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Assessing the Impacts of Divestiture and Deregulation in Telecommunications

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I. Introduction

Ten years ago, on January 8, 1982, the end of the century-old AT&T system was announced. Following several years of partial entry deregulation and a multi-year antitrust case held largely outside public attention, a consent agreement split up “Ma Bell”—the world’s largest company and one of America’s major institutions. A decade later, it is possible to begin to survey the impacts.

Regulatory developments in the United States have followed the ascendancy of various schools of economic thought. 19th century laissez-faire was accompanied by the emergence of an end-to-end near-monopoly. The early 20th century Progressive era established a system of regulatory institutions; the trust-busting sentiment of the period also led in 1913 to a commitment by AT&T to the Department of Justice that contained the company structurally and behaviorally. During the New Deal, a more centralized regulatory structure emerged through the Communications Act of 1934. As part of the burden-sharing philosophy of the time, AT&T was left intact, and financial transfers were built into the system to achieve universal service.

A key element of regulation was the limitation of monopoly profits by the imposition of rate-of-return regulation. This inevitably also led to regulation of service quality, investments, expenditures, and rate structure, since all of these enter into the overall profit picture. Perhaps most importantly, it led to control of market structure and restriction of entry.

During the New Deal, concerns were raised in an FCC study over AT&T’s vertical integration. After a hiatus during the war years, the Justice Department followed up with an antitrust suit that ended in 1956 with a consent decree which kept AT&T intact but restricted it to its existing lines of business. Even so, the seeds for the end of monopoly were sowed soon thereafter. The *Above 890* (1959) decision allowed firms to provide microwave long-distance services for their own use. This led in time to the offering of service to others, determined in the MCI case (1968), and to eventual public switched offerings (MCI *Execunet*, 1978). Similarly, the *Hush-a-Phone* (1955) and *Carterfone* (1968) cases opened the door to competition in the provision of equipment attached to the AT&T network.

By the early 1970s, disenchantment with the performance of monopoly had led to a convergence of several schools of thought. The pro-competitive Chicago approach joined with the anti-monopoly views of many institutionalists to provide the theory behind the government’s new antitrust law suit against AT&T, filed in 1974. AT&T defended itself with a body of economic theory associated with Bell Labs and Princeton. But after a bitter fight and eight years later, the

company agreed to divest itself of local monopoly telephone operations, and (partly through other regulatory proceedings known as *Computer Inquiry I and II*) was allowed to enter new markets.

II. Reviewing the Effects of Deregulation and Divestiture

After more than half a century of stability, the telecommunications system underwent radical change in the 1970s and 80s. In this restructuring, economists took varying positions that can be stratified along two dimensions—antitrust and deregulation.

Along the antitrust dimension, classic economic analysis suggested that a monopoly would lead to incentives to set prices above marginal costs unless constrained by, e.g., regulation, and a failure to rapidly offer service and equipment options. Similarly, there would be a shifting of profits into other activities and other groups, and inefficiency in operations. Others argued, however, that in certain situations a natural monopoly was efficient: as long as a market was *contestable*, a monopolist would behave as if competition existed in order to protect its position; and regulation would prevent the shift of monopoly profits.

The second dimension along which economists differed is regulation, with some arguing the need to protect the public from high prices and low performance, and others pointing to the efficiency loss due to bureaucratized and coopted regulation.

Together these two dimensions combine into four distinct positions.

A. Pro-regulation, Anti-monopoly

This category includes traditional “good government” advocates in the style of Louis Brandeis or Harold Greene (the judge in charge of the AT&T case), and those economists who believe that market power may require a curb by both structural and regulatory intervention. In this view, while the powers of AT&T have been cut in the 1970s and the '80s, its successor companies could now operate with much greater impunity. Holders of this view expected large residential rate increases, service quality reductions, attempts to create new monopolies horizontally and vertically, and continued control of the equipment market by AT&T through its technical dominance and traditional ties to operating companies.

B. Pro-monopoly, Pro-regulation

This category includes traditional state regulators and those economists, such as J. K. Galbraith, who believe in the necessity for large firms in order to perform complex tasks, and who dismiss structural antitrust policy in favor of regulation. In their view, it was misguided to dismantle the efficient and socially redistributive AT&T system. They expected cost increases, price increases, distributional inequities, technical incompatibilities, reduction in universality of service, and a reduction in R&D. They were skeptical about the prospects for long-distance and equipment competition.

C. Anti-monopoly, Deregulatory

This group includes pro-competition centrists or free market advocates who believe that competition is needed to be established by intervention. An example is William Baxter, the government's chief advocate for the AT&T divestiture. Those holding this perspective expected that with the monopoly and its inefficiency broken, market forces and competition could assert themselves. The

results would be dropping costs, cost-based pricing, innovation, higher productivity, and faster modernization.

D. Pro-monopoly, Deregulatory

This category includes some members of the Chicago and Princeton schools of thought. The former believe that competition rather than bureaucrats should have reduced AT&T's power, if it was inefficient. The latter opposed attacking an efficient natural monopoly. Both expected government policy to lead to a loss of productivity.

Which of these perspectives turned out to be more correct than the others? The next section will take a look at the empirical record during the past decade. However, several caveats are necessary. Each of the several subtopics would deserve a full-length study. Some of the data are for a particular state or company, and may not be representative. Some of the reported data may be self-serving. And most importantly, one cannot necessarily infer a causal connection between deregulation and divestiture on the one hand, and certain developments that subsequently took place on the other hand. With this in mind, let us now turn to the empirical evidence.

Universality of Service

Overall telephone penetration did not decline after divestiture, as was predicted by many, but actually increased, from 91.4% in 1983 to 93.6% in 1991 [7, 3]. Though the rate of change for penetration has slowed [12, 384], one would expect an asymptotic leveling off of growth rates as one approaches 100%. For the middle class (household income > \$30,000/yr) penetration was 98% and higher [6, 30–39]. For the very poor (income < \$5,000–7,500; the official poverty line for a household of 4 was \$11,012 in 1987), it rose from 82.7% to 84.9% in 1989 before sliding back to 82.8% in 1991. For Blacks in that income bracket, penetration rose from 74.7% in 1983 to 80.0% in 1988, and then declined to 74.3% in 1991. For poor Hispanics, it rose from 71.1 to 72.6% in 1989 before falling to 70.2% in 1991.¹ It needs to be seen whether the 1991 declines are caused by recession or by causes more long term in nature.

For senior citizens, telephone penetration is above the national average: 96.9% for 65–69 years old in 1991, and an even higher 97.3% for those above 70 years. Nor do rural telephone subscribers seem to have been pushed off the network. Rural states such as Iowa, Nebraska and North Dakota have telephone penetration well above the national average (95.6%, 96.0%, and 96.6%). 95% of all farms in the country have telephones.

Prices

Given the divergence of traditional telecommunications prices from cost, 300% rate increases for residential subscribers were frequently predicted. But the reality has been different. Nationwide since the divestiture, consumer price index for all telephone service rose just over half as fast (19.7%) as the CPI for all goods and services (34%) in the same period [6, 144–45; 7, 10, 16]. Local telephone service increased by 56.2% (in absolute terms, from \$11.58 to \$17.78), while interstate toll service fell 33%.

Furthermore, many of the local rate increases occurred in the period immediately after di-

1. Statistics for low-income Blacks and Hispanics seem particularly subject to substantial swings from one reporting period to the next.

vestiture as accumulated rate requests were decided. Aggregating for all states, local rate hikes approved by state commissions were \$3.88 billion in 1984, and rapidly declined thereafter to \$1.15 billion in 1985, \$.29 billion in 1986, to minus \$.52 billion in 1987, minus \$1.37 billion in 1988, \$.84 billion in 1989, and minus \$.45 billion in 1990. In the first half of 1991, rates began to increase again for the first time since late 1986, by \$10.5 million.

This is not to say that there has been no impact on the trend of prices. The real price for all telephone service has been falling since 1953, accelerating between 1973 to 1978 but leveling off after 1983. The real price of local service, which tracked the movement of all service quite closely from 1963 to 1973, began to rise for the first time since the late 1940s following divestiture [12, 385].

Throughout the period 1980–1989, an average household's annual expenditures as a percentage of its total expenditures remained a remarkably constant 2.0% [7, 14].

The benefits of divestiture were not shared equally but correlate with income. One study concludes that the overall effect has been mildly regressive, with the lowest income quintile of households paying approximately \$16 more per year due to telephone service repricing, and the wealthiest quintile saving about \$15 per year [4, 112–15]. But these are not especially high figures. Those users whose telecommunications expenditures are weighted toward interstate toll service were most likely to benefit directly from the pricing trends that divestiture shaped. Business users reaped clear benefits. Their telecommunications costs, including toll, WATS and private line use, using 1984 as a base of 100, stood at 76.9 in 1988 [15].

Local rates did not rise as much as initially feared, in part because costs could be contained. Among the reasons were lower interest rates and taxes. But other factors were higher productivity, lower staffing, lower equipment prices, and long-term technological trends. Some of these will be discussed below.

Service Quality

Another feared result of divestiture was a decline in service quality. There is a tendency to romanticize the past. Yet in the late 1960s and early 1970s, several major cities experienced serious service problems. The *New York Times*, in an editorial in August 1969, called telephone service “miserable,” “wretched,” and “the worst in the memory of older New Yorkers . . .” [25].

The FCC, along with several of the states' utility commissions, tracked developments in service quality. Dial-tone delay has remained reasonably constant, and transmission quality has generally risen; but the more people-intensive on-time performance on orders for residences have suffered a steady if minor reduction since 1987. Intra-LATA calls have maintained a very high level of call completions (over 99.5%).

For long-distance service, the rapid transition to fiber-based transmission, with competing companies investing billions of dollars, seems to have improved sound quality and reduced blockage. Inter-LATA completion rates have climbed steadily since 1986. Thirteen long-distance firms sampled by the Florida PSC performed at a much higher level than the required 90% call completion rate, with the best quality performer, US Sprint, at 97.45%. AT&T, despite its economies of scale, was ranked fourth, but the differences are minor [8, Table 15].

Large business customers' surveyed satisfaction rose from 91.5% in 1985 to 93.5% in mid 1989, while small businesses in the same period moved from 92.2% to 93.5% and residential consumers from 93.5% in 1985 to 94% in 1989 [13, 261].

Thus, service quality in regular performance has been high and rising. On the other hand,

the system has suffered when it comes to reliability robustness to shocks. Here, the number of large-scale outages has grown in recent years. Just in 1991, there were a series of large service disruptions. In January, a fiber cut in New York City caused 6 million homes to be without long distance service and shut down the N.Y. Mercantile Exchange and Commodity Exchange. A signalling system failure in Baltimore, in June, led to loss of telephone service in 10 million homes in four states, and, in September, a power failure in New York City caused 2 million homes to be without long distance service and required the shut down of three major N.Y. airports for six hours. Similar outages affected service in other states. As society becomes more dependent on telecommunications, any service disruption becomes a matter of serious concern.

This history of recent service disruptions can be largely attributed to the growing technical diversity and complexity of telecommunications. The extraordinary technical features of networks involving software of several million lines has increased the difficulty of detecting failures in advance, while competition to implement new technology as quickly as possible has led to decreased testing periods. Economies of scale and new network capabilities have led to a growing concentration of network traffic, and this has contributed to the broad scope of service disruptions. Moreover, as the system becomes more interconnected (and it becomes more difficult to place the blame for any network deficiencies on a particular entity) the possibility of quality free-rider problems has risen [17]. On the other hand, it also becomes possible for users to reduce exposure to risk by diversifying their providers of service.

Productivity

Productivity growth for the telecommunications sector in the 1980s has been positive. Labor productivity for the seven Baby Bells, when measured in terms of lines per employee, show a cumulative gain from 1983 to 1988 of 34.9%. The number of lines per employee rose from 132 to 178 [2, 295].

If only telco employees (as opposed to all RHC employees engaged in other lines of business) are counted, productivity grew from 152 access lines per employee in 1984 to 227 in 1991 [3]. Revenue per employee grew from \$115 in 1985 to \$144 in 1990, a gain of 25.2%.

One study estimates annual average total factor productivity growth in U.S. telecommunications from 1971 to 1983 to have been 3.8% for entire industry, and 3.19% for the Bell System. Following divestiture, the Bell System's productivity growth slowed to 3.13 during 1984–1988, while it was 3.94 for the total sector [4, Table 1]. In other words, there was a reduction in productivity improvements. After 1990, the efforts of the Bell companies to reduce cost and staffing were particularly serious, but measures of the effects are not yet in. One study found an average of 2.4% annual productivity growth for the RBOCs in the years 1984–1988, and a doubling of productivity growth (4.7%) for 1989. It predicted average annual productivity gains throughout the 1990s at 4.1% [24, 15].

Research and Development

Divestiture and deregulation also raised the fear about a technological decline which would come about by AT&T's research arm Bell labs being curtailed by a more profit-minded management. But the opposite occurred. Total R&D employment rose from 24,100 in 1981 to 33,500 in 1985, if one adds Bell Labs and Bellcore, and the regionals' joint R&D firm [20, 73–80]. By 1988, the regional companies were building their own laboratories, and total R&D employment rose to 35,600. Research and development as a share of Bell System revenues was as much as 50% higher

in the years 1983–88 as it was between 1973 and 1983.² According to one estimate, Bell Labs employees constituted approximately 5.3% of the total number of AT&T employees in 1984, but by 1989, that figure had almost doubled to 10.3% [21, 103].

The integration of telecommunications markets is at least potentially adverse to continued innovation: integration requires standardization which necessarily limits the possibilities of innovation. At the same time, however, interoperability can increase competition and diversity by enabling equipment manufacturers to enter the market with a single product or small sets of products, rather than having to devise an entire network structure [16].

Modernization

It is difficult to assess the impact of divestiture and deregulation on investment in network infrastructure. Average investment per line in the U.S., according to unpublished OECD figures [23, 153], show the U.S. in the 13th position of 24 OECD countries over the decade, with \$218 per main line, compared with \$305 for Germany, \$244 for Japan, and \$239 for France. On the other hand, most of U.S. investment went into modernization, while other countries still invested in expansion of the basic network. Looking only at modernization over the decade, the U.S. annual figures (\$183) compare with Japan (\$174), are ahead of France (\$137) and the U.K. (\$90), but behind Germany, whose \$219 includes cable television investment [23, 162]. On the other hand, U.S. modernization investments have dropped over the decade from \$190 in 1980 to \$88 in 1989, a drop of 8.1% compounded annually, while it grew annually for the U.K. by 7.1% and for Germany by 5.1% [23, 165]. France (–5.4%), Japan (–2.2%) and Canada (–2.2%) also had negative growth rates.

Compared to several other major countries, the U.S. was slow in the upgrade of networks to all-digital ISDN systems [23, 185]. Similarly, in the introduction of Signalling System-7 technology U.S. penetration is 6.3% while in France it is 47.6% [23, 189]. On the other hand, switching is quite advanced in the U.S., with 42.5% digital lines (compared with 70.7% in France and 2.6% in Germany) [23, 177]. If all electronically switched lines are considered (digital and analog) the U.S. has 96.6%, far ahead of France (75.9%), Japan (44.8%), U.K. (23.5%) and Germany (1.5%) [23, 179].

Long Distance Competition

AT&T's long-distance rates were reduced about 45% in real terms between 1984 and 1991 [6, 154]. (These reductions were partly offset by end-user line charges.) AT&T's share of inter-LATA long-distance service dropped from 84.2% in 1984 to 62.9% in 1990 [7, 35]. (As a percentage of all users, however, AT&T's share is higher because it has more small subscribers.) If short-haul interexchange service is included in the market definition, i.e., if local exchange companies' regional (intra-LATA) service is included, AT&T share is about 60%.

At the same time, the market as a whole grew rapidly. Interstate switched access minutes grew 111% from 37.5 billion minutes in 1984 to 79.1 billion in 1991. Annual growth rates were 9.5% in 1986, 18% in 1987, 13% in 1988, 13% in 1989 and 11% in 1990. While AT&T's volume increased by 58%, that of its competitors rose almost 400% from their much smaller base [7, 34].

The number of registered competitors steadily increased from 42 in 1982 to 611 in 1990, before declining to 597 in 1991 [7, 29]. Of these, almost all are resellers, i.e., not facility-based.

2. See Crandall and Galst [4, 151]. Exclude RBOC non-Bellcore R&D.

However, resellers, too, provide competitive pressure. MCI, the strongest of AT&T's rivals, had grown to an \$8.4 billion company in 1991. US Sprint completed a \$3 billion fiber network, and won 40% of the large contract for the federal network, FTS-2000.

Local Competition

While the divestiture was predicated in part on facilitating long-distance competition by providing equal access to the local loop, there was far greater skepticism about the possibility for competition for that loop itself, i.e., for local traffic. But, such competition has begun to appear, albeit almost always for larger users.

Local competition is emerging principally through fiber-optic metropolitan area networks (MANs), also known as alternative local telecommunications systems (ALTS) or competitive access providers (CAPs). Their revenues have been growing at a rate of about 22% per year [26]. Estimates of total revenues for 1990 range widely, from \$138.1 million to \$400 million [9; 26].

Other potential competition in the local loop may come from access based on the cable TV infrastructure, or from cellular and micro-cellular telephone traffic that serves stationary locations.

Equipment

The vast Bell System and all of its customers—comprising 80% of the total market—were in the past substantially foreclosed to other suppliers by its vertical integration with AT&T's manufacturing subsidiary, Western Electric. Although many expected the BOCs to cling to AT&T as their equipment supplier after divestiture, in fact they embraced a wide variety of non-AT&T equipment quite rapidly.

Procurement of network equipment by local telephone companies is governed by their obligation to state regulators to pay the lowest possible prices (where rate-of-return regulation applies) or by the incentive to keep cost savings as profits (under price caps).

AT&T's national market share for central office switches dropped from 70% in 1983 to 53% in 1989, with Northern Telecom reaching 40% [5, 143–44]. Central exchange equipment costs declined from approximately \$325 per digital line on an industry-wide basis in 1984 to less than \$100 in 1991. This is significantly lower than those paid by telephone administrations in France, Germany, or Britain.

AT&T has steadily expanded its telecommunications equipment business internationally through various alliances. On the other hand, it has not fared well in the computer field. In 1990, after six years of losses, it acquired the large computer firm NCR for \$7.4 billion, to become the world's fifth-largest computer manufacturer. More generally, the firm faces continuing obstacles in attempting to reconcile its dual roles as communications service provider and equipment manufacturer. Its service activities are often in conflict with its best customers, the local exchange companies. As a consequence, AT&T's home base is less assured than those of its global competitors.

Employment

The number of employees at AT&T and its successor companies fell. By 1990, AT&T had reduced its work force by 90,000 jobs, 25,000 of which were cut in 1989 alone, from their pre-divestiture total of about 370,000. The RHCs dropped from 583,000 employees at divestiture to 542,000 by the end of 1991, a reduction of about 7%. This is partly attributable to the

lower manpower requirements of digital equipment. Cuts in 1984 and 1985 were 2.8% and 3.1%, respectively. In 1990 and 1991, RHC cut-backs increased again [3], and these trends can be expected to continue. For example, Ameritech and NYNEX announced plans to reduce their work force by an additional 2,300 and 9,900, respectively. On the other hand, many of the new private or public carriers generated hundreds of new (but usually non-unionized) jobs, and the Bell companies increased employment in their subsidiaries.

Many employment losses were in customer terminal manufacturing and are part of the more general decline of US-based consumer electronics manufacturing. If equipment is defined more generously to include also computers, "smart" office equipment, etc., the number of manufacturing jobs has increased.

For both the telecommunications network and equipment, the Bureau of Labor Statistics predicts employment increases of 2% annually, but these figures seem somewhat over-optimistic.

Trade

The flip side of competition in equipment is that US firms lost enormously in terms of markets. The U.S. trade balance for telecommunications equipment, which had been positive though shrinking in 1981 and 1982, became deficits of \$1.15 billion in 1984, \$2 billion in 1986, and \$2.6 billion in 1988 [1, 461]. Official trade statistics suggest an improvement to \$1.93 billion in 1989, but almost \$400 million of it is attributable to revised accounting methods rather than real gains. A further improvement occurred in 1990, with the trade deficit falling to \$790 million [11]. Imports increased from \$2.8 billion in 1983 to over \$7.1 billion in 1987, while exports grew from \$2.3 billion to \$6.3 billion [10; 11]. In central office switches, the foreign-based companies' share greatly increased [22]. The use of foreign equipment grew, in particular from Asian suppliers; in 1987, only 43% new terminal equipment certifications (so-called Part 68 Registrations) went to US firms (including licensees of foreign firms), while 49% went to the Far East firms [27]. All these tendencies created an unanticipated problem for U.S. foreign trade which is likely to become a major issue for negotiation, since telecommunications procurement is a politicized process in most countries of the world.

Privacy

Privacy as a problem has surfaced in the context of caller-ID service, which provides identification of the caller's identity. But the issue of privacy is really far broader. A new generation of privacy problems has emerged, as more transactions are conducted electronically, and information is easier to collect, store, access, match, and redistribute.³ The number of carriers and service providers has grown enormously, leading to an increasingly open network system in which information about use and user is exchanged across companies. Furthermore, transmission conduits increasingly include unsecured portions, for example due to mobile communications.

The provision of information services (at least to business users) is a thriving industry, and is likely to remain so. There are currently hundreds of information service providers operating within the U.S., and according to one projection, the demand for information services is likely to increase by 20% annually through 1995 [23, 221]. The 1991 decision to allow BOCs to enter the

3. For example, in 1962, the federal government had 1,030 computer central processing units; in 1972, 6,731; in 1982, 18,747; and in 1985, over 100,000 [14, 81].

information services market⁴ has ensured that the myriad of emerging privacy issues in this area will have to be dealt with in the context of common carriage.

Most of the concern over privacy issues stems from the introduction of new or enhanced telecommunications apparatus. For instance, caller-I.D. allows identification of a calling party's number without their knowledge. This might reveal a caller's unlisted number or negate the possibility of making an "anonymous" phone call to the police. Wireless communication equipment such as cellular phones and cordless telephones can be easily monitored by a nearby radio receiver, while emerging technology such as facsimile machines, automatic dialers and synthetic voice facilitate intrusive and unsolicited "junk" messages [18, 9–12].

III. Conclusion

After these empirical observations, we can return to the four categories of economic perspectives on telecommunications deregulation and divestiture, and make the following observations:

1. Along the pro and anti-monopoly axis, those who held pro-monopoly (or anti-interventionist) views were not supported by what happened later. The benefits of monopoly seem to have been lost primarily only in the reliability and privacy areas. The impact of lowered barriers to entry due to AT&T restructuring was larger than predicted by those advocating that free markets will result in similar impacts. While they might be right in the long term, the divestiture accelerated competitive entry considerably and revealed the extent of accumulated inefficiencies.
2. Along the regulation versus deregulation axis, deregulators were more often right than the pro-regulators. However, the latter were also correct in a number of instances. Furthermore, their alarms often led to protective policies, such as lifeline service for the poor, which in some instances provided the corrective that made deregulatory policies viable. Deregulators were often correct, but there also emerged a variety of new types of issues that lead to new regulatory actions to enable competitive entry, such as open network architecture, and interconnection of alternative local telephone companies.

Based on this admittedly partial evidence, one may conclude at a minimum that the system proved itself capable of adjusting to major and rapid change. Some of the negative fall-out was moderated by regulatory actions. In other cases, offsetting economic adjustments took place, and the overall impact, as a whole, was positive.

As a consequence, there has been no upheaval. Though benefits have not been shared equally, the worst fears were not realized, and the telecommunications sector is more dynamic and innovative than it had been under the old monopoly. But it is also subject to centrifugal forces that need attention.

Based on the experience of the past decade, it is reasonable to assume that networks of various categories—long-distance, international, mobile, specialized—will proliferate, and that equipment options will become abundant. Can one expect the resultant "network of networks" to be totally self-regulating, with no role for government?

The key task for the U.S. telecommunication policy in the future is to balance the institutional diversification of the network system with technical integration. One must pay attention

4. *Information Services Ruling, U.S. v. Western Elec. Co., Inc.*, Civ. Action No. 82-0192 (HHG) (D.D.C. July 25, 1991).

to the question of how the various pieces of the network of networks will fit together. The past ten years have been preoccupied with preparing and executing the AT&T divestiture and with liberalizing markets. It will continue. But it will also be inevitable to move beyond, and to assure the functioning of a network based on diversity. It is a unique undertaking because it has never been done before.

This does not mean to recreate a monopoly system but rather to provide the system with tools of integration in those cases where they are not self-generating by market forces, due to the peculiarities of a system of interconnected competitors. Examples for areas in need of integration are:

1. Physical Interconnectivity

As various discrete networks grow they must interoperate in terms of technical standards, protocols, and boundaries. Interconnectivity does not happen by itself, since it is not in the incumbent's interest to grant it to competitors; that is our lesson of decades of American experience. This leaves a highly controversial and complex role for regulators, as they are asked to overcome barriers to interconnection. One recent example is the granting to local service competitors interconnectors of so-called collocation rights in New York State. Another example is the U.S. Department of Transportation's proposed interconnection and access rules for four computerized airline reservation systems which are among the country's largest private information networks. A third example is the granting, by the FCC and several states, of unbundled access rights to service providers under "Open Network Architecture" rules [16].

2. Informational Interconnectivity

Telephone carriers are starting to offer pathways for interactive and mass announcement services, and they are likely to provide video transmission over fiber lines. Not only are telephone carriers entering the video distribution business, but cable and other media firms are about to offer telecommunications services themselves. These trends blur the distinctions between telephony and mass media such as television and cable TV. These communications industries have worked under different regulatory regimes.

Public telephone carriers have traditionally operated under common carriage principles, i.e., without discrimination among users based on the content of their messages and with no influence or responsibility over the content transmitted. In contrast, private telecommunications networks, television network operators and over-the-air broadcasters, are not common carriers. For example, a cable network may create rules against transmission of certain types of information. The interconnection of public telecommunications with private ones and with cable television networks requires a reconciliation of the differing regulatory systems. Otherwise, information would be subject to scrutiny at each interconnection point. This would reduce the free flow of information in the system in the same way that trade and commerce would be impacted if each industry had its own money [19]. The likely end-result need be a mixed system of common and private carriage, with rules on hand-off and interconnection.

3. Finance Interconnectivity

In an environment of multiple networks, it becomes increasingly difficult to maintain the traditional system of internal transfers from one class of users to another. Yet all political signs point

to a continuation of support, especially for the rural areas. This will have to be done not through internal redistribution but in the normal manner of taxation and budget allocation, e.g., either by general taxes, or by a specialized telecommunications value-added tax that is earmarked for a “universal service fund,” or by similar devices.

These “post-deregulatory” issues will, no doubt, lead to significant controversies, and occupy the U.S. and other countries for years to come. None of the tasks is beyond our grasp in terms of complexity or political feasibility. But they require an end to the nostalgia for the simplicity of the golden age, as of the romantic notion that competitive entry makes all policy superfluous. It requires a look forward to a very different network environment, one of diversity, entry, modularity, user choice, globalism and connectivity. Thus, the AT&T divestiture of 1984—and the adjustments to it—should cease to obsessively preoccupy the policy agenda, and make room for the resolution of new issues which require much thought and attention.

References

1. Baudhuin, Michael D. “Issues of International Trade,” in *After the Breakup: Assessing the New Post-AT&T Divestiture Era*, edited by Barry G. Cole. New York: Columbia University Press. 1991, pp. 460–66.
2. Bolter, Walter G. and James W. McConnaughey. “Innovation and New Services,” in *After the Breakup: Assessing the New Post-AT&T Divestiture Era*, edited by Barry G. Cole. New York: Columbia University Press, 1991, pp. 285–304.
3. Bye, Marianne G., *Regional Holding Companies: Third Quarter 1991 Results*. New York: Shearson Lehman Brothers, Telecommunications Services Industry Follow-Up. November 19, 1991.
4. Crandall, Robert W. and Jonathan Galst. “Productivity Growth in the U.S. Telecommunications Sector: The Impact of the AT&T Divestiture.” Unpublished paper, The Brookings Institution, 1991.
5. Egan, Bruce L. and Leonard Waverman. “The State of Competition in Telecommunications,” in *After the Breakup: Assessing the New Post-AT&T Divestiture Era*, edited by Barry G. Cole. New York: Columbia University Press, 1991, pp. 117–48.
6. Federal Communications Commission, Industry Analysis Division. *Monitoring Report, CC Docket No. 87-339*. July 1991.
7. ———. *Trends in Telephone Service*. August 1991.
8. Florida Public Service Commission. *Telephone Service Evaluations—Fort Myers*. 1990.
9. Gross, Joel D., “Competition Is Emerging in the U.S. Telephone Market.” New York: Donaldson, Lufkin & Jenrette Industry Viewpoint, June 7, 1991.
10. International Trade Administration, U.S. Dept. of Commerce. *U.S. Telecommunication Trade in 1987*. Washington: 1988.
11. ———. *U.S. Telecommunications Trade in 1990*. Washington: April 1991.
12. Kimmelman, Gene and Mark N. Cooper. “Telephone Penetration,” in *After the Breakup: Assessing the New Post-AT&T Divestiture Era*, edited by Barry G. Cole. New York: Columbia University Press. 1991, pp. 380–88.
13. Kraushaar, Jonathan M. “Service Quality” in *After the Breakup: Assessing the New Post-AT&T Divestiture Era*, edited by Barry G. Cole. New York: Columbia University Press. 1991, pp. 253–63.
14. Linowes, David F. *Privacy in America: Is Your Private Life in the Public Eye?* Urbana and Chicago: University of Illinois Press, 1989.
15. New York State Telephone Association, Inc., *Newsletter*, November 1988.
16. Noam, Eli M. “Beyond ONA: Designing a Modular Network.” Columbia Institute for Tele-Information, working paper series #405, 1990.
17. ———. *Hearing on Network Reliability and Regulatory Oversight*. Testimony before the Subcommittee on Government Information, Agriculture and Justice, U.S. House of Representatives. October 2, 1991.
18. ———. “Privacy in Telecommunications Services.” Columbia Institute for Tele-Information, working paper series #406, 1990.
19. ———. “Private Networks and Public Objectives.” Paper presented at Aspen Institute for Information Structures, Queenstown, Maryland. July 24, 1991.
20. Noll, A. Michael, “The Effects of Divestiture on Telecommunications Research.” *Journal of Communications*, 1987. 73–80.

21. ———, “The Future of AT&T Bell Labs and Telecommunications Research.” *Telecommunications Policy*, April 1991. 100–105.
22. NTIA, U.S. Department of Commerce. *NTIA Trade Report: Assessing the Effects of Changing the AT&T Antitrust Consent Decree*. Washington: 1987.
23. ———. *Telecommunications in the Age of Information*. Washington: 1991.
24. Reingold, Daniel P. “Max Headroom: The Baby Bells Are Not All Alike.” New York: Morgan Stanley Investment Research. 1990.
25. Stannard, Richard. “Integrating Quality of Service Standards with Incentive Regulation.” New York PSC, speech given to the NARUC Regulatory Workshop, Michigan State University. August 1989.
26. Teske, Paul and John Gebosky. “Local Telecommunications Competitors: Strategy and Policy.” Unpublished paper presented to the 18th Annual Telecommunications Policy Research Conference. October 1, 1990.
27. Von Alven, William H., editor. “The Billboard: A Newsletter for Part 68 Applicants.” February 1992.