amount of traffic because the large IXCs could either share capacity on a nearby existing long distance switch or

64. *States Meander Toward Rules to Foster CAP Competition*, TELCO BUS. REP., July 5, 1994, at 1.

65. *New Visions of Communications*, *supra* note 48, at B1.

66. *Local Competition by CAPS Still Embryonic in Western States*, ST. TELEPHONE REG. REP., June 8, 1992.

67. MCI has purchased a significant amount of right-of-way from Western Union. *Telecommunications Alert*, May 1, 1992, at 1. MCI has also recently filed for state certification as a CAP in Indiana. See *States Meander Toward Rules to Foster CAP Competition*, *supra* note 64, at 1.

68. According to an MCI expert economist, Kenneth Baseman, "the marginal activation costs and marginal operating costs for new circuits activated on facilities already in place are generally quite low and do not differ significantly depending on whether the IXC is collocated or the IXC's POP is several miles away." *In the Matter of Expanded Interconnection with Local Telephone Company Facilities; Amendment of Part 69 Allocation of General Support Facility Costs*, 7 F.C.C.R. 7369, (Oct. 19, 1992) (citing Affidavit of Kenneth Baseman at 23–24).

economically use a somewhat distant switch to provide local dialtone until traffic justifies a truly local switch. Adding switch capacity is relatively simple with modern modular switches such as the 5ESS. Furthermore, because the IXCs have fiber facilities in place with excess capacity, the cost of transport to take advantage of a distant "local" switch would be minimal.

b. Competitive Access Providers

Competitive access providers (CAPs) have entered many major cities by deploying fiber loops through dense downtown areas. They are already providing competition for local exchange carriers without the benefit of unbundled local networks. Competition for transport services will increase the traffic on CAP networks and decrease average unit costs, making CAPS more effective competitors for a larger portion of business.

The strategic intent of CAPs appears to involve providing expanded services.⁶⁹ MFS Communications, Inc. has recently announced that it will offer local and long distance services in New York City.⁷⁰ To support this effort, it plans to install Ericsson switches in its network.⁷¹ The service will be "available immediately in Manhattan and will be extended to the rest of the New York metropolitan area over the next few months."⁷² MFS does not intend to stop with New York. According to its half page advertisement for this new service, "Service is available in New York now. National expansion is underway."⁷³

CAPs have invested in loops that give them access to a large number of customers with a relatively high demand for telephone service. CAPs may not be positioned to compete for customers throughout the local service areas, but they are well beyond the venture capital stage and now represent formidable competitors to the local exchange carriers. The largest CAP, Teleport, is owned by several large cable companies, including TCI, Comcast, and Cox and thus possesses the financial backing to ensure its ability to effectively compete.⁷⁴ This investment by the cable companies reveals their expectation that CAPs

69. *MFS Communications Co.: Unit Tries to Win Customers from New York Telephone*, WALL ST. J., Oct. 6, 1993, at A4.

70. *Local Service Resellers Target Small Businesses in 41 States*, ST. TELEPHONE REG. REP., Oct. 21, 1993, at 1.

71. *See MFS Communications Co.*, *supra* note 69.

72. *Id.*

73. *Id.* at B7.

74. *Continental and Comcast Each Acquire 20% Share of Teleport*, FIBER OPTIC NEWS, Dec. 28, 1992.

will provide telephony expertise and their belief that further synergies exist.

Investment advisors and the CAPs themselves believe CAPs have a significant role in the future of telecommunications. In discussing the acquisition of Teleport by TCI and Cox, Goldman Sachs says that the alternative access market is “substantial” and represents a significant opportunity for cable companies.⁷⁵ TCI’s CEO John Malone believes there is a potential market of \$40 billion annually for alternative access carriers; he expects the alternative access market to generate revenues of at least \$1 billion in three years and to potentially represent 25 percent of the total access marketplace.⁷⁶ Such optimistic numbers, while obviously not precise, are indicative of the potential for CAPs to become significant access providers.

With switch integration, CAPs with switches can easily become the local phone service provider to those businesses their networks reach. In addition, the ability to rent loops in areas their networks do not reach will enable CAPs to provide service to businesses and residences with little incremental investment as long as those customers are served by end offices their networks do reach. CAPs can also expand their geographic coverage sequentially and determine the optimal path for their new fiber loops by leasing capacity in the short term while determining where to install plant expansions. Finally, the CAPs will be able to compete to serve multi-location businesses even when they do not have a physical presence near each of the satellite offices.

CAPs also will be able to increase their target customer base significantly with unbundling. CAPs are already reaching new customers. With unbundling, CAPs may deploy fiber in other areas and reach even more potential customers. CAPs can use unbundling to determine demand for their services and perform true market research by purchasing pieces of LECs’ networks before determining where to construct their own facilities. Further, CAPs will be able greatly to reduce the risk of new construction by establishing an active customer base prior to completing their facilities.

Clearly, local exchange services are exposed to forms of competition not imaginable even a decade ago. Local exchange is certainly not the monolithic essential facility once described in industrial organization textbooks. New technology and regulatory changes have brought fundamental transformation. Competition increases daily. Full-scale competition in access, exchange, and interexchange services is both inevitable and desirable. Competition in telecommunications has not

75. GOLDMAN SACHS, *COMMUNICOPIA: A DIGITAL COMMUNICATION BOUNTY* 20 (1992).

76. *Id.* at 21.

advanced yet to the point where it alone will suffice to guarantee all the public policy objectives traditionally embraced in the United States.⁷⁷ The rapid expansion of competition in the local exchange permits and requires regulatory changes and the development of new policies to further the transition to a fully competitive telecommunications environment.

IV. THE REQUIRED POLICY FRAMEWORK⁷⁸

In order to capture the benefits of innovation, policy makers must make aggressive moves to modify the regulatory institutional approaches in place in the United States today. The following principles should guide this process.

Replace Regulation with Competition. Enabling customers to choose among competitive service providers constitutes the most efficient form of "regulation." While competition will increase whether regulators want it to or not, good regulatory policy can ensure that competition proceeds more quickly and that all customers enjoy the benefits of competition. Also, good regulatory policy can promote the right kind of competition, that which responds to real market demands and reflects real economic efficiencies. Regulators should avoid policies that stimulate artificial competition wherein participants exploit regulatory distortions and arbitrage uneconomic pricing schemes.

Promote Competitive Neutrality. Because technology is proceeding at breath-taking speeds and advanced telecommunications are becoming absolutely crucial to competitive success in more and more industries, it is vital to adopt policies that promote continued development of healthy competition in telecommunications while ensuring that social policy objectives, such as universal service, are maintained. Therefore, regulatory policies should be competitively neutral. Policies that treat competitors differently can bias customers' choices and distort entry and investment decisions. Policies should provide competitors with an opportunity to compete but should not attempt to guarantee their success. Policies should promote and protect competition, not protect competitors from competition.

77. Although the New Zealand government completely deregulated the industry with far less apparent competition. *See generally* L. Evans *et al.*, *supra* note 8; *See also* Intervention and Openness and Economic Performance: New Zealand, OECD ECONOMIC SURVEYS, Oct. 1994.

78. R. Harris and D. Teece, *Telecommunications in Transition: Innovation, Unbundling, and Reintegration*, (forthcoming 1995) (manuscript on file with author).

Facilitate Market Responsiveness. Public policies should attempt to be responsive to current and expected market conditions in both the industry being regulated and related industries. Prices, as signals of cost and value, play a critical role in market exchange. Regulators should therefore allow prices to be set by market forces whenever possible, or, alternatively, emulate market forces when they do set prices or pricing parameters. Similarly, regulators should allow, to the maximum extent possible, market forces to determine what variety of products and services will be offered. Regulators should recognize that market pressures have increased the rewards of good public policies (i.e., those which stimulate investment, increase usage, and promote economic development in the states) and the costs of policies that are not consonant with market conditions (e.g., uneconomic bypass, self-supply, and relocation of facilities).

Synchronize Regulatory and Competition Policies. It is also important that rate regulation and competition policy are synchronized. As competition policies, whether by design or in effect, further open markets to competitive entry, regulatory policies should be reformed to ensure that they are consistent with actual and expected conditions in the marketplace. For competition policy to work well, pricing should be market driven with only limited, targeted exceptions. Competition policies should recognize when, and the degree to which, prices are not market driven. In the best situation, prices are regulated only when competition or customer discretion is inadequate to protect buyers from the exercise of market power.

Remove Barriers to Entry and Competition. When technically feasible, and when balanced by appropriate changes in other regulations, regulations should be used to reduce or remove barriers to entry and competition. Probably the most important step in removing entry barriers in access and exchange services is unbundling the local network into its component parts. The most important step in removing entry barriers in interexchange competition is waiving or eliminating the MFJ line-of-business restriction that prevents the RBOCs from offering interLATA services.

V. UNBUNDLING AND “AS IF” CONTESTABILITY

One of the most exciting ways to accelerate competition in local exchange is unbundling. Both Ameritech and Rochester Telephone have advanced plans that would accomplish a dramatic restructuring of the industry by coupling unbundling with relief from the interLATA

restructures in the MFJ.⁷⁹ If implemented, unbundling will reduce entry costs, increase competitive and entrepreneurial opportunities, and stimulate the development of the Information Superhighway. Unbundling, coupled with interLATA relief, would foster a competitive environment where success is determined by market forces, rather than regulatory or judicially-imposed asymmetries. Ameritech's unbundling plan, known as the Customer First Plan (CFP), offers the following:

1. *Loops*. Local loops on an unbundled basis at tariff rates established by state regulatory agencies. Ameritech will propose rates that are above long-run incremental costs but do not exceed fully distributed costs. Access to local loops would be at the main distribution frame or the digital cross-connect frame.

2. *Switching*. Interconnection to its local switching with loops provided by others. The switch integration of the Plan permits all providers to seamlessly connect to a "network of networks."

3. *Signaling*. Unbundling of SS7⁸⁰ call set-up capabilities and permitting competitors to access the SS7 signaling network without subscribing to Ameritech's transport or switching service.

4. *White Pages Listings, 911 Service, Deaf-Relay Services*. On an optional basis.

5. *Cooperative Engineering*. Cooperative engineering, operation, maintenance, and administrative practices on an optional basis.

6. *Rights-of-Way*. Where sufficient space permits, conduit and pole attachment space on a nondiscriminatory basis to authorized interconnectors.

7. *Mutual Compensation*. Mutual compensation arrangements at reciprocal rates for termination of traffic by state-certified alternate exchange providers.

8. *Numbering Plans*. Complete NXX codes⁸¹ to other qualified providers.

9. *Local Telephone Number Portability*. Portability to the fullest extent permitted by current technology. The company is committed to supporting the development of more robust options through industry forums.

79. Vince Vittore, *Rochester Tel: Blueprint for Change*, AMERICA'S NETWORK, Jan. 15, 1995, at 24.

80. Signaling System Seven is an out-of-band network over-laid on the public telephone network to provide network management. A SS7 signal is a request to any number of facilities that switches down the line to open up circuits, engage billing systems, and otherwise prepare to carry, process, bill, answer, block, screen, record, or respond to a call. KELLOGG ET AL., *supra* note 13, at 863.

81. NXX codes are any three-digit code. In telephone convention, "N" is any number from two to nine; "X" is any number from zero to nine. *Id.* at 860.

10. *Usage Subscription.* Use of Ameritech's loops and local dial tone provision while they carry all outbound traffic on their networks. In essence, this might be termed intraLATA presubscription. Thus, a new entrant can offer alternative service without requiring the customer to change telephone numbers.

The essence of the CFP is that it dramatically lowers entry barriers into the local exchange and quarantines residual sunk cost facilities, leaving the effectively contestable part of the local exchange under the control of market forces and the portion requiring substantial amounts of sunk capital (basically the local loop) subject to price cap regulation. The services of the sunk facility are provided to any industry participant, including Ameritech, on the same terms and conditions.

The key to guaranteeing competitive outcomes in any context is the existence of conditions enabling entry. Even the threat of entry disciplines prices. This well-accepted proposition, historically rooted in the analysis of eminent economists as diverse as Sylos-Labini⁸² and Schumpeter,⁸³ and recently renovated and extended by the insightful work of Baumol, Panzar and Willig,⁸⁴ means that if one lowers artificial entry barriers and new entrants need not incur significant sunk costs then all the benefits of competition are available regardless of the market share of the incumbent. This is, in essence, the market discipline the CFP will create. Of course, the state of the current technology may not instantaneously enable all elements of the local exchange to be contestable. However, providing the elements on a non-discriminatory basis and at price levels no higher than their opportunity cost will ensure "as if" contestability because the relevant businesses are effectively contestable. Professor Baumol is quite laudatory of Ameritech's efforts, noting that "Ameritech should be commended for addressing itself to the principal preconditions for ultimate removal of the interexchange restriction, that is, the elimination of entry barriers into exchange operations and the encouragement of exchange competition."⁸⁵ Indeed, the CFP is the embodiment of principles developed and vigorously advanced in other contexts by Professor Baumol over the past decade. He also notes that "unbundling, if it is carried out fully and effectively, can greatly facilitate the entry process."⁸⁶ Baumol further points out that unbundling will not transform loops into contestable markets.⁸⁷ But that

82. PAOLO SYLOS-LABINI, *OLIGOPOLIO E PROGRESSO TECNICO* (1956).

83. JOSEPH A. SCHUMPETER, *CAPITALISM, SOCIALISM AND DEMOCRACY* (3rd. ed. 1950).

84. W. J. BAUMOL ET AL., *supra* note 26.

85. W. J. Baumol, *On the Ameritech Proposal for Entry into interLATA Services* 12 (February 1994) (unpublished manuscript, on file with author).

86. *Id.* at 10.

87. *Id.* at 11.

answers the wrong question. The relevant inquiry is whether the services of the loop will be provided to all on a nondiscriminatory basis. Ameritech's recent tariff filings guarantee the answer to this question is affirmative.

One can measure the degree of contestability of a market by the "share of the investment that is composed of capital that is sunk."⁸⁸ Setting aside the loop, the CFP enables a new entrant to enter practically any segment of the local exchange with truly a minimal investment. In this manner, Ameritech's unbundling and switch integration will facilitate and assist entry. Through the CFP, Ameritech offers its competitors the right to access its network at non-discriminatory rates.⁸⁹ The CFP essentially confers on Ameritech's competitors whatever economies of scale and scope Ameritech possesses. Few, if any, irreversible investments will need to be deployed by new entrants in order to compete because new entrants can simply rent from Ameritech. As Baily and Baumol note, "if an industry behaves as if it is contestable, most of the benefits of perfect competition can be attained without government intervention."⁹⁰

If implemented, Ameritech's unbundling plan will make the local exchange effectively contestable. A provider wanting to enter any segment could do so at relatively low cost. Entry barriers, in essence, would be eliminated. This flood of new entry will result in heightened competition, both in terms of price and service offerings. The latter is especially critical because service innovations and technological advances confer the greatest benefits upon telecommunications users. The competition to meet consumer needs and create new consumer demands will produce gains that dwarf the savings derived from intensified price competition.

VI. LOCAL EXCHANGE COMPETITION AND INTERLATA RELIEF

The consent decree and the MFJ entered into between the government and AT&T recognized that in the presence of monopoly power and rate of return regulation, the RBOCs might have the incentive and the ability to impede competition through integration into the inter-LATA business and, therefore, should be prevented from entering this

88. *Id.* at 3.

89. These tariffs are no higher than those which Professor Baumol advances under his Efficient Component Pricing rule. William J. Baumol & J. Gregory Sidak, *Toward Competition in Local Telephony* (1994).

90. Elizabeth E. Bailey & William J. Baumol, *Deregulation and the Theory of Contestable Markets*, 1 *YALE J. ON REG.*, 111, 123 (1984).

business until such time as the ability or incentive to impede competition or circumvent regulation had disappeared.⁹¹ This paper does not attempt to second guess the wisdom of these restrictions, but merely notes that accepted economic literature recognizes that the potential for adverse consequences from integration⁹² occurs only when “a non-trivial degree of monopoly exists.”⁹³ Absent the incentive or the ability to exercise market power, the rationale for the MFJ evaporates. Indeed, this has been explicitly recognized by the Court:

It is probable that, over time, the Operating Companies will lose the ability to leverage their monopoly power into the competitive markets from which they must now be barred. This change could occur as a result of technological developments which eliminate the Operating Companies’ local exchange monopoly or from changes in the structures of the competitive markets. In either event, the need for the restrictions . . . will disappear, and the decree should therefore contain a mechanism by which they may be removed.⁹⁴

The Court further noted “[t]he restrictions imposed upon the separated BOCs by virtue of section II(D) [the line of business restrictions] shall be removed upon a showing by the petitioning BOC that there is no substantial possibility that it could use its monopoly power to impede competition in the market it seeks to enter.”⁹⁵

Unbundling along the lines proposed by Ameritech, if faithfully implemented, would remove any residual concern that the RBOCs could upset the terms of competition in the interLATA business. Absent Congressional action, unbundling provides the best opportunity for breaking the regulatory and judicial gridlock that exists in the United States telecommunications industry by enabling the Courts to do what is correct: eliminate prohibitions against RBOC entry into the long-distance business. Doing so will not only stimulate competition in the interLATA market but also yield some old-fashioned integration economies that will assist the development of the Information Superhighway.

It has long been recognized that economies of scope exist between the local and long-distance businesses. Indeed, Professor Baumol discusses “efficiencies derived from coordinated operation of an integrated

91. See U.S. v. AT&T, *supra* note 1, at 194–95.

92. InterLATA entry would involve integration by Ameritech of local and long distance service.

93. OLIVER. E. WILLIAMSON, *MARKETS AND HIERARCHIES* 115 (1975).

94. See U.S. v. AT&T, *supra* note 1, at 194–95.

95. *Id.* at 231.

network.”⁹⁶ Network-wide planning decisions “make production less costly when local and long-distance operations are contained within one firm.”⁹⁷ The RBOCs will recognize scope economies if waivers are granted since they will be able to use many of their embedded facilities to provide long-distance services. Excess capacity can thus be used to provide service that others might provide by making new investments. Savings in investment are thus recognized to the ultimate benefit of society. Likewise, with the CFP, IXC and others will be able to recognize scope economies in providing local service.

Of perhaps greater quantitative significance are the economies that come from systems innovation which will be facilitated once inter-LATA waivers are granted. Innovation facilitates non-price competition in the form of new services in addition to price competition. Economists recognize that the MFJ restrictions “ignore the foregone consumers’ surplus [that would be available] from services that the RBOCs would and might offer but for the restrictions.”⁹⁸

The restriction on the RBOCs from operating interLATA vitiates their capacity to deliver services customers want and in the manner customers prefer. LATAs are purely artificial constructs which make no geographical, technological, or organizational sense.⁹⁹ InterLATA restrictions are a primary reason for the slow adoption and diffusion of mobile data services, ISDN,¹⁰⁰ voice messaging, and other network services.

The granting of interLATA waivers will increase the value to customers of many broadband services. Remote teaching via videoconference is such an opportunity. Because many businesses and educational institutions (e.g., Ford, GM, and the University of Illinois) have facilities which span several LATAs, the waivers will permit the local telephone company to provide these services on a company-wide or institution-wide basis. Moreover, because many network services have high fixed costs, the removal of interLATA restrictions will at minimum increase

96. See Bailey & Baumol, *supra* note 90, at 135.

97. *Id.*

98. *Id.* at 131.

99. The thrust of telecommunications innovation has been to erase the confines of geography. Wireless technologies can make a phone as mobile as its users. New fiber optic transmission and satellite technologies are greatly reducing the significance of distance as a factor in cost, and new providers are modeling their networks and their equipment to serve a pattern based not on geography but on communities of interest: educational institutions, hospitals, financial markets, corporations, etc.

100. Integrated Services Digital Network (ISDN) is a standardized, all-digital network that integrates voice and data communications through existing copper wiring. See KELLOGG ET AL., *supra* note 13, at 856.

the size of the potential customer base and bring forward services which involve significant scale economies and network externalities.

Furthermore, the removal of the interLATA restriction would enhance the efficiency of RBOC services as they are currently configured, leading to lower prices and better services. Examples include Centrex, Caller ID, and enhanced facsimile services already offered by the RBOCs. Centrex is a service offering which competes with PBX equipment. Regional Centrex is a complete private network for a customer with locations in multiple LATAs connected via long-distance services. The interLATA restriction prevents the RBOCs from offering regional Centrex services.¹⁰¹ If the RBOCs are able to offer the one-stop shopping for customers that regional Centrex entails, they could provide an important competitive alternative to the PBX-based private networks that have proliferated in the United States. Again, this increase in competition will reduce the costs of service and stimulate service innovation.

Removal of the interLATA restriction would also facilitate the commercialization of enhanced facsimile services. At present, a RBOC wishing to compete in such services has to install equipment in every LATA where service is desired. LATAs with a small amount of potential usage are not economic to serve under this arrangement but could be more efficiently served from another larger LATA with higher volumes. This innovative service is thus not available to customers who would have it but for the interLATA restriction.

The social cost imposed by the interLATA restrictions can be further illustrated by one of the RBOC's, in this case Ameritech's, abortive efforts to provide voice mail services through its acquisition of Tigon.¹⁰² Ameritech was unable to achieve the benefits of integration that were necessary to profitably operate Tigon's voice mail service. MFJ restrictions have increased Ameritech's costs and lowered its revenues, thereby crimping the competitive operation of its business.¹⁰³

Voice mail services such as Tigon are sold with two main components: mailboxes and an "800" Telephone access. Because Ameritech could not resell or provide long-distance services and its competitors could, Ameritech could not factor in "800" service resale into its prices for voice mail services.¹⁰⁴ This meant that Ameritech could not

101. See U.S. v. AT&T, *supra* note 1, at 141.

102. Ameritech eventually sold Tigon to Octel Corp. *Long Distance Ban Forces Ameritech to Sell Tigon to Octel*, ENHANCED SERVICES OUTLOOK, Oct. 1992, at 1.

103. *Id.*; See also Robert S. Vinton, *Can the RHCs Get A Slice of The Enhanced Services Pie?*, TELEPHONY, APR. 16, 1990, at 104.

104. *Long Distance Ban Forces Ameritech to Sell Tigon to Octel*, *supra* note 102, at 1; Vinto, *supra* note 103, at 104.

take advantage of buying discounted "800" service and passing lower prices onto its customers. Ameritech could only sell the mailbox. This allowed Tigon's major competitors to heavily discount basic mailbox fees and earn healthy margins on 800 resale. Tigon, because of the interLATA restriction, did not have this pricing flexibility and as a result, had to either accept overall margins below those of its rivals or lose sales. More importantly, Tigon's customers were denied the price reductions others enjoyed through volume discounts.

Tigon was further disadvantaged by the confusion created among less sophisticated buyers. While Ameritech's Tigon customers were forced to purchase their own "800" services separate from the Tigon mailbox, a competitor's customers would find that feature bundled into its price for basic voice mail service. This created customer confusion, as competitors exploited the notion that with the Ameritech services the customer had to "buy more." Another disadvantage was Ameritech's inability to achieve scale and scope efficiencies. The MFJ prohibition and the attendant customer confusion forced Tigon to build a higher cost network than its competitors. In many instances, Ameritech erected a database in separate LATAs, even when engineering principles and marketing data would indicate the superiority of an alternative, central facilities strategy. As a consequence, it had to choose between not optimizing its network design or serving a more limited market area than its competitors. The Tigon example highlights the fact that artificial regulatory boundaries which cause duplicate investment are a subtle but costly tax on the economy. These real costs and foregone opportunities are no longer acceptable.

VII. CONCLUSION

The competitive model has been embraced, at least rhetorically, as the right way to organize the telecommunications industry in the United States in order to reflect new technological realities and opportunities. It is in fact the only model likely to facilitate the investment needed to put the Information Superhighway in place and provide the necessary off-ramps and on-ramps. The speed with which the model is being advanced in the United States, however, is alarmingly slow. Perhaps this would not matter very much if it did not involve high opportunity costs and if we did not face ubiquitous global competition in all aspects of our commercial life. However, falling behind has both economic and geopolitical consequences. Further, it denies the American people the fruits of technological innovation developed at home. Congress seems unable

to grapple with the issues.¹⁰⁵ It is now, therefore, up to the regulators and the Courts to embrace the policies needed to promote dynamic competition and the building of the Information Superhighway. Removing entry barriers everywhere, coupled with regulatory neutrality, is of critical importance. Once this is accomplished, incentives will exist to facilitate private investment in the provision of enhanced services on the Information Superhighway. If unbundling of the local exchange is necessary to unblock the political and judicial roadblocks to more substantial reforms (such as the interLATA and other entry barriers in the MFJ), then it should be universally embraced and rapidly implemented. The stakes are too high for dilatory behavior in Congress and the Courts to be tolerated any longer.

AFTERWORD¹⁰⁶

One noticeable feature of the telecommunications competitive landscape is the rapid pace at which events unfold. Since the presentation of this article in September, 1994, Ameritech's Customer First Plan (CFP) has received the enthusiastic support of the Department of Justice (DOJ).¹⁰⁷ The DOJ has indicated that it will file a motion in support of the experimental implementation of CFP when Ameritech applies to United States District Judge Harold Greene for a waiver.¹⁰⁸ If the waiver is granted, we will see first hand whether the conclusions of this paper are correct.

Under the terms of the proposed order negotiated between the DOJ and Ameritech, Ameritech would be allowed to offer interLATA service on a provisional basis from the LATAs encompassing the Chicago, Illinois and Grand Rapids, Michigan areas. If the Order is approved by the Court, Ameritech will not be allowed to enter into interLATA until the DOJ determines that "actual" competitive conditions exist in local markets within the waiver area.¹⁰⁹ Once Ameritech begins operation as an independent carrier, the DOJ will continue to monitor the trial with a wide range of supervisory powers and will maintain the authority to terminate the experiment at any time.¹¹⁰

105. See, e.g., Edmund L. Andrews, *Bill to Revamp Communications Dies in Congress*, N.Y. TIMES, Sept. 24, 1994, at 1.

106. Written April 10, 1995.

107. *Local Phone Wars Just One Call Away*, CHI. TRIB., Apr. 4, 1995, at 1.

108. *Id.*

109. *Opening the Local Market*, CHI. TRIB., Apr. 10, 1995, at 12.

110. *Communications, Justice Department Approves Plan To Allow Bell Company Into Long-Distance*, DAILY REP. FOR EXECUTIVES, Apr. 4, 1995, at A64.

In the past six months, there have been a number of significant competitive developments in both Chicago and Grand Rapids. In Chicago, two competitive access providers, MFS Communications and Teleport, have been certified to offer local exchange service, and a third, MCI Metro, has applied to do the same.¹¹¹ City Signal, Inc., owned by Teledial America, already provides competitive local phone services in both Grand Rapids and Detroit.¹¹² Other alternative providers of local service are entering, including cable companies. Chicago is home of two separate tests of cable-based telephone service. MCI and Jones Lightwave intend to test linking a few residents in Chicago suburbs to MCI's long distance service.¹¹³ Motorola, Inc., TCI, and Teleport Communications Group are providing local phone service over cable lines on a test basis in Arlington Heights, Illinois.¹¹⁴

In addition to facing heightened competition in local exchange, Ameritech will be operating under additional guidelines that were not elements of the original CFP. Foremost, Ameritech is required to operate its interexchange business as a separate subsidiary.¹¹⁵ Although I have never endorsed the idea that Ameritech has either the incentive or the ability to engage in cross-subsidization, this structural separation offers ironclad protection against such a possibility.

Developments over the last six months have confirmed many of the propositions advanced in this paper and elsewhere. The local exchange is not a natural monopoly and indeed stands on the brink of an explosion in the number of competitive alternatives. The proposed DOJ order safeguards any residual possibility of competitive harm by adopting the protections of the CFP, by calling for active monitoring of the local exchange market, and by requiring the structural separation of Ameritech's new long-distance business from its existing local business.

In sum, if the courts approve Ameritech's CFP in Illinois, we will shortly witness a major step in the structural reform of the United States telecommunications industry.

111. Edmund L. Andrews, *MCI Maps Plan for Local Phone Services*, N.Y. TIMES, Mar. 6, 1995, at D1. See also Frederick H. Lowe, *Phone Service on Cable Lines to Be Tested in Arlington Hts.*, CHI. SUN-TIMES, Oct. 13, 1994, at 57.

112. *Major Players in Valley Fiber Optics Competition*, THE ARIZ. REPUBLIC, Nov. 14, 1993, at H1.

113. Jon Van, *MCI's New Front in Phone Wars: Local Service; Ameritech Rival Says It Will Offer Discount Rates*, CHI. TRIB., Jan. 5, 1994, at 1.

114. *Phone Service on Cable Lines to Be Tested in Arlington Hts.*, *supra* note 110, at 57.

115. *Communications, Justice Department Approves Plan To Allow Bell Company Into Long-Distance*, *supra* note 109, at 65.