Untangling Tin Cans on a String: The Difficulty of Regulating Access to Even the Simplest Telephone Exchange

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Untangling Tin Cans on a String:
The Difficulty of Regulating Access to Even the Simplest Telephone Exchange

Charles W. Needy†

The Federal Communications Commission recently decided that the price a local exchange carrier charges other carriers for access to its network may recover only long-run incremental costs and a reasonable share of forward-looking common costs. The FCC thereby rejected the "parity pricing" rule recently advocated in this Journal by William J. Baumol and J. Gregory Sidak as the standard for pricing access to the network bottleneck facilities controlled by monopolists. This rule calls for access prices to recover not only the long-run incremental cost but also all other "opportunity costs." These include any monopoly rents and any contributions to imprudent investment that monopolists are collecting in sales of retail services but will lose as a result of providing access. This Article presents evidence that parity pricing is not of general applicability to regulatory policies in the United States. When retail prices are already at efficient levels, the rule recovers the same costs as a traditional pricing model like the FCC plan. Parity pricing therefore is interesting as a replacement for the FCC plan only when retail prices recover substantial monopoly rents or cost inefficiencies. The issue is whether regulators in that situation are more likely to achieve efficient retail prices by setting prices directly after determining incremental costs for numerous services or by setting prices for a few bottleneck facilities to promote competitive entry. Results from the FCC's first formal study of long-run incremental costs show the difficulty of unraveling incremental costs, even when services are provided by the simplest configuration of facilities. The author thus agrees with William B. Tye and Carlos Lapuerta that regulators mandate access to bottleneck facilities as a way of fostering competition, moving retail prices closer to the efficient levels they cannot identify. These goals cannot be achieved by parity pricing because it requires access prices to include the monopoly profits and cost inefficiencies that regulators are trying to eliminate.

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Introduction

Government regulators have long hunted for efficient prices in accounting records of past costs, even though it is well known they should be searching in forward-looking cost studies. Some things, like the proverbial keys dropped in a dark alley, are searched for not where they are, but in the vicinity of the nearest light. In a litigious society, one must be cautious in telling firms how to recover their costs. The appeal of accounting records is that they are the firm's own representations of the expenses they have incurred. The relevant costs, however, are not past but future costs. As Alfred E. Kahn observes, accounting records can only hint at the level of forward-looking costs.\(^1\) Hence, government regulators should determine prices from forward-looking cost studies. Those cost studies, however, are difficult to perform and justify in court.

*Need for incremental-cost studies.* Recent developments in the telecommunications industry have pushed regulators away from accounting costs and toward forward-looking studies. Technological changes have enabled competitors to enter certain markets and serve the largest customers at prices well below historical booked costs. Because the incumbent monopolists' networks are bypassed, the remaining customers must bear an increasingly larger share of the incumbents' common costs and social subsidy costs. Moreover, some of the bypass is economically inefficient if some entrants are less efficient than the incumbent monopolists.

To forestall such problems, the Federal Communications Commission (FCC) has moved away from rate-of-return regulation, which relies heavily on accounting costs to define rate bases. The FCC has largely replaced it with price regulation that sets caps on access service prices. In addition, the FCC bases the wholesale prices of unbundled access elements on forward-looking costs.\(^2\) To make that transition, which is intended to lead eventually to deregulation, the FCC adopted a flexible pricing policy. It permits the largest local exchange carriers (LECs), all of which are under price-cap regulation,\(^3\) to establish prices for new access services at levels effectively as low as long-run incremental cost (LRIC), the generally accepted benchmark for efficient pricing.\(^4\) As a consequence, the FCC has had to take on the considerable burden of performing LRIC studies, in formal proceedings, to establish price floors for access services that prevent strategic anticompetitive pricing


\(^2\) For a distinction between unbundled network elements and access services, see infra note 81.

\(^3\) For an explanation of the FCC's form of price cap regulation, see infra note 16.

\(^4\) Economists generally regard average LRIC, calculated for a large incremental block of expected sales, as the practically achievable benchmark for efficient pricing, which is the price that would be set in a perfectly competitive, or perfectly contestable, market. See, e.g., KAHN, supra note 1, at 85. For a definition of LRIC, see discussion infra Part I.
designed to prevent entry. These studies also help establish ceilings for access element prices that are largely based on LRIC.

Article objectives. Supported by the first of such studies, this Article examines the efficacy of the access pricing rule called parity pricing. The Article draws on the results of the FCC's inquiry into the lawfulness of certain volume and term price discounts for the LECs' two most commonly offered high-capacity services. The inquiry addressed the FCC's concern that the largest of these price discounts, some of which exceed 70 percent, may be anti-competitive. Several firms competing with incumbent LECs in the markets for those services claimed that the price discounts were so large that some prices fell below LRIC. The study found that there was insufficient evidence of predatory pricing to justify further investigation but did not actually determine LRIC for either service, even after the FCC had collected cost data and industry comments for nearly a year.\(^5\)

The study also yields interesting implications with regard to parity pricing, the subject of much debate in the current and recent editions of this Journal. The parity pricing rule addresses the problem of how to price competitive access to the bottleneck facilities controlled by monopolists that are competing, in downstream markets, with non-vertically integrated rivals that rely on such access to compete. Like the FCC's access pricing plan, the rule requires that access prices recover the monopolists' LRICs of their resources utilized and a share of forward-looking common costs. However, the rule also calls for the recovery of "opportunity costs," which include any monopoly rents, and any contributions to imprudent investment, that the monopolists now collect in their sales of retail services but will lose as a result of providing access.

As intended, parity pricing ensures an efficient distribution of resources among firms in the competitive downstream markets and prevents entry by inefficient firms when the access facility is a bottleneck. The rule's opponents generally agree with the rule's requirement that access prices must recover incremental costs together with opportunity costs, a share of common costs, and the costs of universal service obligations. What opponents strongly object to, however, is its requirement that access prices must also recover any monopoly rents and contributions to overinvestment being recovered in retail prices. They argue that this requirement forces entrants to indemnify incumbent monopolists against any losses, thereby perpetuating monopoly rents and foreclosing allocative and dynamic efficiencies.

\(^5\) The FCC has neither endorsed nor approved any of the findings in this study. However, following the study's completion in January 1994 the FCC stated: "At this time, we are not persuaded that LEC offerings are priced below their average variable cost. Nevertheless, we will continue to examine LEC pricing behavior in the future, and will be vigilant in examining any evidence of unreasonable pricing practices on the part of the LECs." \textit{In re} Expanded Interconnection with Local Telephone Company Facilities, 9 F.C.C.R. 5154, 5201 (1994).
Parity pricing implications. This Article provides evidence that the parity pricing rule is not a practical option for resolving most access pricing problems encountered by regulators in industries earning monopoly rents and offering numerous services. Changes in technology, together with the use of multiple technologies, make the identification of network bottleneck segments difficult. For this rule to be used harmlessly, however, regulators must correctly identify the natural monopoly segments in large networks. Otherwise, downstream competitors can evade the high access prices that parity pricing dictates by vertically integrating upstream, bypassing incumbents’ upstream facilities. Importantly, this may occur even when competitors are less efficient in upstream markets. Hence, with imperfect information, a regulator’s attempts to apply the rule may not promote productive efficiencies in downstream markets, as proponents claim, but may instead lead to productive inefficiencies elsewhere. Parity pricing therefore relies heavily on regulators’ abilities to predict where market entry will occur. This makes the rule especially inapplicable to a multi-service industry like telecommunications, where multiple technologies have blurred the distinction between bottleneck and competitive sectors.

Even when bottlenecks are unambiguous, parity pricing is impractical as a general access pricing rule. Because it perpetuates monopoly rents and inefficiencies unless retail prices are effectively constrained, regulators wanting to use it must be willing to assume retail prices are at efficient levels. This assumption is reasonable only when wholesale access prices are at efficient levels and when many competitors in downstream markets make retail prices efficient. Under those improbable conditions, however, parity pricing is not needed to protect downstream markets from inefficient entry. Competition handles that task well.

However, regulators cannot safely assume that retail prices are at efficient levels when downstream competitors must rely on rivals’ upstream facilities. Recognizing this, parity pricing proponents call on regulators to supplement the rule with safeguards holding retail prices at efficient levels. Regulators cannot do that, however, without first identifying relevant costs. This means they would have to perform LRIC studies to determine efficient prices for numerous services. As this Article demonstrates, that task is infeasible. It may be feasible, however, to determine efficient prices for a few bottleneck facilities. Regulators therefore primarily regard access pricing rules not as a tool for maximizing static productive efficiencies but, rather, as a mechanism for fostering competitive entry. Market entry moves retail prices closer to the efficient levels regulators cannot identify. More important, it brings innovations yielding better services. When technological innovation eventually reaches the point that LRIC calculations are impractical even for access facilities, prudent regulators will scrap their access policies, step aside, and let competition take its course in a deregulatory environment.
This view is nowhere more evident than in the 1996 Telecommunications Act (1996 Act). This legislation instructs federal and state regulators to forego their historical role of trying to constrain the pricing practices of incumbent monopolists while also trying to protect them against competitive entry. The 1996 Act requires regulators, instead, to “provide for a pro-competitive, deregulatory national policy framework designed to accelerate rapidly private sector deployment of advanced telecommunications and information technologies and services to all Americans by opening all telecommunications markets to competition.”6 The deregulatory goals in that legislation cannot be served by a pricing rule that, to avoid perpetuating monopoly rents and inefficiency, must be supplemented with intrusive regulatory oversight of retail service prices. Nor can the dynamic pro-competitive goals be served by a pricing rule focused only on static productive efficiencies.7

Outline. Part I of this Article provides background information on the study. It defines relevant cost concepts and provides a procedural history of the study. It also explains the importance of an LRIC-based price test at the FCC and describes the plant configuration of the services at issue. Part II summarizes the study results for major issues arising in the FCC’s inquiry. Part III explains the implications that these results have for parity pricing when network bottleneck segments are easily identified. Finally, Part IV explains the implications when bottleneck segments are not easily distinguished from other segments.

I. Study Background

This Part defines relevant cost concepts and provides a procedural history of the study. It also identifies average variable cost (AVC) as the cost standard the FCC adopted as a predatory pricing test and explains why the FCC often accepts an LRIC-based showing as an acceptable surrogate for an AVC-based showing. In addition, this Part discusses the simplicity of the plant configuration needed to provide basic channel termination services.

A. Relevant Cost Concepts

A carrier’s ability to attribute costs to individual services in a cost-causative manner depends largely on the nature of the costs. Of particular relevance to this study are the following cost concepts.

Long-run cost. Economists consider a company to be operating in the “long run” if none of its costs are fixed with respect to service output. This condition usually is satisfied when the operating period exceeds one year.

7. For a definition of static and dynamic efficiencies, see infra note 61.
because the telecommunications company has sufficient time to acquire or sell virtually all facilities and to modify the number of its employees. In contrast, the "short run" is usually a period less than a year, in which some costs are fixed with respect to service output.

**Incremental cost.** The additional cost a firm will incur as a result of producing an additional increment of a service, when holding all other services constant, is referred to as incremental cost.\(^8\) Usually expressed per unit of output, incremental cost is greatly affected by the way the increment is defined. The incremental cost of carrying an additional call from a residence to an end office, for example, is virtually zero if the residence is already connected to that end office, but the incremental cost of establishing such a connection is the full cost of the loop. Economists generally regard "average LRIC," calculated on a per-unit basis for a large incremental block of expected sales, as the practically achievable benchmark for efficient pricing.\(^9\)

To avoid confusing average LRIC with other types of average cost that are not incremental in nature, the former is referred to hereafter as simply "LRIC." Incremental cost may include the cost of a facility dedicated to the service in question or a shared facility that is used by that service together with other services.

**Stand-alone cost.** If a firm provides only two services, stand-alone cost is the forward-looking cost at which a service can be provided by a specialized competitive supplier offering only that service. Stand-alone cost thus represents the total cost of constructing and operating facilities dedicated to a specific service.\(^10\) The "stand-alone cost test" commonly used by regulators requires that no service price exceed the stand-alone cost of that service. If a firm provides more than two services, the stand-alone cost test requires that no group of services subsidize any other group of services.

**Common costs.** The costs of some shared facilities and operations, however, are not incremental with respect to the individual services they provide. These costs are referred to as "common costs" or "joint costs." They include costs such as the basic network managerial expenses that do not vary with respect to the output of a particular service. Unsubsidized firms nonetheless must recover these common costs in order to break even. Yet, because a cost-causative relationship does not exist between these costs and individual services, they can be distributed among services in many different

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8. The FCC has defined the LRIC of a service as its incremental cost during a period that is sufficiently long for all of the firm's costs to be variable or avoidable. See In re Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, 11 F.C.C.R. 451, 885 § 677 (1996) [hereinafter Interconnection Order]. Economists recognize that, if LRIC is decreasing over the relevant output range, LRIC will be less than long-run average total cost. Under this condition, an unsubsidized firm must charge a price above LRIC in order to recover all its costs and break even. See generally KAHN, supra note 1, at 124-33. Note that, when the increment is specified as only one unit of output, economists refer to the additional cost as "marginal cost."

9. See, e.g., KAHN, supra note 1, at 85.

ways without affecting economic efficiency. Economists therefore generally advise regulators to keep prices between a price floor set by LRIC and a ceiling set by stand-alone cost in order to give firms proper incentives to build efficient multi-service facilities. The FCC adopted this guideline for the pricing of access to unbundled network elements.1

Opportunity cost. Whereas business accountants regard production cost as an explicit out-of-pocket expenditure, economists define cost more broadly to also include foregone opportunities for using real resources to produce other services and goods. Under rate-of-return regulation, firms are generally permitted to recover opportunity costs, in this sense, by imputing a value to stockholders' equity, i.e., the share of the firm's resources that is not financed by explicit interest payments.

B. Procedural History

Initiation of inquiry. In 1992, Metropolitan Fiber Systems (MFS) and several other competitive access providers (CAPs) were concerned that the FCC's flexible pricing policy for price cap LECs was allowing certain retail prices to fall below cost.12 The CAPs were particularly concerned about the prices of high-capacity, special access services.13 In the Collocation Order, the FCC discussed two issues raised by MFS and others regarding the volume and term discount rate plans offered by LECs for high capacity services.14 One issue is whether these discounts overstate actual cost differences and thus discriminate in favor of certain customers. The other issue is whether the discounts are so large that they result in predatory rates.15 The FCC concluded that reasonable volume and term discounts can be an appropriate means of pricing these services to reflect the efficiencies associated with larger traffic volumes and the certainty associated with longer term deals.

The FCC further concluded, however, that in light of the emergence of access competition the largest discounts may be discriminatory or anticompetitive. Noting that the record was inadequate to reach any

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11. Interconnection Order, supra note 8, at ¶ 679, 698.
12. Although LECs still provide most interstate access service, a growing number of CAPs have entered the access market, deploying fiber-optic rings and microwave systems to serve the needs of large businesses with high-capacity connections to the point-of-presence (POP) of an interexchange carrier (IXC). This enables business customers to bypass the LECs' networks when making toll calls.
13. Special access service is simply unswitched access service. It does not provide access to the switched public network. Rather, it provides private lines dedicated to the exclusive use of one customer or a group of allied customers. The private line is called a "DS0 circuit" when it provides a voice-grade equivalent circuit. To be considered high capacity, it must provide at least the capacity of a DS1 circuit, which is the equivalent of 24 DS0 circuits. The services examined in this inquiry provide capacities much greater than this. The smallest provides a single DS3 circuit, which is the equivalent of 28 DS1 circuits. The largest provides 36 DS3 circuits.
conclusions regarding the lawfulness of any particular discounts, the FCC decided that some additional inquiry is needed to help it determine whether to promulgate guidelines requiring cost justification for any subset of these discounts. The FCC therefore directed its Common Carrier Bureau (Bureau) to initiate such an inquiry based on LEC cost support data for some of the largest existing discounts.

**Development of inquiry methodology.** In developing a methodology for evaluating the reasonableness of such discounts, the Bureau considered two alternative approaches. One approach is to determine whether the discounts are fully justified by cost reductions attributable to the larger traffic volumes or longer term service contracts. Because this approach involves a comparison of various rates charged for services that are identical except for volume and term commitments, it addresses the price discrimination issue. The other approach is to determine whether the largest discounts result in rates below a price floor standard such as AVC. As explained below, this approach addresses the predatory pricing issue.

The Bureau decided to focus on the predatory pricing issue because it believed the key question in this inquiry is whether LECs are setting prices so low as to force competitors out of business. The Bureau also believed a limited inquiry is capable of answering this question. The Bureau therefore reviewed data submitted by MFS and a number of LECs, as well as other data available to the FCC, to select the largest discounts for further study. Based on this review, the Bureau decided initially to focus on the largest volume and term discounts available under the DS3 special access tariffs of four price cap LECs: Ameritech, Bell Atlantic, Pacific Bell, and US West. On December 18, 1992, the Bureau issued letters to these LECs, directing them to provide cost and revenue data that would show whether the selected rates cover AVC and are otherwise just, reasonable, and nondiscriminatory. In response, the LECs submitted data on January 15, 1993. The Bureau determined that these data were too aggregated to permit a proper analysis. Consequently, in letters

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16. These carriers are referred to as "price cap LECs" because they are operating under the FCC's modified form of price cap regulation rather than under traditional rate-of-return regulation. This form of regulation is mandatory for Regional Bell Operating Companies (RBOCs) and GTE. It is optional for all other LECs that do not participate in the National Exchange Carrier Association (NECA) service pool. Under these rules, a separate Price Cap Index (PCI) is established for service groupings called baskets. The initial PCI for each basket was set at 100 and was initialized on interstate rates targeted at the authorized rate of return. The PCIs are adjusted on an ongoing basis to reflect productivity gains, general inflation, and certain costs changes that are considered exogenous, i.e., out of the LEC's control. Individual prices within each basket may be changed if the price changes satisfy certain constraints and do not cause the aggregate price for all services in the basket to exceed the PCI for that basket. Proposed price increases falling outside the pricing constraints, or causing the aggregate price to exceed the PCI, require more documentation and face a high probability of suspension. A price cap LEC can increase its earnings by increasing its actual productivity to a level above the productivity differential in the price cap formula. If annual earnings exceed specified levels, a portion of those earnings must be shared with customers through prospective price reductions for a one-year period. These rules are codified at 47 C.F.R. §§ 61.42-61.49 (1995). The rules were initially adopted in October 1990 and became effective on January 1, 1991. See Policies and Rules Concerning Rates for Dominant Carriers, 5 F.C.C.R. 6786 (1990) [hereinafter LEC Price Cap Order].
issued on April 23, 1993, the Bureau required the LECs to submit certain additional cost data and a detailed description of certain network plant configurations. Bell Atlantic submitted this information on May 10, 1993, and the other LECs submitted it on May 14, 1993.

After determining that these data submissions contained errors or were otherwise insufficient, the Bureau's Competitive Pricing Division issued letters on September 24, 1993 requiring the LECs to provide corrections and certain additional data. The LECs submitted this information on October 15, 1993. Moreover, in response to questions that Bureau staff members had asked over the phone, the LECs submitted further information in letters filed at various stages of the inquiry. Finally, a number of interested parties commented on this inquiry in *ex parte* statements. The study results show that the Bureau did not actually determine LRIC for either service, even after collecting cost data and industry comments for nearly a year. Instead, the Bureau obtained increasingly disaggregated data in each round of data collection until it was able to determine whether there was sufficient evidence of predatory pricing to warrant further inquiry.

C. Applicable Cost Standards

To show how the study relates to FCC pricing policies, it will be useful to describe predatory pricing and explain why the FCC adopted AVC as the tariff review standard that is to be used in evaluating the below-band filings of price cap LECs. The following discussion provides that background information and also explains why the FCC accepts a showing that a rate exceeds LRIC as sufficient evidence that it also exceeds AVC.

*Description of predatory pricing.* A company engages in predatory pricing whenever it temporarily lowers price below the competitive level with the intent of eliminating competitors or deterring potential competitors from entering the market. To be successful, this pricing strategy must be implemented through a three-stage process. In the first stage, the predator temporarily lowers price below the competitive price level. In the second stage, the damage to competitors or discouragement of potential competitors enables the predator to create or maintain substantial market power. In the third stage, the predator recoups revenues lost during the temporary price reduction by raising price above the competitive level, perhaps as high as the monopoly level.

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One way of identifying predatory pricing is to determine whether a company’s intent is anti-competitive. Such an approach is difficult, however, because aggressive price cutting often is the very essence of competition and thus does not necessarily imply anti-competitive intent. As a result, the FCC, as well as the courts, focuses on a cost standard to determine whether low prices are intended to eliminate competition rather than to promote it. This approach is based on the belief that, unless a price is intended to be predatory, a company will not set that price so low that a service adds more to total costs than to total revenues.

**AVC test for below-band filings.** The FCC established a cost standard to guard against predatory pricing in the LEC Price Cap Order. It decided that “the question whether prices are below marginal cost, or its surrogate, average variable cost is central to the determination of whether prices are predatory.”

In effect, the FCC recognized that the ideal test for predation is a showing of whether price is below marginal cost, i.e., the additional cost incurred to provide one more unit of a product or service. Yet, due to the difficulty of measuring marginal cost, the FCC required LECs to use AVC as a surrogate for it. Specifically, the FCC required price cap LECs to show that below-band tariff filings are above AVC, rather than marginal cost, in order to avoid suspension.

AVC is estimated by summing all costs that a firm can control in the “short run,” usually a period of a year or less, and then dividing this sum by the total quantity of service supplied. The FCC therefore regards AVC as consisting of all costs that vary with respect to the amount of service provided during the short run. AVC typically includes the costs of wages, maintenance supplies, income taxes, and billing, but excludes the sunk costs associated with fixed plant.

**LRIC data substituted for AVC data.** The price cap companies that have made below-band filings typically have chosen to substitute LRIC data for AVC data when showing they have satisfied the requirement that rates exceed AVC. The FCC has permitted this substitution because it believes a cost test

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18. *LEC Price Cap Order*, supra note 16, at § 310. Throughout the discussion below, the term “AVC” refers only to short-run AVC.

19. The FCC acknowledged that it might be possible to show that a rate is predatory even though it exceeds AVC. The FCC observed, however, that it is seeking “a standard which requires suspension only of those rates which are so low that they can be presumed to be anticompetitive.” It explained that, although it is convinced that below-band reductions introduced under price caps will be more pro-competitive than predatory, it is erring on the side of caution by not giving streamlined tariff review to below-band filings. It concluded that, in the event it is possible to show that a below-AVC rate is predatory, petitioners will have an opportunity to do so; they can demonstrate that there is reason to investigate a rate decrease that the FCC would otherwise permit to go into effect after 45 days. *Id.*

20. If the companies had submitted the required short-run AVC data, they would have had to identify costs that are fixed in the short run, which by definition must exhibit fixed costs. They reported no fixed costs, which implies the costs are long run in nature. Moreover, the companies characterized the data as representing direct, forward-looking AVCs. See, e.g., Submission by Bell Atlantic of Jan. 15, 1993, *In re Expanded Interconnection with Local Telephone Company Facilities*, 9 F.C.C.R. 5154 (1994) (CC No. 91-141). Consequently, they effectively described the costs as long-run AVC. It is equivalent in this case to LRIC, where the service in question constitutes the increment and where, for purposes of developing a service unit cost, the firm averages incremental cost over the expected number of service
based on LRIC results in a pricing floor higher than that based on AVC. This result is likely because, in the long run, more costs vary with respect to output than is true for the short run. For example, whereas some plant is fixed with respect to output in the short run and is thus excluded from AVC, it varies with respect to output in the long run and thus is included in LRIC. This implies that, as a test for predatory pricing, an LRIC standard generally is more difficult to satisfy than an AVC standard. It also generally implies that passing an LRIC standard demonstrates that the AVC standard also is passed. Presumably, the price cap companies selected this more difficult approach to bolster the showing that the rates under review are reasonable.

In this inquiry, all four companies decided to make an LRIC showing rather than an AVC showing. There seem to be several practical reasons for this decision. First, as noted above, a short-run test generally considers an operating period of a year or less. The AVC test therefore is inappropriate for the services examined here, most of which are provided under five- and ten-year contracts. Second, LECs have well-developed computer and accounting systems for determining LRIC. This is so because the FCC permits LECs to submit LRIC data in fulfillment of the FCC's new service test,\(^2\) and because many state commissions use it as a tariff review standard.

Third, LRIC calculations are easier to defend than AVC calculations if legal challenges arise. Given that AVC is a short-run concept, its level is sensitive to the way "short run" is defined. At one extreme, AVC is a small fraction of LRIC if the short run is defined to be so short it permits few factors of production to vary with output changes. At the other extreme, AVC may approximate or even exceed LRIC if the short run is defined to be so long it is indistinguishable from the long run. This definition therefore is a potentially contentious issue which carriers can avoid by opting for the LRIC test. In this inquiry, for example, use of the LRIC test enables the companies to render moot the ALTS' claim that "the standard for what constitutes average variable cost pricing has never been unambiguously defined . . . ."\(^2\)

D. Plant Configuration for Services at Issue

The LECs provide two basic types of high capacity special access service. One is channel termination service. It provides a connection between the customer premises and the entrance facility at the closest serving wire center.

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unit sales. This is so because the companies developed these forward looking costs for the specific services in question, not for a large group of dissimilar services or for all services. The FCC refers to such a forward looking cost as "total service LRIC" or "TSLRIC." See Interconnection Order, supra note 8, at 677.


\(^2\) ALTS Study, supra note 17, at 2.
The other is channel mileage service. It provides a connection between or among serving wire centers. Channel termination service. The plant configuration for channel termination service is so simple that it resembles a typical child's notion of telephone infrastructure: tin cans and a string. It consists of a fiber loop connected at each end to an optical line terminating multiplexer (OLTM) unit and cross-connect. The LEC installs one OLTM unit on the customer premises and the other at its serving wire center. The fiber loop consists of four fiber strands, two being used for transmitting and receiving, and two for protection. The fiber loop and both OLTM units are fully dedicated to the customer.

Channel mileage service. Similar to channel termination service, channel mileage service uses a four-strand fiber channel terminating into OLTM units and cross-connects. Notwithstanding this similarity, the plant configuration for channel mileage service is more complex than channel termination service because it constitutes one link of a shared interoffice network encompassing many central offices and customers. When a customer needs a link between two adjacent serving wire centers, the customer's signal usually engages only two OLTM units, one at the originating office and the other at the terminating office. When a customer needs a link over a long distance, however, its signal engages two additional OLTM units for every intermediate office needed to complete the channel. Moreover, if any interoffice channel exceeds a length of twenty miles, it is likely that an optical regenerator will be used.

Unlike the OLTM units used for channel termination service, those used for this service are common to numerous services. The capacity of these units therefore is shared among many different services, including both switched and special access services. DS3 channel mileage service, for example, usually is provided using OLTM units with a capacity of twelve DS3 channels. Although that capacity is typical of units now being installed in large offices, it may vary from three to thirty-six DS3 channels, depending on the size and location of the office. Similar to the electronics, the interoffice fiber also varies in form. LECs use a diverse combination of aerial,
underground, and buried fiber cables. As a result of these many differences in network routing and plant type, the cost of providing this service varies substantially not only among individual companies but also among study areas served by the same company.

II. Study Results

The major issues in this inquiry are, first, whether reported costs indicate that rates exceed the cost standard for predatory pricing and, second, whether reported costs are based on appropriate costing methodologies. To address those issues, this Part explains how service features and rates compare among companies and how the reported costs compare to the cost standard. This Part also describes the companies’ costing methodology, evaluates that costing methodology, and summarizes the study results.

A. Comparison of Service Features, Rates and Discounts

Channel termination service. The services offered by the four companies are distinguished by length of the service contracts (service terms), type of interface required (electrical or optical), and capacity for DS3 channels. The four channel termination services selected for this study exhibit several important feature differences. Table I shows that the US West service, for example, is for a ten-year term, while the other three services are for five-year terms.

Also, whereas the Ameritech and PacBell services provide electrical interfaces at the customer premises, the Bell Atlantic and US West services provide optical interfaces. This is an important difference because, as noted above, an electrical interface requires the LEC to supply a second OLTM unit, thereby almost doubling the electronics cost. In addition, the DS3 channel capacity of these four services varies from twelve to thirty-six channels. The LEC-provided OLTM units are unable to supply their full capacity unless they are equipped with a full set of DS3 channel plugs. One plug is required for each DS3 channel. Since these plugs constitute a substantial portion of the total electronics cost, three companies—PacBell being the only exception—offer customers the option of purchasing less than a full plug set. These companies break the monthly rate into two elements. One element is a flat rate per DS3 channel plug that applies to the number of plugs installed. The purpose of this element is to recover the cost of these plugs. The other element is a flat rate intended to recover all other costs. In contrast, PacBell charges a single flat rate for the service and provides a full set of channel plugs.

26. Whereas underground fiber is placed in a conduit, buried fiber is not.
27. The rates shown are those in effect on October 31, 1993. Although the companies price the two rate elements separately, customers cannot purchase them separately.
plugs. Table 1 shows that, assuming a full set of channel plugs is supplied, monthly rates vary from $6,000 for Bell Atlantic to $17,100 for Ameritech.

### Table 1: Features and Rates of Channel Termination Service

<table>
<thead>
<tr>
<th>Features</th>
<th>Ameritech</th>
<th>Bell Atlantic</th>
<th>PacBell</th>
<th>US West</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS3 Channel Capacity</td>
<td>24 channels</td>
<td>12 channels</td>
<td>12 channels</td>
<td>36 channels</td>
</tr>
<tr>
<td>Interface Type</td>
<td>Electrical</td>
<td>Optical</td>
<td>Electrical</td>
<td>Optical</td>
</tr>
<tr>
<td>Service Term</td>
<td>5 years</td>
<td>5 years</td>
<td>5 years</td>
<td>10 years</td>
</tr>
<tr>
<td>Monthly Rates</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flat</td>
<td>$7,500</td>
<td>$4,200</td>
<td>$9,000</td>
<td>$6,998</td>
</tr>
<tr>
<td>Per DS3 Channel Plug</td>
<td>$400</td>
<td>$150</td>
<td>n/a</td>
<td>$55</td>
</tr>
<tr>
<td>Total With Full Plug Set</td>
<td>$17,100</td>
<td>$6,000</td>
<td>$9,000</td>
<td>$8,978</td>
</tr>
</tbody>
</table>

**Channel mileage service.** Like channel termination services, the channel mileage services provided by the companies differ in important ways. Table 2 shows that, whereas the Bell Atlantic service provides three DS3 channels, the other three services provide only one.  

### Table 2: Features and Rates of Channel Mileage Service

<table>
<thead>
<tr>
<th>Features</th>
<th>Ameritech</th>
<th>Bell Atlantic</th>
<th>PacBell</th>
<th>US West</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity in DS3 Channels</td>
<td>1 channel</td>
<td>3 channels</td>
<td>1 channel</td>
<td>1 channel</td>
</tr>
<tr>
<td>Service Term</td>
<td>5 years</td>
<td>5 years</td>
<td>1 month</td>
<td>10 years</td>
</tr>
<tr>
<td>Monthly Rate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mileage Term (per DS3)</td>
<td>$334</td>
<td>$2,294</td>
<td>$833</td>
<td>$320</td>
</tr>
<tr>
<td>Mileage (per DS3 Mile)</td>
<td>$103</td>
<td>$255</td>
<td>$44</td>
<td>$34</td>
</tr>
</tbody>
</table>

There also are differences in service term. It is one month for PacBell, five years for Ameritech and Bell Atlantic, and ten years for US West. However, the pricing structure is the same for all four companies. The monthly rates consist of two elements. One is a flat rate unaffected by the number of DS3 miles provided. It is intended to recover service costs that are not distance sensitive, *e.g.*, those costs associated with OLTM units and cross-connects in originating and terminating offices. It is generally called a “mileage termination charge.” Table 2 shows that, on a per DS3 basis, these

---

28. Although the mileage termination and mileage elements are priced separately, they cannot be purchased separately. US West’s rate for the mileage element applies only to the zero to eight-mile band; above 50 miles, the rate increases to $40. Because Bell Atlantic’s channel mileage service has no volume discount, the DS3x3 rate shown in Table 2 is simply 3 times its DS3 rate.
The charges range from a low of $320 (US West) to a high of $833 (PacBell). The other element, called the “mileage charge,” is assessed on the number of DS3 miles provided in the interoffice channel. Fundamental to this charge is the air mile distance between originating and terminating offices. This charge is intended to recover distance sensitive costs, including all service costs associated with the interoffice fiber cable, optical regenerators, and OLTM units and cross-connects located in intermediate offices.

**Package containing both services.** A comparison of the companies’ monthly rates was simplified by developing a combined rate for both channel termination and channel mileage services. This combined rate was examined because customers tend to purchase the services together and because a high rate on one may offset a low rate on the other. The combined rate, calculated for a typical service package, is the sum of charges for channel termination (assuming a full set of channel plugs is supplied), mileage termination, and an eight-mile interoffice link. However, a combined rate for one company is not easily compared to that for other companies because the number of DS3 channels provided varies greatly among the companies. Consequently, each combined rate was divided by the number of DS3 channels provided to obtain a normalized rate showing the rate per DS3 channel.

Table 3 shows that the package rates range from a low of $841 (US West) to a high of $1,945 (Bell Atlantic). Table 3 further shows that the discounted rates for this package are the result of discounts ranging from 48 to 68 percent off base rates.

In order to highlight the service that is the primary source of the package discounts, the discounts were calculated for unbundled package services and elements. Table 3 shows that the rates for channel termination service reflect the companies’ use of large discounts ranging from 70 to 85 percent off base rates. The discounts for channel mileage service, however, are much less. The mileage termination charges, for example, reflect the use of only modest discounts, if any. These discounts range from 0 to 20 percent. Similarly, the discounts for the mileage charge range from 0 to 21 percent for three companies while the fourth, Bell Atlantic, has a discount of 62 percent. Table 3 shows that the normalized discount rates per DS3 channel termination rates for Ameritech and PacBell are $713 and $750, respectively. These discounted rates are roughly comparable because each applies to a service using an electrical interface. As for the two services using an optical interface and therefore using only one OLTM unit, the normalized discounted rates per DS3

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29. The interoffice link is assumed to be eight miles long because US West’s channel mileage rate applies only to zero- to eight-mile distances, and because the typical interoffice link appears to be at least eight miles long.

30. This normalization procedure, which facilitates a comparison of effective per-DS3 rates by assuming that all four companies offer the same package, necessarily yields some per-DS3 rates that differ from those shown in Table 2. The data in that table are derived with a normalization procedure that assumes each company offers the package that it actually offers under tariff, in order to highlight rate differences between those packages.
channel termination are less expensive. These discounted rates are $500 and $249 for Bell Atlantic and US West, respectively.

Table 3: Comparison of DS3 Base Rates to Maximum Discounted Rates
(Normalized per DS3)

<table>
<thead>
<tr>
<th></th>
<th>Ameritech</th>
<th>Bell Atlantic</th>
<th>PacBell</th>
<th>US West</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Maximum Discounts</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Channel Termination</td>
<td>74%</td>
<td>85%</td>
<td>70%</td>
<td>73%</td>
</tr>
<tr>
<td>Mileage Termination</td>
<td>5%</td>
<td>17%</td>
<td>0%</td>
<td>20%</td>
</tr>
<tr>
<td>Mileage</td>
<td>19%</td>
<td>62%</td>
<td>0%</td>
<td>21%</td>
</tr>
<tr>
<td>Service Package</td>
<td>54%</td>
<td>68%</td>
<td>48%</td>
<td>50%</td>
</tr>
<tr>
<td><strong>Base Rates</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Channel Termination</td>
<td>$2,700</td>
<td>$3,303</td>
<td>$2,500</td>
<td>$939</td>
</tr>
<tr>
<td>Mileage Termination</td>
<td>$352</td>
<td>$924</td>
<td>$833</td>
<td>$400</td>
</tr>
<tr>
<td>Mileage</td>
<td>$127</td>
<td>$225</td>
<td>$44</td>
<td>$43</td>
</tr>
<tr>
<td>Service Package</td>
<td>$4,070</td>
<td>$6,031</td>
<td>$3,683</td>
<td>$1,683</td>
</tr>
<tr>
<td><strong>Discounted Rates</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Channel Termination</td>
<td>$713</td>
<td>$500</td>
<td>$750</td>
<td>$249</td>
</tr>
<tr>
<td>Mileage Termination</td>
<td>$334</td>
<td>$765</td>
<td>$833</td>
<td>$320</td>
</tr>
<tr>
<td>Mileage</td>
<td>$103</td>
<td>$85</td>
<td>$44</td>
<td>$34</td>
</tr>
<tr>
<td>Service Package</td>
<td>$1,874</td>
<td>$1,945</td>
<td>$1,933</td>
<td>$841</td>
</tr>
</tbody>
</table>

B. **Comparison of Reported Costs to Cost Standard**

To facilitate a comparison of the reported monthly LRIC costs to the cost standard, the FCC calculated a rate/cost ratio for all services. Because these high-capacity services typically are provided with one or more twelve-pack OLTM units, and because LECs typically have twelve-pack OLTM units installed in central offices, the rates were normalized to reflect an equivalent number of 12-pack OLTM units for purposes of this comparison.\(^{31}\) With regard to channel termination services, Table 4 shows that the lowest rate/cost ratio is 1.6 for PacBell. This ratio implies that PacBell's rate is 60 percent above its reported LRIC. In contrast, the highest ratio is 3.4 for Bell Atlantic, which implies that its rate is 240 percent above its reported LRIC. Table 4 also shows the rate/cost ratios for channel mileage service. Assuming that an

\(^{31}\) The normalization procedure assumed that only one OLTM unit would be provided per channel termination, i.e., that optical termination was provided because the customer owned his own OLTM unit at the end of the channel termination line. This was done both for rates and costs. In addition, the portion of costs attributed to circuit equipment was adjusted to reflect an equivalent number of 12-pack OLTM units. As discussed above, each of the four companies has chosen to substitute LRIC data for the AVC data requested by the Bureau. Ameritech's data are based on its Illinois study area. Bell Atlantic's data for channel mileage service are converted from a DS3x3 basis to a DS3 basis. US West's mileage element rate applies only to a zero to eight-mile band.
eight-mile channel is supplied, these ratios range from a low of 1.14 (US West) to a high of 2.36 (Ameritech). The data in Table 4 therefore indicate that rates exceed reported LRIC for all services.

Table 4: Rate/Cost Ratios for Services
(Normalized per DS3)

<table>
<thead>
<tr>
<th>Service</th>
<th>Ameritech</th>
<th>Bell Atlantic</th>
<th>PacBell</th>
<th>US West</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Channel Termination Service</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rate</td>
<td>$4,275</td>
<td>$6,000</td>
<td>$4,500</td>
<td>$2,993</td>
</tr>
<tr>
<td>Cost</td>
<td>$1,563</td>
<td>$1,788</td>
<td>$3,565</td>
<td>$2,081</td>
</tr>
<tr>
<td>Rate/Cost</td>
<td>2.7</td>
<td>3.4</td>
<td>1.3</td>
<td>1.4</td>
</tr>
<tr>
<td><strong>Channel Mileage Service</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mileage Term. Element</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rate</td>
<td>$334</td>
<td>$765</td>
<td>$833</td>
<td>$320</td>
</tr>
<tr>
<td>Cost</td>
<td>$203</td>
<td>$729</td>
<td>$484</td>
<td>$249</td>
</tr>
<tr>
<td>Rate/Cost</td>
<td>1.6</td>
<td>1.0</td>
<td>1.7</td>
<td>1.3</td>
</tr>
<tr>
<td>Mileage Element</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rate per DS3 Mile</td>
<td>$103</td>
<td>$85</td>
<td>$44</td>
<td>$34</td>
</tr>
<tr>
<td>Cost per DS3 Mile</td>
<td>$36</td>
<td>$24</td>
<td>$46</td>
<td>$34</td>
</tr>
<tr>
<td>Rate/Cost</td>
<td>2.9</td>
<td>3.5</td>
<td>0.9</td>
<td>1.0</td>
</tr>
<tr>
<td>Total Service</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rate (8-Mile Chan.)</td>
<td>$1,161</td>
<td>$1,445</td>
<td>$1,185</td>
<td>$592</td>
</tr>
<tr>
<td>Cost (8-Mile Chan.)</td>
<td>$491</td>
<td>$923</td>
<td>$854</td>
<td>$521</td>
</tr>
<tr>
<td>Rate/Cost</td>
<td>2.4</td>
<td>1.6</td>
<td>1.4</td>
<td>1.1</td>
</tr>
</tbody>
</table>

C. General Description of Costing Methodology

The companies all use the same basic, four-step costing methodology to develop LRIC. First, the companies identify the investment associated with a given service. Because LRIC is forward looking, this investment is estimated on a prospective basis using equipment prices that are current, not historical. Second, this investment is converted to "unit investment" to show investment per facility unit or per service capacity unit, e.g., per fiber trunk or per DS3 circuit. In developing unit investment, the companies adjust investment by a forecast of expected utilization for each facility. For example, to develop investment per circuit for a twelve-circuit regenerator expected to be utilized at two-thirds capacity, the investment is averaged over twelve circuit years. For a more detailed description of each company's methodology as filed in In re Expanded Interconnection with Local Telephone Company Facilities, 9 F.C.C.R. 5154 (1994) (CC No. 91-141), see Response by Ameritech of May 10, 1993, at 3-4; Response by Bell Atlantic of Jan. 15, 1993, at 3-4; Response by PacBell of Jan. 15, 1993, at 1-2; Response by US West, Jan. 15, 1993, at 1-2.
circuits (the capacity) and divided by two-thirds (the capacity utilization or “fill factor”). This adjustment using a fill factor is necessary to ensure that the complete investment is included in the cost-of-service study and recovered in the rates.

Third, a series of loading factors are applied to these unit investment amounts to account for related capital costs, which include the costs of facility installation, power backup, poles and conduit, and land and buildings. Fourth, this “fully loaded” unit investment is converted to an annual cost by applying annual cost factors. Some of these factors reflect capital expenses such as depreciation, cost of money, and income tax while the remainder reflect non-capital expenses such as gross receipts taxes, maintenance, administration, and marketing.

D. Evaluation of Costing Methodologies

Investment in major facilities. The FCC evaluated the reasonableness of reported investments by analyzing the investment data for certain major types of equipment. For channel termination service, the analysis focused on reported investment in OLTM units and channel plugs. As Table 5 shows, these typically account for roughly three-fourths of the service-related investment. The channel plugs alone represent a substantial portion of service-related investment, from 18 percent (Ameritech) to 32 percent (Bell Atlantic).

Fiber and conduit investment was reported as accounting for only 6 to 8 percent of service investment for three companies, and 18 percent for the fourth (PacBell). Building and land investment is even smaller, ranging from 4 to 8 percent for the three companies reporting it. Table 6 shows that OLTM investment, normalized to reflect twelve DS3 channels of capacity, varies from $48,559 (Ameritech) to $64,737 (PacBell). This variation between the extreme figures does not seem unreasonable, given that the former figure may reflect the scale economies of obtaining twelve channels of capacity from a facility providing twenty-four channels, whereas the latter figure pertains to a facility providing only twelve channels.

33. As noted earlier, OLTM units are optical light terminating multiplexers.
34. Table 5 does not show a breakout of the channel plugs investment for PacBell because it reported it aggregated with the OLTM unit investment. Unlike the other companies, PacBell reported a small residual investment for the enclosure and battery panel that is installed at the customer premises. Table 5 shows that this investment accounts for only 4 percent of PacBell’s service-related investment.
35. US West’s unit investment, for example, was normalized by dividing it by three because the US West facility provides 36 DS3 channels, i.e., 3 times the capacity of a facility providing 12 DS3 channels. OLTM cost includes a full set of channel plugs, installation, and power backup.
36. However, if scale economies explain the apparent unit cost reduction as channel capacity increases between those two LECs, it is unclear why US West’s unit investment ($63,594) is only 2 percent less than that of PacBell, which offers an OLTM unit with only one-third the capacity of US West’s OLTM unit. This result was determined to be reasonable, given that sales of 36-channel OLTM units are substantially less than that of 12- and 24-channel equipment. Moreover, even assuming the worst scenario, i.e., that US West’s unit investment is typical of that encountered by the other LECs, a
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Table 5: Major Components of Channel Termination Investment

<table>
<thead>
<tr>
<th></th>
<th>Ameritech</th>
<th>Bell Atlantic</th>
<th>Pac Bell</th>
<th>US West</th>
</tr>
</thead>
<tbody>
<tr>
<td>OLTMs</td>
<td>$152,436; 65%</td>
<td>$31,107; 42%</td>
<td>$129,473; 53%</td>
<td>$124,585; 49%</td>
</tr>
<tr>
<td>Channel Plugs</td>
<td>$41,800; 18%</td>
<td>$23,615; 32%</td>
<td>N/A</td>
<td>$66,196; 26%</td>
</tr>
<tr>
<td>X-Connects</td>
<td>$27,678; 12%</td>
<td>$8,955; 12%</td>
<td>$48,358; 20%</td>
<td>$31,646; 13%</td>
</tr>
<tr>
<td>Other</td>
<td>$0; 0%</td>
<td>$268; 0%</td>
<td>$11,000; 4%</td>
<td>$0; 0%</td>
</tr>
<tr>
<td>CIRCUIT</td>
<td>$221,914; 94%</td>
<td>$63,945; 86%</td>
<td>$188,831; 77%</td>
<td>$222,427; 88%</td>
</tr>
<tr>
<td>Fiber/Conduit</td>
<td>$13,809; 6%</td>
<td>$4,281; 6%</td>
<td>$44,401; 18%</td>
<td>$20,475; 8%</td>
</tr>
<tr>
<td>Investment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Building/Land</td>
<td>$0; 0%</td>
<td>$5,845; 8%</td>
<td>$13,273; 5%</td>
<td>$9,813; 4%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$235,723</td>
<td>$74,071</td>
<td>$246,505</td>
<td>$252,715</td>
</tr>
</tbody>
</table>

Table 6: Features and Costs of OLTM Units

<table>
<thead>
<tr>
<th></th>
<th>Ameritech</th>
<th>Bell Atlantic</th>
<th>PacBell</th>
<th>US West</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity in DS3 Channels</td>
<td>24 channels</td>
<td>12 channels</td>
<td>12 channels</td>
<td>36 channels</td>
</tr>
<tr>
<td>OLTMs Provided</td>
<td>2 units</td>
<td>1 unit</td>
<td>2 units</td>
<td>1 unit</td>
</tr>
<tr>
<td>Total Per 12 Channels</td>
<td>$97,118</td>
<td>$54,722</td>
<td>$64,737</td>
<td>$190,781</td>
</tr>
<tr>
<td>Annual Depreciation per 12 Channels</td>
<td>$8,093</td>
<td>$4,560</td>
<td>$10,434</td>
<td>$5,530</td>
</tr>
</tbody>
</table>

For channel mileage service, data was obtained on investment in the two elements of which the service is comprised. These are the central office mileage termination facilities, called the “mileage termination element,” and the interoffice message transport facilities, called the “mileage element.” For the mileage termination element, the analysis focused on circuit equipment investment which, as Table 7 shows, accounts for more than 90 percent of the predation problem still would not be evident. Such an assumption implies that Ameritech and Bell Atlantic’s unit investments are actually 33 and 18 percent larger than reported. Such increases in cost, however, would not raise their LRICs above tariffed rates. As Table 4 shows, the rates are more than 200 percent above reported costs for these two companies.
total investment attributed to that element. For the mileage element, the analysis primarily targeted the circuit equipment, fiber, and conduit investment which, as Table 7 shows, constitute at least 97 percent of the element's total investment.

Table 7: Major Components of Channel Mileage Investment
(Normalized per DS3)

<table>
<thead>
<tr>
<th>Mileage Termination Element</th>
<th>Ameritech</th>
<th>Bell Atlantic</th>
<th>Pac Bell</th>
<th>US West</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circuit Equipment Investment</td>
<td>$8,649</td>
<td>$27,889</td>
<td>$23,028</td>
<td>$11,555</td>
</tr>
<tr>
<td>Building and Land Investment</td>
<td>$0</td>
<td>$2,643</td>
<td>$1,585</td>
<td>$96</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$8,649</td>
<td>$30,532</td>
<td>$24,613</td>
<td>$12,151</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mileage Element</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Circuit Equipment</td>
<td>$287</td>
<td>$277</td>
<td>$768</td>
<td>$649</td>
</tr>
<tr>
<td>Fiber and Conduit Investment</td>
<td>$2,327</td>
<td>$806</td>
<td>$1,748</td>
<td>$1,147</td>
</tr>
<tr>
<td>Building and Land Investment</td>
<td>$0</td>
<td>$29</td>
<td>$53</td>
<td>$29</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$2,614</td>
<td>$1,112</td>
<td>$2,569</td>
<td>$1,825</td>
</tr>
</tbody>
</table>

In a few instances, the investment reported for a particular factor input seemed questionable but, due to its small size, was determined to have such a small effect on LRIC that it had no appreciable effect on the large gap between LRIC and the applicable rate. This situation occurred, for example, with respect to the investment in fiber loops dedicated to channel termination service. Table 8 shows that loop investment per route mile varies greatly among companies, from a low of $1,819 (Bell Atlantic) to a high of $6,466 (US West). This difference may be largely explained by a variation among companies in the relative mix of aerial, buried, and underground cables, which differ substantially in cost. Alternatively, it may be explained simply

37. It is not surprising that the investment figures for major factor inputs are found to be more accurate than those for minor factor inputs. Given the considerable expenses incurred by performing cost studies, companies generally update these studies more frequently for the major components used in providing a service than they do for the minor components.

38. Channel termination loop contains four fiber strands, two for the transmit and receive functions and two for protection. Loop length is the route mile distance between end user and serving wire center. The US West loop length in Table 8 represents the average length for all of its DS3 services.
by error. In any event, this investment accounts for only 6 to 8 percent of the total service investment for all but one of the companies (see Table 5 and related discussion above) and the effect on LRIC is not substantial even if the highest figure ($6,466) were used by all four companies.

### Table 8: Unit Investment for Channel Termination Loops

<table>
<thead>
<tr>
<th></th>
<th>(A)</th>
<th>(B)</th>
<th>(AxB)</th>
<th>(C)</th>
<th>(AxB)/C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loop Route Mile Investment</td>
<td>Average Loop Length</td>
<td>Unadjusted Loop Unit Investment</td>
<td>Loop Fill Factor</td>
<td>Adjusted Loop Unit Investment</td>
<td></td>
</tr>
<tr>
<td>Ameritech</td>
<td>$4,315</td>
<td>3.2 miles</td>
<td>$13,809</td>
<td>1.00</td>
<td>$13,809</td>
</tr>
<tr>
<td>Bell Atlantic</td>
<td>$1,819</td>
<td>2.0 mile</td>
<td>$3,639</td>
<td>0.85</td>
<td>$4,281</td>
</tr>
<tr>
<td>PacBell</td>
<td>$4,440</td>
<td>2.0 miles</td>
<td>$8,880</td>
<td>0.20</td>
<td>$44,401</td>
</tr>
<tr>
<td>US West</td>
<td>$6,466</td>
<td>1.9 miles</td>
<td>$12,285</td>
<td>0.60</td>
<td>$20,475</td>
</tr>
</tbody>
</table>

With regard to channel mileage services, the companies reported the investment for typical circuit configurations and, as a result, the investment for specific types of equipment was rarely available. The investment thus was generally averaged over an entire network consisting of various types and sizes of equipment. Where equipment-specific data were available, analyses were performed to determine if the data were reasonable. Where such data were unavailable, the relative shares of total investment attributed to certain classes of equipment, e.g., OLT units, were studied. Tables 5 and 7 above, for example, show such shares for the major components of both services. The investment data were determined to be reasonable.

Although ALTS, MFS, and Teleport were critical of assumptions underlying the costing methodologies, they did not show that any specific equipment investment figures were incorrect. This lack of specific criticism seems particularly significant for the circuit equipment dedicated to channel termination service, against which they focused most of their objections. This electronic equipment consists of only three major components (OLT units, channel plugs, and cross connects), all of which, as Table 5 shows, are easily identified. The prices of these components thus should be readily available to MFS and Teleport, who have experience in buying electronic equipment from the few manufacturers providing it with capacities as high as twelve to thirty-six DS3 channels.

averaged regionwide. Loop length for the other companies represent average lengths for the particular maximum discounted DS3 services in question, averaged regionwide (a comparable US West figure for such service is 0.01 mile).
Untangling Tin Cans on a String

Allocation of shared facilities. For the channel termination services, all facilities are dedicated to individual customers and thus are not shared among different services. For the channel mileage services, however, most facilities are shared. All four companies use the same basic procedure for allocating investment in a shared facility among the relevant services. They allocate it based on the relative share of the facility’s capacity used by each service. For example, if an OLTM unit with a capacity of twelve DS3 channels provides one DS3 channel mileage service in addition to other services, one-twelfth of the investment is allocated to a DS3 channel. Under an LRIC approach, the allocation of shared investment by relative use is a conservative method that tends to result in a high price floor. The study examined a number of different factors that the companies used in allocating shared facilities among various services.

With regard to the mileage element of channel mileage service, for example, the study scrutinized the average number of intermediate offices that were reported to be engaged by that service. Also examined were several key factors that the companies use in developing unit investment estimates for the fiber and conduit investment attributable to the mileage element. One of these factors is the route/air miles factor that indicates roughly how much longer the actual ground route is than the air route would be. Consider, for example, Ameritech. Table 9 shows that Ameritech uses a route/air miles factor of 1.50, which implies the route is 50 percent longer than the air miles figure on which the customer’s rate is based.

Column AxB in Table 9 shows that Ameritech’s fiber investment per air mile is $8,948 (i.e., 1.50 times its $5,965 fiber investment for a route mile). Column C shows that the share of the fiber connected to OLTM units is 0.64, which means that the remainder is spare. Column D shows that the connected fibers are terminated on OLTM units having a channel capacity of twelve DS3s, which defines the capacity of the attached fiber. Column E shows that only 71 percent of the capacity of the OLTM units (and, hence, the capacity of the fiber) is actually used. Column F shows that the installation of conduit (to protect the fiber) will increase the cost by 42 percent. Table 9 shows that, when all these factors are considered, Ameritech has a fiber and conduit unit investment per DS3 mile of $2,327. All of these factors for Ameritech, as well as those for the other companies, either seemed appropriate or, where this was doubtful, had no appreciable effect on LRIC

39. The utilization of connected fiber equals the average fill factor for all OLTM units because companies assume that all OLTM units are connected to fiber. Moreover, the capacity of the fiber is limited by that of the attached OLTM units. The unit investment for fiber connected to OLTM units consists of two fiber pairs, i.e., there are four fiber strands, two used for transmitting and receiving and two used for protection.

40. The conduit loading factors shown in Table 9 are based on underlying factors (not shown), one of which is the relative deployment of underground fiber (which uses conduit) and buried fiber (which does not).
due to the small amounts of investment involved. Neither the ALTS study nor the Teleport study criticizes any of these factors specifically.

### Table 9: Trunk Unit Investment for Mileage Element

<table>
<thead>
<tr>
<th></th>
<th>(A) Route Mile Fiber Investment</th>
<th>(B) Route/Air Miles Factor</th>
<th>(AxB) Fiber Investment per Air Mile</th>
<th>(C) Share of Fiber Connected to OLTMs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ameritech</td>
<td>$5,965</td>
<td>1.50</td>
<td>$8,948</td>
<td>0.64</td>
</tr>
<tr>
<td>Bell Atlantic</td>
<td>n/a</td>
<td>n/a</td>
<td>$5,812</td>
<td>1.00</td>
</tr>
<tr>
<td>PacBell</td>
<td>$3,590</td>
<td>1.49</td>
<td>$5,349</td>
<td>0.68</td>
</tr>
<tr>
<td>US West</td>
<td>$4,600</td>
<td>1.27</td>
<td>$5,842</td>
<td>0.67</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(D) DS3 Channel Capacity of Fiber Unit</th>
<th>(E) OLTM Unit Fill Factor</th>
<th>(F) Conduit Loading Factor</th>
<th>(AxBxF)/(CxDxE) Fiber &amp; Conduit Unit Investment per DS3 Mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ameritech</td>
<td>12</td>
<td>0.71</td>
<td>1.42</td>
</tr>
<tr>
<td>Bell Atlantic</td>
<td>12</td>
<td>0.85</td>
<td>1.41</td>
</tr>
<tr>
<td>PacBell</td>
<td>12</td>
<td>0.46</td>
<td>1.23</td>
</tr>
<tr>
<td>US West</td>
<td>12</td>
<td>0.81</td>
<td>1.28</td>
</tr>
</tbody>
</table>

**Fill factors.** For the circuit equipment used in channel termination service, all four companies used a fill factor of 1.0, indicating that this equipment is fully utilized. This factor is appropriate because this electronic equipment is fully dedicated to individual customers and thus is not available for other uses until the service is terminated. For the fiber loop dedicated to this service, however, PacBell and US West used fill factors of 0.20 and 0.60, respectively, as shown above in Table 8. Each of these factors is based on the average utilization rate of all fiber loops in a company’s combined study areas. These factors are probably conservative for developing LRIC for channel termination service. They seem conservative for LRIC because the fiber loop utilization rate will likely increase in the long run as demand for the service increases. They seem low for AVC because nearly all spare loop

\(^{41}\) To simplify a comparison of data among companies, the Bell Atlantic data shown in Table 9 were converted from a DS3×3 basis to a DS3 basis. The air/route mile factor shown for US West pertains only to the 0-8 mileage band, which is the band to which its rate applies; US West’s air/route mile factor is 1.52 for all mileage bands combined.

\(^{42}\) Moreover, the utilization rate for fiber dedicated to specialized high-capacity services such as DS3 should be higher than that used for switched services. Further investigation would be needed to confirm this, however.
fiber is a sunk cost that should be excluded from the calculation of short-run variable costs. The use of these conservative estimates is harmless because it has the effect of raising both LRIC and AVC, making either predation standard more difficult to satisfy.

In contrast, the other two companies seem to have overstated their fill factors for the fiber loop dedicated to channel termination service. Table 8 shows that Ameritech used a fill factor of 1.0, which is unrealistic for developing LRIC because it allows for no spare capacity. Bell Atlantic used 0.85, the fill rate engineers generally aim for and commonly refer to as the "objective fill rate." It nonetheless seems likely that the actual fill rate will fall short of this objective over the long run because, as soon as the objective fill rate is attained, companies tend to add new fiber, thereby adding additional spare capacity. In any event, Ameritech and Bell Atlantic's high estimates for this fill rate are inconsequential. One reason is that they only affect the unit cost of loop fiber, which is a minor component of this service. Another reason is that AVC is the FCC's required cost standard and, as noted above, a high fill factor is appropriate for developing AVC because it excludes nearly all spare fiber as a sunk cost.

The network used for channel mileage service is more homogenous than that used for channel termination service, and there appears to be no distinction between switched and special access spare capacity. Consequently, for the circuit equipment used in channel mileage service, all four companies based fill factors on the average utilization of the DS3 channel capacity of this equipment. This procedure produced circuit equipment fill factors ranging from a low of 0.71 (Ameritech) to a high of 0.85 (Bell Atlantic). These factors are at or below the engineering objective fill rate of 0.85, discussed above. These factors therefore seem reasonable for developing LRIC and would be conservative if the companies had chosen to satisfy the easier cost standard, AVC.

Finally, for the interoffice fiber providing channel mileage service, Ameritech, PacBell, and US West developed fill factors by multiplying circuit equipment fill factors by the portion of interoffice fiber connected to circuit equipment. This procedure is reasonable because it takes into consideration that unconnected fiber is not utilized and that connected fiber is generally underutilized, i.e., does not carry the full number of channels that the electronics connected to it is capable of generating. From an LRIC perspective, the factors derived from this procedure were found reasonable for each company except Bell Atlantic, which appears to have overstated its fill factor for the interoffice mileage element of this service. Yet, because Bell

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43. Arguably, perhaps as much as 5 percent of the loop fiber dedicated to this service should remain spare so it is available for testing or administrative purposes.
44. The circuit equipment fill factors for PacBell and US West are 0.79 and 0.80, respectively.
45. Table 9 shows that, whereas the other companies estimated that two-thirds of interoffice fiber is connected to OLTM units in central offices, Bell Atlantic estimated that all such fiber is connected. In contrast, PacBell appears to have been conservative in estimating its fill factor for this fiber. As noted
Atlantic’s reported LRIC for that element is less than a third of its tariffed rate, as Table 4 shows, a correction of this error still leaves a wide margin between LRIC and the rate. These results demonstrate that the companies’ fill factors generally seem reasonable and, when they are applied to channel termination service, tend to be conservative. Although a few inaccuracies were found, they either had no significant effect on LRIC or raised it, making the LRIC “price floor” harder to meet, not easier.

None of the parties filing comments demonstrates that any fill factor is deficient. Indeed, ALTS is the only party that criticizes the submitted factors specifically. It claims that even modest overestimation of the fill factors can greatly reduce LRIC, making a rate appear to recover more than LRIC.\footnote{ALTS Study, supra note 17, at 1, A1, A5. ALTS also claims that PacBell is the only company to report fill factors. This is incorrect. At the request of the Bureau’s Tariff Division, the companies reported fill factors for both fiber and circuit equipment for each of the two services. The Tariff Division provided this information to ALTS, MFS and Teleport on September 24, 1993, a month before the ALTS study was submitted and two months before the Teleport Study was submitted.}

ALTS does not show this to be true, however, for any submitted fill factor. Instead, ALTS describes a hypothetical situation in which the fill factor for OLTM units is drastically reduced, causing the LRIC of PacBell’s channel termination service to exceed its tariffed rate. To accomplish this, ALTS substitutes a 0.38 fill factor for the 1.0 factor used by PacBell. ALTS nonetheless fails to show that PacBell’s factor is overestimated by even a modest amount. Given that the OLTM units used in providing PacBell’s channel termination service are fully dedicated to customers under a five-year contract, PacBell’s use of a 1.0 fill factor seems reasonable.\footnote{Although the OLTM units may not be used continually throughout their estimated 12-year life, PacBell adjusts LRIC to reflect this by assuming investment must be fully recovered in only 6 1/2 years.}

Factors for capital costs, excluding land and building. The companies apply annual cost factors to unit investment figures to convert them into annualized costs. The key factors reflect capital costs, specifically depreciation, cost of money, and income tax. With regard to the depreciation factors, all appear to be reasonable. Indeed, the depreciation factors used by Ameritech and PacBell tended to be overly conservative. For channel termination service, they depreciated almost all circuit equipment investment over six or six and one-half years, as Table 6 shows, instead of using the twelve-year life prescribed by the FCC for that type of investment. Their use of these very conservative estimates of useful life had the effect of raising the

earlier, its interoffice circuit equipment fill factor is 0.79, which represents the average fill rate of all circuit equipment having a variety of different capacities of DS3 channels. See supra note 44. In developing the fill factor for interoffice fiber, however, PacBell did not use that 0.79 factor. Instead, it used a more conservative figure based on the utilization of circuit equipment having a capacity of exactly 12 DS3 channels. Because such equipment had been only recently deployed, its utilization level, which Table 9 shows to be 0.46, is still far below the objective level. This figure may be too conservative for developing LRIC because, in the long run, the equipment likely will be used at a level closer to the objective utilization level.

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estimated LRIC for this service, making the LRIC test more difficult to satisfy. Meanwhile, all money factors and income tax factors were found consistent with those that the companies usually use to calculate these types of expenses and thus were found appropriate. It is significant that neither the ALTS study nor the Teleport study demonstrates that any of these factors are deficient.

*Factors for non-capital costs plus land and building.* The companies also employ cost factors that are intended to reflect land and building costs and non-capital costs. The latter are operating expenses, which include maintenance, billing and collection, marketing expenses, and gross receipts taxes. In most instances, the companies are unable to precisely determine what portions of these costs are attributable to any specific service. They therefore distribute them among the various services, including DS3 services, using crude allocation factors derived from cost studies that, ideally, are updated at least once a year. Unfortunately, what is difficult for the companies themselves is nearly impossible for a regulatory commission like the FCC. There is no practical way to verify that all of these common costs have been accurately identified.

The FCC nonetheless evaluated these costs to determine whether any seem unreasonable or are clearly incorrect. With regard to land and building costs, the companies' data show that such costs account for roughly 5 percent of total service costs on average for all companies except Ameritech, as shown in Tables 5 and 7. Ameritech incorrectly excluded all land and building costs from its LRIC estimates. Additionally, two companies incorrectly excluded certain operating expenses. Ameritech, for example, incorrectly excluded administrative, marketing, billing and collection, and customer service expenses. In addition, Bell Atlantic incorrectly excluded billing and collection expense. As noted earlier, the FCC requires, at a minimum, that billing and collection expense be included in AVC. For an LRIC approach, other operating costs such as administrative, marketing, and customer services expenses should also be included. Moreover, maintenance expense should be included in both the AVC and LRIC tests. Yet, even after the LRIC estimates were adjusted to account for incorrectly excluded costs, the margins between rates and LRIC were not substantially narrowed.

ALTS and Teleport criticize these cost data which, except for maintenance expense, they refer to as common costs. They claim it is inappropriate that the companies' used smaller common cost loadings for

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48. These exclusions are evident in Table 10 below, which identifies the non-capital and capital costs reported by the companies. These findings therefore support ALTS' claim that Ameritech mistakenly excluded administrative and marketing expenses from LRIC. See ALTS Study, supra note 17, at 3.

49. In Table 10 below, Bell Atlantic's marketing expense and customer services expenses are not shown because they are included in administrative expense.
these DS3 services than they do for their expanded interconnection services.\textsuperscript{50} The study results confirm that those loadings are much different. The companies do not claim, however, that the common cost loadings for expanded interconnection service represent incremental costs that belong in LRIC. They describe these loadings as simply the difference between that service’s revenue requirements and its direct costs. That is, if direct costs are increased by this amount of common costs in order to set rates, all of the revenue requirements will be recovered. The common cost loadings thus are not cost estimates but, rather, closure factors. This implies that, if the inconsistency in loadings is determined to be a problem, it will not be because common costs are understated for DS3 services but, rather, because they are overstated for expanded interconnection services.

ALTS further claims that the cost estimates are highly sensitive to the common cost loading factors used by the companies.\textsuperscript{51} The study results show otherwise. As noted above, common costs are insensitive to incremental units of a service and thus should have little effect on LRIC. The cost of establishing a marketing department or billing and collection operation, for example, is substantial for a large multi-product company serving millions of customers. Even so, due to the scale economies enjoyed by such large operations, these costs should increase little when the company provides an additional increment of one service.

The non-capital factors nonetheless were examined to determine if the outcome of this inquiry might be sensitive to them. This was done for channel termination service, which is the primary focus of ALTS’ criticism because it exhibits the largest rate discounts. As Table 3 shows, these discounts range from 70 to 85 percent. Table 10 shows the non-capital costs as a percentage of the capital costs for this service. After these percentages are corrected to account for operating expenses mistakenly excluded, the non-capital costs are approximately 30 percent of capital costs for all four companies. This percentage would have to be at least 4 times greater in order to raise LRIC above tariffed rates. Table 10 shows that, to close the margins between rates and LRIC, the required percentages range from a low of 126 percent (PacBell) to a high of 352 percent (Bell Atlantic).\textsuperscript{52} These results indicate that the margins between rates and LRIC are so large that a resolution of the issue at hand, \textit{i.e.}, whether rates for this service are predatory, is not sensitive to a doubling, or even quadrupling, of these non-capital factors.

\textsuperscript{50} See \textit{ALTS Study}, supra note 17, at A6; \textit{Teleport Study}, supra note 17, at 5-7.
\textsuperscript{51} \textit{ALTS Study}, supra note 17, at A1.
\textsuperscript{52} Similar results were obtained when non-capital costs plus land and building costs were compared to capital costs plus maintenance.
Untangling Tin Cans on a String

Table 10: Relative Sizes of Non-Capital and Capital Costs for Channel Termination Service

<table>
<thead>
<tr>
<th></th>
<th>Ameritech</th>
<th>Bell Atlantic</th>
<th>PacBell</th>
<th>US West</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Capital Costs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depreciation</td>
<td>$41,495</td>
<td>$7,370</td>
<td>$31,170</td>
<td>$25,192</td>
</tr>
<tr>
<td>Cost of Money</td>
<td>$12,713</td>
<td>$6,845</td>
<td>$15,582</td>
<td>$14,837</td>
</tr>
<tr>
<td>Income Tax</td>
<td>$5,088</td>
<td>$2,904</td>
<td>$6,165</td>
<td>$6,413</td>
</tr>
<tr>
<td><strong>Total Annual</strong></td>
<td>$59,296</td>
<td>$17,119</td>
<td>$52,917</td>
<td>$46,442</td>
</tr>
<tr>
<td><strong>Non-Capital Costs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintenance Expense</td>
<td>$2,255</td>
<td>$1,799</td>
<td>$2,679</td>
<td>$3,658</td>
</tr>
<tr>
<td>Administrative Expense</td>
<td>$0</td>
<td>$2,165</td>
<td>$9,710</td>
<td>$6,385</td>
</tr>
<tr>
<td>Marketing Expense</td>
<td>$0</td>
<td>n/a</td>
<td>$2,125</td>
<td>n/a</td>
</tr>
<tr>
<td>B&amp;C, Customer Svc. Expense</td>
<td>$0</td>
<td>n/a</td>
<td>$167</td>
<td>n/a</td>
</tr>
<tr>
<td>Ad Valorem Tax</td>
<td>$1,757</td>
<td>$0</td>
<td>$1,730</td>
<td>$3,516</td>
</tr>
<tr>
<td>Other Tax</td>
<td>$496</td>
<td>$374</td>
<td>$0</td>
<td>$438</td>
</tr>
<tr>
<td><strong>Total Annual</strong></td>
<td>$4,508</td>
<td>$4,338</td>
<td>$16,411</td>
<td>$13,997</td>
</tr>
</tbody>
</table>

| Non-Capital as % of Capital | 8%   | 25%   | 31%   | 30%   |
| Percent Required to Close Margin | 246% | 352% | 126% | 131% |

With respect to channel mileage service, Table 11 shows the capital and non-capital costs for the mileage termination element of that service. The amount of non-capital costs varies from 12 to 41 percent of the amount of capital costs. Table 12 shows that, for the mileage element of that service, the amount of non-capital costs varies from 9 to 48 percent of the amount of capital costs. None of these figures suggest that a predatory pricing problem exists, given that the maximum available discounts for channel mileage service are relatively small. Table 3 shows that the companies report discounts ranging from 0 to 20 percent for the mileage termination element of that service. Similarly, Table 3 shows that, except for Bell Atlantic, all of the companies report relatively small discounts (ranging from 0 to 21 percent) for the mileage element of that service. At 62 percent, Bell Atlantic’s maximum discount for the mileage element is relatively high. Even so, Table 4 shows that the discounted rate is still 3.5 times the reported cost for that element. This implies that the cost estimate must be increased by more than 250 percent in order to demonstrate predatory pricing of that element.

53. Bell Atlantic’s DS3x3 service costs in Table 11 were divided by 3 to normalize them on a DS3 basis to facilitate a comparison with the other companies’ costs.
Table 11: Relative Sizes of Non-Capital and Capital Costs for Mileage Termination Element

<table>
<thead>
<tr>
<th></th>
<th>Ameritech</th>
<th>Bell Atlantic</th>
<th>PacBell</th>
<th>US West</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Capital Costs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depreciation</td>
<td>$1,464</td>
<td>$3,184</td>
<td>$2,000</td>
<td>$1,236</td>
</tr>
<tr>
<td>Cost of Money</td>
<td>$530</td>
<td>$2,742</td>
<td>$1,521</td>
<td>$712</td>
</tr>
<tr>
<td>Income Tax</td>
<td>$188</td>
<td>$1,167</td>
<td>$602</td>
<td>$309</td>
</tr>
<tr>
<td><strong>Total Annual</strong></td>
<td>$2,182</td>
<td>$7,093</td>
<td>$4,123</td>
<td>$2,257</td>
</tr>
<tr>
<td><strong>Non-Capital Costs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintenance Expense</td>
<td>$208</td>
<td>$660</td>
<td>$367</td>
<td>$202</td>
</tr>
<tr>
<td>Administrative Expense</td>
<td>$0</td>
<td>$839</td>
<td>$931</td>
<td>$323</td>
</tr>
<tr>
<td>Marketing Expense</td>
<td>$0</td>
<td>n/a</td>
<td>$204</td>
<td>n/a</td>
</tr>
<tr>
<td>B&amp;C, Cust. Svc. Expense</td>
<td>$0</td>
<td>n/a</td>
<td>$16</td>
<td>n/a</td>
</tr>
<tr>
<td>Ad Valorem Tax</td>
<td>$27</td>
<td>$0</td>
<td>$166</td>
<td>$175</td>
</tr>
<tr>
<td>Other Tax</td>
<td>$24</td>
<td>$159</td>
<td>$0</td>
<td>$27</td>
</tr>
<tr>
<td><strong>Total Annual</strong></td>
<td>$259</td>
<td>$1,658</td>
<td>$1,683</td>
<td>$727</td>
</tr>
<tr>
<td><strong>Non-Capital as % of Capital</strong></td>
<td>12%</td>
<td>23%</td>
<td>41%</td>
<td>32%</td>
</tr>
</tbody>
</table>

Table 12: Relative Sizes of Non-Capital and Capital Costs for Mileage Element

<table>
<thead>
<tr>
<th></th>
<th>Ameritech</th>
<th>Bell Atlantic</th>
<th>PacBell</th>
<th>US West</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Capital Costs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depreciation</td>
<td>$149</td>
<td>$73</td>
<td>$136</td>
<td>$136</td>
</tr>
<tr>
<td>Cost of Money</td>
<td>$184</td>
<td>$115</td>
<td>$172</td>
<td>$122</td>
</tr>
<tr>
<td>Income Tax</td>
<td>$65</td>
<td>$51</td>
<td>$68</td>
<td>$54</td>
</tr>
<tr>
<td><strong>Total Annual</strong></td>
<td>$398</td>
<td>$239</td>
<td>$376</td>
<td>$312</td>
</tr>
<tr>
<td><strong>Non-Capital Costs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintenance Expense</td>
<td>$25</td>
<td>$15</td>
<td>$20</td>
<td>$21</td>
</tr>
<tr>
<td>Administrative Expense</td>
<td>$0</td>
<td>$31</td>
<td>$112</td>
<td>$45</td>
</tr>
<tr>
<td>Marketing Expense</td>
<td>$0</td>
<td>n/a</td>
<td>$25</td>
<td>n/a</td>
</tr>
<tr>
<td>B&amp;C, Cust. Svc. Expense</td>
<td>$0</td>
<td>n/a</td>
<td>$2</td>
<td>n/a</td>
</tr>
<tr>
<td>Ad Valorem Tax</td>
<td>$8</td>
<td>$0</td>
<td>$20</td>
<td>$27</td>
</tr>
<tr>
<td>Other Tax</td>
<td>$4</td>
<td>$5</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td><strong>Total Annual</strong></td>
<td>$37</td>
<td>$52</td>
<td>$179</td>
<td>$93</td>
</tr>
<tr>
<td><strong>Non-Capital as % of Capital</strong></td>
<td>9%</td>
<td>22%</td>
<td>48%</td>
<td>30%</td>
</tr>
</tbody>
</table>

Hence, to support the allegation that cost exceeds the discounted rate when Bell Atlantic's non-capital costs are increased to a more realistic level, ALTS would have to make a difficult showing. It would have to demonstrate that the level of these non-capital costs, which is shown in Table 12 to be only
22 percent of the level of capital costs, should instead be several hundred percent greater than the level of capital costs. ALTS fails to show that a more than ten-fold increase in non-capital costs is warranted. Further, because the mileage element is not sold separately from the mileage termination element, ALTS would have to demonstrate that cost exceeds the combined rate for both elements of channel mileage service.

E. Summary of Results

When the LRIC standard was applied to the submitted data, the FCC staff study found that the rates exceed LRIC for both services, a finding that seems especially clear for channel termination service. For that service, rates are 60 to 240 percent above the companies' corresponding LRIC estimates. For channel mileage service (assuming an eight-mile channel), rates are 14 to 136 percent above the LRIC estimates. Even after certain necessary adjustments were made to these estimates, none of these rate/cost margins was greatly narrowed.

The study found that the basic costing methodologies and the underlying assumptions were generally reasonable. Indeed, these assumptions generally appear conservative for channel termination service, the service exhibiting the largest rate discounts and receiving the most criticism from commenting parties. Even though some assumptions were deficient, the resulting errors affected small cost components and therefore had no appreciable effect on the outcome of this study. Specifically, the study results show that rival firms had targeted their harshest criticism at a cost component (i.e., non-capital costs) that is so small that it would have to be at least quadrupled in order to close the large gaps between reported LRICs and the corresponding tariffed rates. Further, the rival firms presented no evidence that these costs, which largely consist of common costs, had been understated.

ALTS and Teleport claim it is inappropriate that the companies are using smaller common cost loadings for these DS3 services than they are for expanded interconnection services. It is true that these loadings are much different. The companies do not claim, however, that the common cost loadings for expanded interconnection services represent incremental costs that belong in LRIC. They describe these loadings as simply the difference between that service's total revenue requirements and total direct costs. That is, if the direct costs are increased by this amount of common costs in order to set rates, all of the revenue requirements will be recovered. This implies the common cost loadings are not cost estimates but, rather, closure factors which reveal nothing about LRIC. Given the results of this study, it appears that, if the inconsistency in loadings is a problem, it is not because common costs are understated for DS3 services but, rather, because they are overstated for expanded interconnection services.

54. *ALTS Study, supra note 17, at A6; Teleport Study, supra note 17, at 5-7.*
The preponderance of the evidence in this study indicates that the largest price discounts have not resulted in predatory rates or in price discrimination attributable to below-cost pricing. Indeed, nearly all of these services are offered under five- or ten-year contracts that make predatory pricing an unlikely strategy. Recovery of losses would not be assured. Absent any evidence that these discounts are anti-competitive, it appears LECs offer them as a way of remaining competitive with alternative suppliers.

This is not to say, however, that these findings remove all doubts about the lawfulness of the discounts in question. Regulators cannot determine AVC or LRIC with certainty. Indeed, the LECs themselves cannot determine these costs with any precision, given the rapid changes in demand and technology that are occurring in the LEC industry. In view of this limitation, the most that can be accomplished in any inquiry relying on the submission of unaudited data is to detect whether problems exist that justify a further use of limited staff resources. Such problems do not appear to exist in this case.

III. Parity Pricing Implications When Bottlenecks Are Unambiguous

In the current and recent editions of this Journal, there has been considerable debate on the efficacy of parity pricing, an access pricing rule that the FCC has rejected on several occasions when developing its access pricing policy for bottleneck facilities. William J. Baumol and J. Gregory Sidak proposed parity pricing as a standard for pricing access to the network bottleneck facilities owned by monopolists. Kahn and his colleague,

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55. During the course of this inquiry, for example, Ameritech revised its LRIC figures downward by 33 percent for the mileage termination element and by 50 percent for the mileage element of channel mileage service. Similarly, Bell Atlantic revised its LRIC figure downward by 33 percent for the mileage element. Ameritech and Bell Atlantic made these changes after performing new cost studies in 1993. Although these revisions did not alter the outcome of this inquiry, the large effects they have on LRIC demonstrate the importance of updating the underlying cost and usage studies.

56. See, e.g., Interconnection Order, supra note 8, at ¶ 708-11; Collocation Order, supra note 14, at 7430, 7436-39. In a certain situation not involving bottleneck facilities, however, the FCC permits LECs to base access prices on the parity pricing rule. This situation occurs when a LEC constructs an open video system (OVS) outside its telephone service area. The FCC does not regard such systems as bottleneck facilities because they compete in the same markets with cable television networks and direct broadcast satellite (DBS) networks. Unlike those rival networks which carry only their own programming, OVS operators are handicapped by the requirement that they must provide carriage for the video programming offered by other firms. To prevent that handicap from impeding the spread of OVS, the FCC permits OVS carriage rates to be based on parity pricing. The FCC explains that parity pricing will not be harmful in this instance because downstream retail prices are competitive and this rule is being used to promote market entry, "as opposed to circumstances where the pricing is used to establish a rate for an essential input service that is charged to a competing new entrant by an incumbent provider." See Interconnection Order, supra note 8, at ¶ 711; Open Video Systems 61 Fed. Reg. 28,698 (1996). For examples of LECs advocating parity pricing for local exchange access, see infra note 70.

William E. Taylor, express support, albeit circumspectly. Baumol and Sidak's proposed pricing rule calls for regulators to set the access price equal to LRIC together with certain common and social obligation costs, plus all potential earnings that the LEC forgoes as a result of being forced to serve its rivals and, thus, to relinquish business to those rivals. The rule is intended to achieve productive efficiency in downstream markets where competitors require access to bottleneck facilities in order to compete with the monopolists' services in those markets. Parity pricing achieves efficiency in downstream markets, in a static sense, if regulators properly apply it to bottleneck access facilities which entrants cannot bypass.

Supported by the FCC's LRIC cost study, this Part argues that, as a general regulatory principle, parity pricing is problematic. When downstream markets have competitive potential, parity pricing is ineffectual. If retail prices are currently inefficient, parity pricing requires unattainable information and may perpetuate monopoly rents. If retail prices are efficient because of regulatory safeguards or competition, parity pricing would produce approximately the same result as the LRIC-based pricing plan. When downstream markets lack competitive potential, with only one or two potential entrants, parity pricing is of very limited use: it may allow for static productive efficiencies. However, parity pricing may foreclose any chance of entry by requiring entrants to compete on unfavorable terms, thereby sacrificing dynamic efficiency. Its usefulness depends heavily on regulators' abilities to predict whether entry will occur in downstream markets and, as Part IV will explain, whether high access prices will induce inefficient entry into upstream markets.


59. See Baumol and Sidak, supra note 57, at 177-78, 184, 196. As explained earlier, the term "LRIC" is used herein to refer to long-run average incremental cost, the term used by Baumol and Sidak. Id. at 177-78.

60. Under parity pricing, the access price is set at a level that allows entrants to be successful if they can add efficiency to the supply of services, while ensuring that inefficient entrants are not made profitable by implicit cross-subsidies extracted from the incumbent monopolists. The rule thus ensures an efficient distribution of resources among firms in the competitive market and prevents the entry of inefficient firms. Parity pricing ensures a "parity," or equivalence, between the profit earned by a firm selling bottleneck facilities and the profit that same firm could have earned from using those facilities to sell retail services instead. See Baumol & Sidak, supra note 57, at 198-201.

61. Static efficiency is a general equilibrium concept that requires given amounts of scarce goods or resources to be optimally used in satisfying certain given ends. Static productive efficiency requires that scarce resources be optimally distributed to minimize the cost of producing a given output. Static allocative efficiency requires that scarce goods or services be optimally distributed, which means they cannot be redistributed in any way that makes one consumer better off without making another worse off. Dynamic efficiency, in contrast, does not require market conditions to remain stationary. Because static concepts assume that market conditions are stationary, they can explain how large firms behave but cannot explain how they became large. Dynamic concepts can do that, however. Dynamic productive efficiency, for example, gives consideration to the way firms adjust to changing technological conditions as they expand under loosely competitive conditions.
A. Merits When Downstream Areas Have Competitive Potential

A major issue in the parity pricing debate is whether this rule can serve the public interest when downstream markets have potential for competitive entry. This is an important issue because, if such potential exists, access prices based on LRIC may promote entry that results in static allocative efficiencies and dynamic efficiencies far exceeding any static productive efficiencies lost in the short term.

1. Ineffectual if Retail Prices Exceed Efficient Levels

Kahn and Taylor recognize that, when parity pricing would produce a markup of consumer price above incremental cost that is economically inefficient, the markup must be determined ultimately by regulators.62 Baumol and Sidak agree that, if retail service prices are not constrained by market forces to preclude monopoly profits, the parity pricing rule forces competitors entering the marketplace to pay access prices that include the foregone monopoly profits. They therefore caution that the rule should be supplemented by regulatory safeguards that will constrain retail prices. Absent such safeguards, they state, the results obtained from parity pricing may not serve the public interest.63 They concede that this problem is a legitimate concern in New Zealand because its form of regulation of the telecommunications industry is "light-handed." They consider the problem a "lesser concern," however, in American regulatory proceedings. The parity principle should be more readily adopted in the United States, they claim, "simply because virtually all state and federal regulatory jurisdictions in the United States currently regulate the prices monopolists can charge for their end products."64

a. Unattainable Informational Requirements

Requires LRIC calculations for retail services. Baumol and Sidak are too sanguine about the ability of regulators to constrain retail prices to efficient levels. As the FCC staff study demonstrates, the identification of LRIC, even for the simplest of retail services, is a daunting task. In the case examined here, the FCC studied LRIC data for only two LEC services—one provided over a complex network and one provided over a simple single-circuit facility. The study results show that the FCC was able to determine that there was insufficient evidence of predatory pricing, but it did not actually determine

64. Id. at 185.
Untangling Tin Cans on a String

LRIC for either service, even after collecting cost data and industry comments for nearly a year.

The FCC undertook a multi-stage cost analysis that yielded increasingly finer levels of cost detail. That lengthy process typically is unavoidable because, when carriers are under scrutiny, they are motivated to provide a minimum of information, in a highly aggregated form, in response to the FCC's data requests. In this case, as each new round of cost data raised new questions, the FCC found it necessary to seek new information in subsequent requests, usually by directing the LECs to further disaggregate the previously submitted data or to further explain the underlying costing methodologies. Throughout this process, the FCC encouraged interested parties—including rival firms who are familiar with equipment costs—to comment on the data submissions.

Because this cost-identification process relies entirely on unaudited cost data submitted by the LECs under scrutiny, the process cannot be fairly characterized as a "determination of LRIC." Rather, it is a potentially endless process that is more akin to removing thin layers of an onion. That process nonetheless has an objective: to continue collecting cost data until the information is sufficient to establish that: (a) there is insufficient evidence of a problem to warrant a further expenditure of limited staff resources, or (b) there is sufficient evidence of a problem to warrant an audit. This study found that there was insufficient evidence that the alleged predatory pricing exists.

In view of the difficulty of identifying LRIC for only two services, it seems unrealistic to suppose that the FCC could determine LRIC for hundreds of services typically offered by large LECs.\(^6\)

\textit{Requires calculations of foregone monopoly rents.} It would be even more difficult to determine the profits associated with foregone sales on such services. Aside from the problem of trying to identify foregone profits at a single point in time, there is the difficulty of identifying profits in subsequent periods when regulators cannot know what the incumbents’ service outputs would have been absent market entry. This task also requires regulators to determine price elasticities of demand for the incumbent’s various services in downstream markets. The incumbents themselves have difficulty estimating price elasticities and, to the extent they do it successfully, it is likely because they change prices in test markets and observe consumer response. Even then, the responses to small price reductions may give little indication of responses to larger price reductions because demand price elasticity may greatly change as price falls. This occurs, for example, when at a certain price level the service becomes highly substitutable for another service.

\footnote{6. Large LECs typically offer more than a hundred interstate services. Indeed, US West offers 396 separately tariffed services for DS1 and DS3 high-capacity services alone. See Ameritech Operating Companies et al., 10 F.C.C.R. 1960, 1972 (1994). These LECs also offer numerous intrastate services. Bell Atlantic’s current intrastate tariffs, for example, list more than two hundred services. The FCC’s Competitive Pricing Division generally regards a service as new and distinct if it offers customers a new feature, or new combination of features, that was previously unavailable.}
In addition, regulators may have to consider the interrelationship between the demand for incumbents' services and the demand for entrants' services. Baumol and Sidak explain that this situation is commonly encountered in telecommunications, for example, because of its two-way nature. Individual subscribers demand more use of a network when they find that there are an increasing number of new subscribers to call. This implies that, as new entrants bring in new subscribers, the entrants will stimulate additional demand for the incumbents. Baumol and Sidak further explain that the incumbents' supply of access to rivals may stimulate demand for the incumbents' retail services if the demand for those services is complementary to that of the entrants' services. Baumol and Sidak thus conclude that these various price elasticity and cross-elasticity effects may need to be considered.66

Similarly, Alexander C. Larson and Steve G. Parsons explain that, if the regulated firm provides multiple services having interrelated demands (e.g., when services are substitutes or complements for each other) the determination of foregone monopoly profits is a complex matter, requiring regulators to identify cross-elasticities of demand.67 The channel termination services discussed above, for example, are characterized by interrelated demands because, having different term and volume conditions, they are partially substitutable for each other. Moreover, approximately half of the channel termination services are sold together with channel mileage services, making those two services complementary.

Requires LRIC calculations for access provided to retail divisions. Even if regulators were able to obtain sufficient information to calculate foregone monopoly rents, additional cost information would be needed to guard against a complication identified by Kahn and Taylor. They caution that regulators may have to study the incumbent monopolists' operations to determine whether there are substantial differences in the incremental cost of the incumbent providing access to its rivals, on the one side, and to its own retail divisions, on the other. If substantial differences are found, Baumol and Sidak explain, the incumbents' own retail operations must not be subject to paying the same access price that is imposed on the entrants. Instead, the access prices should differ by the amount of the difference in incremental costs.68 Consequently, a determination of foregone monopoly profits may require complex studies to obtain the following information: LRICs for access facilities provided to entrants; LRICs for access facilities provided to incumbents' own retail operations; LRICs for incumbents' retail operations;

66. See Baumol & Sidak, supra note 57, at 197.
67. ALEXANDER C. LARSON & STEVE G. PARSONS, TELECOMMUNICATIONS REGULATION, IMPUTATION POLICIES AND COMPETITION 14 (Hastings College of the Law Essay, University of California, 1994).
68. Kahn & Taylor, supra note 58, at 228.
and price cross-elasticities of demand for the incumbents' and entrant's retail services.

As Larson and Parsons observe, such an endeavor is so heavily dependent on predictions and assumptions that it is analogous to the discounted cash flow analysis performed by firms making business decisions such as capital budgeting. Larson and Parsons thus conclude that any attempt by a regulatory agency to fully take foregone monopoly profits into account would constitute micro management, bringing the firm's internal decision-making methods under regulatory scrutiny. Consequently, when retail prices may be substantially above efficient levels, the informational requirements of parity pricing are too large for this rule to be of practical use in regulated network industries.

b. **Perpetuation of Monopoly Rents and Inefficiency**

Economists have long known that a reasonably achievable efficient price must be based on incremental cost, including incremental opportunity costs. By opportunity costs, however, economists do not customarily mean losses of money profits. Instead, they mean foregone opportunities for using real resources to produce other services and goods, as Kahn and Taylor explain. Tye correctly observes that Baumol and Sidak's definition of the term can be misleading and confusing.

That confusion is evident, for example, in Baumol and Sidak's claim that the Energy Policy Act of 1992 made the electric power industry an "obvious candidate" for the application of parity pricing. As they explain, that legislation effectively empowered the Federal Energy Regulatory Commission (FERC) to compel vertically integrated electric utilities to transport

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69. See Larson & Parsons, supra note 67, at 21.

70. More than a century ago, John Stuart Mill recognized that the rent that could be earned by land in one use constitutes a cost that firms must pay when using that land in another use. William Stanley Jevons, another 19th century economist, later developed that concept to show that the true economic cost of any input cannot be less than its potential earnings in the most profitable alternative use. See M. Blaug, Economic Theory in Retrospect 76-77 (1962). In this century, economists built on those ideas to develop transfer pricing theory to show how a vertically integrated firm can maximize profits by correctly pricing a component manufactured by one of its divisions and transferred to another of its divisions. See, e.g., Jack Hirshleifer, On the Economics of Transfer Pricing, J. Bus. 30 (1956). Parity pricing appears to be an application of transfer pricing theory. For examples of LECs advocating such an approach in FCC proceedings, see Comments Submitted by Bell Atlantic Telephone Companies, BellSouth Telephone Companies, Pacific Bell, and Nevada Bell on Nov. 5, 1991, In re Expanded Interconnection with Local Telephone Company Facilities, 9 F.C.C.R. 5154 (1994) (CC No. 91-141); Ameritech's Direct Case filed on Mar. 21, 1995, at 7 and Rebuttal by Southwestern Bell Telephone Company filed on Apr. 11, 1995, at 14-15, In re Local Exchange Carriers' Rates, Terms, and Conditions for Expanded Interconnection through Virtual Collocation for Special Access and Switched Transport (CC No. 94-97).

71. Kahn & Taylor, supra note 58, at 229.

72. Tye states that "[r]evenues lost to incumbent firms as a result of competition are not an opportunity cost for the use of the bottleneck facility in the true economic sense of the word, as would occur if one customer's use of the facility displaced that of another customer." William B. Tye, The Pricing of Inputs Sold to Competitors: A Response, 11 Yale J. on Reg. 203, 211 (1994).
competitively generated power over their transmission lines. At the same 
time, they note, the legislation requires that the prices for wholesale wheeling 
shall be sufficiently high to recover all transmission costs, including "an 
appropriate share, if any, of legitimate, verifiable and economic costs."73 
Baumol and Sidak interpret this statement to imply that parity pricing may be 
used because they have shown that foregone monopoly profits are legitimate 
and verifiable costs.74 Their semantic device thus seems to convert lost net 
revenues into legitimate costs. As Tye cautions, the danger in this bestowal of 
legitimacy is its implication of entitlement.75 

Government regulators generally permit an incumbent monopolist to 
recover opportunity costs of capital, in the ordinary sense, by imputing a 
value to the stockholders' share of the firm's resources and to debt. This is 
usually done by estimating what minimum rate of return on stockholder 
equity is required in order to attract additional investment into the regulated 
industry and estimating the current cost of debt. Regulators examine rates of 
return in competitive industries that of are comparable risk, if any exist, and 
use expert testimony to determine these opportunity costs. As the FCC staff 
study demonstrates, the FCC includes an imputed cost of money in 
determining LRIC.76 The FCC decided that the access price should include, in 
addition to LRIC, a reasonable share of forward-looking common costs, 
which are not incremental with respect to the element. The FCC stated, 
however, that this common-cost share must not be so large that it pushes price 
above the element's stand-alone cost.77

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73. Baumol & Sidak, supra note 57, at 185-86 (emphasis added) (quoting 16 U.S.C. § 824(a) 
(Supp. 1994)).

74. Id.

75. See Tye, supra note 72, at 211. It therefore is important to characterize foregone net revenue 
in a way that does not suggest incumbent monopolists are entitled to it. Neoclassical economists 
identified these net revenues as essentially rents, which are earnings that are unnecessary for firms to be 
willying to produce current output levels. To the extent the monopoly rents are predictable, they become 
capitalized over time in the firm's costs when the firm is sold to new owners. Hence, the traditional view 
is that monopoly profits are essentially rents, not costs, and these profits tend to disappear, when 
predictable, because the rents collected by the firm's initial owner become embedded in the costs of 
subsequent owners. For further explanation, see Benjamin Klein et al., Vertical Integration, Appropriable 

76. When evaluating access facility prices, the FCC estimates LRICs not for retail services but, 
rather, for approximately a dozen unbundled network elements. Those elements include local loops, local 
and tandem switches (including all vertical switching features provided by such switches), interoffice 
transmission facilities, network interface devices, signaling and call-related database facilities, operations 
support systems functions, and operator and directory assistance facilities. See Interconnection Order, 
supra note 8, at ¶ 27. If interconnection is provided, instead, through physical collocation at central 
offices, the bottleneck facility primarily consists of a cage (protecting the interconnector's equipment), 
floor space, cross-connect, and short length of fiber. Alternatively, if interconnection is provided through 
virtual collocation, the facility typically consists of an OLTM unit, cross-connect, and short length of 
fiber.

77. Interconnection Order, supra note 8, at ¶¶ 694-98. With regard to access services, the FCC 
permits LECs to use non-uniform common cost loadings in order to have pricing flexibility. See 
Amendments of Part 69 of the Commission's Rules Relating to the Creation of Access Charge 
Therefore, if the FCC were to adopt parity pricing, there would be nothing new about including incremental opportunity costs in access prices because the FCC already includes such costs when determining LRIC. Nor would there be anything new about including a fair share of common costs. Rather, the novel feature of parity pricing, and hence the focus of the debate, is its requirement that access prices must also recover any foregone monopoly rents (visible as monopoly profits or hidden in costs) and any foregone contributions to overinvestment or other inefficiencies. That requirement distinguishes parity pricing from the FCC's access pricing plan and other more traditional LRIC-based plans.

c. Incompatibility With Broad Regulatory Goals

As a replacement for traditional LRIC-based access pricing plans, parity pricing is of special interest when incumbent monopolists have substantial monopoly rents or imprudent investments to forego. At issue, then, is whether regulators facing such situations are more likely to force service prices to efficient levels by determining LRICs for retail services, as parity pricing requires, or instead by determining LRICs for bottleneck facilities.

As this study demonstrates for the telecommunications industry, the first approach requires the FCC and state commissions to attempt to determine LRICs for hundreds of services. Like the channel mileage services described earlier, most services are provided over complex multi-state networks consisting of numerous types and vintages of equipment.

Regulators also would have to determine the associated foregone monopoly profits. This would have to be done initially for approximately 100 large non-rural LECs and, eventually, for many of the remaining 1200 incumbent LECs if they cannot persuade state regulators that they should be exempt from interconnection requirements. The second approach, in generally propose that access price be based on LRIC with no markup for common costs. They state that LRIC already includes a markup to recover forward-looking costs, some of which are common to the service in the short run because they are fixed in that period. Such a markup may be necessary nonetheless, they state, if a non-network entity which does not offer reciprocal network services is being granted access. See William B. Tye & Carlos Lapuerta, The Economics of Pricing Network Interconnection: Theory and Application to the Market for Telecommunications in New Zealand, 13 Yale J. on Reg. 419, 495 (1996).

78. For this reason, a red flag should go up whenever incumbent monopolists claim to have a way to implement parity pricing without monopoly rents, as though wanting to make raisin bread without raisins.

79. An argument can be made for allowing retail service prices to rise above LRIC as high as stand-alone cost. See supra note 4. That is the FCC's current policy where pricing flexibility is allowed. There is no evidence, however, that stand-alone costs are easier to determine than LRICs for the numerous services offered by LECs. Due to economies of scope, individual services are not usually provided on a stand-alone basis; and comparing the various groups of services offered by rival carriers is not a simple task. Moreover, this alternative approach does not avoid the difficulty of having to calculate foregone monopoly profits.

80. More than 1200 LECs, operating in approximately 1400 study areas, are under federal rate-of-return regulation. See 1994 Data Filed With Commission by National Exchange Carrier Association.
contrast, requires federal and state regulators to determine LRICs for the much smaller number of unbundled elements of which bottleneck facilities are comprised.  

Mandatory network interconnection therefore is most attractive when efficient price levels are difficult to identify for retail services. This usually occurs when services are numerous or LRICs are fast-moving targets. Those difficulties are largely due to rapid technological changes resulting in a proliferation of new services and continual changes in costs. Although this situation creates a strong need for efficient interconnection pricing rules, parity pricing is no help. When regulators choose to foster competition as a way of approaching efficient pricing of retail services, they already have such difficulty in attempting to identify LRIC that a determination of foregone monopoly profits is out of the question. As Tye correctly observes, the parity pricing approach implicitly assumes "regulators have decided that efficient pricing of the final product is to be achieved with regulatory intervention, not by price competition among alternate firms encouraged by regulatory rules to protect competitive access."  

Indeed, absent competitive entry, efficient retail price levels are likely unidentifiable even when there are no monopoly profits. One reason for this is that the regulatory process itself raises incumbent monopolists' costs with procedural delays and regulation-induced distortions. Another reason is that monopoly rents may become embedded in costs over time. If regulators allow monopoly profits to persist for many years, the profits become predictable and other companies eventually recognize that the monopoly firm has a value far exceeding its replacement cost. To acquire the profitable firm, those companies may bid up the firm's market price until the monopoly profits are reduced, if not eliminated, by the new owner's cost of financing the

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1. Tye, supra note 72, at 206.
2. Tye, supra note 72, at 206.
3. For a discussion of input and output distortions that rate-of-return regulation tends to cause, see generally Charles W. Needy, Regulation-Induced Distortions (1975); Charles W. Needy, Optimal Distortion Mix for Constrained Profit-Maximization, 15 Econ. Inquiry 251 (1977).
Economists therefore say that, although monopoly rents initially may appear as profits, the monopoly rents will eventually become capitalized, i.e., embedded in the firm’s costs, to the extent that these rents are predictable by potential purchasers of the firm. Significantly, the profit tends to disappear not because retail service prices fall but because costs rise. This implies retail prices may far exceed competitive levels long after monopoly profits have disappeared. Hence, because parity pricing takes those prices as a given and tends to perpetuate them, the rule discourages entry that could reveal whether the incumbents’ costs are at inefficient levels.

Baumol and Sidak intend for parity pricing to be used even when LRIC-based methodologies, such as the FCC’s access plan, could result in substantial competitive rivalry in downstream markets. This is evident in their view that parity pricing “applies to any network industry.” They claim it is the fault of regulators, not the parity principle, that monopoly rents exist.

Baumol and Sidak therefore call for their rule to be supplemented with regulatory constraints that would correct retail prices directly, thus eliminating the monopoly rents. This implies that regulators must set retail prices at efficient levels by accurately identifying LRICs—together with a share of any forward-looking common costs—for numerous retail services, despite the regulators’ demonstrated inability to ever accomplish such a task. Until regulators find a way of doing that, monopoly rents will persist. Therefore, in attempting to implement parity pricing, regulators must also calculate the rents foregone when incumbents lose increments of sales to their rivals. This calculation cannot be performed unless regulators determine the cost of various increments of service output lost to rivals—LRIC information which, if it were available, would have enabled regulators to eliminate monopoly rents at the outset. The lost-profit calculation also cannot be performed unless regulators determine demand elasticities so as to estimate the various service output levels that incumbents would have enjoyed absent the entry by rivals. When access prices are above efficient levels, the informational requirements needed for a proper implementation of parity pricing are so large that they even exceed the requirements for solving the initial problem.

Although there is some truth to the claim that regulators are at fault when monopoly rents exist, regulators cannot be faulted for declining to use an access pricing rule that fails to address that problem. The regulatory safeguards called for by the rule’s proponents do not generally exist in regulated network industries, which typically offer multiple services and are

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84. Regulators are well aware of this situation and try to prevent it to the extent possible. When a local exchange is transferred between LECs, for example, the FCC permits the acquiring LEC to include in its rate base only the booked costs that had been reported for that exchange by the selling LEC. In addition, the FCC uses price cap regulation to provide incentives for cost reductions.

85. Baumol & Sidak, supra note 57, at 171.

86. See id. at 178, 196.

87. Id. at 178.
impacted by technological innovations causing frequent changes in costs and introducing new services. Prudent regulators therefore mandate interconnection to bottleneck facilities wherever feasible as a deregulator's safeguard. This implies they should try to achieve efficient retail prices through LRIC-based access pricing, not through parity pricing requiring aggressive price regulation. In this regard, Tye and his colleague, Carlos Lapuerta, observe that the difficulty of implementing parity pricing "raises the question as to why one should not simply dispense with measuring the incumbent's opportunity costs, create a competitive wholesale market to which all suppliers have access . . . and let competition on equal terms take its course." 89

2. Unnecessary as Replacement Model if Retail Prices are Efficient

Because parity pricing perpetuates monopoly rents and inefficiency unless retail prices are effectively constrained, regulators wanting to use the rule must be willing to assume retail prices are at efficient levels. This assumption is safe, however, only when wholesale access prices are at efficient levels and, absent entry barriers in downstream markets, there are so many competitive firms there that retail prices also must be efficient. Under those conditions, parity pricing is not needed to protect downstream markets from inefficient entry. Competition does that well. Consequently, if regulators were to find retail prices already at efficient levels in downstream markets, parity pricing would be not only harmless but also unnecessary.

However, it is not safe to assume that retail prices are at efficient levels when competitors must rely on upstream bottleneck facilities. Recognizing this, Baumol and Sidak argue that the advantages of parity pricing are unambiguous when regulators impose supplementary safeguards that ensure efficient retail prices in downstream markets, 90 a view Kahn and Taylor share. 91 The rule's proponents thus claim that parity pricing especially shines when regulators constrain retail prices to efficient levels. As explained above, however, regulatory safeguards cannot achieve this result. Regulators cannot identify LRICs for individual services. Even if they could, parity pricing would shine no brighter than the FCC's LRIC-based pricing plan. In this hypothetical situation, both would produce approximately the same result. They would recover LRIC and sufficient forward-looking common costs to give incumbents a fair opportunity to earn a normal rate of return on prudent

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88. Regulators nonetheless have a demonstrated ability to force retail prices far below the (unidentified) economically efficient levels when they want certain services to be cross-subsidized. Even in that circumstance, however, parity pricing is ineffictual as a basis for recovering social costs, as explained below in Part IV.C.2.

89. See Tye & Lapuerta, supra note 77, at 447.

90. Baumol & Sidak, supra note 57, at 178.

91. Kahn & Taylor, supra note 58, at 226.
investment. Accordingly, regulators would have little incentive to substitute parity pricing for an LRIC-based plan, which has general applicability, even if retail prices were somehow forced to efficient levels.92

B. Merits When Downstream Areas Lack Competitive Potential

In response to Tye's argument that regulators use access pricing to encourage competitive entry, Baumol and Sidak state, "We simply did not consider the competitive option to be part of the subject of our essay."93 The actual subject, they explain, was how to price access when there is no viable alternative to regulation. They therefore conclude that it would be nonsense to answer that the regulator "should turn to competition, even in circumstances where competition does not work."94 Baumol and Sidak thus seem to argue that it is unfair to assume that the only way regulators can achieve efficient retail prices is to foster competition in downstream markets through LRIC-based access prices and unfair, based on that assumption, to conclude that parity pricing is not useful.

Notwithstanding the apparent inconsistency with their other statements,95 Baumol and Sidak's response seems to imply that their primary concern is the use of parity pricing when contested downstream markets are non-competitive, presumably when there are only one or two entrants and no others waiting in the wings.96 If this is what they intend, they are correct that parity pricing may play a useful role in a market that is so close to natural monopoly, and is so untouched by technological change, that competitive rivalry cannot develop. Unable to stimulate any allocative or dynamic efficiencies in those non-competitive markets, regulators may decide to settle instead for the static productive efficiencies offered by parity pricing.

Regulators should approach such a decision cautiously, however, because parity pricing may foreclose any chance of entry by requiring entrants to compete on unfavorable terms that shelter incumbents against all losses resulting from competitive entry.97 To the extent compensation is necessary to

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92. As the proponents of parity pricing demonstrate, there are several different ways to achieve the result dictated by parity pricing. Likewise, LRIC-based approaches may use many different methods for estimating a combined value for LRIC and a pertinent share of forward-looking common costs. Accordingly, when retail prices are efficient, causing these two models to coincide and produce nearly the same result, one model is not necessarily any more difficult than the other for regulators to implement, or any more intrusive with respect to the monopolists' operations.

93. Baumol & Sidak, supra note 57, at 179.

94. Id.

95. See infra note 116 and accompanying text.

96. This interpretation of their response is consistent with their choice of primary examples, both of which involve only one rival firm. One example is a simple theoretical model in which one railroad seeks interconnection with a second railroad. See Baumol & Sidak, supra note 57, at 179-89. The other is a brief case history of an entrant LEC that sought interconnection with an incumbent LEC in New Zealand. See id. at 189-95.

97. Tye demonstrates that parity pricing prevents the entrant from competing on equal terms with the incumbent, because the only terms being held equal are their per unit contributions to the incumbent's common costs. Even if the entrant's incremental cost of providing the downstream service is no higher.
ensure recovery of a reasonable share of the incumbents' forward-looking common costs, this requirement is neither inappropriate nor unique to parity pricing. The LRIC-based plan adopted by the FCC and advocated by Tye and Lapuerta calls for the recovery of such forward-looking common costs. Like parity pricing, these more traditional LRIC-based plans compel entrants to compete on unequal terms with incumbents. As Kahn and Taylor observe, the asymmetrical treatment of entrants and incumbents is necessary to ensure that incumbents recover their pertinent common costs and to prevent an inefficient duplication of facilities. Unlike those traditional plans, however, parity pricing places entrants at an even greater disadvantage in several respects. It requires entrants to compensate incumbents for any foregone monopoly profits. It also requires compensation for any overinvestment costs or other inefficiencies that are being recovered in retail prices.

Before regulators implement such a rule, they should require its proponents to show that the public interest is best served when, in the interest of protecting monopoly rents and imprudent investment, access prices are raised to levels that may not only discourage entry but choke it off altogether in many markets. Such a policy is only appropriate when it is evident that LRIC-based access prices would result only in an elimination of static productive efficiencies without any compensating reductions in retail prices or dynamic efficiencies. One important drawback is that such outcomes usually are not evident, especially in industries affected by rapid technological changes. The effective use of parity pricing therefore largely depends on the regulator's ability to predict future market conditions. As the FCC's study shows, however, it is difficult enough for regulators to estimate the service costs of incumbents, much less predict those of future entrants and also predict the response of customer demand to a decline in retail prices. Even so, if parity pricing is to promote the public interest, regulators must have such knowledge in order to know when the rule will achieve static productive efficiencies without sacrificing greater static allocative efficiencies and dynamic efficiencies.

than that of the incumbent, the retail price they both must meet will only allow the entrant to recover that incremental cost plus a contribution to the common costs of the incumbent, an amount that must be given to the incumbent when obtaining access. Tye thus concludes that, when the entrant and incumbent are equally matched in efficiency, the retail price does not permit the entrant to recover its own common costs. See supra note 72, at 210-21. Kahn and Taylor acknowledge that this disparate treatment of the entrant and incumbent "is indeed asymmetrical." Kahn & Taylor, supra note 58, at 236.

98. See supra note 77.
100. For this reason, Kahn and Taylor state that parity pricing should be permitted only when the markup of retail prices over incremental costs are no greater than necessary to allow the incumbent monopolist a fair opportunity to earn a return on its invested capital. Id. at 223.
101. Another important drawback of using parity pricing when downstream markets are noncompetitive is that this is the market condition most favorable to inefficient bypass of upstream facilities. Under this condition, the high access prices that are supposed to discourage inefficient entry
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It is unrealistic to expect regulators to successfully predict where market entry will result in substantial competition and where it will not. Kahn and Taylor recognize that it is preferable to leave determinations of the long-term prospects of new ventures to the market generally, because it is difficult to determine whether new entrants have competitive merits. The entry of just one or two rivals into a market may produce dynamic efficiencies that well exceed any static productive efficiencies achievable through direct regulatory intervention. Baumol and Sidak acknowledge that, even in downstream intra-LATA markets where a LEC has been challenged by only two or three rivals, the extent of competition far exceeded expectations. Accordingly, the idea that parity pricing has general applicability in regulated network industries must be inspired by the belief that regulators are better qualified to judge the viability of new ventures than are the potential entrants having expertise in such ventures and having their own money at risk.

IV. Parity Pricing Implications When Bottlenecks Are Ambiguous

This Part explains that, due to changes in technology and consumer demand, regulators may not accurately identify the bottleneck sectors in a monopolist’s network. Mistaking potentially competitive sectors for bottlenecks, regulators may misapply the parity pricing rule by using it to price access for network segments that rival firms can duplicate, albeit at

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102. Kahn & Taylor, supra note 58, at 234. Kahn and Taylor write:

[Most economists give consideration to] (1) the preferability of leaving determinations of the long-term prospects of new and uncertain ventures to the market generally and to financial markets in particular. If a new venture of this kind is indeed meritorious—that is to say, carries sufficient promise of becoming profitable after an initial learning period—then the general presumption is that investors will be willing to supply the necessary capital, including the coverage of losses during the learning period; [and] (2) the difficulty of determining whether the would-be competitor is indeed a struggling, inexperienced but promising newcomer that both requires and deserves some special preference in order to give it an opportunity to demonstrate its competitive merits . . . .

Id. (paragraph numbers changed). Similarly, Kahn writes:

[The plunge into competition is inescapably a plunge into the unknown. The essence of the case for competition is that the potential performance of an industry is unknowable; it is the rivalry of independent suppliers that offers the greatest possible assurance that all economically feasible avenues for cost reduction and service innovation will in fact be explored and their results subjected to the impartial test of the marketplace.

2 Alfred E. Kahn, THE ECONOMICS OF REGULATION: PRINCIPLES AND INSTITUTIONS 305 (1970). Kahn cautions, however, that he "would find it extremely difficult himself, in the face of the objective record of good performance and the qualitative arguments that provide at least a highly plausible basis for attributing those results in important measure to vertical integration, to recommend the plunge into the unknown." Id.

103. Baumol & Sidak, supra note 57, at 174. Similarly, Tye seems to argue that LRIC-based access pricing is generally beneficial because dynamic efficiencies can result from competitive rivalry among only a few entrants. Tye does not state that regulators use access pricing as a tool for converting monopoly into pure competition. Instead, he states that regulators use access pricing to create "price competition among alternate firms" to serve the broad goal of a "regulatory transition to deregulation." Tye, supra note 72, at 203, 206 (emphasis added).
higher costs than the incumbents incur. This misapplication creates incentives for downstream rival firms to vertically integrate upstream, bypassing incumbents' upstream facilities even where incumbents are more efficient. Regulators' attempts to use parity pricing therefore may result in losses of productive efficiency in upstream markets offsetting, or even exceeding, the intended gains in downstream markets. That risk makes the parity pricing rule particularly inapplicable to regulated network industries, like telecommunications, that are greatly affected by technological innovation or rapid growth in consumer demand.

A. Reliance on Regulators to Detect Natural Monopoly

1. Incompatibility of Natural Monopoly With Multiple Technologies

The concept of natural monopoly implicitly assumes a known technology. As Daniel F. Spulber explains, this concept is based on the idea that a single superior technology exists, is commonly known, and is available to all potential entrants. Under these hypothetical circumstances, the survival of a single firm in the market must reveal that the market is a natural monopoly because other firms failed even though they had access to the same technology. However, Spulber observes that a "natural monopoly technology," which ensures that one firm is more efficient than two others using the same technology, may not create a natural monopoly market. The reason, he states, is that market entrants may draw on other technologies, develop new technologies, or have information about alternative technologies that is unavailable to incumbents. Another reason is that a growth in market demand could warrant an increase in output far beyond the level at which a single firm exhausts its scale economies, making room for additional firms to enter the market at a large scale and survive.

2. Blurred Distinction Between Bottleneck and Contestable Areas

The traditional view is that a natural monopoly exists when economies of scale are so persistent that a single firm can serve the market at lower unit cost than two or more firms. As explained earlier, it is difficult enough for regulators to determine whether incumbents have lower unit cost. It is more difficult still to determine whether the scale economies are "so persistent" that natural monopolies are sustainable. Regulated networks may have no clear boundaries between natural monopoly segments and competitive segments.

105. See, e.g., F. M. Scherer, INDUSTRIAL MARKET STRUCTURE AND ECONOMIC PERFORMANCE 482 (1980).
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Incumbent monopolists usually have large networks exhibiting a wide range of cost and demand conditions in various areas of the network. A likely result is that some segments are bottlenecks, some will face entry by one firm, and others will become competitive.

Accordingly, when regulators find it necessary to mandate interconnection, they cannot safely assume that entire upstream networks are bottlenecks. To be competitive in downstream markets, entrants may need to interconnect directly at a number of different upstream segments, some of which may be potentially competitive once the entire upstream network is available for access. Incumbent monopolists may be unwilling to allow their downstream rivals to interconnect at any point in the incumbents’ upstream networks. They may be particularly reluctant to allow access to upstream network segments if they know that some of those segments will be potentially competitive after rivals have gained access to the bottleneck segments. The monopolists’ unwillingness to interconnect therefore does not mean that all upstream segments of a large network are natural monopolies. Predicting the competitive potential of various upstream segments likely will be difficult, however. In complex networks, distinguishing between upstream and downstream segments is also likely to be difficult. Moreover, the two-way nature of some industries, like telecommunications and railroads, makes such a distinction meaningless in many areas because adjacent firms may terminate equivalent amounts of traffic into each other’s network.

B. Stimulus for Inefficient Entry Upstream

If an incumbent’s upstream facility is not a natural monopoly and no barriers to entry exist, downstream competitors are not captive customers and can evade high access prices. Consequently, if regulators mistakenly apply parity pricing to a network’s non-bottleneck segments, they may lower productive efficiency by creating incentives for downstream competitors to bypass the incumbents’ upstream facilities. The regulator’s ability to identify natural monopoly segments accurately therefore is essential to an effective implementation of this rule.

In this regard, F. M. Scherer states, “Quite generally, the more prone markets are to a breakdown of competitive supply conditions, the stronger are individual buyers’ incentives to protect themselves by integrating upstream.”106 Scherer explains that, if competition in vertical price relationships breaks down, some firms may be induced to integrate operations even though the operations are most efficiently run when they are vertically disintegrated. If that occurs, other firms are induced to do the same, if they can, out of fear that the supply of an input will become less reliable. Recognizing their reliance on the supplier’s restraint and good will, these other firms often choose to create a more dependable source by constructing

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106. Id. at 91.
their own facilities. Even when those firms incur a cost penalty to accomplish this, they may prefer higher costs to the risk of being gouged eventually by the more efficient supplier. The likely result, Scherer states, is that the size of a sustainable firm will increase, reducing the number of competitive firms and increasing market concentration.\(^{107}\)

Consequently, there is risk in using parity pricing when natural monopoly boundaries are ambiguous and downstream retail prices are above efficient levels. The risk is that, when downstream competitors are confronted with the high access prices set by parity pricing, many will waste resources on attempting to bypass the efficient upstream facilities instead of developing their own downstream services, even when that is what they do best.

C. Probable Harm to Telecommunications Industry

Baumol and Sidak claim parity pricing is “the unambiguous answer” to the problem of pricing access to local telephone exchanges,\(^{108}\) a view shared by Kahn and Taylor.\(^ {109}\) Paul W. MacAvoy seems to agree. He states that the parity pricing rule is “more adaptable to conditions in telecommunications than suggested by the many (distracting) examples from railroads and electric power.”\(^{110}\) These claims notwithstanding, the telecommunications industry is the worst place to implement a pricing rule that, like the static equimarginal rule from which it is derived,\(^ {111}\) yields unambiguous results only under stationary conditions that permit regulators to easily define costs, market boundaries, and competitive conditions. The telecommunications industry is anything but stationary. Further, because retail prices in the LECs' downstream markets include substantial monopoly rents, attempts to use parity pricing will likely create incentives for inefficient bypass of upstream facilities to occur.

\(^{107}\) Id. at 90-91.

\(^{108}\) Id. at 172-73.

\(^{109}\) Kahn and Taylor agree with that pricing policy “in the present circumstances of telecommunications.” Kahn & Taylor, supra note 58, at 226.

\(^{110}\) Paul W. MacAvoy, Telecommunications in Transition: Introduction, 11 YALE J. ON REG. 116 (1994). MacAvoy also seems to agree with Baumol and Sidak that parity pricing will promote efficiency in telecommunications. MacAvoy states that this rule “helps develop regulatory and exchange carrier practices that do not impede the technological and innovative sources of competition in communications.” Id.

\(^{111}\) The idea that prices, costs, and consumer benefits should be equal at the margin is the basis of the “marginal revolution” that occurred primarily in the period 1870-1914. It also is the basis of neoclassical economics which, in Blaug’s view, was nothing more than the spelling-out of the equimarginal rule in ever wider contexts. See Blaug, supra note 70, at 276.
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1. Incentives for Bypass Upstream

Because LEC retail prices in downstream markets recover substantial monopoly rents,\(^\text{112}\) the use of access prices set above the levels prescribed by the FCC's LRIC-based plan will create incentives for inefficient bypass of incumbents' upstream facilities. Accordingly, if parity pricing is to solve more problems than it creates, the FCC would have to develop a practical methodology for determining which local exchanges are comprised predominantly, if not entirely, of natural monopoly segments. The rule's proponents suggest no way of doing this. On the contrary, they suggest it cannot be done. Baumol and Sidak write:

Since we cannot be certain which arenas of local telephone service, if any, are natural monopolies, it would be senseless for the regulator to try to determine which areas have this attribute and to permit entry into only those sectors deemed not to be natural monopolies. Rather, the most rational way to distinguish the arenas into which entry is feasible is to let the market decide.\(^\text{113}\)

This statement acknowledges the futility of trying to identify natural monopoly sectors when considering whether to permit entry. It is likewise futile to try to identify those sectors when considering whether to make entry difficult, the effect parity pricing has on downstream markets.

One reason why bottleneck boundaries are ambiguous is the changing structure of the local networks. MacAvoy explains that telecommunications "is changing so fundamentally as to eliminate structures that define firms, markets, and industries as they have existed over the last fifty years."\(^\text{114}\) Quoting Peter W. Huber, MacAvoy states that entrants into local exchange markets have moved the network away from a "single, long, expensive star-like pyramid with utility cost structures toward overlapping short ring-like geodesics in which competition prevails."\(^\text{115}\) Another reason for the ambiguity in market boundaries is the unpredictable nature of innovation and competitive rivalry. Baumol and Sidak explain:

Soon after the Modification of Final Judgment, it became apparent that competition would exist between the LECs and interexchange carriers such as AT&T, MCI, and Sprint. Yet, the extent to which competition between these two groups has grown was not widely foreseen. The primary arena in which that competition has occurred

\(^\text{112.}\) See discussion infra Part IV.C.2.c.
\(^\text{113.}\) WILLIAM J. BAUMOL & J. GREGORY SIDAK, TOWARD COMPETITION IN LOCAL TELEPHONY 121 (1994).
\(^\text{114.}\) See MacAvoy, supra note 110, at 115.
\(^\text{115.}\) Id. at 116. See also PETER W. HUBER ET AL., GEODESIC NETWORK II: 1993 REPORT ON COMPETITION IN THE TELEPHONE INDUSTRY 2.11 (1992).
is the transmission of messages within the LATAs. . . . With both LECs and IXCs participating in the lucrative intraLATA intrastate market, both groups pursued business in the arena with vigor. Competition in the local arena is now provided or threatened from a bewildering array of sources: the IXCs, overlapping LECs, resellers, cable television firms, private bypass arrangements, cellular telephone and other wireless services, and local fiber-optic networks.¹¹⁶

Baumol and Sidak thus recognize that unforeseen competition and unpredictable innovations are blurring the boundaries between competitive and natural monopoly markets.

Not only are natural monopoly segments hard to find in local exchanges, they also are hard to sustain. Baumol and Sidak observe that competition is moving upstream. They state, “The LECs do continue to possess bottleneck services, even though competition threatens to erode or even to eliminate them.”¹¹⁷ Similarly, Kahn and Taylor state that there is a “rapidly growing threat of competition to [the LECs’] historic monopoly.” They further state:

[T]he monopoly power of the telephone companies as wholesale suppliers of access to their networks . . . is clearly limited and transient. Their networks are already subject to bypass through interconnections between large customers and interexchange carriers, either directly or via competitive access providers, and they face the growing threat of direct competitive challenge also from radio-based telephone carriers and cable operators, whether or not in alliance with out-of-region telephone companies. In these circumstances, it would be suicidal for the local telephone companies to retreat from retail competition and attempt to rely solely on their continued ability to exploit such monopoly power as they currently enjoy in providing access to ultimate customers.¹¹⁸

This statement by Kahn and Taylor, like the statements by other proponents above, describes LECs as not only facing competition in downstream markets but also confronting imminent competition for their remaining bottleneck facilities. These statements suggest that, if any network industry exists where bottleneck areas are so readily identified that parity pricing can be used without inducing inefficient bypass, the telecommunications industry may be the least likely candidate.

¹¹⁶. Baumol & Sidak, supra note 57, at 174 (emphasis added).
¹¹⁷. Id. at 175.
¹¹⁸. Kahn & Taylor, supra note 58, at 239 (footnotes deleted).
2. Likelihood of Monopoly Rents in Downstream Prices

The misapplication of parity pricing to non-bottleneck segments is not, by itself, sufficient to create incentives for inefficient bypass. Inefficient entry into upstream markets is not induced unless downstream retail prices recover significant monopoly rents or cost inefficiencies, because such recovery is necessary to raise the access price set by the parity pricing rule above that set by the FCC's LRIC-based plan. In this regard, Kahn and Taylor state that intra-LATA toll and business prices are so inflated that they are substantially above both LRIC and embedded costs. They therefore argue that regulators should use parity pricing in local telephone exchanges as a mechanism for recovering a fair share of a firm's social costs and common costs from downstream competitors. This is necessary, they state, to prevent the entry of inefficient firms which occurs when entrants bear no portion of those cost burdens. If regulators were to attempt to use parity pricing under these circumstances, however, it is unclear whether a high access price would discourage as much inefficient entry into downstream markets as it creates in upstream markets. There are also several other problems with Kahn and Taylor's proposal that merit discussion.

a. Kahn and Taylor's Proposal

For local telephone exchanges, Kahn and Taylor recommend that regulators establish access prices by using the same wholesale markup that is being used for retail prices, an approach they show to be equivalent to parity pricing. That is, the markup of access price above incremental cost for the facility is set equal to the markup of retail price above incremental cost for the service.

This approach is equitable, Kahn and Taylor state, because regulators require LECs to satisfy universal service obligations by providing many services, such as residential exchange services, at prices barely above, or even below, incremental cost. Kahn and Taylor observe that, as compensation, regulators allow LECs to raise prices far above incremental cost on other services such as toll and local business services. Consequently, where regulators require prices to fall below incremental cost, they create cross-subsidies among different exchange services. Where regulators require prices to exceed incremental cost but embody inefficiently low markups, they create the need for other services to bear a larger share of common costs. In this way, certain services are required to pay for costs comprised of (a)

119. Id. at 237.
120. Id. at 236.
121. Id. at 228, 237.
122. Id.
unrecovered incremental costs that must be cross subsidized, and (b) common costs that are disproportionately allocated among services.

To explain why parity pricing can recover those costs without sacrificing static productive efficiency, Kahn and Taylor write:

The non-marginal, common, or fixed costs of incumbent telephone companies and competitors alike are irrelevant to the efficient distribution of the contested business among them. The only relevant determinant is their comparative marginal costs, and that is the basis on which the rules of [parity pricing]... would ensure that efficient outcome.123

That statement is illuminating as to why Kahn and Taylor propose parity pricing as a vehicle for recovering cross-subsidy contributions and common costs. Although a portion of the social obligation costs are incremental to favored residential services, all of those costs are nevertheless common with respect to the toll and business services that must pay for them. Toll and business customers cannot avoid the social cost burden by purchasing less service, because that would only result in a rate increase for such services to ensure full recovery of the social costs. This implies that the social costs are common with respect to the provision of downstream services by the LEC and its rivals and thus are irrelevant to the efficient distribution of the business among them. Because social costs are common in that sense, Kahn and Taylor claim that parity pricing recovers social costs from downstream competitors—in the same way Baumol and Sidak claim that it recovers foregone monopoly rents—without impairing static productive efficiency.124

b. Monopoly Rents and Inefficient Bypass

Kahn and Taylor claim that their proposal would “merely perpetuate the preexisting regulatorily-prescribed set of markups, sufficient—but in principle no more than sufficient—to permit the utility companies to earn the return to which they are entitled.”125 They further claim:

In the context of U.S.-style regulation, the contribution that a telephone company loses when competitors capture business from it is the markup that was already incorporated, with its regulatory commission’s approval, in the regulated prices of the services in question. In regulatory proceedings assessing proposed interconnection charges, the only reasonable assumption is that the

123. Id. at 237.
124. Id. at 228-30, 237.
125. Id. at 237 (emphasis added).
commission has set those permissible retail prices at levels . . . just sufficient to enable the utility company to earn its necessary return on invested capital.  

Those statements assert, first, that the LECs' markups of retail prices over incremental cost are regulatorily prescribed and, second, that the resulting rates of return permit LECs to earn a "necessary" return that is "no more than sufficient."

Both assertions are incorrect. One misconception is Kahn and Taylor's view that the LECs' markups on retail services are "regulatorily prescribed." Pursuant to the FCC's jurisdictional separations rules, LECs allocate approximately 74 percent of local exchange costs to the state jurisdiction, where price cap regulation has replaced rate-of-return regulation in most states. The remaining 26 percent is allocated to the federal jurisdiction, where the costs are recovered through a federal subscriber line charge (federal SLC) imposed on loop subscribers and a minute-of-use charge imposed on IXCs. Since 1992, the largest LECs have been under federal price cap regulation. They provide approximately 92 percent of the industry's subscriber lines. Hence, the linkage between retail prices and costs has essentially been severed in the federal jurisdiction and in most states. That broken linkage implies that the LECs' retail markups are not prescribed by regulators. Price cap regulation, as its name suggests, prescribes price ceilings, not margins between incremental cost and price.

Even under rate-of-return regulation, federal and state regulators generally do not establish margins between incremental costs and retail prices. It therefore is not surprising that the FCC concluded, when rejecting a similar proposal for the pricing of local network access elements, that "the

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126. Id. at 231 (emphasis added).
127. See generally 47 C.F.R. §§ 36.1 et seq.
128. See VARIOUS LECs, FCC 43-04 REPORTS (1995) available in ARMIS.
129. Rather, federal and state regulators determine total revenue requirements for a few broad service classes, which are based on all costs allocated to those service classes. Before that can happen, however, a LEC's total costs must first must be separated between the state and interstate jurisdiction pursuant to the FCC's separations procedures. This is necessary because most LEC facilities are shared by both intrastate and interstate services. Yet, because most facility costs are common (not incremental) to both of those services, it is impossible to jurisdictionally separate most costs in a manner reflecting cost causation. Instead, they are separated based on dozens of different prescribed allocation factors that are generally derived from crude measurements of relative usage. Although it is possible to separate some costs in a cost-causative manner, the prescribed procedures are inaccurate, sometimes deliberately so to meet universal service obligations.

As a result, the separations process destroys virtually all evidence of a cost-causative relationship between services and costs. After intrastate costs come out of that blender, state commissions find that incremental costs cannot be reconstructed. Likewise, the same problem exists for LECs operating under rate-of-return regulation in the federal jurisdiction (which have not been subjected to a rate-of-return proceeding for six years). Accordingly, the FCC decided that it is feasible to base the price of unbundled network elements on LRIC (plus a share a common costs) only if LRIC is derived from jurisdictionally unseparated costs. See Interconnection Order, supra note 8, at ¶¶ 83-86. That decision has been contested, however, and the 8th Circuit Court has stayed the Interconnection Order. See infra note 152.
existing retail prices that would be used to compute incremental opportunity costs under [parity pricing] are not cost-based.\textsuperscript{130}

Another misconception is the claim that a LEC's rate of return is restricted to only a "necessary return." Price cap regulation, by its very nature, does not prescribe rates of return. While it is true that price cap LECs are earning "the return to which they are entitled," they are sometimes entitled to large returns. Although the FCC's target rate of return on interstate net investment is 11.25 percent, most price cap LECs have rates of return exceeding that level.\textsuperscript{131} Two RBOCs exceeded a 15 percent return in 1994 and four RBOCs exceeded that level in 1995. For price cap LECs as a group, the weighted average rate of return was 13.58 percent in 1994 and 13.91 percent in 1995.\textsuperscript{132}

Returns on stockholder equity, \textit{i.e.}, the portion of capital that is not debt, are generally higher.\textsuperscript{133} The 1995 average rate of return on stockholder equity was 16 percent for all large LEC operating companies that have at least $100 million in annual revenues.\textsuperscript{134} Table 13 shows rates of return on equity for those operating companies.\textsuperscript{135}

\textsuperscript{130} See Interconnection Order, supra note 8, at ¶ 709.

\textsuperscript{131} The cost of capital for incumbent LECs may now be less than 11.25 percent, the authorized rate of return established in 1990 for rate-of-return LECs. In the Represcription Reform Order, the FCC found that the rate of return prescription may warrant revision if the monthly average yield on ten-year U.S. Treasury securities changes by more than 1.5 percent (\textit{i.e.}, 150 basis points), and the change continues for six months or more. See Amendment of Parts 65 and 69 of the Commission's Rules to Reform the Interstate Rate of Return Represcription and Enforcement Processes, 10 F.C.C.R. 6788, 6802-03 (1995) (Represcription Reform Order). By October 1995, the average yield had decreased by 2.6 percent, exceeding the trigger established in that order. Consequently, in February 1996, the FCC's Common Carrier Bureau invited comment on whether to initiate a proceeding to represcribe the authorized rate of return for incumbent LECs subject to rate-of-return regulation. See Common Carrier Bureau Sets Pleading Schedule in Preliminary Rate of Return Inquiry, Public Notice, 11 F.C.C.R. 3651 (1996).

\textsuperscript{132} The highest 1995 rate of return for an RBOC was the 16.78 percent reported by Ameritech. Its 1994 rate of return was 13.39 percent. See VARIOUS LECS, FCC FORM 492 REPORTS (1996) and (1995) \textit{available in} ARMIS.

\textsuperscript{133} Return on net investment does not reveal return on stockholder equity because, for large LECs, approximately 42 percent of investment is financed by debt that, in 1994, cost only 7.21 percent on average to finance. See Common Carrier Bureau Sets Pleading Schedule in Preliminary Rate of Return Inquiry, 11 F.C.C.R. 3651, 3654 (1996). The economic cost of debt, however, must also include any opportunity costs that exist as a result of using borrowed funds to support operations rather than investing those funds elsewhere. The economic cost of debt therefore is usually considered to be the current cost of capital. See supra note 131.

\textsuperscript{134} Rate of return on stockholder equity was calculated by dividing net income by equity. Net income is an amount that accumulates month-to-month and is reported at year end. Although equity varies during the year, it does not accumulate because it is like a stock, not a revenue stream. LECs report a "snapshot" of equity at year end to show what it is at a point in time. Consequently, it was necessary to average the 1994 and 1995 year-end equity figures to obtain averaged figures that are representative of equity throughout 1995. The LEC stockholder equity and net income data were obtained from Table B-1, Rows 440 and 465, respectively, of the FCC ARMIS 43-02 Reports for 1994 and 1995.

\textsuperscript{135} Table 13 shows low and high rates of return only if the holding company's operations in multiple states are under separate operating companies for each state (\textit{e.g.}, Ameritech) rather than a single operating company (\textit{e.g.}, Southwestern Bell Telephone Company).
example, average 15 percent for its seven operating companies. These rates range from 7 percent (District of Columbia) to 18 percent (Maryland). The rates of return for Pacific Telesis’ two operating companies are 14 percent (Pacific Bell) and 19 percent (Nevada Bell).

Table 13: Rate of Return on LEC Stockholder Equity, 1995

<table>
<thead>
<tr>
<th>Operating Company Name</th>
<th>Lowest Return</th>
<th>Average Return</th>
<th>Highest Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ameritech Operating Companies</td>
<td>39%</td>
<td>43%</td>
<td>49%</td>
</tr>
<tr>
<td>NYNEX Telecommunications</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Bell Atlantic Operating Companies</td>
<td>07%</td>
<td>15%</td>
<td>18%</td>
</tr>
<tr>
<td>Pacific Telesis Operating Companies</td>
<td>14%</td>
<td>14%</td>
<td>19%</td>
</tr>
<tr>
<td>BellSouth Telecommunications</td>
<td>—</td>
<td>11%</td>
<td>—</td>
</tr>
<tr>
<td>Southwestern Bell Telephone Company</td>
<td>—</td>
<td>13%</td>
<td>—</td>
</tr>
<tr>
<td>US West Communications</td>
<td>—</td>
<td>13%</td>
<td>—</td>
</tr>
<tr>
<td>GTE/Contel Operating Companies</td>
<td>00%</td>
<td>25%</td>
<td>58%</td>
</tr>
<tr>
<td>Sprint/United Telephone Companies</td>
<td>15%</td>
<td>17%</td>
<td>30%</td>
</tr>
<tr>
<td>Southern New England Telephone</td>
<td>—</td>
<td>17%</td>
<td>—</td>
</tr>
<tr>
<td>GTE Operating Companies</td>
<td>07%</td>
<td>16%</td>
<td>21%</td>
</tr>
<tr>
<td>Sprint/Centel Operating Companies</td>
<td>11%</td>
<td>16%</td>
<td>19%</td>
</tr>
<tr>
<td>Other Large Independents</td>
<td>-03%</td>
<td>13%</td>
<td>34%</td>
</tr>
</tbody>
</table>

The LECs are entitled to those rates of return because, under the FCC’s price cap rules, LECs are allowed to exceed the target rate of return as an incentive to be more efficient. Ameritech, for example, trimmed its workforce in 1994 by laying off approximately 10,300 employees. Largely as a result of the severance and “buyout” expenses in 1994, Ameritech’s rate of return on equity was approximately negative 30 percent (not shown) that year. In contrast, the resulting reductions in wages, together with the suppression of stockholder equity when retained earnings fell in 1994, caused surprisingly high returns in 1995. Table 13 shows that 1995 rates of return on equity range from 39 percent (Ohio Bell) to 49 percent (Illinois Bell). Importantly, these returns are not a one-year aberration. Ameritech’s returns on equity may remain well above average for many years as a result of its work force restructuring.

That such rates of return are permitted under price cap regulation does not imply, however, that they are normal or necessary. Cynics might argue that Ameritech should have restructured in 1991 before implementing price caps, when it would have lowered prices—not afterwards in 1994, when it raised earnings. Furthermore, the existence of these earnings under price cap

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136. For a discussion of the FCC’s price cap rules, see supra note 16.
137. 1994 Ameritech Annual Report to Shareholders 44-45. Ameritech recorded restructuring costs in 1994 of $728.1 million, or $455.8 million after tax. Id.
regulation does not imply that the resulting markups between retail prices and incremental costs would be approved under rate-of-return regulation. Indeed, because regulators have required LECs to "provide much of their service at rates either below incremental costs or embodying inefficiently low markups above those costs," as Kahn and Taylor observe, retail markups in the profitable downstream markets must be large.\footnote{138} Otherwise, the LECs' rates of return on their total operations, which also includes the less profitable residential services, could not be so high. These large downstream margins, and regulators' limited abilities to identify natural monopoly, together imply that attempts to use parity pricing may result in substantial inefficient bypass of LEC upstream facilities. Moreover, to the extent bypass is incomplete, Kahn and Taylor's proposal would likely result in access prices that perpetuate monopoly rents.\footnote{139}

c. Difficulty of Isolating Relevant Retail Margins

The apparent simplicity of equating wholesale and retail margins disappears on closer inspection. Whereas the FCC's plan requires LRIC to be determined only for individual access elements, e.g., an electronic switch, Kahn and Taylor's prescription requires LRIC to be determined both for the elements and for whatever group or groups of retail services are deemed relevant. Even when LECs offer the same facility both as a wholesale element and as a retail service, their proposal is no easier to implement than the FCC's plan. However, because network access is taking the form of retail services being unbundled into the underlying basic network elements, services far outnumber the elements. Margins thus may need to be calculated for many groups of services.

Left to their own devices, incumbents have incentives to game this system by defining the "relevant" set of retail services in a way that maximizes the margin used in calculating wholesale prices. This strategy is

\footnote{138} Kahn and Taylor, \textit{supra} note 58, at 236. 
\footnote{139} As their above statements show, Kahn and Taylor propose their version of parity pricing for use "in the context of U.S.-style regulation," namely for regulation of LEC access prices. It is unclear to what extent they intend for their prescription to be applied to other segments of the telecommunications industry or to other network industries. They seem to concede, however, that their proposal is inappropriate for the New Zealand telecommunications industry. They write:

[Opponents of [parity pricing], including Justice Gault, of the New Zealand Court of Appeal, protest that the entitlement claimed by the LECs to recover the "opportunity costs" of business lost to competitors is merely a rationalization for the continued collection of monopoly profits. They are right, it could well be.]

The ultimate determination of how large a markup of retail price above marginal cost is economically efficient, and therefore what level of contribution may correspondingly be incorporated in interconnection charges, must be supplied, in circumstances such as these, by regulation, the absence of which in New Zealand was the ultimate reason for the Court of Appeal rejecting our proposals.

\textit{Id.} at 231.
evident in the mandatory virtual collocation tariffs filed by price cap LECs in September 1994. The FCC suspended and investigated those tariffs, finding that they raised significant questions of lawfulness regarding cost allocations, particularly the margins assigned to these wholesale access offerings in order to recover common costs. The FCC determined that the margins for comparable, high-capacity access services were nonuniform. BellSouth, for example, reported margins ranging from 17 percent to 727 percent. GTE System Telephone Companies reported margins ranging from 2 percent (California) to 2,581 percent (Washington).\(^{140}\)

The FCC further determined that substantial differences existed between the margins the LECs proposed to apply to their access prices and those currently applied to the comparable retail services. Bell Atlantic, for example, proposed to assign a margin of 65 percent to collocation access elements while assigning margins as low as 23 percent to comparable services. US West proposed to assign a margin of 72 percent to collocation access elements while assigning margins as low as 27 percent to comparable services. The FCC also found that LECs generally conceded that the variations in retail margins were due to differences in market conditions, not costs. The FCC concluded that its policy of promoting competitive entry into local exchange markets would be frustrated by "the practice of assigning high overheads to the LEC facilities upon which interconnectors rely to provide competitive services while assigning low overheads to the very services against which interconnectors are trying to compete."\(^{141}\) The risk is that an incumbent’s choice of a set of pertinent retail services will be too broadly defined, so as to mistakenly include noncompetitive services having high margins. This results in inflated wholesale margins in areas where the incumbent must compete with downstream rivals.\(^{142}\) The FCC’s experience with retail margins therefore suggests that Kahn and Taylor’s proposal would not be simple to implement in any network industry offering a multiplicity of services.

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141. Id. at 1972-75. This practice is one way of achieving the price squeeze discussed by Tye. See Tye, supra note 72, at 219-21.
142. In addition, the meaning of “service” is not beyond dispute. For the purpose of evaluating virtual collocation tariffs, the FCC considered a service to be a separately tariffed offering that provides point-to-point transport and can be purchased on a stand-alone basis. In contrast, Southwestern Bell Telephone Company argued that two such services actually constitute a single service when they are usually acquired together. Southwestern Bell’s approach, if it had been permitted, would have raised the lowest reported service margin (by averaging over two services). This was an important issue because the FCC, rejecting the approach Kahn and Taylor recommend, decided that the margin assigned to access should equal the lowest margin assigned to any service with which downstream competitors must compete. See In re Local Exchange Carriers' Rates, Terms, and Conditions for Expanded Interconnection Through Virtual Collocation for Special Access and Switched Transport, 10 F.C.C.R. 3927 ¶¶ 12, 18-21 (1995).
d. Inconsistency With 1996 Act

Kahn and Taylor's proposal conflicts with current regulatory goals. It is based on the implicit assumption that, at a time when regulators are mandating access to foster competition, they would want to retain a tangle of inexplicit subsidies that were sustainable for decades only because regulators sheltered incumbents against competition.\(^{143}\) Kahn and Taylor recognize, when referring to entry artificially induced by high subsidy-burdened toll rates, that the best way of removing that artificial inducement is for regulators to allow LECs to rebalance their prices for residential, business, and toll services to bring them closer to efficient levels.\(^{144}\) Therefore, it is evident that Kahn and Taylor much prefer to have these subsidy mechanisms corrected than perpetuated.

So does Congress. The 1996 Telecommunications Act directs the FCC to revise federal universal service support mechanisms to make them specific and predictable.\(^{145}\) The 1996 Act states that "[universal service] support should be explicit."\(^{146}\) The states are permitted to adopt additional universal service standards "only to the extent that such regulations adopt additional specific, predictable, and sufficient mechanisms to support such definitions or standards that do not rely on or burden Federal universal service support mechanisms."\(^{147}\) Importantly, the 1996 Act further stipulates that "a telecommunications carrier may not use services that are not competitive to subsidize services that are subject to competition."\(^{148}\)

To implement these congressional directives, the FCC initiated a proceeding, forming a Federal-State Joint Board, to develop a method for comprehensively revising the universal service support mechanisms.\(^{149}\) When deciding on an access pricing rules in a separate proceeding, the FCC rejected proposals to include funding for universal service mechanisms in access

\(^{143}\) David L. Kaserman and John W. Mayo describe four major subsidy flows: from long distance customers to local service customers; from business customers to residential customers; from light users of local service to heavy users of that same service; and from urban customers to rural customers. David L. Kaserman & John W. Mayo, Cross-Subsidies in Telecommunications: Roadblocks on the Road to More Intelligent Telephone Pricing, 11 YALE J. ON REG. 131 (1994).

\(^{144}\) Id. at 237.

\(^{145}\) Telecommunications Act of 1996, supra note 6, § 254(b)(5).

\(^{146}\) § 254(e).

\(^{147}\) § 254(f).

\(^{148}\) § 254(k).

\(^{149}\) Federal-State Joint Board on Universal Service (FCC No. 96-93, CC No. 96-45) (rel. Mar. 8, 1996) (proposing rules to implement the universal service provisions in Section 254 of the 1996 Act). Emerging competition is also requiring the Commission to consider changes to other rules. See Price Cap Performance Review for Local Exchange Carriers, 11 F.C.C.R. 858 (1995) (soliciting comments on proposed rules to implement the universal service provisions in Section 254 of the 1996 Act).
prices, as Kahn and Taylor propose, on the grounds that such action is contrary to the intent of the 1996 Act. Likewise, when rejecting parity pricing plans similar to that proposed by Kahn and Taylor, the FCC stated that "Congress specifically determined that input prices should be based on costs because this would foster competition in the retail market."151

In summary, Kahn and Taylor's proposed methodology is not based on regulatorily prescribed margins or normal rates of return. It therefore is indiscriminate in what it would recover through access prices. Incumbents could recover not only social obligation costs but also foregone monopoly rents apparent as profits, monopoly rents embedded in costs, sunk overinvestment costs, and other inefficiencies. Regulators may ultimately decide that some of those losses are the legacy of past regulation and should be recovered during a transition period. If so, regulators should base their decisions on explicit cost studies rather than assume that retail price margins indicate what is necessary.

Conclusion

The main arena for the parity pricing debate changed dramatically when Congress adopted the 1996 Act, reversing the course of telecommunications regulation. Historically, regulation of the telecommunications industry has been based on the premise that services could be provided most efficiently through a regulated monopoly network. Federal and state regulators focused their efforts on regulating the prices and behavior of the monopolies while, at the same time, shielding them from competitive entrants. The 1996 Act adopts exactly the opposite approach. It requires telephone companies to open their networks to competition. The 1996 Act also creates a new partnership between the FCC and state regulators, instructing them to work together to develop access policies that will preclude incumbent LECs from using their control of bottleneck facilities to impede competition.152 The 1996 Act also

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150. The FCC stated:
Sections 254(d) and 254(e) of the 1996 Act mandate that universal service support be recovered in an equitable and nondiscriminatory manner from all providers of telecommunication services. We conclude that permitting states to include such costs in rates arbitrated under sections 251 and 252 would violate that requirement by requiring carriers to pay specified portions of such costs solely because they are purchasing services and elements under section 251. Section 252(d)(1) requires that rates for interconnection, network elements, and access to network elements reflect the costs of providing those network elements, not the costs of supporting universal service. Interconnection Order, supra note 8, at ¶ 712 (footnotes omitted).

151. Id. at ¶ 710.

152. The FCC subsequently implemented the pro-competitive provisions of that legislation. See Interconnection Order. That order has been stayed, however, by the United States Court of Appeals for the Eighth Circuit. The Court explained that the FCC, by prescribing detailed guidelines for establishing interconnection prices, may have overstepped its jurisdiction, impinging on the states' traditional rate-setting function. See generally Iowa Utilities Bd. v. FCC, 1996 WL 589204 (8th Cir.). In the wake of controversy over the stay, five former Chief Economists of the Antitrust Division of the U.S. Department
requires incumbent LECs to offer interconnection, providing access to unbundled network elements. The FCC does not intend for this fundamental change in regulation to bring gains restricted to only short-term static efficiencies. Rather, the FCC expects the opening of markets to competition to “blur traditional industry distinctions and bring new packages of services, lower prices and increased innovation to American consumers.”

In this new regulatory regime, LRIC studies will continue to play an important role. Indeed, until the industry’s transition to deregulation is complete, such studies should be far more important than they were prior to the 1996 Act. Their primary use, however, will be for evaluating unbundled access element prices, not service prices. As demonstrated above, LRIC studies are too difficult to be used extensively for the latter purpose. Such an attempt would be especially impractical for the FCC, which regulates nearly 1300 LECs and approximately 35,000 cable companies.

The parity pricing rule, in contrast, is not generally useful in this new regulatory paradigm as a result of the rule’s unrealistic informational requirements. Changes in consumer demand and the growing use of multiple technologies make it difficult for regulators to identify network bottleneck segments. Regulators therefore may not know whether attempts to apply the rule would promote productive efficiencies in downstream markets, as proponents claim, or instead lead to productive inefficiencies in upstream markets. Such inefficiencies may result when regulators, mistaking upstream facilities for a natural monopoly, impose high access prices that create incentives for downstream competitors to bypass those facilities.

Furthermore, regulatory bodies like the FCC are most interested in access pricing as a way of fostering competitive entry that brings dynamic efficiencies far exceeding static productive efficiencies. Parity pricing cannot serve that goal. By recovering monopoly rents, overbuilding costs, and other inefficiencies through access prices, this rule perpetuates problems that regulators are trying to eliminate. Of course, if regulators were able to identify incremental costs for numerous retail services, they might purge monopoly rents and inefficiencies from retail prices, providing the supplementary safeguards called for by the rule’s proponents. Yet, such an accomplishment—which would make any regulator proud—means the heavy lifting has already been done. Parity pricing, therefore, is a remedy only after the major problems have been solved.

of Justice declared their support for the FCC’s LRIC-based plan. See Letter of Dec. 2, 1996 from Bruce Owen et al. to Reed E. Hundt, FCC Chairman (CC No. 96-98).

153. Interconnection Order, supra note 8, at 8.