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Telecommunications Liberalization The U.S. Model

Robert W. Crandall

The United States has been in the process of liberalizing telecommunications for at least thirty years and perhaps more. Private microwave licenses were first considered in 1956 and granted in 1959. Competitive entry into certain long-distance communications common carriage was first sought by Microwave Communications Incorporated (now MCI) in 1963; the Federal Communications Commission (FCC) approved its entry in 1969. Terminal equipment (“customer premises equipment”) was finally liberalized in 1977. Entry into ordinary, switched long-distance first occurred without FCC authorization in 1974, but it was another four years before this entry (by MCI) was upheld by the courts despite the FCC’s vehement protests.¹

Finally, in 1996, the U.S. Congress passed and the president signed the 1996 Telecommunications Act, which included, among other provisions, a requirement that *state* regulators permit entry into the delivery of local telecommunications services and—eventually—intrastate long-distance calls. This act also frees the Bell operating companies to enter long-distance markets under prescribed conditions, allows all local exchange companies to enter the video distribution business, and eliminates much of the formal rate regulation of cable television. Most of current U.S. telecommunications policy attention is quite understandably focused on implementing this 1996 act, but a thorough understanding of the American “model” of liberalization requires an examination and understanding of thirty years of trying to open telecommunications markets to competition.

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1. *MCI Telecommunications Corp. v. FCC*, 561 F.2d 365 (D.C. Cir. 1977), *cert. denied*, 434 U.S. 1040 (1978); *MCI Telecommunications Corp. v. FCC*, 580 F.2d 590 (D.C. Cir. 1978), *cert. denied*, 439 U.S. (1978).

Liberalization and deregulation of trucking and airlines occurred much more swiftly in the United States. Why should telecommunications take so long?

14.1 Monopoly, Regulation, and the Distortion of the Rate Structure

Until recently, telecommunications has generally been thought to be a network industry characterized by economies of scale and density that make it a natural monopoly, but this view has rarely been afforded a market test because most nations have provided legal protection of a single, national (and typically government-owned) carrier.² The United States was an exception because it never had a government-owned telephone system, and it even permitted open entry into telephony in the early part of this century.

Competition soon fell victim to a series of mergers and acquisitions and a government regulatory policy that was erected in lieu of antitrust enforcement.³ By the 1930s, the industry was essentially a set of regulated private monopolies comprising the American Telephone and Telegraph Company (AT&T) and a few smaller, independent operating companies. State regulatory commissions had the authority to control intrastate rates (local service and intrastate long-distance calls) of the local operating companies while the FCC exercised loose authority over interstate long distance provided solely by AT&T. The implicit premise of this regulation was one of franchised monopoly, natural or not, protected from entry as long as it served the “public interest.”

In practice, U.S. regulators—like those in most countries—protected the franchised monopolies from entry while requiring that they price their services in response to political forces.⁴ Over time, this meant that long-distance rates would be set at levels substantially above cost while local connections, particularly for residences, were priced below their long-run incremental cost. Equally important, most states required that rates be *lower* in rural and exurban areas than in urban areas despite the obvious fact that incremental costs of these connections were higher in less densely populated areas.⁵ Finally, residential connection rates were generally far

2. There are numerous studies of the economies of scale and scope in telecommunications. For a useful summary, see Waverman (1989, table 8).

3. For a review of this history, see Brock (1981). An alternative view may be found in Temin (1987).

4. In most countries, the telephone company has been a public enterprise, often part of the postal, telegraph, and telephone authority. These enterprises have generally pursued the same practice of keeping local access charges low and long-distance rates artificially high. Most developed countries and even many developing countries are now in the process of privatizing their telephone companies and establishing independent regulatory authorities like those found in the United States.

5. Most developed countries have local monthly rates that do not vary by geographic area. However, Canada had rates that were more distorted than those in the United States prior to recent regulatory actions. See Crandall and Waverman (1996).

lower than monthly charges to businesses for the same service in the same area.

These regulatory distortions in the rate structure were not widely understood in an era in which no one tried to compete with the established telephone monopolists. However, once the FCC began to admit entry into interstate services in the 1970s, these distortions became visible and even controversial, creating artificial incentives for entrants to attack the overpriced interstate service markets. The implicit subsidy from these interstate services to local residential service that was once accomplished largely through internal transfers within AT&T was made explicit in the form of “access charges” paid by long-distance carriers to local companies for originating and terminating their calls. When AT&T was broken up in 1984 to settle an antitrust suit brought by the federal government, the FCC began a protracted policy of reducing the subsidies flowing through these access charges. However, the states moved far less aggressively and were generally hostile to allowing entry into intrastate markets. As a result, even today—nearly thirty years after telecommunications liberalization began with MCI’s entry into long-distance services—U.S. telephone rates do not even approximate the long-run incremental cost of services.

14.2 The Requisites of Successful Liberalization

The United States essentially stumbled into the liberalization of telecommunications in the 1960s and 1970s. There was no carefully drawn plan to introduce competition into any market, nor was there legislation requiring such liberalization. Rather, the FCC responded to a variety of political pressures and direct petitions from those desiring to offer long-distance service or competitive terminal equipment.⁶ As the distinctions between telecommunications and computer services began to blur, the commission was forced to draw the line between regulated “telecommunications” services and unregulated computer-like terminal equipment.

Competition developed in the long-distance market by a combination of FCC rules and a series of accidents.⁷ The FCC decided in 1969 and again in 1971 to allow “specialized” carriers to offer dedicated interstate service—private lines—to business customers. It did not, however, grant MCI or subsequent entrants the right to offer ordinary, switched long-distance services to any subscriber, business or residential. Nevertheless, MCI began to offer switched services in 1974 by terminating its calls over Bell company connections designed for other purposes. When the FCC

6. See Crandall (1981). “Terminal equipment” or “customer premises equipment” is that equipment used by the telephone subscriber to connect to the network. It includes telephone handsets, private branch exchanges (PBXs), modems, fax machines, and answering machines.

7. This history is reviewed in Brock (1981) and, more recently, in Crandall and Waverman (1996).

attempted to block MCI from offering these services, the federal appellate court refused to enforce its order, citing the absence of a procedural record that showed that MCI's service was not in the public interest. When AT&T attempted to deny MCI and other entrants use of its local circuits to originate and terminate such calls, a variety of antitrust suits were filed, including the 1974 Sherman Act suit that would eventually culminate in the breakup of AT&T.

Obviously, the U.S. government did not have a clear plan to introduce competition into telecommunications. Rather, liberalization lurched forward through a series of uncoordinated regulatory and legal actions. Had a liberalization plan been devised, once the government decided that competition was feasible in a network industry such as telecommunications, it should have contained at least the following:

1. An early end to rate distortions created by decades of government regulation
2. Assurances that incumbent carriers cannot utilize their control of "bottleneck" facilities to disadvantage entrants
3. Market incentives, but no direct or indirect subsidies, for entrants to build new facilities
4. A commitment to phase out regulation very soon after entry occurs

In the United States, trucking, airline, and—on a more limited basis—railroad liberalization satisfied these four conditions. As we shall see, U.S. telecommunications liberalization has not and is now proceeding in a direction that violates at least three of them.

14.3 Telephone Rate Distortions

All government regulation is a political process. As a result, political considerations generally lead regulators to craft a variety of cross-subsidies in the regulated rate structure to benefit various favored constituent groups. Obviously, such cross-subsidies cannot withstand liberalization because competition drives the above-cost rates toward cost, thereby depriving regulators of the sources of funds for such subsidies. The U.S. airline regulator, the Civil Aeronautics Board, began to purge the regulated rate structure of these cross-subsidies almost a decade before deregulation. In telecommunications, a large share of these cross-subsidies remain, serving as impediments to full liberalization. Despite a substantial body of research that demonstrates such cross-subsidies are an inefficient and largely ineffective mechanism for inducing subscribers to remain on the network, these subsidies are still defended as necessary to achieve "universal service."

The magnitude of cross-subsidy in U.S. telecommunications can be shown quite succinctly with two charts. Local service is generally priced

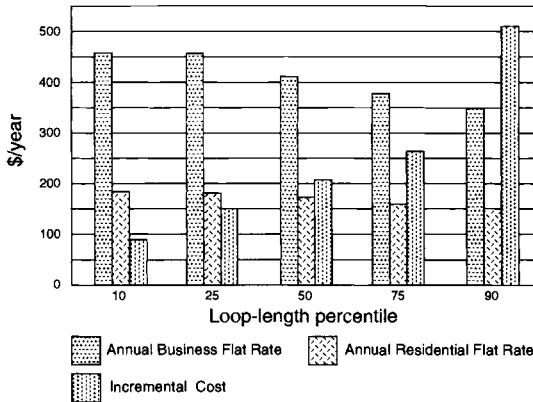


Fig. 14.1 Average U.S. business and residential local rates, 1994

on a flat-rate basis—allowing callers to make unlimited calls within a local area—that declines with the increase in incremental cost of providing it.⁸ Figure 14.1 shows the average residential and business charges arrayed by “loop length,” the distance of the subscriber from the local switch.⁹ Subscribers in less densely populated areas require more copper wire (or copper plus fiber) to serve them, yet in the United States rates for both businesses and residences decline with the increase in the incremental cost of service that is driven by declining population density. In addition, as figure 14.1 shows, businesses typically pay twice as much for the same service in any given geographic area despite the fact that the incremental cost of business lines is generally somewhat lower than the incremental cost of residential lines in the same geographic area.¹⁰

The historical (book) cost of providing local connections is less relevant to pricing decisions in an industry with some long-lived assets and rapid technical change than for others, but these historical accounting costs provide at least an indication of the *average* level of costs that must be recovered in a regulated industry. In 1995, the local exchange companies that submitted their financial results to the FCC reported a total of \$51.2 billion in noncapital costs for 148.4 million switched lines, or about \$345 per line. Not all of these costs were dedicated to providing subscriber access,

8. Flat rates are slowly giving way to measured rates as carriers begin to petition their state regulators for a more rational rate structure in the face of prospective entry.

9. These data are drawn from NARUC (1994a) and a “benchmark cost” study of local network costs funded by several local and long-distance carriers.

10. These are obvious generalizations about *average* rates across the lower forty-eight states. Businesses are generally closer to the central office, but they generally account for more busy-hour minutes of use than do residential subscribers. On balance, before the Internet complicated life for all telecommunications providers, business and residential rates should have been about the same in any given geographic location.

Table 14.1 Average Local Telephone Rates in the United States, 1995

Service	Rate (\$)
Installation charge	38.10
Monthly residential rate (unlimited calling)	19.54
Monthly single-line business rate (unlimited calling) ^a	41.77
Local call rate ^a	0

Source: FCC (1997, tables 8.4 and 8.5).

^aA few states do not permit flat-rate unlimited calling for businesses; the average business rate shown here is either the flat rate or the rate that includes 200 five-minute business-day calls per month. The zero local call rate is therefore the modal rate, but not the average rate.

but a large share undoubtedly were. In addition, these companies had about \$150 billion in net undepreciated plant in service, or slightly more than \$1,000 per line. Assuming a 25 percent capital charge for the before-tax cost of capital plus depreciation, this suggests an annual capital cost of about \$250 per year. Thus total accounting costs for the U.S. local companies are nearly \$600 per year, most of which is required to build and maintain local access facilities. By comparison, the average U.S. residential rate was \$19.54 and the average single-line business rate for flat-rate service was \$41.77 in 1995 (see table 14.1).¹¹

The second chart (fig. 14.2) shows the enormous gap between the charges paid by long-distance carriers to the local telephone companies for connecting their calls and the local companies' incremental cost of originating and terminating these calls.¹² Because of this wide gap, both for interstate and intrastate calls,¹³ long-distance rates are artificially high and most local residential rates are artificially low. Average long-distance rates in the United States remain far above the long-run incremental cost of the service, which is likely between 5¢ and 7¢ per minute.¹⁴ To some extent, the disparity between interstate rates and costs reflects the failure to account for competitive discount plans. Even with these discounts, however, table 14.2 shows that average *transactions* prices for all custom-

11. Several states no longer offer flat-rate service for business customers. Therefore, the data in table 14.1 reflect either the flat rate or the rate for a single line generating 200 five-minute business-day calls per month.

12. These data are taken from the FCC's periodic *Telephone Trends* reports produced by the Industry Analysis Division of the Common Carrier Bureau.

13. Interstate rates are regulated by the FCC; intrastate rates are regulated by the state commissions. The FCC recently acted to reduce interstate (per minute) access charges, but this action may well be appealed to the courts, thereby delaying its implementation.

14. This estimate is the subject of considerable dispute. Robert Crandall and Leonard Waverman in an affidavit prepared for Ameritech's application for entry into in-region long-distance services in Michigan contend that the long-run incremental cost of long-distance service, excluding marketing and administrative costs, is between 1.5¢ and 2.5¢ per minute, including the cost of originating and terminating calls on local company networks. Even if marketing and overhead costs are 5¢ per minute, long-run incremental costs plus average marketing and overhead costs should be no more than 7.5¢ per minute.

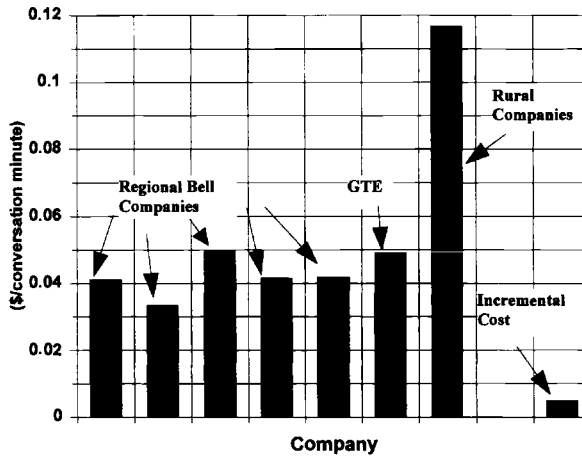


Fig. 14.2 Interstate access charges versus incremental cost, 1998

Table 14.2 Average Discounted Rates for Interstate Long-Distance Service, 1985-95

Year	Average Rate (\$/minute)
1985	0.37
1986	0.30
1987	0.25
1988	0.24
1989	0.22
1990	0.19
1991	0.18
1992	0.17
1993	0.17
1994	0.16
1995	0.15

Source: Hall (1997).

ers, business and residential, are still above long-run incremental costs. Approximately 5¢ of this difference is due to the regulatory overpricing of local company access charges; the remaining 3¢ to 5¢ appears to be rents retained by the long-distance carriers or dissipated in nonprice rivalry reflected in marketing expenses.

There is considerable disagreement over the degree to which long-distance rates have fallen in the United States because of the growth in discount pricing plans and the absence of accurate data on minutes of calling. Nevertheless, most data sources provide substantial evidence of real rate declines since 1984, driven in large part by the FCC's reduction of access charges from more than 17¢ per conversation minute in 1984 to

6¢ per minute in 1995 (see table 14.3). The most important issue is whether rates continued to decline in the 1990s after the FCC initiated price caps and the growth of MCI and Sprint (the third largest carrier) slowed. The real list prices for the major carriers have actually risen since 1990 while Hall's MCI data on average revenue per minute show a continuing decline.

The reduction in long-distance access rates has been effected through the phasing-in of a "subscriber line charge" that is now \$3.50 per month for residences and as much as \$6 per month for businesses. Despite this new charge, however, real local rates—including the subscriber line charge—have not risen in the past decade (figure 14.3).

There are other sources of cross-subsidies for local telephone rates in

Table 14.3 Average Long-Distance Rates in the United States (dollars per minute)

Distance	AT&T	AT&T	Bell Company	Bell Company
	Undiscounted Interstate Rate, 1997	Undiscounted Interstate Rate, January 1984	IntraLATA Rate, December 1994 ^a	Intrastate Rate, December 1983 ^b
25 km	0.28	0.26	0.15	0.15
100 km	0.28	0.32	0.25	0.34
200 km	0.29	0.41	0.29	0.38
1,000 km	0.30	0.47	n.a.	n.a.

Sources: FCC (1997) and NARUC (1996b).

Note: Table reports rates for five-minute daytime call. n.a. = not applicable.

^aSee n. 19.

^bPredivestiture.

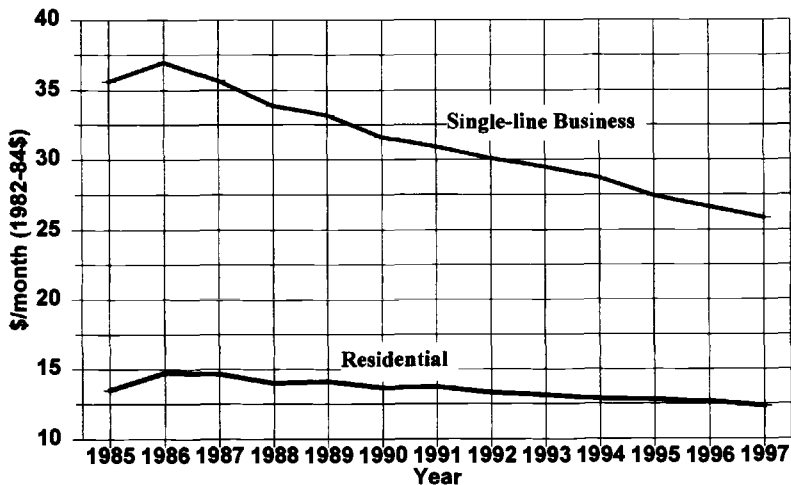


Fig. 14.3 Average U.S. real local residential rates, 1985-97

the United States: vertical services, high-bandwidth services, and even advertising in the Yellow Pages. However, figures 14.1 and 14.2 capture the essence of the cross-subsidies in the period before and immediately after the passage of the Telecommunications Act of 1996.

If liberalization is to proceed, it is obvious that these cross-subsidies cannot remain. While regulators cannot know carriers' costs with any precision, they should be making their best efforts to unwind these subsidies before unleashing the forces of competition. However, these U.S. regulators had little formal idea of the structure of carriers' costs until the 1996 act required that local carriers lease their facilities to new entrants *at cost*. Now, every state commission is involved in lengthy regulatory proceedings to determine its local carriers' costs for setting *wholesale* rates while failing to move *retail* rates toward these costs. Indeed, the FCC's first set of rules under the 1996 act established guidelines for these cost determinations that were extremely controversial and immediately subjected to court appeal.¹⁵ I turn to some of the issues raised in this appeal in the next section, but before doing so it is necessary to stress that many U.S. regulators continue to try to enforce a politically motivated set of subsidies to rural subscribers in general, and residential subscribers in particular, from a distorted *retail* rate structure while promoting competition.

14.4 Telephone Penetration and Usage

Telephone pricing policies in the United States and most other countries have been devised with the purported goal of encouraging "universal service." Nevertheless, telephone subscriber penetration (per 100 persons) is only marginally greater in the United States than in most other high-income OECD countries (table 14.4). Of all countries, Sweden has the highest number of main telephone lines per 100 population, but the United States and Canada are somewhat above the European average in this regard. Canada's local line rental rates are somewhat below those in the United States and its free-calling areas are generally larger, but its average per capita income is somewhat below the U.S. equivalent. However, a larger percentage of Canadian households have at least one telephone line than do U.S. households (Crandall and Waverman 1996, table 1-8).

Because the United States has generally used flat-rate charges for monthly line rentals and local calling, particularly for residences, U.S. residences and most business establishments face a zero marginal cost for local calls. These artificially low local call charges obviously stimulate very intensive use of the local network by U.S. telephone subscribers. In table

15. The U.S. Court of Appeals for the Eighth Circuit ruled on this appeal in July 1997, deciding against the FCC on virtually every important issue, but the Supreme Court reversed the court of appeals in *AT&T v. Iowa Utilities Board* in January 1999.

Table 14.4 Telephone Lines per 100 Population, 1994

Country	Lines per 100 Population
Belgium	44.9
Canada	59.2
Denmark	60.4
France	54.7
Germany	48.3
Italy	42.9
Japan	48.0
Netherlands	51.1
Norway	55.4
Sweden	68.3
United Kingdom	48.8
United States	60.2

Source: International Telecommunication Union (1996).

Table 14.5 Telephone Calls per Line in the United States and Other OECD Countries, 1994

Country	Local Calls per Line	National Long-Distance Calls per Line
Germany	787	559
Japan	1,165	273
Netherlands	528	639
United States	3,250	583

Sources: Non-U.S. data, International Telecommunication Union (1996); U.S. data, FCC (1997).

14.5 I show average calls per line for the United States and for a few other OECD countries for which data are available. Clearly, U.S. telephone subscribers make far more local calls than do German, Japanese, or Dutch subscribers. Moreover, given extended-area local service in many U.S. states, many of these calls would be considered long-distance calls in many countries. Thus the total number of national long-distance calls in the United States is somewhat understated in table 14.5 relative to the numbers in other countries.¹⁶

Modern telephone technology provides extremely reliable service as long as the telephone plant is maintained and sufficient switching and transmission capacity is provided. In the 1990s, the Bell operating companies have averaged less than 1 second of service disruption per access line per quarter, or about 3 seconds per line per year (Kraushaar 1996). Al-

16. These data are at best illustrative given the problems in the data and the differences in approaches to collecting them across countries.

most all service quality complaints today are related to delays in scheduling installation or maintenance calls.

14.5 The Bottleneck

In any network industry, there may be “essential bottleneck” facilities that incumbents control to the temporary or permanent disadvantage of new entrants. Transportation carriers may control sections of track, bridges, or terminal facilities that they refuse to make available to competitors. In the United States, such actions may violate the antitrust laws, but relying on antitrust enforcement may substantially slow liberalization of heretofore regulated monopoly industries. As a result, regulators must address the problems raised by such bottlenecks.

In telecommunications, bottlenecks allegedly arise for two reasons.¹⁷ First, a subscriber may be connected to the network through a single line or interface that is controlled by the incumbent carrier. Even if a new carrier replaces the incumbent, this new carrier may now control an essential bottleneck with the same effect on competition in various markets. Second, new entrants may require substantial capital and time to duplicate certain facilities that incumbents already possess. To provide true network service, the entrant has to be able to interconnect its new subscribers with all other subscribers. The entrant may be forced to build the facilities required to accomplish this interconnection. As a result, the entrant may claim that many of these facilities should be offered him by the incumbents on reasonable terms—at least until the entrant can replicate them. The crucial policy issues involve defining the scope of these essential facilities and the period of time for which they should be available from the incumbent.

14.5.1 Long-Distance Services

In the United States, AT&T used its control of local bottleneck facilities to deny to subscribers connections of quality equivalent to those provided to its own (Long Lines) long-distance operations. In part, this occurred because AT&T’s local switching capacity—like that of most monopolists of the time—was built in the 1960s and 1970s under the assumption that there would be no long-distance competition. Without modifying these switches, AT&T could not offer equal, trunk-side connections to its new rival(s).

After AT&T was divested of its operating companies as the result of an antitrust suit brought in 1974 and settled in 1982, the divested “regional Bell operating companies” were required to modify their switches to pro-

17. For an exhaustive analysis of the potential for bottleneck abuse, see Bernheim and Willig (1996).

Table 14.6 Market Shares in the U.S. Long-Distance Market, 1984–95 (percentage of revenues)

Year	AT&T	MCI	Sprint	All Others
1984	90.1	4.5	2.7	2.6
1985	88.3	5.5	2.6	5.6
1986	81.9	7.6	4.3	6.3
1987	78.6	8.8	5.8	6.8
1988	74.6	10.3	7.2	8.0
1989	67.5	12.1	8.4	12.0
1990	65.0	14.2	9.7	11.1
1991	63.2	15.2	9.9	11.8
1992	60.8	16.7	9.7	12.9
1993	58.1	17.8	10.0	14.2
1994	55.2	17.4	10.1	17.3
1995	53.0	17.8	10.0	19.2

Source: FCC (1997).

vide equal access to all long-distance competitors. The other local companies were required to follow shortly thereafter. This conversion to equal access took place in the 1984–87 period, and the resulting effect on competition was dramatic, as table 14.6 shows. AT&T began to lose market share much more rapidly after 1984 than in the previous decade when MCI was laboring against an integrated AT&T that did not provide equivalent access.

Many observers use the results in table 14.6 to argue that integration between the provision of local access and other telecommunications services is necessarily adverse to the development of competition in the latter sectors. However, AT&T could have been required to provide equal access by the FCC even without the antitrust divestiture. Indeed, the Canadian telephone companies continue to be integrated but are now required to offer equal access to long-distance competitors. As a result, competition has developed extremely rapidly in Canada without vertical divestiture—indeed even more rapidly than was the experience in the United States.

The United States went too far in mandating “equal” access, requiring local companies to offer connection services to AT&T and its rivals at the same rates despite the fact that the local companies’ costs of connecting AT&T calls were lower than the costs of connecting the new competitors’ calls because AT&T delivered its calls in quantities and at locations that were less expensive to connect. This implicit subsidy was deemed to be desirable in order to give new entrants a competitive advantage. Similarly, in earlier years, when new carriers could not obtain equal-quality connections, they were provided enormous discounts that apparently overcompensated for this disadvantage.

14.5.2 Local Exchange Access Services

Until the 1996 Telecommunications Act, most states did not allow competition for local services except in the form of new “competitive access providers” who built fiberoptic rings to serve business customers in large cities. Indeed, there were few requests for entry into suburban or rural areas, probably because of the distorted retail rate structure.

The 1996 act now requires that all local companies “unbundle” their networks and offer the various components or “network elements”—switching, transport, signaling, the local loop, and so forth—to any and all entrants at rates that reflect some measure of cost. Thus local incumbents must lease *any* facility, whether a bottleneck or not, to new entrants. In addition, incumbents must interconnect at any technically feasible point with new entrants.

These requirements for unbundling and leasing all network elements to entrants create enormous controversy over the number of such elements into which the network must be divided and the rates to be charged for each. Surely, the only true bottleneck in the local network is the final subscriber line (local loop) or the interface between the subscriber’s line and the rest of the network. To encumber the process of liberalization with the requirement of complex new regulations concerning the piecemeal division of incumbent networks preserves regulation more than it fosters liberalization.

The appropriate policy for interconnecting local networks is less obvious. It is possible that incumbents could design an interconnection system that makes interconnection with entrants difficult because the latter have more modern technology and therefore different interconnection requirements. Reciprocal interconnection agreements have worked successfully for decades for adjacent networks, but few countries have imposed them on *competing* networks in the same geographic area. Some regulation may be necessary to assure that incumbents do not frustrate competition, but the U.S. 1996 act’s requirement for interconnection at all “feasible” points may be excessive.

On the other hand, any interconnection requirement is likely to be controversial. If a carrier changes its technology, as it must periodically in the face of such rapid technical progress, any rival carrier may complain that the changes have the effect of and were even designed to frustrate competition if the changes alter interconnection conditions. Given the absence of full competition in local telephone services anywhere in the world, we simply have too little experience to be sure that we know how to navigate through these choppy seas.

14.6 Encouraging Facilities-Based Entry

Network industries are often very difficult to enter because of the enormous scale of investment required. It might be argued that some subsidy is required to encourage entrants or to overcome first-mover advantages in the provision of terrestrial network or even satellite services. Yet, in the United States, four new entrants have built competing national fiberoptic networks, and at least one other company is preparing to build another one despite the apparent existence of excess transmission capacity. Similarly, there are several direct broadcast satellite systems in operation in the United States and more to come. More to the point, there are at least four proposed low- or medium-orbiting satellite systems being designed or built to offer global wireless communications. Thus there would appear to be little grounds for providing subsidies to encourage entry into such services where the markets are very large and the technology is constantly improving, thereby reducing the incumbent's first-mover advantages.

In smaller countries, competition among terrestrial networks may not develop without some direct or indirect subsidies, but even in these countries such subsidies are surely questionable. If scale economies are great and the markets are small, subsidies may only encourage inefficient entry that requires permanent subsidy for survival. While there could be welfare gains from such a perpetual subsidy system, the political economy of maintaining it surely argues for caution.

The most contentious single issue in implementing the 1996 Telecommunications Act in the United States is the measure of cost to be used in setting rates for wholesale unbundled elements. In August 1996, the FCC ruled that states should base such rates on "forward-looking" estimates of long-run incremental costs, where the basis for such costs is the most modern technology found anywhere in an incumbent's network. This requirement to price at TELRIC—"total-element long-run incremental cost"—means that incumbents must offer their networks for lease at rates below their own embedded costs because of the rapid technological change in telecommunications.¹⁸ Unless the incumbent has been depreciating its plant rapidly to reflect the rate of obsolescence and charging accordingly for its services, it will be unable to recover its costs from the new forward-looking wholesale rates. The FCC's ruling was initially overturned by the U.S. court of appeals on jurisdictional grounds, but many state regulators nevertheless used some form of forward-looking wholesale pricing in their implementation of the 1996 act.

The U.S. policy of requiring the unbundling of all local network elements and pricing them at forward-looking costs rather than historical

18. This requirement has been dubbed TELRIC-BS (total-element long-run incremental cost—blank slate) by Alfred Kahn (1998).

embedded costs has exceedingly unfortunate effects on entry incentives. Why should entrants assume the costs and risks of building their own network facilities when they can lease any combination of incumbents' facilities at prices that reflect engineers' assessments of the lowest costs currently available through new construction? The FCC's ruling may have this effect at first—inhibiting entry through the construction of new facilities. One and a half years after the passage of the 1996 act, there were few major new entrants into local services, but more recently entry has accelerated.

14.7 Deregulation

In many countries mere privatization is a step forward in telecommunications policy. In others, some liberalization—such as allowing competition in “value-added” services—is a major advance. Ultimately, however, liberalization must be accompanied by forbearance or deregulation if the benefits of competition are to be realized.

Perhaps the most important mistake made by the United States in liberalizing its telecommunications sector has been the perpetuation of a burdensome regulatory regime while extolling the virtues of market competition. Unlike most other countries, the United States has a divided system of regulation that derives from its federalist origins. Intrastate communications is regulated by the states; interstate communications is regulated by the FCC. The Congress could easily alter this regime by eliminating state regulation, federal regulation, or both. Unfortunately, the recent Telecommunications Act extended this complex regulatory system and even made it worse by mandating new FCC rules to guide the states, rules that have become the centerpiece of lengthy court appeals.

Both the states and the FCC are responsible for the unfortunate rate distortions described above. Both have continued to regulate competitive portions of the telecommunications sector far too long. After many years of contentious proceedings, the FCC was able to prevail in requiring the states to deregulate the sale or lease of terminal equipment—the handsets, PBXs, answering machines, modems, and other equipment with which we communicate over the network. Subsequently, the FCC waited eleven years after the AT&T divestiture to deregulate AT&T fully. Between 1989 and 1995, AT&T was regulated by a price-cap regime whose principal objective was to prevent AT&T from abusing its market power by *reducing* rates to the disadvantage of rivals. Such regulation is more likely to cartelize an industry characterized by open entry than to prevent the re-appearance of monopoly.

Many states still regulate long-distance communications within their borders even though the longer calls have been opened to competition for more than a decade. The 1996 act requires the states to liberalize entry

into providing the shorter calls, but only after the regional Bell companies are permitted to enter the longer-call market.¹⁹

Indeed, most of the arguments for continuing regulation after liberalization come from new entrants who see the regulatory process as a mechanism for constraining the incumbent and reducing the probability of price competition. In the United States, the new long-distance carriers have long opposed the decision by the FCC to discontinue formal tariff filings that announce price changes in advance. They were successful in court as long as AT&T was under rate regulation, but having deregulated AT&T, the FCC is now apparently able to deny all carriers the right to file tariffs in advance of rate changes.

The 1996 act should have provided for immediate deregulation of retail telephone rates once entry was opened and a set of wholesale prices were established for unbundled elements and interconnection. Dozens of studies of the effects of regulation in rivalrous industries demonstrate that regulation generally prevents prices from adjusting to costs and protects certain seller or buyer groups, often through deliberate cross-subsidies. Even though the 1996 act mandates the introduction of competition into most telecommunications markets that are not now competitive, it also continues and even extends the regime of cross-subsidies, instructing the FCC to assure that they be explicit and competitively neutral. This mandate plus the extensive new requirements for regulating wholesale rates and interconnection provide far too many opportunities for participants in the regulatory process to engage in rent seeking. It also provides for adverse incentives.

For example, the new 1996 act requires that states and the FCC certify that local exchange and access markets are reasonably open to competition before allowing the regional Bell companies to enter the long-distance market. As a result, three of the most likely entrants into local services—the largest long-distance companies—have a perverse incentive to refrain from investing in local facilities or from aggressively pursuing local customers so that they can claim that the local Bell companies have failed to open their networks sufficiently to allow them to enter. Similarly, the Bell companies may be persuaded to delay local competition in their territories because the states are not required to open intraLATA (intrastate) long-distance services to competition until the Bell companies are granted entry

19. The details of these market divisions are perhaps too complicated to describe fully in this paper, but they derive from the 1984 AT&T divestiture. After divestiture, the regional Bell companies were allowed to provide only local access and exchange services and long-distance services within their "local access and transport areas" (LATAs). Larger, more populous states have two or more such LATAs; hence, the Bell companies cannot provide *intra-state* long-distance services between these areas. The 1996 act allows the Bell companies into the *interLATA* market after they have complied with a "competitive checklist" for facilitating entry into their local markets.

into in-region interLATA services, which, in turn, is likely to be delayed by the FCC for several years.²⁰

Equally important, the continuing regulation of incumbent local carriers makes it difficult for them to respond to market conditions by changing their rates or service options. These carriers are still subject to lengthy state regulatory processes to adjust these rates or service conditions. As a result, low residential rates are likely to remain for some time, particularly in suburban and rural areas, reducing the incentive for new carriers to enter these markets except on a selective basis to attract heavy users of long-distance, vertical, or Internet services.

14.8 Conclusion

To some observers, the fact that the United States has had the longest experience with telecommunications liberalization suggests that it might be a model for other countries to follow, particularly in the growth-oriented Pacific basin. However, observers should ask why liberalization is still not complete in the United States thirty years after it began. The answer is quite clearly that U.S. politicians have been reluctant to shed the notion that telecommunications regulation should be retained in order to move rents among political constituent groups—most notably between urban and rural subscribers. The committees of Congress that control telecommunications policy are dominated by representatives from rural areas, and even conservative Republicans from these areas are willing to combine with liberal Democrats to use telecommunications policy to redistribute income. This redistributionist goal, achieved largely through internal cross-subsidies, will be difficult to achieve if full liberalization occurs. As a result, regulation remains an important and counterproductive force.

Other countries may learn several lessons from the U.S. experience in attempting to liberalize telecommunications:

1. Reduce rate distortions as much as possible *before* attempting to introduce competition.
2. Require only limited unbundling of “essential” facilities for a limited time. Otherwise, encourage entrants to build their own facilities.
3. Establish a certain date for deregulating rates after entry barriers are lowered and entrants begin to offer services.

20. In the nineteen months since the act was passed, only two Bell companies were able to persuade their state commissions that they have met the competitive checklist required for entry into in-region interLATA long-distance services, and both have been denied entry by the FCC. It may be several years before any Bell company is able successfully to run the gauntlet of state, Department of Justice, and FCC clearances for in-region long-distance entry. In the interim, many may simply decide that the prize is not worth the cost of ceding market share in their own local markets.

4. Limit regulation to the requirement of reciprocal interconnection after retail rate and service deregulation occurs.

The United States has been trying to liberalize telecommunications for thirty years. This fact, by itself, provides ample testimony against the U.S. "model." Indeed, in countries where national telecommunications carriers are notoriously inefficient, the U.S. model of a long adjustment period and continued regulation can be justified as providing the "safeguards" against the rapid loss of jobs that is required for carriers to become efficient. The United States never had a government-owned telecommunications monopoly; therefore, it has fewer excuses for continuing telecommunications regulation this long. Estimates of the static economic losses from regulatory rate distortions in the U.S. industry range from about \$10 billion to \$30 billion per year. With wireless costs falling so rapidly, it seems unlikely that any temporary or even permanent exertion of monopoly power that might be unleashed by total deregulation could reduce economic welfare by as much.

References

- Bernheim, B. Douglas, and Robert D. Willing. 1996. *The scope of competition in telecommunications*. Washington, D.C.: American Enterprise Institute, October.
- Brock, Gerald W. 1981. *The telecommunications industry*. Cambridge, Mass.: Harvard University Press.
- Crandall, Robert W. 1981. *After the breakup: U.S. telecommunications in a more competitive era*. Washington, D.C.: Brookings Institution.
- Crandall, Robert W., and Kenneth Flamm, eds. 1989. *Changing the rules: Technological change, international competition, and regulation in communications*. Washington, D.C.: Brookings Institution.
- Crandall, Robert W., and Leonard Waverman. 1996. *Talk is cheap: The promise of regulatory reform in North American telecommunications*. Washington, D.C.: Brookings Institution.
- FCC (Federal Communications Commission). 1997. *Statistics of communications common carriers, 1995/96*. Washington, D.C.: Federal Communications Commission.
- Hall, Robert E. 1997. Affidavit submitted on behalf of MCI in the Federal Communications Commission's Docket no. cc 97-121, April.
- International Telecommunication Union. 1996. *World telecommunications indicators*. Geneva: International Telecommunication Union.
- Kahn, Alfred E. 1998. *Letting go: Deregulating the process of deregulation*. Lansing: Michigan State University, Institute of Public Utilities.
- Kraushaar, Jonathan. 1996. *Update on quality of service for the local operating companies aggregated to the holding company level*. Washington, D.C.: Federal Communications Commission, Common Carrier Bureau, Industry Analysis Division, March.
- NARUC (National Association of Regulatory Utility Commissioners). Annual-a.

- Bell operating companies exchange service telephone rates.* Washington, D.C.: National Association of Regulatory Utility Commissioners.
- . Annual-b. *Bell operating companies long distance message telephone rates.* Washington, D.C.: National Association of Regulatory Utility Commissioners.
- Temin, Peter, with Louis Galambos. 1987. *The fall of the Bell system.* Cambridge: Cambridge University Press.
- Waverman, Leonard. 1989. U.S. interexchange competition. In *Changing the rules: Technological change, international competition, and regulation in communications*, ed. Robert W. Crandall and Kenneth Flamm. Washington, D.C.: Brookings Institution.

Comment Shin-Horng Chen

When talking about liberalization, one may expect free competition with few regulations. This is not the case in telecommunications. Market opening in telecommunications around the world is often followed by regulation or, to be more precise, re-regulation. In his paper, Robert Crandall tries to show us that according to the U.S. experience, regulations can undermine market opening. He begins by listing four requisites of successful liberalization, namely, no rate distortion, elimination of facility bottlenecks, market incentives only for promoting entry, and a commitment to phase out regulation very soon after entry occurs. For the benefit of readers, Crandall may need to elaborate on those requisites.

However, in the United States and many other countries, rate distortion does occur because of cross-subsidies and, more important, because of universal service requirements. Like it or not, universal service has been considered essential to telecommunications. Thus arises the question of how regulators should deal with the universal service requirement if they are to eliminate rate distortion.

Crandall also suggests regulators get rid of facility bottlenecks mainly in terms of interconnection. In this regard, equal access may be required. However, he has observed that the FCC went too far in mandating "equal access," requiring local carriers to offer connection services to AT&T and its long-distance call rivals at the "same" rate. This gave AT&T's rivals an advantage because local carriers' costs of connection to AT&T were generally cheaper than those to AT&T's rivals. On the surface, setting interconnection fees at the same rate for AT&T and its rivals may be fair, but it ignores the marginal cost pricing principle. Having said that, the above observation may also mean that AT&T has enjoyed advantages over its rivals in terms of getting access to interconnection, which seems to be the legacy of AT&T as the incumbent in the United States. How long

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should the regulator and new entrants live with such an incumbency advantage without taking any action?

Crandall also suggests that apart from the interconnection requirement, regulators can encourage facility-based entry to promote network competition. This may be desirable and feasible for a large country such as the United States, but for a small country such as Taiwan, facility-based entry and network competition may be limited to some extent by its territory and market size. As a matter of fact, we have seen operators around the world forge strategic alliances and mergers to provide interconnected services. This may mean that network competition need not take the form of facility integration.

The 1996 U.S. Telecommunications Act requires regulators to regulate the rates for wholesale services provided by local call carriers on the basis of forward-looking estimates of long-term incremental costs. This rule together with the policy requiring the unbundling of all local network elements, according to Crandall, has prohibited entry into local call services through the construction of new facilities. However, if historical embedded costs are used to determine the rates for wholesale services, different problems may arise. For example, we in Taiwan asked Chunghwa Telecom (CHT), the incumbent, to rebalance its tariffs. CHT has done so by basing its new tariffs on historical costs. However, one may argue that CHT's historical costs probably include the costs of X-inefficiency, which are the legacy of CHT as the state monopoly. As a result, CHT's new tariff structure may not reflect productive efficiency. Therefore, using the historical cost approach to determine tariff rates may not be appropriate.

In principle, we all agree that liberalization means allowing market forces to prevail, but I am not entirely convinced by Crandall's call for a governmental commitment to phase out regulation very soon after entry occurs—while how soon is open to interpretation. It is feasible and desirable to introduce competition into the telecommunications industry. Having said that, the industry has retained the features of scale and scope economies in certain segments of the market. Also, there are incumbency advantages against new entrants. Certain regulations or regulatory oversight may therefore be needed for some time to foster an environment of fair competition.

Comment Tsuruhiko Nambu

In 1996, the U.S. Telecommunications Law was revised from its 1934 form. What was most impressive to me at that time was the spirit of the newly

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revised law, captured in the following: "The objective of this law is not to protect competitors but to protect or enhance competition." Last summer, however, we got the orders of the FCC, and I was totally surprised to see that the spirit of the law had more or less faded. Robert Crandall's paper is an excellent exposition of the basic problems of the U.S. situation. I will summarize the relevant issues.

1. FCC regulation may have the effect of inhibiting facility-based entry into the local market.

2. This follows from the orders of the FCC saying that interconnection should be done at the forward-looking cost. Forward-looking cost means the best technology available in the foreseeable future.

3. If regional Bell operating companies (RBOCs) always interconnect newcomers on the basis of forward-looking cost, newcomers will lose the incentive to invest in the local loop simply because investment is meaningless when they are guaranteed the best technology at the cheapest cost by the incumbents.

It is my understanding that the present situation was brought about by the deep-rooted conflict between RBOCs and long-distance carriers, which is traceable to the accidental decision of the AT&T breakup. The difficulties now stem from confused decisions at that time. The LATA concept is an example. Artificial lines were drawn between local areas partly based on the advice of AT&T. It became a big burden on telecommunications players. But the situation is more or less the same in Japan, where the dispute over the desirability of breaking up Nippon Telephone and Telegraph (NTT) continued until 1997.

Summing up, the U.S. model has traits that are highly colored by the historical accidents of the AT&T antitrust case. My feeling is that the U.S. experience cannot be a useful model for developing countries because in such countries government or public monopoly is a major player and anti-trust forces are not at work.

The Japanese model might be more applicable to these countries because, in Japan, a public monopoly (NTT) was privatized and competition was introduced. But I must also stress that government is a dangerous thing. Yesterday, government was like a chicken, but in my view, government is now like a cat in telecommunications regulation.

Finally, I will touch on the divestiture problem. The main points are stated in Nambu (1997). In my view, the divestiture plan was doubtful in that it may help create more competitive structure in the future. On top of that, the AT&T breakup teaches us a lesson. After divestiture the RBOCs and AT&T became true opponents and mutual mistrust developed. Now the RBOCs and long-distance carriers are discussing interconnection rules.

Huge documents exist on the study of different engineering models:

Hatfield I, II, III; the benchmark cost model I, II, III; the Strategic Planning Policy Alliance model; and so forth. Some of them are sponsored by the RBOCs, others by long-distance carriers. The results of calculations of reasonable charges are totally diverse. Of course, there cannot be an absolutely accurate figure for interconnection charges. The fatal problem is the insurmountable mistrust between the RBOCs and long-distance carriers. Divestiture may well create this kind of difficulty as a by-product.

I stress the peculiarity of telecommunications networks, where the platform of interconnection plays a decisive role for developing the industry. If people put too much weight on competition policy where divestiture is the choice for promoting competition, they may lose sight of the economic losses caused by the selfish and myopic behavior of telecommunications carriers.

Reference

- Nambu Tsuruhiko. 1997. Is "bottleneck" a viable concept for the breakup of NTT? *Telecommunications Policy* 21 (2): 113-26.