

TELECOMMUNICATIONS REGULATION: AN INTRODUCTION

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THE U.S. TELECOMMUNICATIONS sector is going through a significant change. A number of factors contribute and define this change. The first is the rapid technological change in key inputs of telecommunications and computer-based services and in complementary goods, which have dramatically reduced the costs of traditional telecommunications services and have made many new services available at reasonable prices. For example, telecommunications cost reductions have made access to the Internet affordable to the general public.

The second reason for the revolutionary change has been the sweeping digitization of the telecommunications and the related sectors. Not only has the underlying telecommunications technology become digital, but the consumer and business telecommunications interfaces have become more versatile and closer to multifunction computers than to traditional telephones. Digitization and integration of telecommunications services with computers create significant business opportunities, impose significant pressure on traditional pricing structures, especially in voice telephony, and threaten the fundamental features of the traditional regulatory regime.

The third reason for the current upheaval in the telecommunications sector was the passage of an important new law to govern telecommunications in the United States, the Telecommunications Act of 1996. Telecommunications has traditionally been subject to a complex federal and state regulatory structure. The 1996 act attempted to adapt the regulatory structure to technological reality, but various legal challenges by the incumbents have so far delayed, if not nullified, its impact.

In general, regulation should be used only when it is clear that deregulated markets are likely to fail even in the presence of reasonably strict antitrust enforcement. Clearly, the success or failure of a market in the absence of regulation depends crucially on the demand and cost conditions under the present

technology. Progress and innovation in telecommunications technologies have been rapid for the past forty years and are expected to continue at a fast pace. As a result of technological change, cost conditions shift considerably over time and can transform a market that requires regulation into one that does not. This is crucial for telecommunications and has led to progressive deregulation. For example, the market for long-distance telecommunications services, starting as a near monopoly in the mid-1970s, was formally completely deregulated in 1995, after strong competition in the 1980s and early 1990s emerged following the breakup of American Telegraph and Telephone (AT&T) in 1984 and the opening of the long-distance market to competition. However, the process of deregulating some services while other services (often produced by the same firms) remain regulated is a complicated task with many pitfalls. Given the complex incentives of firms that participate in many markets and often face competitors who participate in just a few, it would be foolish to proceed with complete deregulation of the telecom sector without a careful analysis.

Telecommunications services are based on an increasingly sophisticated and complex network able to produce a rich variety of services that differ in distance traveled, quality, amount and nature of data or voice transmitted per unit of time, requirement of immediate (real-time) delivery, and so on. Making effective use of elements of market organization in many telecommunications contexts often requires considerable and detailed regulation. Many times, these regulations, even if they work well for existing markets, have pretty poor results when applied to markets for new products. This lack of flexibility of regulation is particularly important in modern telecommunications because new telecommunications services are continually produced, helped by the availability of complementary goods and services. For example, the demand for low-level data transmission as required by the World Wide Web and the Internet would not be possible without the wide availability and low prices of computers. But it would be foolish to start applying the traditional regulatory framework to the Internet, and the Federal Communications Commission (FCC) has correctly understood this.

Finally, telecommunications regulation is hampered by the various exigencies of regulation in general, such as political intervention and lobbying. Political intervention is complicated because some telecommunications services (such as access to emergency services) are essential for all and others, such as basic service, are considered necessities.

A number of factors drive the U.S. telecommunications industry today:

- dramatic and continuing reductions in the costs of transmission and switching
- digitization
- the 1984 breakup of AT&T's monopoly, resulting in a competitive long-distance service sector and a monopolized local telecommunications sector

- restructuring of the regulatory environment through the implementation of the 1996 Telecommunications Act, twelve years after the breakup of AT&T
- the move of value from underlying services (such as transmission and switching) to interfaces and content
- the move toward multifunction programmable devices with programmable interfaces, such as computers, and away from single-function, nonprogrammable consumer devices, such as traditional telephone appliances
- reallocation of electromagnetic spectrum, allowing for expanded wireless services interconnection and interoperability of interconnected networks
- standardization of communications protocols
- the existence of network effects whereby connection to a large network is more valuable for each customer, and the fact that small networks unable to reach critical mass are unlikely to survive

These, in turn, have a number of consequences:

- increasing pressure for cost-based pricing of telecommunications services
- price arbitrage between services of the same time immediacy requirement
- increasing competition in long-distance services
- the possibility of competition in local services
- the emergence of Internet telephony (voice-over Internet protocol [VOIP]) as a major new telecommunications technology

Why Have Telecommunications Regulation?

To answer the question, "Why have telecommunications regulation?" one must first answer the question, "Why have regulation in general?" The logic of competition law in the United States is that efficiency (allocative, productive, and dynamic) is the desired outcome of antitrust policy, and competition is the means of achieving it. Thus antitrust laws are used to guard against restrictions on competition. Economic regulation has been established as a last resort for those markets where it is clear that competitive outcomes cannot be achieved by market forces;¹ where deviation from economic efficiency is deemed socially desirable; where the social and private benefits are clearly different, including cases in which minimum safety standards increase social welfare; and to allow for coordination in technical standards or market equilibriums.² Telecommunications can qualify under all four of these criteria as an industry in which some form of regulation is appropriate.

The main reason proposed for regulating telecommunications has been that a desirable competitive outcome could not be achieved by market forces.

In the last decade of the nineteenth century and the first three decades of the twentieth century, AT&T, after many of its patents had expired, faced significant competition in local telecommunications by independent telephone companies. The independents typically started at the local level and wired many businesses and households in small and midsize towns, sometimes also creating regional long-distance networks. There were periods in the first decade of the twentieth century when independents had in total more local lines than AT&T, although the near monopoly of AT&T in long distance was never seriously challenged until the 1970s. AT&T refused to interconnect with the independents, forcing many businesses to subscribe to two telephone companies with disconnected and incompatible networks, an independent to reach local customers (mainly households) and AT&T to reach suppliers.³

AT&T stated that it was concerned with the quality standards of independents and offered to incorporate most of them in the Bell System, but clearly there were also business and strategic reasons behind AT&T's refusal to interconnect. The benefit to an independent telephone company of access to the AT&T long-distance network was much larger than the benefit to AT&T of adding to its network the mostly residential customers of an independent. Although not clearly articulated in network economics terms, the issue facing the independents and AT&T was clearly a fundamental issue in network economics. Modern network economics teaches us that the incentives of firms of different sizes to interconnect differ depending on the value and size of the new demand that is created by interconnection (Economides 1991; 1996). Typically, a large and high-value network has a significantly smaller incentive to interconnect with a smaller, low-value network than the smaller one has to interconnect with the larger one. This can easily lead to a refusal by the larger, high-value network to interconnect.

In summary, market incentives led AT&T to refuse to interconnect with smaller (local and long-distance) networks, though such interconnection was considered socially desirable. This was the first reason for which regulation at the federal and state levels was imposed with a requirement to interconnect public switched telecommunications networks.⁴ There were clearly some service markets in the time period leading to the 1930s in which only one firm could survive. Monopoly prices in general are predicted to be high, and AT&T's long-distance prices during this period were high. This gave a further justification to regulation, since free entry was unlikely to increase the number of competitors in many service markets.

The second and third reasons for regulation (deviation from social efficiency being desirable and a difference between the social and private value of telecommunications) were generally articulated after regulation was already in place. In the 1960s regulators did not let prices of basic local service rise in their attempt to achieve "universal service," that is, to include as many households as possible in the telecommunications network, on the basis that this

was desirable even if it were allocatively inefficient. The ability of customers to receive calls and make emergency calls also played a role in setting the goal of universal service. Basic telecommunications service is now considered a necessity, and its inexpensive and ubiquitous provision is guaranteed by regulation.⁵

The fourth reason for regulation, that the regulator can help the industry achieve technical compatibility and avoid fragmentation, has had only limited application to telecommunications. Clearly, technical compatibility in a network industry is important since it allows all users to get the full benefits of the combined networks rather than the benefits of only the one they subscribe to. In practice, the present de facto compatibility standards in voice transmission and in higher data protocols are largely the legacy of the pre-1984 AT&T monopoly and the adoption of Internet protocols that were created with government subsidization, with the requirement that they be made public. The regulatory requirements are typically on interconnection and at the level of voice transmission. There is no regulatory requirement of compatibility in many areas, including wireless equipment, wireless text messaging, higher data protocols, and interfaces.⁶

In understanding telecommunications regulation in the United States, it is useful to keep in mind the particular factors that made regulation the appropriate policy answer at some point in time. As technology and population densities change, some markets that may have been natural monopolies in the past may not be natural monopolies any more, and it may be better to allow competition in those markets while keeping regulation in the rest. The question of the desirability of regulation in various markets has been asked repeatedly over time, resulting in the present regime of progressive deregulation.

The public interest objective of telecommunications regulation is vague. Most economists agree that a valid objective is to increase total surplus, that is, consumers' surplus plus profits of active firms. Most economists also agree that the public interest should promote innovation and growth. Although it is difficult to quantify the exact effect of innovation and growth on income, there is wide consensus that these should be promoted and are part of the public interest. Finally, the public interest may include subsidization of telecommunications services that are considered necessities, such as basic local service, or those that are deemed to increase productivity and growth, such as Internet access. Given the vagueness of the concept of the public interest, various groups lobby politicians and regulators to include their objectives as part of the public interest. This rent-seeking behavior sometimes leads to telecommunications regulators to impose policies that have little to do with telecommunications markets.

Having outlined the potential benefits of regulation, I should also note that there are significant drawbacks and costs created by regulation. First, regulators generally do not have the latest technological information. In an industry with fast technological change, such as telecommunications, this can

lead to significant divergence between costs and prices as costs fall much faster than prices. This has happened consistently both in the old regulated AT&T and in regulated local-exchange carriers. Second, regulated firms may be able to use the regulatory setup to create barriers to entry and thereby perpetuate their profitable existence. For example, the first application of MCI to provide switched long-distance service was rejected by the FCC; MCI had to sue and was allowed in long-distance service only after a court decision. Third, the regulatory setup is slow, cumbersome, bureaucratic, and, in many cases, politically influenced. In practice, the regulatory system is much easier to influence by politicians than the judicial system. Fourth, because of the public interest provision, there can be significant rent-seeking activity by various groups, especially in issues relating to mergers that have strict, externally imposed deadlines. Fifth, in an industry with fast technical change, it is hard to define the appropriate array of regulated products; and new and evolving products are difficult to regulate correctly. Thus regulation should be used sparingly, and only when there are no good alternatives.

A new problem in regulatory supervision has been added with the recent aggressive intervention of the Competition Committee of the European Union in telecommunications matters. The European Union intervened in the mergers of MCI and WorldCom and of WorldCom with Sprint. This has created a situation in which large telecommunications companies contemplating a merger have to argue their case in front of the United States Department of Justice, the European Union Competition Committee, the public utilities commissions in fifty states, and other foreign regulatory bodies. This not only adds to the complexity and the cost of the merger but also creates the possibility that the requirements imposed by different regulatory bodies will contradict one another, and it would not be feasible to meet all of them. It also creates the possibility that conditions in financial markets may change considerably between the time a merger is announced and the time it is consummated, so that one of the merging parties may not find the merger desirable at the later date and may use a regulatory objection to abandon the merger without penalties. This increases the incentives of private parties opposing a merger to intervene, attempting to lengthen the approval process in hope that financial conditions may change during the approval process.

U.S. Telecommunications Regulation

Telecommunications has traditionally been a regulated sector of the U.S. economy. The market for telecommunication services and equipment went through various stages of competition after the invention of the telephone by Alexander Graham Bell. Regulation was imposed in the early part of this century and remains today in various parts of the sector.⁷

The Period of AT&T's Near Monopoly

Following a period of expansion and consolidation, by the 1920s AT&T had an overwhelming majority of telephony exchanges and submitted to state regulation. Federal regulation was instituted by the 1934 Telecommunications Act, which established the Federal Communications Commission. In its heyday, from the 1930s to 1981, AT&T dominated all aspects of telecommunications in the United States. It had approximately 90 percent market share of local access lines and more than 90 percent of the long-distance revenue. It used almost exclusively equipment of Western Electric, its equipment division. It owned a top research laboratory, Bell Laboratories, which conducted both applied and theoretical research. Crucial scientific inventions of the twentieth century, such as the transistor and the integrated circuit, occurred at Bell Laboratories. By the 1970s, AT&T had achieved universal service—more than 90 percent of U.S. households had a telephone—and it kept improving the quality of its services.

Regulation of the U.S. telecommunications market was marked by two important antitrust lawsuits that the U.S. Department of Justice brought against AT&T and the Bell System. In the first one, *United States v. Western Electric*, filed in 1949, the U.S. Department of Justice claimed that the Bell operating companies practiced illegal exclusion by buying both production equipment and customer premises equipment (telephone appliances and switchboards) only from Western Electric, a part of the Bell System. The government sought a divestiture of Western Electric, but the case was settled in 1956, with AT&T agreeing not to enter the computer market but retaining ownership of Western Electric. The second major antitrust suit, *United States v. AT&T*, was started in 1974. The government alleged the following:

- that AT&T's exclusive relationship with Western Electric was illegal
- that AT&T monopolized the long-distance service market
- that AT&T refused to interconnect telecommunications competitors as well as customers' premises equipment, thus being liable for a "refusal to deal"
- that AT&T used various discriminatory practices that raised the costs of competitors
- that AT&T abused the regulatory process and did not provide complete information to regulators
- that AT&T set prices to exclude competitors, including practicing predatory pricing

The Department of Justice sought divestiture of both manufacturing and long-distance service from local service.⁸ Late in the Carter administration,

the department offered to accept only the divestiture of manufacturing. AT&T refused and later had to accept a much more onerous breakup. The case was settled by the modified final judgment in 1984. AT&T retained its long-distance network, but seven regional Bell operating companies (RBOCs) were broken away from it.⁹ Each RBOC comprised a collection of local telephone companies that were part of the original AT&T. Regional Bell operating companies remained regulated monopolies, each with an exclusive franchise in its region, and were not allowed to provide long-distance service.

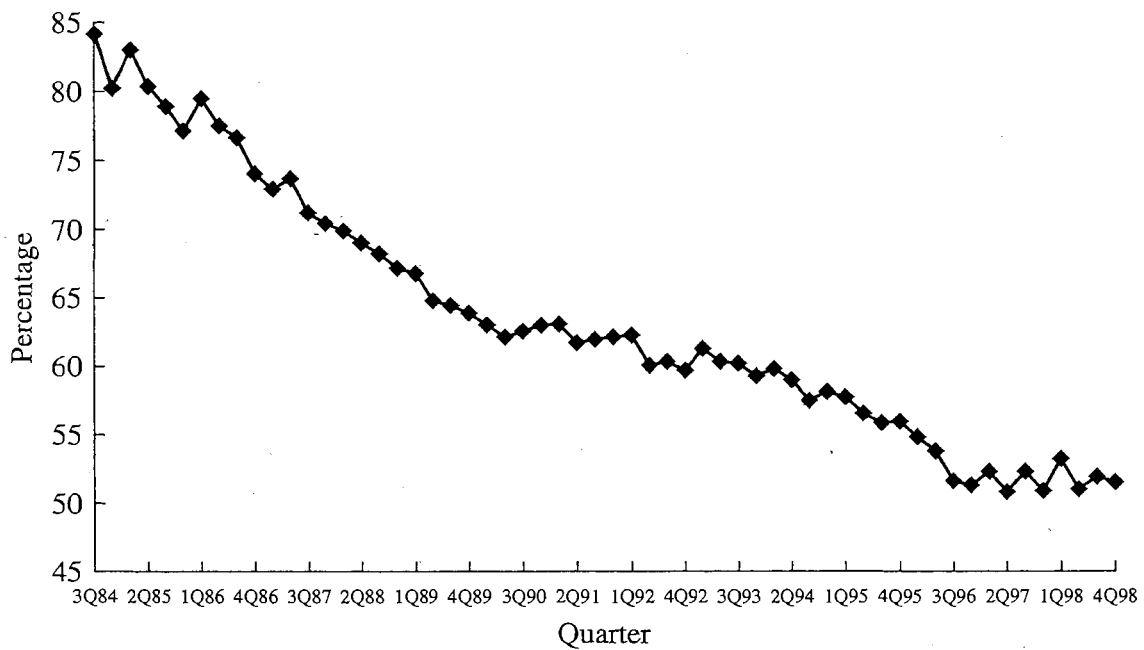
Microwave transmission was a major breakthrough in long-distance transmission that created the possibility of competition in long distance. Microwave transmission was followed by technological breakthroughs in transmission through satellite and fiber-optic wire. By the time competition took root in long distance, fiber-optic technology had become the dominant technology of transmission.

The Postbreakup Years

The breakup of AT&T crystallized the recognition that competition was possible in long distance while the local market remained a natural monopoly (see, for example, Crandall 1991). The biggest benefits to consumers during the past eighteen years have come from the long-distance market, which was transformed during this period from a monopoly to an effectively competitive market. However, consumers often do not reap the full benefits of cost reductions and competition because of an antiquated regulatory framework that, ironically, was supposed to protect consumers from monopolistic abuses and instead sometimes protects the monopolistic market structure.

Competition in long distance has been a great success. The market share (in minutes of use) of AT&T fell from almost 85 percent in 1984 to barely 50 percent in 1998, as shown in figure 3.1, and presently below 45 percent. The revenue market share of AT&T, shown in figure 3.2, also fell dramatically. Since the 1984 modified final judgment, the number of competitors in the long-distance market has increased dramatically. Soon after the judgment, two nationwide facilities-based competitors, MCI and Sprint, emerged as strong competitors of AT&T. Facilities-based competitors deployed their own fiber-optic switched network. Over the past decade, a number of new strong facilities-based competitors entered with nationwide (or significant-coverage) networks, including Qwest, Level 3, Williams, and Global Crossing.¹⁰ There are also a number of smaller regional facilities-based carriers as well as a large number of "resellers" that buy wholesale service from the facilities-based long-distance carriers and sell to consumers. For example, there are currently about five hundred resellers competing in the California interexchange market, providing strong evidence for the ease of entry into this market. At least twenty new firms have entered the California market in each year since 1984.

FIGURE 3.1 *AT&T's Market Share of Interstate Minutes, 1984 to 1998, at Three-Month Intervals*

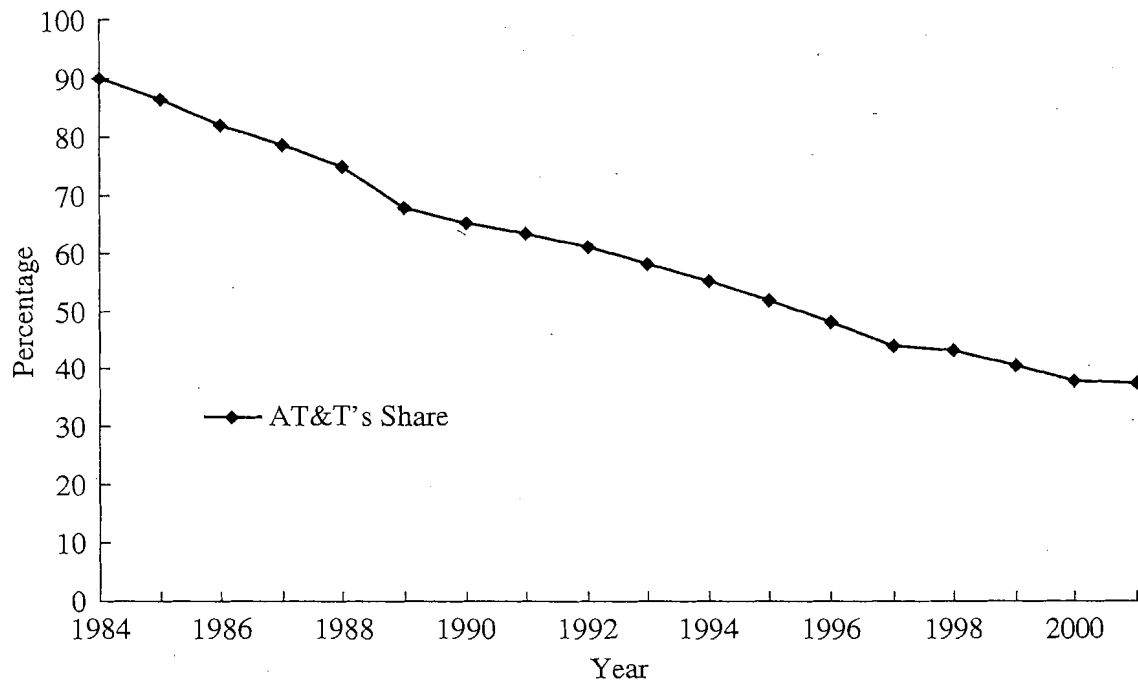


Source: Data from FCC (2003a; 2003c).

Prices of long-distance phone calls have decreased dramatically. The average revenue per minute of AT&T's switched services was reduced by 62 percent between 1984 and 1996. Figure 3.3 shows the average revenue per minute for AT&T relative to 1984 (upper line) as well as the average revenue per minute for AT&T net of access charges relative to 1984 (lower line).¹¹ The FCC declared AT&T "nondominant" in the long-distance market in 1995 (FCC 1995). Most economists agree that presently the long-distance market is effectively competitive.

The modified final judgment did not allow the RBOCs to provide "in-region" long-distance phone service: that is, each RBOC was prohibited from offering long-distance service that originated in its local area. The main reasons for that restriction were to avoid three types of anticompetitive actions by a local service monopolist that would also own a long-distance service subsidiary: vertical price squeeze, price discrimination against the opponents of the local monopolist's long-distance subsidiary, and nonprice discrimination against the opponents of the local monopolist's long-distance subsidiary.

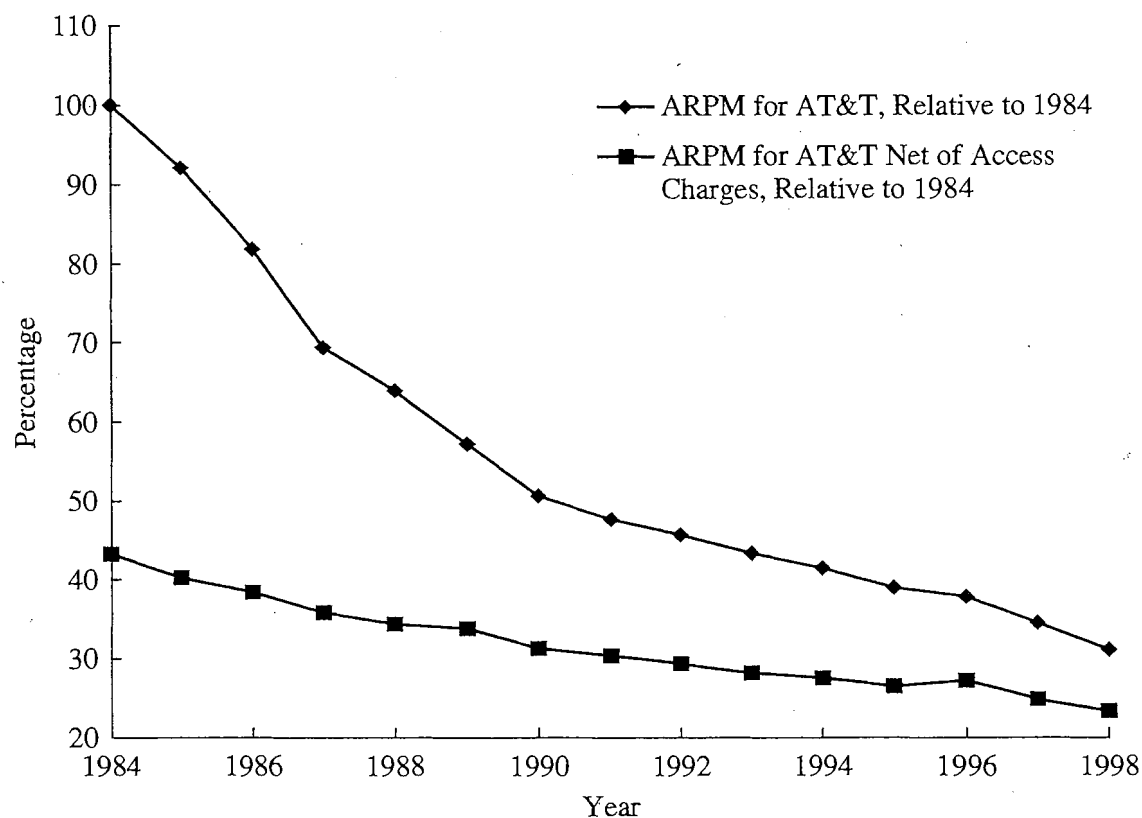
A long-distance phone call is carried by the local telephone companies of the place it originates and the place it terminates, and only in its long-distance part by a long-distance company. Originating access and terminating access

FIGURE 3.2 *AT&T's Share of All Long-Distance Revenues, 1984 to 2001*

Source: Data from FCC (2003a; 2003c).

are provided by local-exchange carriers to long-distance companies and are essential bottleneck inputs for long-distance service. A local-exchange monopolist sets a per minute originating fee (a) paid by all long-distance companies for calls originating from its region. Origination and termination fees are approved by the state public utility commission.¹² If the local-exchange monopolist also provides long-distance service, it can influence the maximum price per minute (p) that an independent long-distance company can charge. Thus a local-exchange monopolist that has vertically integrated in long-distance service can control the gross revenue per minute ($p - a$) of its long-distance rivals. By setting its long-distance price and influencing the access charge, the vertically integrated local-exchange monopolist can squeeze or even make negative the gross per minute revenue ($p - a$) of the long-distance rivals so that they are marginalized or even driven out of business. This is called a “vertical price squeeze.” A local-exchange monopolist with a long-distance subsidiary can also use price and nonprice discrimination against long-distance competitors to disadvantage them (see Economides 2003; Economides, Lopomo, and Woroch 1996; Economides and White 1995; Faulhaber 2004). Thus to insulate long-distance competition from leveraging in the long-distance market of the RBOC monopoly power in the local exchange and to protect the public

FIGURE 3.3 Average Revenue per Minute (ARPM) of AT&T's Switched Services and ARPM Net of Access Charges, 1984 to 1998



Source: Data from Hubbard and Lehr (1998).

interest, the 1984 modified final judgment restricted the RBOCs from providing in-region long-distance service.¹³

Local telephone companies that came out of the Bell System (RBOCs) actively petitioned the U.S. Congress to be allowed to enter the long-distance market. To a large extent in response to this pressure, Congress passed the Telecommunications Act of 1996. The great success of competition in long distance allowed Congress to appear balanced in the Telecommunications Act of 1996 by establishing competition in local telephony while allowing RBOCs into long distance after they had met certain conditions. However, the transition of local markets to effective competition will not be as easy or as quick as it was in the long-distance markets. This is because of the nature of the product and the associated economics.

Many telecommunications companies are presently trying to be in as many markets as possible so that they can bundle the various products. Com-

panies believe that consumers are willing to pay more for bundled services for which the consumer receives a single bill. Bundling also discourages consumers from migrating to competitors, who may not offer the complete collection of services, so that consumer "churn" is reduced.

The 1996 Telecommunications Act and Its Impact

The Telecommunications Act of 1996 attempted a major restructuring of the U.S. telecommunications sector. The act will be judged favorably to the extent that it allows and facilitates the acquisition by consumers of the benefits of technological advances. Such a function requires the promotion of competition in all markets. This does not mean immediate and complete deregulation. Consumers must be protected from monopolistic abuses in some markets as long as such abuses are feasible under the current market structure, which was in many ways determined by the legacy of regulation. Moreover, the regulatory framework must safeguard against firms exporting their monopoly power in other markets.

In passing the Telecommunications Act of 1996, Congress took radical steps to restructure U.S. telecommunications markets. These steps had the potential to result in significant benefits to consumers of telecommunications services, telecommunications carriers, and telecommunications equipment manufacturers. But the degree of success of the act depends crucially on its implementation through decisions of the FCC and state public utility commissions and the outcome of the various court challenges that these decisions face.

The 1996 act envisioned a network of interconnected networks that are composed of complementary components and generally provide both competing and complementary services. The act used both structural and behavioral instruments to accomplish its goals. It attempted to reduce regulatory barriers to entry and competition. It outlawed artificial barriers to entry in local-exchange markets in an effort to accomplish the maximum possible competition. Moreover, it mandated interconnection of telecommunications networks, unbundling, nondiscrimination, and cost-based pricing of leased parts of the network, so that competitors can enter easily and compete component by component and service by service.

The act imposed conditions to ensure that de facto monopoly power would not be exported to vertically related markets. Thus it required that competition be established in local markets before the incumbent local-exchange carriers would be allowed in long distance. It preserved subsidized local service to achieve universal service but imposed the requirement that subsidization be transparent and that subsidies be raised in a competitively neutral manner. Thus it led the way to the elimination of subsidization of universal service through the traditional method of high access charges.

It crystallized changes that had become necessary because of technological progress. Rapid technological change has always been the original cause of regulatory change. The radical transformation of the regulatory environment and market conditions that is presently taking place as a result of the 1996 act is no exception.

Logic of the Act

The logic behind the 1996 act was essentially to break the network into components and let everyone compete in every part, as well as in end-to-end services. To achieve this, the act mandates interconnection, unbundling, and nondiscrimination. Moreover, it takes away some of the incumbent's advantages that arise purely from historical reasons by mandating the lease of unbundled network elements at cost, mandating wholesale provision of any service presently provided by the incumbent local exchange carriers, and imposing phone number portability. To preserve the competition in long distance, the act attempted to ensure that monopoly power arising from historical or other reasons in the local exchange is not exported in other markets. Finally, it attempted to impose nationwide standards for competition and take some regulatory power away from the states.

The 1996 Act allows entry of RBOCs in long distance after they open their local-exchange networks to competition. Thus from the point of view of an RBOC, entry into long-distance service provision was supposed to be the reward for allowing competition in the local exchange and losing its local-exchange monopoly. The act was based on the belief that the individual private incentives of the RBOCs would be sufficient to drive the process. Thus it did not impose penalties for delay or noncompliance. This has proved to be a serious deficiency. Congress thought that the "carrot" of entry in long distance would be sufficient reward for RBOCs to open their local networks. Events have shown that Congress erred in this; RBOCs' behavior showed that they were willing to pay the price of staying out of long distance for a while rather than open their local networks.

Entry in Local Services as Envisioned by the Act

At the time of this writing, the "last mile" of the telecommunications network that is closest to the consumer (the "local loop") still remains a bottleneck controlled by a local-exchange carrier. The Telecommunications Act of 1996 boldly attempted to introduce competition into this last bottleneck, and, before competition took hold, to imitate competition in the local exchange.

To facilitate entry in the local exchange, the act introduced two novel ways of entry other than through the installation of owned facilities. The first

allowed entry in the retailing part of the telecommunications business by requiring incumbent local-exchange carriers to sell to entrants at wholesale prices any retail service that they offer. Such entry is essentially limited to the retailing part of the market.

The second and most significant novel way was through the leasing of unbundled network elements from incumbents. In particular, the 1996 Act required that incumbent local-exchange carriers unbundle their networks and offer for lease to entrants network components (unbundled network elements) at prices “based on cost” (sect. 252[d][1][a][i]) that “may include a reasonable profit” (sect. 252[d][2]) and be “nondiscriminatory” (sect. 252[d][1][a][ii]).¹⁴ Thus it envisioned the telecommunications network as a decentralized network of interconnected networks.¹⁵

Many firms, including the large interexchange carriers AT&T and MCI-WorldCom, attempted to enter the market through “arbitration” agreements with incumbent local-exchange carriers under the supervision of state regulatory commissions, according to the procedure outlined by the act. The arbitration process proved to be extremely long and difficult, with continuous legal obstacles and appeals raised by the incumbent local-exchange carriers. To date, more than eight years after the signing of the act by President Bill Clinton, entry in the local exchange has been limited in most residential markets.

As of June 2003, entrant competitive local-exchange carriers provided service to 14.7 percent of the approximately 183 million local telephone lines nationwide (FCC 2003c, sec. 8, table 6), but only 3.4 percent of end users were served over facilities owned by competitive local-exchange carriers.¹⁶ Forty-two percent of all competitive local-exchange carriers’ lines served medium and large business, institutional customers, and government customers.¹⁷ For services provided over leased facilities, the percentage of service by competitive local-exchange carriers, which is total service resale of services by incumbent local-exchange carriers, declined to 19 percent at the end of December 2002, while the percentage provisioned over acquired unbundled-network-element loops grew to 55 percent.

Entry of RBOCs in Long-Distance Service

In 1996 RBOCs had 89 percent of telephone access lines nationwide. Most of the remainder belonged to GTE and independent franchise holders. Competitive access providers (who did not hold a franchise monopoly) had less than 1 percent of all residential access lines nationwide. Besides providing access to long-distance companies, local-exchange carriers also provide lucrative custom local-exchange services such as call waiting, conference calling, and automatic number identification. Basic local service provided by local-exchange carriers is considered not to be particularly profitable.

