

# **The Telecommunications Act of 1996 and its Impact\***

by Nicholas Economides\*\*

September 1998

## *Abstract*

This paper analyzes the effects on the implementation of the Telecommunications Act of 1996 (“Act”) on US telecommunications markets and is based on my forthcoming book with the same title. The Act is a milestone in the history of telecommunications in the United States. Coming 12 years after the breakup of AT&T, the Act attempts to move all telecommunications markets toward competition. The Act envisions competition in all telecommunications markets, both in the markets for the various elements that comprise the telecommunications network, as well as for the final services the network creates. Building on the experience of the long distance market, which was transformed from a monopoly to an effectively competitive market over the last 12 years, the Act attempts to promote competition in the hitherto monopolized local exchange markets. The Act recognizes the telecommunications network as a network of interconnected networks. Telecommunications providers are required to interconnect with entrants at any feasible point the entrant wishes. Most importantly, the Act requires that incumbent local exchange carriers (“ILECs”) (i) lease parts of their network (unbundled network elements) to competitors “at cost”; (ii) provide at a wholesale discount to competitors any service the ILEC provides; and (iii) charge reciprocal rates in termination of calls to their network and to networks of local competitors. Moreover, the Act requires that ILECs that came out of the Bell System meet a number of requirements, including a public interest test, before they may enter into the long distance market. Thus, the Act provides some safeguards against the export of ILEC monopoly power to other parts of the network. Numerous legal challenges to the Act and its implementation have been raised by the ILECs resulting in very slow implementation of the Act, and, in many cases, in no substantial implementation of the provisions of the Act. Thus, more than two years after the passage of the Act, there is very little entry and competition in local exchange markets. In response to the apparent failure of the implementation Act, there has been a wave of mergers in the US telecommunications industry.

Key Words: telecommunications, regulation, competition

JEL Classification: L1, D4

\* Presented at the Annual Telecommunications Policy Conference, Tokyo, Japan, December 4, 1997. I thank Hajime Hori, Bob Kargoll, Steve Levinson, and two anonymous referees for helpful comments.

\*\* Stern School of Business, New York, NY 10012. Tel. (212) 998-0864, fax (212) 995-4218. E-mail: [neconomi@stern.nyu.edu](mailto:neconomi@stern.nyu.edu), [www: http://raven.stern.nyu.edu/networks/](http://raven.stern.nyu.edu/networks/)

# The Telecommunications Act of 1996 and its Impact

## 1. Introduction

The telecommunications sector has witnessed dramatic reductions in costs in (i) transmission, using fiberoptic technology; (ii) switching and information processing because of reductions of costs of integrated circuits and computers. Cost reductions have made feasible many data- and transmission-intensive services.

Cost reductions usually allow for entry of more competitors and intensification of competition. However, in telecommunications, consumers have not reaped the full benefits of cost reductions and intensification of competition because of an antiquated regulatory framework that, ironically, was created to protect consumers from monopolistic abuses.

The telecommunications sector has witnessed progressive deregulation. The AT&T breakup (Modification of Final Judgement, “MFJ”) in 1984 resulted in competition in manufacturing, long distance,<sup>1</sup> and information services, while it kept the regime of regulated monopoly in local telephony.

The direct effect of the breakup of AT&T was competition in long distance. AT&T’s share in long distance is presently at about 50%. At the same time, unexpectedly, local telephone companies (Local Exchange Companies, “LECs”) have realized significant profits.

In parallel, wireless telephony grew to great success. The “world wide web” emerged as a ubiquitous network “living” on top of the telephone network. Cable

---

<sup>1</sup> Local exchange carriers that came from the Bell System (AT&T), Regional Bell Operating Companies (“RBOCs”), were not allowed to compete in the long distance market under the MFJ.

television achieved high penetration. New (and cheaper) wireless services (Personal Communications Services “PCS”) and direct satellite broadcast are reaching the market.

## **2. Goals of the Act**

With this background, President Clinton signed the Telecommunications Act of 1996 (“Act” or “1996 Act”) into law in February 1996. This was the first major reform since the original 1934 Telecommunications Act. The Telecommunications Act of 1996 attempts a major restructuring of the US telecommunications sector.

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

The Act will be judged favorably to the extent that it allows and facilitates the acquisition by consumers of the benefits of technological advances. Such a function requires the promotion of competition in all markets. This does not mean immediate and complete deregulation. Consumers must be protected from monopolistic abuses in some markets as long as such abuses are feasible under the current market structure. Moreover, the regulatory framework must safeguard against firms leveraging their monopoly power in other markets.

In passing the Telecommunications Act of 1996 (“1996 Act”) Congress took radical steps to restructure U.S. telecommunications markets. These steps may result in very significant benefits to consumers of telecommunications services, telecommunications

---

carriers, and telecommunications equipment manufacturers. But the degree of success of the 1996 Act depends crucially on its implementation through decisions of the Federal Communication Commission and State Public Utility Commissions as well as the outcomes of the various court challenges that these decisions, and the Act itself, face.

The 1996 Act envisions a network of interconnected networks that are composed of complementary components and generally provide both competing and complementary services. The 1996 Act uses both *structural* and *behavioral* instruments to accomplish its goals. The Act attempts to reduce regulatory barriers to entry and competition. It outlaws artificial barriers to entry in local exchange markets, in its attempt to accomplish the maximum possible competition. Moreover, it mandates interconnection of telecommunications networks, unbundling, non-discrimination, and cost-based pricing of leased parts of the network, so that competitors can enter easily and compete component by component as well as service by service.

The 1996 Act imposes conditions to ensure that *de facto* monopoly power is not exported to vertically-related (complementary) markets. Thus, the Act requires that competition be established in local markets *before* the incumbent local exchange carriers are allowed in long distance service.

The Act preserves subsidized local service to achieve “Universal Service,” that is, the provision of basic local service to the widest possible number of customers. However, the Act imposes the requirement that subsidization is transparent and that subsidies are

raised in a competitively neutral manner. Thus, the Act leads the way to the elimination of subsidization of Universal Service through the traditional method of high access charges.<sup>2</sup>

A potential drawback of the Act is that it does not provide for penalties for non-compliance. It rather relies on the firms' own incentives to drive them to choose according to what the Act expects. In this respect, the Act may have underestimated the ability of incumbents to stall the implementation process of the Act. Moreover, the Act definitely overestimated the importance of ILECs' long distance entry as an incentive for ILECs to open their local markets to competition. In the last two years, without exception, the ILECs chose to forego long distance entry and rather continue to receive local service monopoly profits.

### 3. **History**

Telecommunications has traditionally been a regulated sector of the US economy. Regulation was imposed in the early part of this century and remains until today in various parts of the sector.<sup>3</sup> The main idea behind regulation was that it was necessary because the market for telecommunications services was a natural monopoly, and therefore a second competitor would not survive. Regulation was imposed to protect consumers from monopolistic abuses.

---

<sup>2</sup> Origination and termination access charges are paid by long distance companies to local exchange carriers for originating or terminating long distance calls to LEC customers. Access charges have been set at high levels purportedly to subsidize Universal Service.

<sup>3</sup> The telecommunications sector is regulated both by the Federal Government through the Federal Communications Commission ("FCC") and by all States, typically through a Public Utilities Commission ("PUC") or Public Service Commission. Usually a PUC also regulates electricity companies.

As early as 1900, it was clear that all telecommunications markets were *not* natural monopolies, as evidenced from the existence of more than one competing firms in many regional markets, prior to the absorption of most of them in the Bell System.<sup>4</sup> Over time, it became clear that some markets were *not* natural monopolies any more, and that it was better to allow competition in those markets while keeping the rest regulated.

The market for telecommunication services and for telecommunications equipment went through various stages of competitiveness since the invention of the telephone by Alexander Graham Bell. After a period of expansion and consolidation, by the 1920, AT&T had an overwhelming majority of telephony exchanges and submitted to State regulation. Federal regulation was instituted by the 1934 Telecommunication Act which established the Federal Communications Commission.

Regulation of the U.S. telecommunications market was marked by two important antitrust lawsuits that the U.S. Department of Justice brought against AT&T. In the first one, *United States v. Western Electric*, filed in 1949, the U.S. Department of Justice (“DOJ”) claimed that the Bell Operating Companies practiced illegal exclusion by buying only from Western Electric, a part of the Bell System. The government sought a divestiture of Western Electric. The case was settled in 1956 with AT&T agreeing not to enter the computer market, but retaining ownership of Western Electric.

The second major antitrust suit, *United States v. AT&T*, was started in 1974. The government alleged that (i) AT&T’s relationship with Western Electric was illegal, and (ii) that AT&T monopolized the long distance market. The DOJ sought divestiture of both manufacturing and long distance from local service. The case was settled by the

---

<sup>4</sup> See Gabel and Weiman (1994) and Mueller (1997).

Modified Final Judgement (“MFJ”). This decree broke away from AT&T seven regional operating companies (“RBOCs”). Each RBOC was comprised of a collection of local telephone companies that were part of AT&T before the breakup. Regional Bell Operating Companies remained regulated monopolies, each with an exclusive franchise in its region.

Microwave transmission was a major breakthrough in long distance transmission that created the possibility of competition in long distance. The breakup of AT&T crystallized the belief that competition was possible in long distance, while the local market remained a natural monopoly. The biggest benefits to consumers during the last fifteen years have come from the long distance market, which, during this period was transformed from a monopoly to an effectively competitive market.

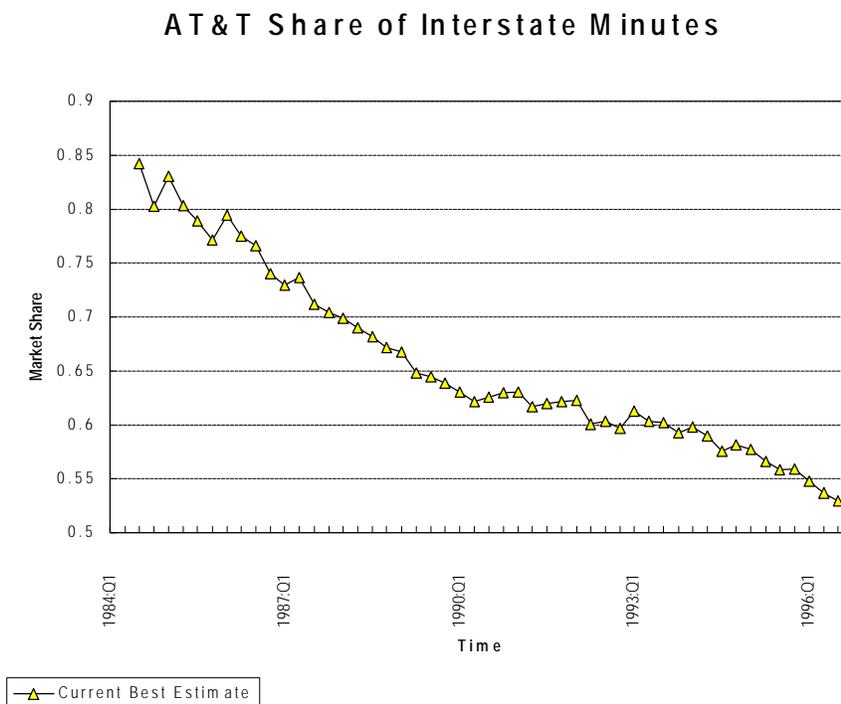
Competition in long distance has been a great success. The market share (in minutes of use) of AT&T fell from 85% to 53% at the end of 1996, as seen in Figure 1.<sup>5</sup> Since the MFJ, the number of competitors in the long distance market has increased dramatically. There are five large facilities-based competitors, AT&T, MCI, Sprint, LDDS-Worldcom, and Frontier.<sup>6</sup> There is also a large number of “resellers” that buy wholesale service from the facilities-based long distance carriers and sell to consumers. For example, currently, there are about 500 resellers competing in the California interexchange market, providing very strong evidence for the ease of entry into this

---

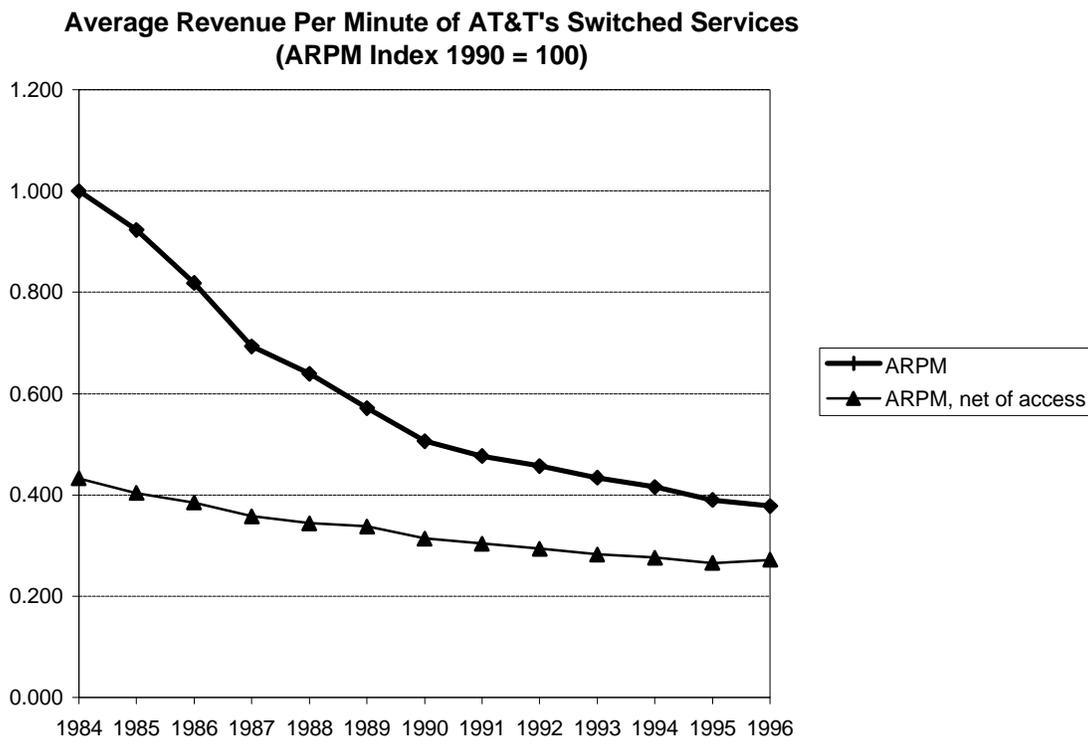
<sup>5</sup> Source: FCC (1996).

<sup>6</sup> These will be limited to four if the merger of MCI and WORLDCOM is approved by regulators and antitrust authorities. Frontier is the new name of Rochester Telephone. In mid 1998 Qwest entered the long distance market as a facilities-based competitor with a nationwide network. Level 3 and others have recently constructed fiberoptic networks and are expected to enter the long distance (data and voice)

market. At least 20 new firms entered the California market in each year since 1984. At present, there are at least 5 “out of region” RBOCs providing service in California through affiliates. In California, a typical consumer can choose from at least 150 long distance companies.



the long distance market by the FCC in 1995.<sup>8</sup> Most economists agree that presently the long distance market is *effectively competitive*.<sup>9</sup>



**Figure 2**

A long distance phone call is carried by the local telephone companies of the place it originates and the place it terminates, and only in its long distance part by a long distance company. Thus, “originating access” and “terminating access” are provided by local exchange carriers to long distance companies and are essential bottleneck inputs for

<sup>8</sup> See Federal Communications Commission (1995).

<sup>9</sup> The claim of tacit collusion in the long distance proposed by MacAvoy (1995) and others has been effectively rebutted by Bernheim and Willig (1997), Hall (1997), Hubbard and Lehr (1994), and Mayo (1996). See also MCI (1997).

long distance service. Origination and termination of calls are extremely lucrative services. Terminating access has an average total cost (in most locations) of \$0.002 per minute. Its regulated prices vary. A typical price is \$0.032 per minute, charged by NYNEX. Such pricing implies a profit rate of 1500%.<sup>10</sup> Access charges reform is one of the key demands of the pro-competitive forces in the current deregulation process.

Local telephone companies that came out of the Bell System (Regional Bell Operating Companies, "RBOCs") actively petitioned the U.S. Congress to be allowed to enter the long distance market, from which they were excluded by the MFJ. The MFJ prevented RBOCs from participation in long distance because of the anticompetitive consequences that this would have for competition in long distance.<sup>11</sup>

The great success of competition in long distance allowed US Congress to appear "balanced" in the Telecommunications Act of 1996 by establishing competition in local telephony, while allowing RBOCs into long distance after they meet certain conditions. However, the transition of local markets to effective competition will not be as easy or as quick as in the long distance markets. This is because of the nature of the product and the associated economics.

Many telecommunications companies are presently trying to be in as many markets as possible so that they can bundle the various products. Companies believe that consumers are willing to pay more for bundled services for which the consumer receives a

---

<sup>10</sup> Termination pricing varies. Pacific Bell, under pressure from the California Public Utilities Commission, now has an access charge of \$0.016 per minute, giving it a profit rate of 700%.

<sup>11</sup> The anticompetitive effects would arise because of the monopoly control by an RBOC of essential "bottleneck" inputs for long distance services, such as terminating access of phone calls to customers that live in the local companies to long distance companies, and are essential bottleneck inputs for long distance service.

single bill. Bundling also discourages consumers from migrating to competitors, who may not offer the complete collection of services, so consumer “churn” is expected to be reduced.

#### **4. Entry in Local Services as Envisioned by the Act**

Currently, the “last mile” of the telecommunications network that is closest to the consumer (the “local loop”) remains a bottleneck controlled by an incumbent local exchange carrier (“ILEC”), a Regional Bell Operating Company, GTE, or a smaller independent. The Telecommunications Act of 1996 boldly attempts to introduce competition in this last bottleneck, and in all parts of the local exchange market, while preserving the effective competition that has developed in the long distance market. Before competition takes hold, the Act attempts to create conditions that imitate competition in the local exchange.

With present technology, entry in the local exchange is inherently more difficult than entry in long distance. Among the factors that contribute to that are:

- (i) High capital requirements. Building the “local loop” that connects the customer to the network requires much more capital *per customer* than creating a long distance network.
- (ii) Need for significant cooperation with the local telephone company that the entrant plans to compete against.
- (iii) Location-specific constraints. While many elements/components of the long distance network are moveable, much of the investment in the local exchange has to be made at specific locations.

To facilitate entry in the local exchange, the Act imposes mandatory interconnection, unbundling, and number portability. In particular, Section 251(c)(2) mandates

“*interconnection*,

- (B) at any technically feasible point
- (C) that is at least equal in quality to that provided by the local exchange carrier to itself or to any subsidiary, affiliate, or any other party to which the carrier provides interconnection; and
- (D) on rates, terms, and conditions that are just, reasonable, and nondiscriminatory, in accordance with the terms and conditions of the agreement and the requirements of this section and section 252.”

Section 251(c)(3) mandates *unbundling*, that is, offering for sale network elements at “rates, terms, and conditions that are just, reasonable, and nondiscriminatory.” To implement interconnection and unbundling, an incumbent is required to allow for physical *collocation* of equipment at its premises [251(c)(6)]. Moreover, all companies have the duty to provide number portability [251(b)(2)], so that consumers can keep their phone numbers if they change local service provider.

The Act introduces two novel ways of entry, besides entry through the installation of own facilities. The first way allows entry in the retailing part of the telecommunications business by requiring incumbent local exchange carriers (“ILECs”) to sell at wholesale prices to entrants any retail service that they offer. Such entry is essentially limited to the retailing part of the market.<sup>12</sup>

---

<sup>12</sup> The Act states that prices for resold wholesale services will be set as follows: “a State commission shall determine wholesale rates on the basis of retail rates charged to subscribers for the telecommunications service requested, excluding the portion thereof attributable to any marketing, billing, collection, and other costs that will be avoided by the local exchange carrier.” [252(d)(3)] Notice that, even if all avoided costs are appropriately identified and deducted from final prices, the ILEC is still able to collect the pre-entry retail profit from resold wholesale services.

#### **4.1 Entry Through Leasing of Unbundled Network Elements**

The second and most significant novel way of entry introduced by the Act is through leasing of unbundled network elements from incumbents. In particular, the Act requires that ILECs (i) unbundle their networks; and (ii) that they offer for lease to entrants network components (unbundled network elements, “UNEs”) “at cost plus reasonable profit.”<sup>13</sup> Thus, the Act envisions the telecommunications network as a decentralized network of interconnected networks.

Entry through leasing of unbundled network elements would be uneconomical unless prices for the leased elements were set at appropriate prices that imitate competitive prices. The Act orders:

Pricing of interconnection or unbundled network elements [252(d)(1)]

- “(A) shall be
- (i) based on the cost (determined without reference to a rate-of-return or other rate-based proceeding) of providing the interconnection or network element (whichever is applicable), and
  - (ii) nondiscriminatory, and
- (B) may include a reasonable profit.”

Appropriate pricing of unbundled network elements, transport, and access termination is crucially important for promoting effective competition. The extent to and the speed with which competition will develop depend critically on having prices for unbundled network elements and services that are as close to efficient economic costs as possible. The more prices exceed efficient economic costs, the less entry there will be. The less entry there is, the less likely it will be that effective competition will develop in

---

<sup>13</sup> The FCC and State Regulatory Commissions have interpreted these words to mean Total Element Long Run Incremental Cost (“TELRIC”) which is the forward looking, long run, (minimized) economic cost of an unbundled element and includes the competitive return on capital.

local exchange markets, and, if effective competition does develop, it will happen more slowly.

There is only one cost measure that fulfills both the requirement of the 1996 Act that the rates for unbundled network elements must be nondiscriminatory, and the need for that requirement to apply not only to the rates charged to different entrants, but also between the entrants and the incumbent. That cost measure is the long-run forward-looking economic cost, or Total Element Long Run Incremental Costs (“TELRIC”).

TELRIC is the sum of minimized costs paid for all inputs required to supply the unbundled network element. TELRIC has the following features: (1) it is a forward-looking economic cost; (2) it is the least cost to provide the service; (3) it is a long run cost; (4) it is an incremental cost; (5) it includes a competitive return on capital; (6) it excludes monopoly rents; (7) it excludes cross subsidies of any kind; and (8) in general, it reflects cost differences among geographic regions.

Using TELRIC as the basis for prices performs several functions which, in combination, guarantee economic efficiency. First, it gives the right signal to consumers in making purchasing decisions among goods, because then these decisions are made on the basis of what society must give up to supply these goods. In other words, it achieves allocative efficiency. Second, such a price directs production to the most efficient, least-cost suppliers, because these producers can offer the lowest prices. In other words, it achieves productive efficiency. Third, it gives the appropriate signal to firms in decisions

---

of investment, entry, and exit, because firms make these decisions purely on the basis of forward-looking costs. In other words, it achieves dynamic efficiency.

#### **4.2 Costs of Unbundled Network Elements Cannot be Based on Private Opportunity Cost; the Irrelevance of ECPR and M-ECPR**

Note that since pricing of leased unbundled network elements is based on cost, it cannot be based on prices of the service for which the element is used, unless prices for all final services are based on cost. For example, the rent price of a switch cannot be determined from the final price of the traffic it carries (local, long distance, or international). This implies that Act does not allow unbundled network elements to be leased at a price equal to *private* opportunity cost, since private opportunity cost (i) is based on the final price of the service for which the element is used; (ii) typically includes the supernormal profits of the incumbent; and (iii) may include past inefficiencies reflected in higher than efficient costs. It follows that rules that base prices on private opportunity cost, such as the efficient component pricing rule (“ECPR”) are contrary to the intent of the Act to promote competition in all telecommunications markets.

The ECPR was first proposed by Willig (1979) and Baumol (1983). In State regulatory hearings during 1997, GTE proposed a variant of ECPR, named M-ECPR. Consider a situation where a good or service  $AB$  is composed of two components,  $A$  and  $B$ , which, for simplicity, are assumed to be combined in a 1:1 ratio. Assume further that firm 1 is originally a monopolist for goods  $A$  and  $B$ , and good  $A$  is required for the production of service  $AB$ , that is,  $A$  is a “bottleneck.” In local exchange markets, the bottleneck service  $A$  is termination access to the customers of the incumbent local

exchange carrier. For simplicity, let the unit cost of component A be  $c_A$ , and the cost of component B be  $c_B$ , while good AB is sold at price  $p_{AB}$ . Now suppose that a new firm (firm 2) enters the market for B and would like to produce service AB. The ECPR sets an “access fee,” or price, for component A, to be paid by firm 2, equal to the pre-entry (monopoly) price of final good AB minus the cost of component B, that is, at  $p_{A,ECPR} = p_{AB} - c_B$ . The ECPR access fee  $p_A$  is thus equal to the cost of A,  $c_A$ , plus the *private* opportunity cost (i.e., profit) of the incumbent,  $(p_{AB} - c_A - c_B)$ , i.e.,  $p_{A,ECPR} = c_A + (p_{AB} - c_A - c_B) = p_{AB} - c_B$ . The inclusion of the incumbent’s *private* opportunity cost (profit) in the access fee implies a perpetuation of inefficient pricing despite entry.

The ECPR was proposed as a way to insure *productive efficiency*, i.e., that the least cost technology is used in production. The ECPR guarantees to the incumbent monopolist its pre-entry profit margin no matter who produces the good (the incumbent or the entrant). Therefore, an entrant that has higher costs for B than the incumbent cannot survive after paying the ECPR-implied fee to the incumbent. This precludes inefficient entry.

Although the ECPR has been proposed as a way to exclude entry in the complementary good market by *inefficient* entrants, it can be used to exclude or marginalize equally efficient or more efficient rivals when there are increasing returns to scale. The bottleneck monopolist may use the ECPR to establish high interconnection or access charges that result in a restriction of the scale of operation of the rival in the complementary market. Given increasing returns to scale, the rival then operates at the high end of its average cost curve. Thus, the monopolist is able to raise the production costs of its rival through the application of the ECPR. This results in a competitive

disadvantage for the rival, as well as in higher prices for final services. Consumers are deprived of lower prices that would have resulted from competition if ECPR were not applied, as well as of competitive choices.

Moreover, in attempting to achieve productive efficiency, the ECPR and related rules force consumers to pay a terrible price in terms of unrealized price decreases and lost consumers' surplus that would have been realized if these rules were not imposed.

Application of the ECPR results in an allocative inefficiency. Moreover, often the loss in allocative efficiency that results from the use of the ECPR (or the M-ECPR) is much larger than any potential gains in productive efficiency from its use. This is proved in Economides and White (1995, 1998). Their argument is simple. Use of the ECPR results in an allocative efficiency (dead weight) loss whenever the original price was above cost. If the entrant/rival is equally efficient as the incumbent, there is productive efficiency loss due to entry, and therefore application of the ECPR results in a pure efficiency loss. If the entrant is productively inefficient, the productive efficiency loss due to entry has to be balanced with the allocative inefficiency created by the ECPR. Economides and White (1995, 1998) show that, for a wide range of parameters, the allocative efficiency losses of the application of ECPR are higher than the productive efficiency losses that would result if an inefficient entrant entered when the ECPR was not applied. Thus, in terms of total efficiency, use of the M-ECPR and the ECPR is detrimental to social welfare and to overall efficiency.

The fallacy of the proponents of the ECPR and the M-ECPR lies in confusing *social* opportunity cost with *private* opportunity cost. Social opportunity cost of a resource reflects the present social cost of the resource and should be correctly included in

a cost calculation. Private opportunity cost is the benefit or cost to a private party of a certain activity. Private opportunity cost differs in general from social opportunity cost, since private opportunity cost does not, in general, reflect the cost of resources to society, which social opportunity cost does.

An example will be helpful to understand the difference. Suppose that two companies, X and Y are competing for the business of customer C, which is worth \$C to each of them. Assume that X and Y are equally cost efficient in serving C. If customer C used to buy from X and now buys from Y, firm X's *private* opportunity cost is \$C. However, the *social* opportunity cost of the switch of customer C from X to Y is exactly zero, since society does not gain or lose from customer C's change of carrier. Essentially, since firm X's loss was firm Y's gain, private opportunity costs and gains canceled each other, and the social cost of customer C's change of carrier is zero.

Prices based on social opportunity cost are efficient but prices based on private opportunity cost are inefficient. Economic theory teaches that, to achieve allocative, productive, and dynamic efficiency, *social* (rather than *private*) opportunity costs (and benefits) should guide pricing decisions. Private opportunity costs differ, in general, from social opportunity costs. In the pricing of access to monopolized bottleneck facilities, there is significant private benefit to the owner of a bottleneck facility in charging a high price for access to the facility. However, high prices of access would result in a significant social loss because they result in prices of final services that are higher than the efficient prices. Therefore, an incumbent monopolist should not be compensated for its (private) opportunity costs (that is, its lost profits) that result from entry of a rival.

Inefficiencies also arise from the application of the ECPR when the monopolist's

costs are not well-known or not transparently observable. The ECPR access fee to the bottleneck facility is equal to the price of the final service minus the incumbent's incremental cost of the complementary component. Thus, when the ECPR is applied, the monopolist has an incentive to understate its incremental costs of the production of the complementary component (i.e., the service where it faces competition) and then employ the ECPR to levy an exclusionary access fee to its rival. This results in higher incremental costs even for a rival that is equally efficient or more efficient than the incumbent. Thus, *even equally efficient or more efficient rivals can be excluded*. In this case the ECPR and the M-ECPR fail in their declared objective, which is to exclude only inefficient entrants.<sup>14</sup>

Even if the monopolist were constrained not to earn positive economic profits in the bottleneck market, if its costs are not perfectly observed, it can claim that some incremental costs of the complementary services are incremental costs of the bottleneck service. Lower incremental costs of the complementary component justify a higher charge for the bottleneck under the ECPR. Again, this higher charge will deter even those rivals which are more efficient than the monopolist in the production of the complementary component.

One of the fundamental properties of a competitive environment is free and unencumbered entry. Free entry drives the competitive process and leads markets to

---

<sup>14</sup> For example, suppose the actual costs of the incumbent were \$0.50 for component A and \$0.40 for component B, and final service AB was originally sold at \$1.20, with a profit of \$0.30. The ECPR access fee for A is \$0.80 ( $= 0.50 + 0.30 = 1.20 - 0.40$ ). If costs are unobservable from the outside, the incumbent has an incentive to claim that the cost of its B component is lower (and consequently that its original profit rate is higher). For example, the incumbent can claim that the cost of B is \$0.36, which is 10% lower than its actual cost of \$0.40. This results in a profit of \$0.34 ( $= 1.20 - 0.50 - 0.36$ ), and an ECPR access fee of \$0.84 ( $= 0.50 + 0.34 = 1.20 - 0.36$ ). Facing this access fee, entrants that are equally efficient in the production of B as the incumbent, i.e., with cost of \$0.40, are foreclosed from entering since they can only sell AB at \$1.24 ( $= 0.84 + 0.40$ ), while the entrant still sells at \$1.20.

lower prices as well as efficient production. On the other hand, the ECPR preserves the market power of an incumbent monopolist. It increases the costs of entrants in the good that is complementary to the bottleneck by acting as an “entry tax,” i.e., an extra cost that entrants have to pay to enter. When the ECPR is applied, entrants face a smaller potential profit margin (difference between consumers’ willingness to pay and cost). Thus, the ECPR diminishes entry and competition in the complementary goods market, and results in higher prices for final services.

Starting from a situation of inefficiently high prices for final services, application of the ECPR preserves these high prices by setting prices for intermediate goods at inefficiently high levels. Thus, competition is not allowed to take its course and drive prices to competitive, efficient levels. Application of the ECPR prevents the natural tendency of the market to self-regulate itself through competition.

It is prohibitively complex and difficult to apply the ECPR in practice. The ECPR defines an access fee for the monopolized service of the incumbent that includes the private opportunity cost to it resulting from entry in a complementary market. In telecommunications there are hundreds of goods/markets that are complementary to a typical monopolized bottleneck such as the “local loop.” These markets correspond to various vertical services that LECs currently provide, as well as to various geographic locations of intraLATA, long distance, and international destinations where calls originating from that loop may terminate. It is clear that these markets have different prices and various price discrimination schedules are used. Adoption of the ECPR requires that a different access fee be determined for the same good or service, say access to the local loop, depending on its use in combination with other goods and services. This

means hundreds of different ECPR-derived access fees for the same good -- clearly an unmanageable situation (as well as discriminatory). Further, even if a regulatory agency is able to untangle this chaotic situation and assign correctly the hundreds of ECPR-based prices to the same bottleneck service or unbundled network element, it would be almost certainly of no use. In the presence of different prices for the same service, there are very strong incentives for providers of complementary unbundled network elements and services to rearrange their own pricing structure so as to arbitrage the price of the monopolized element to a single price. And, that price will have, in general, little discernible relation to the hundreds of ECPR-based prices that the administrative agency would have worked so hard to set. In short, administratively, ECPR-based prices are unworkable and unlikely to last. It is much easier, as well as more efficient, to price unbundled network elements without reference to private opportunity costs.

In its First Report and Order (FCC (1996)), the FCC ruled that the ECPR was not appropriate for setting prices for unbundled network elements. In many State regulatory hearings on the implementations of the Act, GTE proposed a variant of ECPR, named M-ECPR. The M-ECPR suffers from the same problems as the ECPR and was correctly uniformly rejected by State regulatory commissions. The lack of validity of the ECPR and of related rules is discussed in more detail in Economides (1998c), Economides and White (1995) and Economides and White (1998).

#### **4.3 Implementation of the Act's Provisions on Entry Through Leasing of UNEs**

Many firms, including the large interexchange carriers AT&T and MCI, attempted to enter the market through "arbitration" agreements with ILECs under the supervision of State Regulatory Commissions, according to the procedure outlined by the Act. The

arbitration process proved to be extremely long and difficult, with continuous legal obstacles and appeals raised by the ILECs. To this date (March 1998), more than two years after the signing of the Act by President Clinton, there has been very little progress in the implementation of the Act. No State has completed the implementation of the Telecommunications Act of 1996. Only 15 of the 50 States have adopted permanent prices for unbundled network elements.<sup>15</sup>

Two other significant obstacles have arisen in the path of entry in the local market. The first is the insistence of ILECs to collect significant non-recurring costs in the leasing of unbundled network elements and in reselling wholesale services to entrants. The ILECs demanded significant non-recurring costs that were often many times higher than the level that ILECs charge their customers for similar changes in service. Often these costs were exaggerated because they were not calculated using the most efficient production technology. This leads to the second obstacle. Costs of customer migration or of UNE leasing were calculated on the basis of manual one-by-one transactions. ILECs have been extremely slow to implement electronic interfaces (similar to the ones used to migrate long distance customers) that would allow for efficient transfer of customers from themselves to competing carriers. Moreover, ILECs have demanded that entrants pay for all transition costs. To maximize efficiency, transition costs to create electronic interfaces or other such infrastructure should be raised from the whole industry in a competitively-

---

<sup>15</sup> These were Colorado, Delaware, Florida, Georgia, Kentucky, Louisiana, Missouri, Montana, New Jersey, New Hampshire, New York, Oregon, Pennsylvania, Texas, and Wisconsin. Of the states that have adopted permanent prices for UNEs, 5 are in the Bell Atlantic/ NYNEX territory (Delaware, New Hampshire, New Jersey, New York, Pennsylvania). Also note that only 4 states have adopted permanent rates in arbitrations of entrants with GTE (Florida, Montana, Oregon, and Texas). For more details see Hubbard and Lehr (1998).

neutral manner. This is because such transition costs are caused by the 1996 Act (rather than by a particular competitor). Unfortunately, to this date in no State have ILECs completed the setup and implementation of such electronic interfaces.

In the absence of final prices, given the uncertainty of the various legal proceedings, and without final resolution on the issues of non-recurring costs and of the electronic interface for switching local service customers across carriers, entry in the local exchange through leasing of unbundled network elements has been minimal. Moreover, entry in the retailing part of the business through total service resale has also been minimal, since the wholesale discounts have been small.

#### **5. Entry of RBOCs in Long Distance Service**

RBOCs (Ameritech, Bell Atlantic, BellSouth, SBC and USWest) have 89% of telephone access lines nationwide. Most of the remainder belongs to GTE. Competitive access providers (who did not hold a franchise monopoly) have less than 1% of residential access lines nationwide. Besides providing access to long distance companies, local exchange carriers also provide lucrative “custom local exchange services” (CLASS), such as call waiting, conference calling, and automatic number identification. Basic local service provided by LECs is considered not to be particularly profitable.

The MFJ which sealed the breakup of AT&T did not allow entry of RBOCs in long distance. The reason for this was that each RBOC was a monopolist in its own region, and there was a clear danger that, if allowed in long distance, the RBOC could engage in a number of anti-competitive actions against its long distance competitors. I discuss such anti-competitive actions in detail below.

The 1996 Act keeps the precaution of the MFJ regarding entry of RBOCs in long distance. Thus, the 1996 Act does not allow entry of RBOCs in long distance until a list of requirements has been met,<sup>16</sup> and the petitioner has proved that its proposal is in the public interest. These requirements can be met only when the market for local telecommunications services becomes sufficiently competitive. If the local market is not competitive when an incumbent LEC monopolist enters into long distance, the LEC can

---

<sup>16</sup> The “checklist” conditions are [section 271(c)(2)(B)]:

- “(i) Interconnection in accordance with the requirements of sections 251(c)(2) and 252(d)(1).
- (ii) Nondiscriminatory access to network elements in accordance with the requirements of sections 251(c)(3) and 252(d)(1).
- (iii) Nondiscriminatory access to the poles, ducts, conduits, and rights-of-way owned or controlled by the Bell operating company at just and reasonable rates in accordance with the requirements of section 224.
- (iv) Local loop transmission from the central office to the customer's premises, unbundled from local switching or other services.
- (v) Local transport from the trunk side of a wireline local exchange carrier switch unbundled from switching or other services.
- (vi) Local switching unbundled from transport, local loop transmission, or other services.
- (vii) Nondiscriminatory access to--
  - (I) 911 and E911 services;
  - (II) directory assistance services to allow the other carrier's customers to obtain telephone numbers; and
  - (III) operator call completion services.
- (viii) White pages directory listings for customers of the other carrier's telephone exchange service.
- (ix) Until the date by which telecommunications numbering administration guidelines, plan, or rules are established, nondiscriminatory access to telephone numbers for assignment to the other carrier's telephone exchange service customers. After that date, compliance with such guidelines, plan, or rules.
- (x) Nondiscriminatory access to databases and associated signaling necessary for call routing and completion.
- (xi) Until the date by which the Commission issues regulations pursuant to section 251 to require number portability, interim telecommunications number portability through remote call forwarding, direct inward dialing trunks, or other comparable arrangements, with as little impairment of functioning, quality, reliability, and convenience as possible. After that date, full compliance with such regulations.
- (xii) Nondiscriminatory access to such services or information as are necessary to allow the requesting carrier to implement local dialing parity in accordance with the requirements of section 251(b)(3).
- (xiii) Reciprocal compensation arrangements in accordance with the requirements of section 252(d)(2).
- (xiv) Telecommunications services are available for resale in accordance with the requirements of sections 251(c)(4) and 252(d)(3).”

leverage its monopoly power to disadvantage its long distance rivals by increasing their costs in various ways, and by discriminating against them in its pricing.<sup>17</sup> The 1996 Act provides that even if all these conditions are met, the entry of RBOCs into long distance must also be in the public interest. This implies that there is a significant hurdle for RBOCs' entry in long distance which may be more difficult to overcome than the fulfillment of the above checklist.

In allowing entry of local exchange carriers into the long distance market, the Act tries not to endanger competition that has developed in long distance by premature entry of RBOCs in the long distance market. However, on this issue, the Act's provisions guarding against premature entry may be insufficient. Hence, to guard against anti-competitive consequences of premature entry of RBOCs in long distance there is a need of a deeper analysis of the consequences of such entry on competition and on consumers' and social welfare.

Once it starts providing long distance service, an ILEC has the incentive and ability to decrease competition in local and local exchange markets through the following actions:

- Cross-subsidization of long distance service from local service revenues.
- The imposition of a vertical price squeezes and other forms of price discrimination on long distance carriers.
- Non-price discrimination (“raising rivals’ costs”), resulting in lower quality, higher costs, and delays for unaffiliated long distance carriers.
- Bundling of local and long distance services before local competition has a

---

<sup>17</sup> See Economides (1998a,b).

chance to develop. Raising customer migration costs if a consumer subscribes to more than one service.

- The selective use of local and long distance bundling schemes to target customers who are more likely to switch to new local service carriers.

These anti-competitive concerns are accentuated by the ILEC's dominant market position in the local exchange market and the lack of incentive for the ILEC to avoid engaging in anti-competitive activity once it has entered the interLATA market.

### **Cross-subsidization**

The fact that an ILEC, if allowed to enter the interLATA market, would provide local, intraLATA, and interLATA services raises a number of anti-competitive concerns. The first anti-competitive concern is cross-subsidization. Multiproduct firms with market power in at least one product market are able to cross-subsidize some lines of business. Such cross-subsidization allows a firm to build-up its brand name and customer base in the subsidized line of business. This is especially likely when a firm enters a new line of business and it has strategic reasons to subsidize this particular line of business. While cross-subsidization is not necessarily a problem in effectively-competitive markets, its presence in monopoly and near-monopoly markets has historically concerned regulators. Cross-subsidization may take place in a variety of ways that harm consumers and potential competitors.<sup>18,19</sup>

---

<sup>18</sup> For example, the ILEC can use its brand name and its associated customer recognition to create a significant strategic advantage for its long distance products. It is also likely that the ILEC will provide this advantage to its newly created division for free. Thus, the ILEC will be benefiting from its position as the incumbent provider of regulated services to market successfully its own competitive services.

### **Vertical Price Squeeze**

Other anti-competitive concerns also arise in the business conduct of a firm that maintains (by itself or through its affiliates) a near monopoly over facilities that are used by its competitors. Beside the cross-subsidization concern mentioned above, a monopolist who also sells a complementary service (by itself or through its affiliate) can impose a *vertical price squeeze* on a competitor in the complementary product market. This happens because the monopolist controls the price of an input of its competitor in the market for the complementary service. For example, an ILEC controls the price of access to the loop by an interexchange carrier. If the ILEC, or its affiliate, is allowed to provide interexchange services as well, it can continue to price access to its competitors significantly above cost while pricing to itself at cost, and thereby squeeze IXC profit margins. The vertical price squeeze can be pushed all the way to the point where the IXC's profit margin becomes zero. An ILEC that also sells toll services (itself or through an affiliate) actually has the *incentive* to impose a vertical price squeeze on its competitors in the interexchange market.

An ILEC's use of a vertical price squeeze allows it or its affiliate to charge prices for interexchange services that are significantly (and artificially) below the prices of its rivals. This is the fastest way for an ILEC (or its affiliate) to gain a significant share of the

---

<sup>19</sup> For example, in California, Pacific Bell has recently admitted that it has such plans. In a recent CPUC hearing to consider the Certificate of Public Convenience and Necessity ("CPCN") (*see* CPUC Docket No. 96-03-007) application of Pacific Bell Communications (a proposed subsidiary of Pacific Telesis that would provide local and long distance services), it became clear that Pacific Bell Communications was considering offering free basic service when the customer made toll calls of \$50 per month (*see* Transcript of December 16, Hearing of the California Public Utilities Commission, pp. 989-990). Such a plan is a clear attempt at cross-subsidization.

IXC market. Although some claim the contrary, it is in an ILEC's interest to impose a vertical price squeeze on its competitor in the interexchange market. In the absence of regulatory intervention, an ILEC's monopoly control of the access market yields significant monopoly profits. The existence of such high profit margins is what facilitates the imposition of a vertical price squeeze. As regulators implement the 1996 Act and new facilities-based competitors enter the local exchange market, the market for access services, unbundled network elements, and local exchange services will gradually become more competitive. This will make a vertical price squeeze more difficult to impose. Thus, from the point of view of the ILEC, now is the opportune moment to impose a vertical price squeeze and gain significant market share in the interLATA market.

BellSouth New Zealand, a subsidiary of an RBOC, has clearly recognized the incentive of an incumbent local exchange monopolist to engage in price and non-price discrimination:

“A dominant incumbent can limit both the scale and scope of its competitors, raising their costs and restricting their product offerings. In addition, it can divert or delay competition and innovation to protect its current revenues...”<sup>20</sup>

### **The Limited Role of Imputation**

Although some claim that an ILEC's ability to impose a vertical price squeeze can be eliminated by the proper use of imputation, this is not correct. First, it is not clear that ILECs will be held to an appropriate imputation standard. Even if an ILEC, moreover, is held to an imputation standard, imputation does not eliminate the possibility of a vertical price squeeze. An imputation rule constrains a dominant carrier to sell a service (or

---

<sup>20</sup> BellSouth New Zealand, (1995), page 2.

component of service) to competitors at the same price it sells to itself or its affiliate. Even if properly administered -- a difficult task which would require *perfect observability* of a number of costs and their proper allocation -- imputation imposes on an ILEC or its affiliate a price floor for interexchange service equal to the price of access plus the incremental cost of any non-access inputs. When such an ILEC (or its affiliate) sets its long distance price at that price floor, the ILEC (and, in the case of an affiliate, the parent company that owns both the ILEC and the affiliate) still receives monopoly profits from artificially-inflated access charges that an equally efficient IXC cannot receive.<sup>21</sup>

Moreover, besides the problems of observability to which I alluded above, it is not difficult for the ILEC to create pricing schemes that, in effect, skirt the imputation rule. Suppose that the ILEC sells both local and long distance services and an imputation rule is in effect. Then, the ILEC could easily skirt the imputation rule. For example, the ILEC could offer a tariff that discounts the price of access in return for volume and time commitments. Although available to all, such an offer might be accepted only by the ILEC's long distance division because its competitors, anticipating facilities-based competition in the local exchange market, will not be willing to accept such volume and time commitments to the ILEC. Thus, in effect, the ILEC can "pay" a lower price for access than do its competitors, even through it adheres to the letter (but not the spirit) of the law on imputation.

A similar example, involving the price of wholesale local exchange service, could be constructed to allow the ILEC affiliate to undercut other local exchange competitors.

---

<sup>21</sup> In other words, an IXC unaffiliated with the ILEC encounters *all* of the access charges it pays as a cost while the ILEC (or its affiliate) incurs some costs of access, but receives as profit the substantial

Even more likely is a scenario in which the ILEC engages in both forms of veiled price discrimination and is able to skirt imputation rules in *both* local exchange and interLATA service. In fact, in such a scenario, the skirting of the imputation rule could be rendered practically invisible by the simple use of price bundling by the ILEC affiliate: a marketing campaign of “one low price for both local and long distance” could make it virtually impossible to detect the violation of any imputation rule (even a well-constructed one).

### **Non-price Discrimination: Raising Rivals’ Costs and Degrading Rivals’**

#### **Quality of Service**

The ILEC can easily discriminate in the quality of interconnection that it provides to competitors. Moreover, such non-price discrimination would be difficult, if not impossible, to detect, absent a requirement that the ILEC provide quality-measurement information (concerning, for example, provisioning intervals, maintenance intervals, repair times, etc.) regarding the services competitors purchase from it.

Non-price discrimination can occur in the way the ILEC provides both access and local exchange services to its long distance division. For example, in providing access services that both the ILEC’s long distance affiliate and competing IXCs must purchase from the ILEC, the ILEC could favor its affiliate by delaying provision of certain access services to its long distance competitors. Similarly, with respect to access trouble repair, the ILEC could identify and prioritize the ILEC’s long distance service for restoration. Without measures of access quality, neither the Commission nor the ILEC’s competitors would realize that such discrimination was occurring. This problem may arise more

---

difference between its access costs and its inflated access charges. No amount of imputation can bridge

acutely for new and innovative services that an IXC may want to introduce, where there are no standard measures of quality and promptness for the ILEC's provision of service.

The ILEC controls the operations support systems that handle the process of moving a customer from the ILEC to a competitor in the local market. By underinvesting in such systems, the ILEC can make the transition to a competitor be full of delays, confusion, and trouble. In this process, not only is the reputation of the entrant tarnished, but, the end-user customer also faces significant costs in making the transition from the ILEC to a competitor. By increasing customers' costs of switching carriers, the ILEC keeps its customers captive, decreases the firm-specific price elasticity of demand (that measures the change in a company's sales that are caused by a decrease in its prices), and keeps the price of end-user services high.

Not only, then, is non-price discrimination feasible, but the ILEC also has incentives to engage in it against its long distance division's rivals. Non-price discrimination by the ILEC against the interexchange rivals of its long distance division will *raise the costs of these rivals* and increase the relative competitiveness of the ILEC's long distance without harming the ILEC's overall profits. A detailed modeling of these incentives can be found in Economides (1998a,b).<sup>22</sup>

### **Bundling: Raising “Customer Migration Costs”**

ILECs will also be able to exercise its market power by offering discounts on bundles of services. Such a bundling scheme will make it more difficult for a customer to

---

this gap between the cost profiles of the two firms.

<sup>22</sup> See Bernheim and Willig (1996) for a description of the ways in which ILECs engage in such practices.

“migrate” from one service provider to another if the customer subscribes to more than one service from the same provider. Such bundling schemes will be much more effective for a firm with near-monopoly power in one portion of the bundle, here the local service market.

If a firm has significant market power, its competitors will have, even in the absence of bundling by the dominant firm, a difficult time attracting customers. The ILEC’s position as the entrenched monopoly provider, which its long distance division will capitalize on, will make it difficult for other firms to convince customers to switch carriers. If the ILEC sells customers bundles of local and toll services, the willingness of customers to switch will be that much less and the ILEC, as a whole, will be able to effectively lock-in a significant portion of its customer base. The direct effect will be a reduction of competition from providers who sell only one component of the bundle, leading to an overall effect of a reduction in competition.

### **The 1996 Act has not Reduced Market Power**

The 1996 Act has not reduced or eliminated the market power of an ILEC in the local market. First, even with an unimpeded implementation of local exchange competition, true facilities-based local exchange competition is still years away. Until facilities-based local exchange competition is at hand, the ILEC will continue to wield significant market power. Second, since the FCC issued its implementing regulations for the 1996 Act on August 8, 1996, ILECs have aggressively pressed to overturn key provisions of the FCC's regulations.

### **The Lack of Incentive for Post-entry Cooperation**

The 1996 Act imposes specific requirements that the ILEC has to fulfill before entering the in-region interLATA market. At present, an ILEC (and its affiliates) would like to be as cooperative as possible, so that they pass the requirements and are certified to provide interexchange service. Once this is accomplished, the ILEC will no longer have any incentive to cooperate with its long distance competitors.<sup>23</sup> Whatever cooperation eventuates after certification will be a result of the particular restrictions imposed by State and Federal Commissions and by the general business restrictions on anti-competitive behavior. And, no matter how fast facilities-based entry occurs in the local exchange market – and such entry may well be slow – ILECs will still dominate local exchange markets for some time.

### **It Will be Difficult for Regulators to Deter Anti-Competitive Activities**

I have already discussed the difficulties connected with the proper and effective use of imputation in preventing price squeezes and other price discrimination. Regulators will also have difficulty in detecting and deterring non-price discrimination. In the emerging deregulated environment, companies are expected to introduce new and innovative products and services. The ILEC will be active in an array of markets with

---

<sup>23</sup> The FCC recognized this concern in its First Report and Order on the implementation of the 1996 Telecommunications Act: “We find that incumbent LECs have no economic incentive, independent of the incentives set forth in sections 271 and 274 of the 1996 Act, to provide potential competitors with opportunities to interconnect with and make use of the incumbent LEC’s network and services,” and “The inequality of bargaining power between incumbents and new entrants militates in favor of rules that have the effect of equalizing bargaining power in part because many new entrants seek to enter national or regional markets.” FCC First Report and Order, CC Docket No. 95-185, (1996), at ¶ 55.

varying degrees of regulatory oversight. Under these circumstances, it will be very hard for regulators to uncover cross-subsidization.

## 6. Universal Service

Traditionally, the United States has adopted a policy to maximize the subscribership of the Public Switched Telecommunications Network (“PSTN”) commonly called “Universal Service.” This policy has significant economic effects. Because universal service requires that some consumers be provided with basic telephone services below TSLRIC, from an efficiency standpoint, there is over-consumption of those services.

Since most studies report very small price elasticities of demand for access, the overconsumption effect may be small, and most of the distortion caused by Universal Service may be a wealth transfer effect. However, depending on how universal service is structured and provided, a host of other inefficiencies may also be created. It is important to describe ways that will minimize (and hopefully eliminate) these *additional* inefficiencies which could arise depending on the manner in which a universal service mechanism is structured.

Historically, attaining the goal of the universal service has focused on keeping basic local exchange telephone service rates low. To achieve this goal, the funds required to subsidize service were extracted from inter- and intra-LATA long distance service. Thus, rates for carrier access and certain other services were set at artificially high levels to provide implicit subsidies to support the universal service objective.

The historical method of promoting subscribership raised subsidies through taxing of traffic-sensitive services through the imposition of the federal, and, in some cases, a State, Common Carrier Line Charges (“CCLCs”), and was based on implicit and hidden subsidies. The historical method of raising subsidies for universal service compares very poorly with the economically efficient method for a number of reasons. *First*, the historical subsidy is not explicit. Therefore, it is unclear who is subsidizing whom. For example, in the present regime, a rural customer who makes a significant amount of toll calls in a high cost area may not be subsidized in net terms. *Second*, the present mechanism is not targeted to those subscribers who require the subsidy. Instead, the LEC receives the subsidy for serving all consumers regardless of their ability to pay the full cost, even if they live in an area where costs do not exceed revenues. *Third*, instead of being funded broadly, the burden of universal service is borne by inter- and intra-LATA toll users thereby introducing inefficiencies to the provision of those services. *Fourth*, the current system is not competitively neutral because the benefits of the current system inure only to the incumbent LECs and not to any of their potential competitors. This system not only inhibits the introduction of competition in the local exchange (because the subsidies flow to the incumbent LEC instead of to the carrier chosen by the consumer) but also may bestow unwarranted benefits on the incumbent LEC to the extent the subsidies are inflated above amounts necessary to provide basic universal service at TSLRIC.

The immediate impetus for change in universal service fund policies arises as a result of the passage of the Telecommunications Act of 1996. The Act introduces fundamental changes in the structure of telecommunications markets in the United States. The most important thrust of the Telecommunications Act is its goal of establishing

competition in all telecommunications markets. Competition generally drives prices closer to cost and imposes a strict discipline. As a result, and once competition takes hold, the prior implicit method of subsidization would no longer be viable, and the Act explicitly rejects such a process by requiring universal service support to be explicit, § 254(e), and by forbidding the continued use of universal service subsidies to cross-subsidize competitively provided services, § 254(k).

The current system of implicit cross-subsidies not only distorts the price of toll calls, but also adversely impacts competition in that market. If the current system is retained, an incumbent LEC that will be providing access services to a competitor will have an unfair competitive advantage in the inter- and intra-LATA toll markets. This is because the incumbent LEC will be providing vertically-related services (access and toll) and will bear only the true economic costs of access, while its competitor will be forced to pay the above-cost rate currently embedded in the access charge. To avoid this result, regulatory commissions must ensure that the funding for universal service is achieved in a manner that is both efficient and competitively neutral.

The 1996 Act aims to “preserve and advance universal service [254(b)]. This means:

- (1) High quality at low rates.
- (2) Access to advanced services in all States.
- (3) Access in rural and high cost areas at comparable prices to other areas.
- (4) Supported by “equitable and nondiscriminatory contributions” by “all providers of telecommunications services.”
- (5) Specific and predictable mechanisms to raise the required funds.

- (6) Access to advanced telecommunications services for schools, health care, and libraries.

Regulatory policy which explicitly deviates from the market outcome in the market for subscription creates a number of complex questions. Among them are who will be subsidized, by how much, by whom, and how will the money actually flow from the subsidizers to the subsidized. If these issues are not resolved in an efficient manner, there will be resulting economic distortions (“secondary distortions”) that may be more significant than their original cause. For example, if the subsidy is extracted from subscribers of a single service, demand for that service will necessarily be impacted in ways which would not be consistent with the goals of the 1996 Act. On the other hand, an efficient solution to these questions can guarantee that no further distortions are created by universal service, *i.e.*, no distortions over and above the original distortion created by the decision to maximize subscribership.

### **6.1 Principles of Economic Efficiency for Universal Service**

Traditionally, universal service was supported by the very high price of access. Once access reform has brought down access prices to cost, and competition in local service has been well established, universal service will be supported by a new fund to be created. In the implementation of the 1996 Act, local competition and access reform should be preconditions to establishing a new universal service fund for large ILECs. If such a fund is established before the local market has been effectively competitive and before access reform has occurred, then the incumbents can sit back and effectively collect

twice for the provision of the same service – once from high access fees and once from the new universal service fund.

An economically efficient universal service fund should conform to the following criteria:

1. All subsidies to promote universal service should be made explicit.
2. Universal service should be funded broadly.
3. Universal service subsidies should be targeted narrowly.
4. Universal service should be achieved in a competitively neutral fashion.
5. The existence and operation of any universal service fund should minimize distortions to other telecommunications services.
6. Subsidized consumers should be served in the most efficient way possible.

These characteristics are embodied in the 1996 Act. The 1996 Act specifies that universal service subsidies should be made explicit (§ 254(e)), funded broadly (§ 254(d)) and achieved in a competitively neutral fashion (§ 254(b)). This framework will minimize to the maximum extent possible the problem of secondary distortions that I identified earlier. I discuss below each of the elements set forth above in turn.

### **Universal Service Funding Should be Explicit**

To promote universal service in the most efficient manner, it is crucially important that regulatory commissions have explicit knowledge of the extent of the subsidy, the source(s) of the subsidies, the identity of the recipients of the subsidies, and the magnitude of subsidies to be received by the recipients. As the Joint Explanatory Statement accompanying the Act makes clear, it is essential that a system of explicit payments

replace the existing implicit support mechanisms.<sup>24</sup> Knowledge of the extent, sources, recipients and magnitude of the subsidies is essential for regulatory commissions to be able to evaluate the success of its universal service program. Moreover, in the fast-evolving telecommunications industry, regulators who have access to such information can more easily make adjustments to the universal service program, if such adjustments are needed.

### **Universal Service Funding Should be Broadly Based**

The 1996 Act explicitly requires that “All providers of telecommunications services should make an equitable and nondiscriminatory contribution to the preservation and advancement of universal service,” § 254(b)(4). This makes good economic sense. Funding should be broadly based to minimize the size of the distortions in the prices of other services. For example, if all universal service funds were to be raised from the “call waiting” service, this would cause an extreme upward distortion in the price of that service and result in a lower subscribership to that service than would result if the price for that service were set at TSLRIC. Indeed, “taxing” only certain services and not all services could inhibit universal service because a consumer’s decision to subscribe might be based on more than just the cost of basic local exchange service.<sup>25</sup> Thus, the current system’s reliance on access charges to fund universal service may be counterproductive in that it drives up the total cost of telephone service. To maximize efficiency, subsidies should not be hidden in traffic sensitive elements.

---

<sup>24</sup> Joint Explanatory Statement of the Committee of Conference at 130-31.

<sup>25</sup> See Eriksson, Kaserman, and Mayo (1995). The finding that higher long distance rates cause reductions in household penetration rates is also found in Hausman, Tardiff, and Belinfante (1993).

### **Universal Service Subsidies Should be Narrowly Targeted**

As a general rule, universal service funds should be targeted to those customers who, in the absence of a subsidy, would not have subscribed or would have dropped off the public switched network. In this manner, the size of the universal service fund and the resulting distortions are minimized to the maximum extent possible. By contrast, untargeted universal service subsidies do not accomplish these objectives. Indeed, untargeted use of universal service funds results in a bigger fund than is actually required which in turn creates larger distortions in the prices of other telecommunications services.

### **The Universal Service Program Should be *Competitively Neutral***

A *competitively neutral* program is one that does not provide any competitor or group of competitors with an advantage over other competitors in the provision of local and other telecommunications services. In the context of universal service, this means that a subsidized consumer keeps the benefit of the subsidy if he switches to a different local service provider. It also means that the fund has to be administered by a neutral party that does not have a competitive interest in the telecommunications marketplace. Finally, it means that the funds to support the program must be collected from as broad a base as possible so that no individual service or group of services is unduly burdened. It is best if the subsidy is raised by an end-user surcharge on all retail revenues of telecommunications services.<sup>26</sup>

---

<sup>26</sup> This requirement was explicitly recognized by the FCC in its 96-182 NPRM (April 19, 1996) at § 145, “Arguably, these principles can be interpreted as requiring competitively-neutral mechanisms for

### **The Existence and Operation of any Universal Service Fund Should Minimize Distortions to Other Telecommunications Services**

The overall goal of telecommunications policy is to maximize efficiency through competition. Given this goal, any distortion created by the universal service fund, that does not directly serve the goal of the universal service fund, should be kept to a minimum. A number of the features of an efficient universal service program, as described earlier, help accomplish this goal.

### **Recipients of Universal Service Subsidies Should be Served in the Most Efficient Way Possible**

It is crucial to serve consumers as efficiently as possible, *i.e.*, at the lowest possible cost. This guarantees that resources are not wasted in serving them, and minimizes the total distortion necessary to accomplish the social objective of the universal service fund. To ensure the efficient distribution of universal service support funds, the size of the subsidy should be based on the total economic cost of providing local service -- *i.e.*, the TSLRIC of basic universal service. Thus, the regulator should determine the TSLRIC of providing basic universal service in each geographic region throughout the State. The subsidy required in each region should be calculated by comparing the TSLRIC of the service to the current, affordable rate. Where the TSLRIC of providing basic universal service exceeds the affordable rate, the carrier providing the service should collect this difference from the fund administrator. Such a system is efficient because (1) it minimizes the cost of the subsidy to society to the maximum extent possible without diminishing the

---

recovering universal service support, rather than recovering such support through rates for inter-

amount of subsidy that consumers receive; (2) it gives the incentive to the serving carrier to provide local services at economic cost; and (3) it does not allow a local service provider to inflate its costs in order to increase the subsidy it receives from the universal service fund.

Progress on the implementation of universal service reform has been very slow. Up to now, no States have implemented a competitively-neutral universal service mechanism.

## **7. Internet Telephony**

The Telecommunications Act of 1996 did not legislate any framework for the most revolutionary of all current innovations in telecommunications, Internet telephony, or more precisely Internet Protocol (“IP”) telephony. This is despite the fact that IP telephony emerges as the favorite mode of operation of new telecommunications networks, such as those built by Qwest and Level3, as well as the required conversion of traditional telecommunications networks, such as the one of AT&T.

Digitization of telecommunication services imposes price arbitrage on the bits of information that are carried by the telecommunications network, thus leading to the elimination of price discrimination between voice and data services. Elimination of such price discrimination can lead to dramatic reductions in the price of voice calls precipitating significant changes in market structure. These changes were first evident on the Internet, a ubiquitous network of applications based on the TCP/IP protocol. Internet-based telecommunications are based on packet switching. There are two modes of operation: (i)

---

connection or unbundled network elements.”

a time-delay mode in which there is a guarantee that system will do whatever it can to deliver all packets; and (ii) a real-time mode, in which packets can in fact be lost without possibility of recovery.

Many telecommunications services do not have a real time requirement, so applications that “live” on the Internet can easily accommodate them. For example, there are currently a number of companies that provide facsimile services of the Internet, where all or part of the transport of the fax takes place over the Internet. Although the Internet was not intended to be used in real-time telecommunications, despite the loss of packets, presently telecommunications companies use the internet to complete ordinary voice telephone calls. Voice telecommunications service started on the Internet as a computer to computer call. About three years ago, Internet telecommunications companies started offering termination of calls on the public switched network. In 1996, firms started offering Internet calling that originated and terminated on the public switched network (“PSTN”), i.e., from and to the regular customers’ phone appliances. The last two transitions became possible with the introduction of PSTN-Internet interfaces and switches by Lucent and others.

Traditional telephony keeps a channel of fixed bandwidth open for the duration of a call. Internet calls are packet based. Because transmission is based on packet transport, IP telephony can utilize more efficiently bandwidth by varying in real time the amount of it used by a call. But, because IP telephony utilizes the real time mode of the Internet, there is no guarantee that all the packets of a voice transmission will arrive to the destination. Internet telephony providers use sophisticated voice sampling methods to decompose and reconstitute voice so that packet losses do not make a significant audible difference. Since

such methods are by their nature imperfect, the quality and fidelity of an Internet call depends crucially on the percentage of packets that are lost in transmission and transport. This, in turn, depends, among other factors, (i) on the allocation of Internet bandwidth (pipeline) to the phone call; and (ii) on the number of times the message is transmitted.

Internet-based telecommunications services pose a serious threat to traditional telecommunications services providers, especially long distance service and international service providers. In the present US regulatory structure, a call originates from a computer to an Internet service provider (“ISP”) (or terminates to a computer) is not charged an “access charge” by the local exchange carrier. This can lead to substantial savings due to the enormously inflated access fees charged by LECs.

In response to the Internet telephony threat, on January 26, 1998, AT&T announced that it will offer a new long distance service carried over the Internet and intranet. AT&T’s service offered at 7.5-9 cents per minute, will originate and terminate on the public switched network (“PSTN”) and therefore will appear to customers like a regular call; no computer will be required. In November 1997, Deutsche Telecom (“DT”) introduced Internet long distance service within Germany. To compensate for the lower quality of voice transmission, DT offers Internet long distance at 1/5 of its regular long distance rates. Internet telephony presently poses one of the most important challenges to the telecommunications sector and its regulation.

## **8. Overseas Experience and Prospects**

Deregulation of telecommunications markets is a delicate affair that has to be done correctly to increase efficiency and avoid disasters. Deregulation of *all* markets without regard to the features of each market in terms of monopoly power, viability of competition, and interaction across markets can lead to disaster. Early attempts to totally deregulate telecommunications have been failures.

The primary example of failure of such total deregulation attempts is New Zealand. New Zealand's telecommunications market was deregulated starting in 1987. The incumbent state-owned telecommunications monopoly was privatized in 1990 as Telecom New Zealand ("TCNZ"). TCNZ was bought by Bell Atlantic and Ameritech with the commitment that they would reduce aggregate ownership to less than 50% by September 1993. In July 1991 31% of the shares of TCNZ were floated in an international stock offering, and, eventually, over 50% of TCNZ was publicly traded in the New Zealand stock market and at the New York Stock Exchange as depository receipts.

New Zealand has opted for "light-handed regulation," that is, a regulatory regime that favors very little intervention. New Zealand did not establish a regulatory body to regulate and monitor the telecommunications sector. Combined with a non-interventionist competition law,<sup>27</sup> light-handed regulation resulted in a very liberal regime in

---

<sup>27</sup> The main regulatory instruments in New Zealand are

- (i) The *Commerce Act* that generally prevents anti-competitive behavior;
- (ii) The *Disclosure Regulations* that impose information disclosure on TCNZ as a dominant incumbent telecommunications provider.

These instruments are reinforced by commitments that TCNZ has made in the course of being privatized. These are

- (i) The *Kiwi share obligation* under which TCNZ committed not to increase prices of local service to existing customers above the rate of inflation;
- (ii) Various "undertakings," i.e., obligations not to restrict competition that are stated in letters exchanged between TCNZ and the New Zealand government in the process of privatization.

Although the Kiwi share obligations have been adhered to, the obligations arising from the

telecommunications in New Zealand. This allowed the newly privatized Telecom New Zealand to act as a practically unrestrained monopolist in its dealings with competitors.

A number of companies entered the New Zealand telecommunications market. Most notably, *Clear* entered the long distance market and *Bell South New Zealand* entered the mobile market.<sup>28</sup> Both companies received interconnection agreement with very favorable terms to TCNZ.

In 1991, *Clear* asked TCNZ for an interconnection agreement to provide local service. After a long legal battle, the case was decided by the Queen's Privy Council that acts as the Supreme Court of New Zealand. The Privy Council decided in favor of TCNZ and established that the ECPR was lawful in New Zealand. This prompted TCNZ to set a very high access termination price for any call that *Clear* would terminate in the TCNZ network while insisting that TCNZ gets free termination access for any calls terminated to the *Clear* network. Since TCNZ has almost 100% of the residential customers, the volume of calls to and from a rival local service provider would be very high. Given the price terms of the interconnection agreement, signed in 1996 after five years of negotiations, the ability of a competitor to break even and survive as a local service provider is questionable.

Despite complete deregulation, TCNZ still dominates all telecommunications markets in New Zealand. A number of suits by competitors for anti-competitive actions of TCNZ are in courts, awaiting the very slow adjudication process. The way that deregulation was implemented in New Zealand failed to create an environment in which

---

"undertakings" have not been adhered to.

<sup>28</sup> *Clear* was partly owned by Bell Canada and MCI. Current shareholders include British

competition would thrive. Most important was the failure to understand that the incumbent monopolist in the local exchange could leverage its market power to foreclose entrants in the local exchange, as well as to disadvantage competitors in the long distance and international markets.

Europe, with the exception of Britain, has lagged behind in telecommunications deregulation. Deregulation and free entry in all markets was mandated by the European Union starting from January 1, 1998.<sup>29</sup> So far, not much facilities-based entry has occurred. Moreover, the position of the European Union on interconnection fees seems ambiguous. To a large extent, the European Union looks up to the United States for guidance in telecommunications deregulation. The delay in the implementation of the Act has cast doubts in its application abroad.

Japan has announced a breakup of the incumbent local monopolist into two geographically-separated local service subsidiaries (NTT-East and NTT-West), as well as the creation of a long distance and global company, all subsidiaries of the NTT holding company. This reform is just beginning, and it is hard to predict its success.

Other parts of the world are generally lagging behind in telecommunications reform, but are also swept by the very fast technical change in the sector.

## **9. Concluding Remarks**

Over two years after the signing of the Act, many of its provisions have been disputed in Court, and the Act's implementation has been very slow and clouded with

---

Telecom, MCI, Television New Zealand and Todd Corporation New Zealand.

<sup>29</sup> Greece, Ireland, and Portugal received a 3 year extension of the deadline.

significant uncertainty. There has been minimal entry of new competitors in the local exchange, both through leasing of unbundled network elements and through resale by entrants of ILECs' services.

The market structure in the telecommunications sector will depend crucially on the resolution of the LECs legal challenges to the 1996 Telecommunications Act.<sup>30</sup> These challenges have derailed the implementation process of the Act and have increased significantly the uncertainty in the telecommunications sector. Long distance companies have been unable to enter the local exchange markets by leasing unbundled network elements ("UNEs"), since the arbitration process that started in April 1996 has resulted in final prices in only a handful of States. In the absence of entry in the local exchange market as envisioned by the Act, the major long distance companies are buying companies that give them some access to the local market.

AT&T has acquired TCG, which owns some local exchange infrastructure. AT&T is also merging with TCI and promises to convert the TCI cable access to an interactive broadband, voice and data telephone link to residences. TCI cable presently reaches 35% of US households. Without access to UNEs, to reach all residential customers, AT&T would have to find another way to reach the remaining 65% of US households. To do this, AT&T has also announced, but not yet implemented, a wireless telepoint technology, similar to cellular mobile technology, but only suitable to immobile or slow-moving receivers. Similarly, MCI is merging with Worldcom, which had just merged with Brooks

---

<sup>30</sup> In one of the major challenges, GTE and a number of RBOCs appealed (among others) the FCC (1996) rules on pricing guidelines to the 8<sup>th</sup> Circuit. The plaintiffs won the appeal; the FCC appealed to the Supreme Court, which accepted the case. A final outcome is expected by the end of 1998.

Fiber, which in turn also owns some infrastructure in local exchange markets.

There have also been a number of mergers among the local exchange carriers. These mergers are motivated by a desire to increase the foothold of the merging companies looking forward to the time that RBOCs will be allowed to provide long distance service.<sup>31</sup> Pacific Bell was acquired by SBC, and NYNEX by Bell Atlantic, despite antitrust objections, in an attempt of the RBOCs to maximize their foothold, looking forward to the time when they will be allowed to provide long distance service. Recently, SBC announced its intention to buy Southern New England Telephone (“SNET”) one of the few companies, which, as an independent (not part of AT&T at divestiture), was not bound by MFJ restrictions and has already entered into long distance. SBC has also announced that it will buy Ameritech. Bell Atlantic has announced its intention to buy GTE. If all the local exchange carrier mergers pass antitrust and regulatory scrutiny, the 8 large local exchange carriers of 1984 (7 RBOCs and GTE) would be reduced to only 4: Bell Atlantic, Bell South, SBC, and US West. The smaller ones, Bell South and US West already feel the pressure, and have been widely reported to be in merger/acquisition talks with a number of parties.

In summary, the very slow implementation of the 1996 Act has resulted in a series of mergers in the telecommunications industry.

The intent of the 1996 Act was to promote competition and the public interest. It will be a significant failure of the US political, legal, and regulatory systems if the interests of entrenched monopolists rather than the public interest as expressed by the US Congress

---

<sup>31</sup> Recently, SBC announced its intention to buy Southern New England Telephone (“SNET”) one of the few companies, which, as an independent (not part of AT&T at divestiture), was not bound by MFJ restrictions and has already entered into long distance.

dictate the future of the US telecommunications sector. Unfortunately, the lack of progress in the implementation of the 1996 Act during the last two years has been a victory for the incumbent monopolists rather than of the US Congress. If the present trend continues, the intend of the 1996 Act to open all telecommunications markets to competition will *not* become a reality.

## References

- Baumol, W. J., 1983, Some Subtle Pricing Issues in Railroad Regulation, *International Journal of Transport Economics* 10, no. 1-2, August, 341-355.
- Bernheim, B. D. and R. D. Willig, 1996, The Scope of Competition in Telecommunications, mimeo. AEI Studies in Telecommunications Regulation.
- BellSouth New Zealand, 1995, Comments on Regulation of Access to Vertically-Integrated Natural Monopolies.
- Crandall, R. W., 1991, After the Breakup: U.S. Telecommunications in a More Competitive Era (Brookings Institution, Washington D.C.).
- Economides, N., 1996, The Economics of Networks, *International Journal of Industrial Organization* 14, no. 2, 675-699.
- Economides, N., 1998a, The Incentive for Non-Price Discrimination by an Input Monopolist, *International Journal of Industrial Organization* 16, March, 271-284.
- Economides, N. 1998b, Raising Rivals' Costs in Complementary Goods Markets: LECs Entering into Long Distance and Microsoft Bundling Internet Explorer, Discussion Paper EC-98-03, Stern School of Business.
- Economides, N., 1998c, The Tragic Inefficiency of M-ECPR, Discussion Paper EC-98-01, Stern School of Business.
- Economides, N., 1998d, US Telecommunications Today, *Business Economics*, April.
- Economides, N., G. Lopomo and G. Woroch, 1996, Regulatory Pricing Policies to Neutralize Network Dominance, *Industrial and Corporate Change* 5, no. 4, 1013-1028.
- Economides, N. and L. J. White, 1995, Access and Interconnection Pricing: How Efficient is the Efficient Components Pricing Rule?, *The Antitrust Bulletin* XL, no. 3, Fall, 557-579.
- Economides, N. and L. J. White, 1998, The Inefficiency of the ECPR Yet Again: A Reply to Larson, *The Antitrust Bulletin*.
- Eriksson, R. C., D. L. Kaserman, and J. W. Mayo, 1995, Targeted and Untargeted Subsidy Schemes: Evidence from Post-Divestiture Efforts to Promote Universal Telephone Service, mimeo., Department of Economics, The University of Tennessee.

- Faulhaber, G., 1996, Public Policy in Telecommunications: The Third Revolution, mimeo.
- Federal Communications Commission, 1995, In the Matter of Motion of AT&T Corp. to be Reclassified as a Non-Dominant Carrier, CC Docket No. 95-427. Order adopted October 12, 1995.
- Federal Communications Commission, 1996, First Report and Order, CC Docket N. 96-98, CC Docket No. 95-185. Adopted August 8, 1996.
- Gabel, D., and D. F. Weiman, 1994, Historical Perspectives on Interconnection between Competing Local Operating Companies: The United States, 1894-1914, mimeo.
- Hausman, J. A., T. Tariff, and A. Belinfante, 1993, The Effects of the Breakup of AT&T on Telephone Penetration in the United States, *American Economic Review*, May, 178-184.
- Hubbard, R. G. and W. H. Lehr, 1994, Declaration in United States of America v. Western Electric Company and American Telephone and Telegraph Company, U.S.D.C., Civil Action No. 82-192, November 1994.
- Hubbard, R. G. and W. H. Lehr, 1998, Improving Local Exchange Competition: Regulatory Crossroads, mimeo., February.
- Kaserman, D. L. and J. W. Mayo, 1996, Competition and Asymmetric Regulation in Long-Distance Telecommunication -- An Assessment of the Evidence, *CommLaw Conspectus* 4, Winter, 1-26.
- MacAvoy, P. W., 1995, Tacit Collusion Under Regulation in the Pricing of Interstate Long-Distance Telephone Services, *Journal of Economics & Management Strategy* 4, no. 2, Summer, 147-185.
- MCI Communications Corporation, 1997, True Competition in the Long-Distance Market, January 27, 1997.
- Mitchell, B., and I. Vogelsang, 1991, *Telecommunications Pricing: Theory and Practice*. (Cambridge University Press).
- Mueller, M. L., 1997, Universal Service, (The American Enterprise Institute, Washington DC).
- Noll, R. G., and B. Owen, 1989, The Anti-competitive Uses of Regulation: United States v. AT&T, in John E. Kwoka and Lawrence J. White, eds., *The Antitrust Revolution*. (New York: Harper Collins), 290-337.
- Webb, M., 1998, Telecommunications Law and Regulation in New Zealand, mimeo.

Willig, R. D., 1979, The Theory of Network Access Pricing, in Harry M. Trebing, (ed.) *Issues in Public Regulation*. Michigan State University Public Utilities Papers. Proceedings of the Institute of Public Utilities Tenth Annual Conference.