

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 equilibria.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

