economically efficient and inefficient—on the other services that will be affected by the rebalancing.

18. I adduce these considerations not in an attempt to dissuade the Commission from adopting its proposed rules: on the contrary, one of the advantages of moving sequentially in introducing competition, from the economic standpoint, is that it does, through its repercussions, force adjustment of other pertinent public policies in an economically efficient direction. My purpose, rather, is to urge the Commission to anticipate those repercussions and the distortions they may introduce, and plan for the requisite adaptations of its other regulatory policies—promptly, where its asymmetrical regulations threaten to permit the introduction of severe inefficiencies, and with a suitable transition where those repercussions are longer-run in character.

B. The experience with interstate toll competition

19. The Commission cites the benefits consumers have enjoyed from its having opened the interstate toll business to competition.[11] This experience is of course instructive, and should guide the Commission in deciding how to proceed here. The lessons are, however, not exactly as the Commission characterizes them. I attach a copy of an analysis of that experience by Dr. William E. Taylor, of National Economic Research Associates, to whose general conclusions I subscribe.

20. As that analysis makes clear, whatever other benefits interstate toll competition has brought—by way, for example, of causing customers to be offered a greatly increased variety of price and service options, and exerting pressures on the

[11]NPRM, paragraph 11.

carriers to modernize their facilities—it has not been directly responsible for lower toll rates, on average, or higher rates of growth of demand. Toll rates have indeed declined and demand expanded at unprecedented rates since divestiture, but these very satisfactory developments are fully explained by the FCC's own actions in reducing carrier access charges and correspondingly increasing subscriber line charges. Those interventions by the Commission have produced enormous net economic benefits, but it was they, not competition itself, that caused prices to decline and demand to grow more rapidly than they would otherwise have done.

21. Moreover—and for precisely this reason—the margins AT&T earned on its toll business did not decline: the drop in its prices merely reflected the reduction in the charges it paid to the LECs for access. In contrast, the entry of price competition into local transport will necessarily compress the LECs' margins on that business, inflated as they are by the need to make a contribution to the prices of other services—unless the FCC imposes a similar burden on the competitive entrants.

22. It is a reasonable supposition that the apparent failure of competition itself to produce substantial price reductions in long distance telephony has been attributable in important measure to continued regulatory handicapping of AT&T and sheltering of its competitors. The equal unit access charges to the IXCs, despite the markedly lower costs to the LECs of providing that service to AT&T, prevent that company from reflecting its large cost advantage in lower prices generally; and the continued requirement that it base its rates on cost averages has created opportunities for its rivals—in economic terms, artificial opportunities—to compete successfully for the business of high-volume customers, on dense routes, where averaging has set its rates

far above costs. The Commission has in recent years, entirely properly, been giving AT&T increasing freedom to deaverage its rates, in order to compete for that business;[12] but, as the recent NERA survey demonstrates,[13] until the changes earlier this month, large customers have clearly believed that those restrictions were preventing them from bargaining successfully for better terms. The restrictions and preferences have had the effect of forcing the dominant carrier to hold a price umbrella over its rivals; and the latter in turn have evidently been content to follow the leader, shaving their prices only marginally, just as the smaller rivals of U.S. Steel were content to do in the early decades of this century, as that giant firm felt likewise compelled to refrain from vigorous price competition in order to avoid regulation or dissolution under the antitrust laws.[14]

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[12]See, "Regulatory Reform for the Long-Distance Marketplace Adopted," referring to CC Docket 90-132, FCC News, August 1, 1991.

[13]John Haring and Harry M. Shooshan III, "Competition and Consumer Welfare in Long-Distance Telecommunications," prepared for AT&T, May 1991.

[14]See, e.g., Walter Adams, The Structure of American Industry, 7th ed., New York: Macmillan, 1986, p. 76. As I have put it previously,

> we can never know under present circumstances to what extent what we are seeing is healthy competition, as opposed to the artificial consequence of the handicaps that regulation and the MFJ have imposed on AT&T and on the Bell Operating Companies. To the extent, for example, that the new entries are a consequence of the fully distributed cost-based price umbrella that the AT&T successor companies are required to hold over the industry, they are no more symptomatic of effective competition and a healthy industrial performance than the decline in the market share of U.S. Steel and the correspondingly more rapid growth of its competitors from 1901 onward, which were also the consequences of a price umbrella that one company felt constrained to hold over an industry....

Op. cit., Telematics, pp. 12-13.

## III. TERMS AND CONDITIONS FOR SPECIAL ACCESS TRANSPORT

23. As the foregoing discussion demonstrates, if the elimination of barriers to competitive entry into the provision of special access transport is to realize its promised economic benefits, it must be accompanied by the establishment of suitable regulatory terms and conditions. In particular, regulation must permit competitive pricing responses, while at the same time guarding against unfair competition and protecting customers with relatively inelastic demands from the burden of excessive prices.[15] The fair competition requirement means, of course, that the Commission must take care to establish prices for interconnections that put the LECs on the one side and the new entrants on the other on an equal competitive plane. The terms and conditions should be framed also with a view to serving such other, only partially economic objectives as the avoidance of rate shock, to the extent the Commission wishes to do so.

24. Regulated prices that deviate from costs play havoc with competitive markets. More immediately in point, competition plays havoc with price structures that deviate from costs—specifically with rate structures, like the present special access tariffs, embodying uniform charges based on averaging the costs of serving high- and

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[15]I believe it is unnecessary, for purposes of this presentation, to attempt to define this last goal more precisely. As the Commission clearly recognizes, it cannot be interpreted as prohibiting all price discrimination: where marginal costs are generally below average costs or average revenue requirements, all purchasers will be benefited by price discriminations involving larger markups on services with inelastic than with elastic demands; conversely, even the customers paying the higher markups are benefited to the extent that their supplier is forced to reduce its markups on competitive services, if this is necessary to retain the business, so long as it continues to make a contribution to the coverage of common costs. I have earlier alluded (see par. 12 above) to the possibility that discriminatory price reductions required by competition may produce inefficient results—specifically, result in markups on services much lower than would be dictated by the demand for those services, considered in the aggregate, because the demand for the services of any single competitor may be highly elastic. Where the competitors are unregulated, however, economic efficiency is fully served by permitting the regulated competitor to meet that competition, with prices all the way down to its incremental costs, if need be.

contribution toward the coverage of common costs. These effects are likely to be large, because there are great economies of scale in the provision of transport: incremental costs per unit are likely to be very low compared with prevailing rates. If the LECs are prevented from offsetting those price decreases with price increases in their high-cost markets, economic efficiency will continue to be thwarted, and the latter services will in the long run attract neither competition nor investment.

## A. Pricing interconnection

27. The price charged to new entrants for interconnection should meet two objectives: it must satisfy basic competitive standards and it must be consistent with the regulatory objectives of recovering from special access services a contribution to common costs and to such social objectives as universal service. Pricing interconnection at the sum of the LEC's incremental cost of providing interconnection and a contribution element will satisfy these twin objectives.[17] The contribution element in the present charges is the amount of revenue net of incremental cost that the LEC receives from selling its own special access service.

28. Unless and until the Commission reduces the need for this contribution by adjusting the ceiling rates on other services, thereby permitting the LECs to make up the loss, or by separations reform, both economic efficiency and continued achievement of those other objectives require that competitive access suppliers be confronted with an interconnection charge embodying the same markup. If instead the

[17]The prescription is similar to the ones adopted by the New York State Public Service Commission and the Illinois Commerce Commission in their recently adopted interconnection orders.

FCC sets the permissible price for interconnection lower than that combined amount, entrants will be in a position to take business away from LECs even where the latter can satisfy the demand at lower incremental costs; and the contribution that the LECs are able to obtain from special access services will be reduced.

B. Price structure of LEC special access transport

29. The prices the LECs are permitted to charge for the special access transport functions that they perform themselves must meet the same two standards I have described in par. 27. Of particular importance are (1) permissible de-averaging; (2) the permissible range of discretionary price flexibility; and (3) the timeliness of LEC pricing changes.

**1. Rate de-averaging**

30. As I have already pointed out, the competition of new, unregulated entrants will tend to drive the prices of the various services they offer toward their respective marginal costs; those costs and prices will not as a general proposition be averaged; and if competition is to be both fair and efficient, the LECs must be given the same opportunity. The result is likely to be—and is likely to have to be—

- o volume discounts, reflecting the lower average costs of high-volume utilization;
- o geographic deaveraging;

- o because of shorter loop lengths, connections between central offices and IXC POPs priced lower than facilities between end users and central offices;[18]
- o distance-sensitive channel termination rates, increasing in cost with the length of loop.

**2. LEC price ranges**

31. The purpose of establishing a range within which the LECs may vary their charges for access services is to permit them to compete for business that they may be able to serve more efficiently than their competitors—thereby avoiding regulatorily prescribed umbrella pricing—on the one hand, while preventing excessive prices for the less competitive services.[19] The price cap on special access services collectively provides a powerful safeguard against the latter contingency. To avoid the possibility that prices for the competitive services might be set too low, the cap should be accompanied by a lower bound of pricing flexibility, set, as a first approximation, at incremental cost plus the contribution element charged to competitors in the interconnection price.[20] Where a competitor threatens completely to bypass the LEC, however, economic efficiency requires that the latter be free to price down to incremental cost alone—that is, without the contribution element. Such a price floor would be low enough to allow the LEC to obtain business for which it is the most

[18]This form of de-averaging is currently in place in the high-capacity intrastate special access tariffs in California.

[19]See note 15, above.

[20]See also pars. 39 and 40 below. For prices above the price floor, there is no need to account explicitly for the contribution element.

efficient provider, while at the same time providing a safeguard against anti-competitive conduct.

32. Once this initial range of discretionary pricing has been established,[21] annual adjustments in both ceiling and floor should be indexed according to the formula now applicable to the rate caps.[22]

### 3. LECs' ability to adjust prices in a timely manner

33. The unregulated entrants will compete by offering customized price quotations to selected customers, by responding to specific requests for proposals, and by entering into contracts with differing terms. The LECs should be free, within the limits I have already prescribed, to respond correspondingly—to change their posted tariffs promptly, as competition requires, and on an individual contract basis (ICB), when competitive bids are solicited or proffered.[23]

34. This means that I disagree with the Commission's expressed intention to maintain the present price bands for DS-1 and DS-3 services. Such a requirement,

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[21]If the bands for price flexibility initially set are narrower than the theoretically correct ones I propose here, the price floors should be indexed downwards over time towards the theoretically correct level.

[22]This approach differs fundamentally from the indexing adopted by the California Public Utilities Commission. Under the California price cap plan, the ceiling is adjusted annually for inflation and productivity, but the floor is indexed for inflation only. I fail to see the logic of this differential treatment: if improvements in productivity are to be expected, I see no reason not to expect them equally in the costs pertinent to the floor as to the ceiling. Under the California plan, given the current rate of inflation and productivity factor, the ceiling and floor will converge rapidly, rapidly eliminating any pricing flexibility permitted the LEC.

[23]See also note 16, above. The New York State Public Service Commission interconnection order of May 8, 1991 approved New York Telephone's request for this type of pricing flexibility in responses to requests for proposals for services subject to competition. Order Regarding OTIS II Compliance Filing, Case 29469 and Case 88-C-004, May 8, 1991, pp. 39-55.

borne only by the LECs, would of course inhibit their ability to respond promptly to price competition and thereby introduce the likelihood of competitive distortions.

35. In contrast, establishing the rate floor initially at incremental cost would remove the need for a cost showing whenever prices departed from within the current limits.[24]

36. The current FCC rules require the initial prices for new services to satisfy both a net revenue and a fully distributed cost test. Since both of these requirements would prevent the LEC from setting prices to meet the competition, at least in some cases, these requirements should be waived in such circumstances. I return to this question in section 6, below.

**4. Reciprocity between LECs and interconnectors**

37. It seems to me the greatest gains in economic efficiency will be realized if interconnection is provided on a reciprocal basis—that is, if the new entrants are required to provide interconnection to the LECs on terms comparable to the terms on which the LECs provide interconnection to them. Fully reciprocal interconnection arrangements, it would seem, would allow each provider to configure its network in the most cost-effective manner. In the same way that new entrants are expected to find partial use of the LEC network the most economical way to provide end-to-end service, there will presumably be occasions in which buying interconnection from a new

[24]It would of course be necessary for the LEC to demonstrate that its proposed prices met the incremental cost test. Once that floor was ascertained, however, it would be free to go down to it without further cost justification: in contrast, under the current price cap rules, the companies have to justify every change they wish to make outside of the prescribed band.

entrant will prove to be more economical for the LEC than extending its network with new facilities of its own.

38. Implicit in the ability to interconnect is the ability to resell services. For example, with interconnection, a new entrant providing a connection between an end use customer and an IXC POP may provide the transport part of the link with its own facilities and resell a LEC channel termination.

## 5. Competitive safeguards and the avoidance of unacceptable discrimination

39. I have already described the two purposes of setting a range of permissible pricing flexibility: to provide safeguards against anti-competitive behavior on the part of the LECs[25] and to protect customers with relatively inelastic demands from unacceptable discrimination. So far as the incremental cost floor is concerned, one view among economists is that it can be set at short-run marginal cost: rates above that level would be presumptively acceptable, with policymakers relying upon the self-interest of the regulated company to price no lower than necessary—above that short-run marginal cost level—to obtain the business. An alternative standard, to which I subscribe—and one in most circumstances providing a greater degree of protection of competitors against exclusionary practices, and of demand-inelastic customers against

[25]See my The Economics of Regulation, Volume 1, Chapter 6.

undue discrimination—would set the floor at long-run incremental cost.[26] This seems particularly apt in an industry that is continually adding to capacity.

40. As I have also pointed out, the use of rate caps further limits the ability of the LEC to cross-subsidize competitive services at the expense of demand-inelastic ones—all the more so since special access services are in a separate cap. Finally, the fact that the proposed rules would extend collocation to IXCs as well as CAPs additionally limits severely the likelihood of predation recommending itself to the LECs: the likelihood of their driving out and keeping out competitive providers such as the major IXCs are remote. These terms and conditions essentially remove both the ability and the incentive of the LECs to engage in anti-competitive pricing and to impose unacceptable burdens on demand-inelastic customers.

**6. Price cap issues**

41. It is difficult to understand the logic of defining as "new services" LEC offerings designed to meet competition. If, however, the interconnection and perhaps reconfigured LEC transport services were to be considered new services under the price cap rules, the question arises whether they should be subject to the net revenue test. It seems to me they clearly should not. The overwhelming likelihood is that increased

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[26]In strict economic terms, the concept of long-run marginal costs relates to a hypothetical situation in which all inputs are variable, and a supplier confronts the possibility of installing entirely new facilities, in effect from the ground up. And the "marginal" relates to the incremental cost of a single unit of output. The concept of long-run incremental cost, in contrast, is more pragmatic: it takes a firm's past history as given, does not assume that it is writing on a blank slate, but recognizes that it will ordinarily be planning the installation of new capacity, at whatever that additional investment will cost given its current situation, and it spreads the costs over either the total output of that additional capacity—in that sense it is a kind of average incremental cost—or over the additional output that is likely to be induced by a price reduction under consideration (or curtailed in response to a price increase.)

competition for special access services is going to reduce the net revenues of the LECs—even more if they are prevented from meeting that competition than if they are permitted to do so. If then the companies' prospective net revenues from these services are compared with present levels, the proposed offerings will necessarily fail the test. Application of the net revenue test would seem to be in fundamental conflict with the Commission's intention to foster competition, which requires that the LECs be free to respond promptly.

42. The other test of prices for new services, under price cap regulation, is fully distributed cost. This standard is irrelevant to the establishment of efficient prices: fully distributed costs are backward- rather than forward-looking and include an inherently arbitrary allocation of joint and common costs. Once competitive alternatives become available, not similarly constrained, holding LEC transport prices for either existing or new services to fully distributed cost is a certain guarantee of an inefficient distribution of the business among the competitors and higher costs for ratepayers collectively.

## C. Definition and Measurement of Contribution

43. As I have already observed, the contribution that must be incorporated in both the interconnection rate the LECs charge competitive access providers and in the price of the LECs' own retail services should be defined as the total revenues from those services minus the incremental cost of providing them, reduced to a per unit basis by dividing the total by the number of units expected to be provided.

44. Strictly speaking, the need for a contribution element arises from any factor that causes rates to depart from incremental costs, such as rate averaging, the pursuit of one or another public policy objective, or the need to recover common costs, in circumstances in which if all rates are set at incremental costs the LECs will not recover their total revenue requirements.

45. Once it has defined and measured the total amount of net revenue contributed by current LEC special access rates, the Commission must then decide how much of this amount should continue to be raised from these services (in the LEC's charges to customers or in its interconnection charges) when collocation is permitted and competition intensifies. In general, except to the extent it is prevented from doing so by the interconnection charges, the increased competition will reduce the amount of those net revenues. It would be anomalous if the Commission were to continue the contributions at their present level: that would defeat a principal economic purpose of its proposed encouragements to competition. It should therefore permit the LECs greater freedom than they now enjoy to reprice their services, in order to reduce the contribution from special access. On the other hand, reducing the contribution only gradually would cushion the shock of any sudden rate changes, and give the Commission and the companies time to offset the resulting losses, by raising the rates of other less competitive services (e.g., subscriber lines) and/or by transferring revenue requirements from the federal to the state jurisdiction by changes in separations.

46. This approach to measuring and assessing the contribution element, as well as administering the LEC rate floors, requires valid incremental cost information.

Therefore, the LECs should develop and the FCC should at the earliest possible date approve measures of those incremental costs of transport and interconnection.

## IV. SPECIAL CONSIDERATIONS APPLICABLE TO SWITCHED ACCESS TRANSPORT

47. The fundamental economic issues identified in the preceding discussion of special access transport services are germane also to the possibility of competition for switched access transport services. Because of the even wider gap between current rates and incremental costs of these services, however, two aspects of the rules of the game that we have already discussed take on even more urgent importance: (1) the LECs' price structures and their ability to change them and (2) the necessity for a well defined contribution element, to be imposed symmetrically on the LECs and their competitors.

48. Apart from the additional costs of the requisite switching facilities, the cost structure for switched access transport services is essentially the same as for special access. The primary determinants of cost are volumes of traffic and to some extent distance of transport. At higher volumes, average costs are very low; and this means that not only are incremental costs over the entire range of output far below average costs, but costs of additional usage of the very high volume facilities are far below the corresponding costs for low-volume facilities. Yet the current rate structure provides for equal charges per unit of traffic—the same rate per minute for both common and dedicated transport (the former via the tandem switch) despite the

difference in the actual costs (average or incremental) of the two kinds of facilities.[27] This disparity between rates and costs is an extreme form of rate averaging, and cannot be sustained in the face of competitive entry, if that entry is to do any economic good, and if the interexchange carriers imposing the higher costs on the system are to have any incentive to develop more efficient methods of access. Also, to an even greater extent than in the case of special access, LEC switched access tariffs do not reflect the higher costs of serving low-density areas or customers requiring long loop lengths.

49. The LECs will require the same kinds of pricing flexibility as I have discussed earlier with respect to the contemplated competitive special access transport environment. Because unregulated new entrants are unlikely to distinguish between switched and special transport when and if entry for both services is allowed, the LECs, in turn, should have the ability to price switched and special transport similarly.[28]

50. New entry into the provision of switched access transport services will have two major effects on consumers and competitors, the extent of which will depend on the particular interconnection arrangements and LEC pricing structures permissible after entry occurs. First, to an even greater extent than for special access, a large amount of the revenues from switched access rates cover common costs and subsidize

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[27]In the Commission's recently initiated investigation of the equal charge requirement in Docket CC 91-213, it recognizes that the pricing of switched access transport and the terms and conditions of increased transport competition must be decided consistently, if the increased competition is to be beneficial.

[28]As I have already observed, the possibility of substitution of special for switched transport, if competition is introduced only into the former, raises this same consideration even before the FCC turns explicitly to the question of switched access transport.

other services. It was shown in Docket 78-72 that the charges for switched access are several times as high as for special access facilities with comparable capacities; and the total contribution from interstate toll seems to be on the order of $10 billion annually.[29] Raising this amount of net revenue will simply not be possible in a competitive environment—unless, to be sure, the LECs are permitted to reprice their several services or the contribution element in the interconnection charge is correspondingly higher.

51. Second, the movement from equal rates to cost-based rates that will be inevitable with entry—in particular, the reflection in the prices of common and dedicated transport of the differences in the respective costs of providing them—will affect interexchange carriers differently, depending on the current configurations of their networks. Carriers, such as AT&T, served by transport facilities that are now priced well above cost will gain relative to the carriers whose transport costs are close to or above current rates. An important consideration, therefore, is how effective the new pricing rules accompanying the introduction of competition would be in mitigating the consequent shock (or windfall) to the several IXCs with respect to a very large component of their total costs.

52. The principles of economically correct pricing of interconnection and LEC switched transport services are the same as in the special access case. The only

[29]My colleagues at NERA inform me that the approximately 300 billion minutes of switched access in 1989 generated about $13 billion from usage-based charges. This produces an average price of about $0.043 per minute. The New England Telephone Company in late 1989 estimated incremental costs of carrier access at a little over $0.01 per peak minute and almost nothing offpeak (Massachusetts DPU Docket 89-300). This suggests a contribution of $0.033 per minute and $10 billion in the aggregate.

difference is that the consequences to ratepayers and competing firms of whatever rules are adopted, rational or irrational, are likely to be much greater.

53. The proper pricing rules are that (1) the interconnection price charged to collocating carriers is to be incremental cost to the LEC of providing interconnection plus the contribution element (which could be assessed on a per minute basis, in much the same way as today's carrier common line charge), and (2) the price floor for the LECs' own switched transport services is incremental cost plus the contribution element.[30]

54. Moving transport prices towards incremental cost and isolating contribution in a single element would mitigate the rate shock experienced by IXCs as LECs move away from today's equal charge per unit transport rates.

[30]Here, as in the case of special access services, the LECs should be permitted to price down to their incremental costs alone, without a contribution element, in circumstances in which they face total bypass of their facilities.

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# EFFECTS OF COMPETITIVE ENTRY IN THE U.S. INTERSTATE TOLL MARKETS

by

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## EFFECTS OF COMPETITIVE ENTRY IN THE U.S. INTERSTATE TOLL MARKETS

The Commission has suggested that historical evidence supports the view that entry and regulated competition have brought benefits to consumers of U.S. interstate long distance services. In particular,

> ...competition in the provision of interstate long-distance service has led to sharply reduced rates, a larger variety of service options, and more rapid deployment of new technologies... [1]

Indeed, since divestiture and equal access transformed interstate long-distance services, prices have fallen and demand has grown at unprecedented rates. While it is tempting to ascribe these changes to the pressures of competition, careful analysis shows that the Commission's policy of rebalancing local and toll rates is directly and entirely responsible for the overall reduction in long distance rates. While competition may drive down prices and expand demand for interstate long-distance services in the future, there is no evidence that entry and competition--as experienced for U.S. long-distance services--have produced these benefits to date.

Long-distance prices fell faster (in real terms) since divestiture than their long-run historical average: from 1984 to 1990, real interstate toll rate reductions averaged about 8.63 percent annually.[2] From 1972-1983, the longest pre-divestiture period over which interstate rate data are compiled by the Bureau of Labor Statistics, interstate toll rates declined at an annual average (real) rate of 2.7 percent. Since the post-divestiture period coincides with the period for which equal access was available and during which AT&T lost substantial market share,[3] it is tempting to attribute these additional price reductions to direct competition among interexchange carriers. But that would be wrong.

From 1984 to 1990, the FCC undertook a fundamental rebalancing of local access and toll rates in the United States, primarily through two related activities. First, the FCC instituted subscriber line charges (end user common line charges) by which interstate non-traffic sensitive costs were recovered directly from end users on a flat rate basis rather than from toll usage charges. Beginning in 1984, subscriber line charge revenues grew from approximately $1.296 billion to $6.069 billion in 1990, and all of that revenue represented lower carrier access charges paid by the interexchange carriers.[4] Second, the FCC instituted a number of separations changes which effectively reduced interstate costs while increasing intrastate costs. The net effect of separations changes (and other

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[1] Expanded Interconnection with Local Telephone Company Facilities, CC Docket No. 91-141, Notice of Proposed Rulemaking and Notice of Inquiry (released May 6, 1991) ("NPRM" of "NOI"), paragraph 11.

[2] Using the BLS producer price index for interstate toll rates, deflated by the BLS GNP-PI.

[3] The FCC calculates that AT&T's market share of switched access minutes of use fell from 84.2 percent in the third quarter of 1984 to 63.1 percent in the first quarter of 1991: see Federal Communications Commission, "Long Distance Market Shares: First Quarter, 1991," June 28, 1990, Table 8.

[4] United States Telephone Association, ex parte presentation to the FCC, CC Docket 87-313, filed August 6, 1990, Table 2.

regulatory changes, including changes in income tax rates) was to reduce carrier access charges an additional $4.493 billion (annually) by 1990.[5] By 1990, carrier access charge expenditures were approximately $9.266 billion less per year because of these changes in federal regulatory policy.

Thus access charges, which constitute a large fraction of the marginal cost of interexchange carriers, fell significantly over the post-divestiture period due to the implementation of subscriber line charges and changes in separations policy. Indeed, AT&T lowered its interstate toll rates over this period, reflecting this reduction in its marginal cost. However, AT&T's total price reduction over this period was no larger than the amount by which its access charges were reduced. See Exhibit 1.

This finding is important in interpreting the U.S. experience with competition for interstate toll services. It suggests that beyond the mandatory reflection of access charge reductions in AT&T's rates, which were then followed by the other IXCs, interexchange carriers initiated no significant price competition for toll services.[6] Indeed, the current situation could better be described as a regulated price umbrella: MCI and Sprint generally followed AT&T price reductions but the gap in prices shrunk from 10-20 percent in mid-1984 to about 5 percent in 1987 when the unequal access discount was essentially eliminated.[7] This lack of price reductions among the IXCs is surprising for two reasons. First, this period witnessed significant erosion in AT&T's share of U.S. interstate toll services, falling from about 84 percent in 1984 to 63 percent in 1991.[8] Second, we observe comparatively large reductions in real interstate toll rates (adjusted for changes in access charges) during the period before divestiture and equal access.[9] If we adjust interstate toll rates to account for the changes in the non-traffic sensitive cost assignment in the Ozark Plan between 1972 and 1984, we observe that real interstate toll rates, net of changes in separations, fell at an annual rate of 6.28 percent.[10] See Exhibit 2. Since inflation averaged approximately 3.6 percent per year from 1984 to 1989, real interstate toll rates, net of changes in access charges, fell at an annual rate of 3.6 percent. Net of access charge changes, real interstate toll rates fell roughly twice as fast in the decade before divestiture than in the six years after. This finding is hardly consistent with the view that competition among interexchange carriers led to drastically lower prices. Rather, it suggests that the type of competitive entry experienced for U.S. interstate toll

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[5] Ibid, Table 5.

[6] This generalization applies to aggregate interstate toll service. There is evidence of competitive pressure reducing toll rates (i) for large business customers (e.g., through new services such as Megacom, Prism, and Ultra-WATS), and (ii) in the intrastate toll markets where long-haul rates fell and short-haul rates rose from 1983 to 1987 (see A. Mathios and R. Rogers, "The Impact of Alternative Forms of State Regulation of AT&T on Direct-Dial Long-Distance Telephone Rates," The Rand Journal of Economics, Autumn 1989, p. 446.

[7] See Michael E. Porter, "Competition in the Long Distance Telecommunications Market: An Industry Structure Analysis," filed with AT&T's Comments in CC Docket 87-313, October 19, 1987.

[8] FCC, "Long Distance Market Shares: First Quarter, 1991," June 28, 1991, Table 3.

[9] Competition in interstate switched services technically began in 1974 with the entry of MCI's Execunet Service, but it is difficult to describe real rate reductions during this period as due to competition since (i) there was very little competition, and (ii) real interstate toll rates fell at an annual rate of 4.8 percent between 1972 and 1974 and at 2.2 percent during the post-Execunet period from 1974 to 1983.

[10] 1972 is the earliest year for which BLS price data for interstate toll service is available.

services since divestiture may not encourage price rivalry for ordinary interstate toll calling.[11]

A second possible consequence of competition for interstate toll services was growth in demand. While changes in the units of measurement make it difficult to compare pre- and post-divestiture interstate toll growth rates, the evidence suggests that toll demand grew more rapidly in the post-divestiture period. Between 1962 and 1982, annual growth in interstate minutes of use averaged 10.5 percent.[12] From 1984 to 1990, interstate switched access minutes of use grew at an annual rate of 12.9 percent,[13] and this measure of demand probably understates demand growth, as it ignores demand served by bypass services, including WATS and MEGACOM-type services. Competition is sometimes alleged to have caused this increase in demand through reducing prices and also through increased marketing activities (such as advertising) and the introduction of new services. Indeed, the Commission cites overall traffic growth as a reason why a loss of market share to competitors need not result in higher prices for remaining customers.[14]

While interstate toll demand did grow at an unprecedented rate after competitive entry, the growth was not due to additional new services, advertising, consumer awareness, etc. The change in the growth rate is completely explained by changes in price, income and population. In Exhibit 3, we predict toll demand based on observed price, income and population and subtract the predicted value from the actual observed value. The rate of growth of this unexplained component of demand measures the rate at which the demand curve shifts outward, due to such non-price factors as marketing and advertising efforts. From the data, we observe that unexplained demand grew approximately 2.5 percentage points more slowly after divestiture: that is, changes in price, income and population more than explain the increase in the rate of growth of interstate toll demand after divestiture.[15] One explanation for this slowdown in the rate of growth of toll demand is bypass: toll demand may have expanded due to competition but the proportion of toll demand measured by switched access minutes of use may have fallen. To examine this possible explanation, we took the LEC estimates of traffic lost to bypass filed with the FCC as part of its Monitoring Report and added them to the switched access demand measurements. Using the sum of bypass and switched access minutes to measure toll growth from 1984 to 1990, we still observe slightly slower growth of unexplained demand in the competitive period. See Exhibit 3.

The same point was made in the recent price cap proceeding (CC Docket 87-313), where the Commission staff requested estimates of the demand stimulation for interstate

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[11]Competitive entry for U.S. interstate toll services differed in several important ways from unfettered free competition. The FCC instituted (i) access charge discounts for entrants to compensate for unequal access, (ii) non-cost-based access transport pricing which favored the smaller entrants to compensate for AT&T's locational advantage, and (iii) asymmetric regulation of AT&T which continues to this day.

[12]AT&T, "Long Lines Statistics, 1960-1982."

[13]FCC, "Trends in Telephone Service," August 20, 1990.

[14]NPRM, paragraph 66.

[15]If one believes competition began in the 1970s, this comparison of pre and post-divestiture growth rates may seem inappropriate. Nonetheless, (i) if competition had a significant effect on demand, one would expect to see it during the transition to equal access, and (ii) if the same comparison is done before and after 1978, the same result appears: unexplained demand grew approximately 1.7 percentage points more slowly in the 1979-89 post-competitive period than in the 1972-1978 period.

toll service stemming from the implementation of subscriber line charges and other exogenous cost changes in LEC access charge filings. As shown in Exhibit 4, the measure of demand stimulation deemed "reasonable" by the Commission in its Order,[16] accounts fully for the demand stimulation actually observed over the period.

While the FCC's policies for interstate toll services have resulted in enormous welfare gains for U.S. consumers, competition--or rather the type of regulated competition actually observed for interstate toll services--is not responsible for these benefits. In general, the FCC's rebalancing efforts led to dramatic reductions in interstate carrier access charges which, in turn, led to lower toll rates and increased toll demand. Despite the dramatic reduction of AT&T's share of U.S. interstate toll services, the substantial price reductions that might have been expected to arise from toll competition have yet to materialize.

The lesson that should be learned from the U.S. experience with interstate toll competition is that regulated competition need not provide the benefits suggested by the economists' idealized competition. Applied to the introduction of competition for special access transport services, we might expect disappointing results for consumers, since the main driver of consumer benefits from the price changes for interstate toll services--reductions in carrier access charges--is not available here in the same degree to produce similar benefits. In addition, the circumstances for interstate toll services after divestiture may have presented an easier setting in which to introduce competition than the conditions for access transport services today. General economic conditions are less favorable today than in the immediate post-divestiture period, and the basic growth rate of interstate toll minutes then was probably higher than the growth rate of the special access transport demand today. Thus AT&T was able to cushion its loss of market share to a greater extent than the LECs could cushion a similar loss in market share in transport today. AT&T's margin on toll service did not decrease significantly after competition began; prices were reduced only as a pass-through of carrier access charge changes. In contrast, the LECs' margin on special access transport services must decrease if they are to remain subject to competitive entry.

[16] Second Report and Order, CC Docket 87-313, released October 4, 1990, Appendix C, paragraph 80.

**TABLE 1**
**Changes in Carrier Access Charges**
**and**
**Changes in AT&T Interstate Toll Rates**

| | Access Charge Changes | Other[1] Exogenous Cost Changes | Access & Cost Changes | AT&T Rate Changes | Cumulative Rate Changes |
|---|---|---|---|---|---|
| 1/1/84 | $0 | | $0 | | $0 |
| 5/25/84 | ($1,400) | | ($1,400) | ($1,400) | ($1,400) |
| 1/15/85 | $274 | | ($1,126) | | ($1,400) |
| 4/26/85 | | | ($1,126) | $303 | ($1,097) |
| 6/1/85 | ($1,157) | | ($2,283) | ($1,157) | ($2,254) |
| 10/1/85 | ($525) | | ($2,808) | | ($2,254) |
| 1/1/86 | | | ($2,808) | ($135) | ($2,389) |
| 2/28/86 | | | ($2,808) | $18 | ($2,371) |
| 4/15/86 | | | ($2,808) | $72 | ($2,299) |
| 6/1/86 | ($2,000) | | ($4,808) | ($2,000) | ($4,299) |
| 1/1/87 | ($1,865) | | ($6,673) | ($1,865) | ($6,164) |
| 3/13/87 | | | ($6,673) | $18 | ($6,146) |
| 7/1/87 | ($593) | | ($7,266) | ($593) | ($6,739) |
| 12/1/87 | | | ($7,266) | $77 | ($6,662) |
| 1/1/88 | ($772) | ($524) | ($8,562) | ($772) | ($7,434) |
| 1/1/88 | | | ($8,562) | | ($7,434) |
| 12/31/88-7/1/90 | ($776) | | ($9,338) | ($782) | ($8,216) |
| Total | ($8,814) | ($524) | | ($8,216) | |

[1]These are exogenous cost changes for AT&T other than access charge changes: specifically, reductions of $315 million from the Tax Simplification Act of 1987 and $209 million form 1987 pension accounting reform. See FCC, Second Further Notice, CC Docket 87-313, released April 17, 1989, Appendix C, page 4.

Sources:

(1) FCC, Appendix C, 2nd Further Notice, CC Docket 87-313, 4/17/89.
(2) AT&T, "Retrospective Analysis of AT&T's Productivity Growth, 1984-88," AT&T Comments on Further Notice of Proposed Rulemaking, CC Docket 87-313, Appendix D.
(3) FCC, Common Carrier Bureau, "AT&T's Performance Under Price Cap Regulation," Report to the Subcommittee on Telecommunications and Finance, Committee on Energy and Commerce, U.S. House of Representatives, October, 1990.

EXHIBIT 2

## REAL INTERSTATE TOLL RATES (NET OF ACCESS CHARGES) FELL FASTER BEFORE DIVESTITURE THAN AFTER

Absent changes in access charges, Exhibit 1 shows that interstate toll rates would have remained roughly constant in nominal terms from 1984 to 1990. In real terms, then, interstate toll rates would have fallen at about 3.6 percent per year (net of access charge changes), since the CPI-U for all commodities fell at an annual rate of 3.6 percent from 1984 to 1990.

This rate of decline of real toll rates (net of access charges) is low compared with the 1970s.[17] According to the Bureau of Labor Statistics producer price index, real interstate toll rates fell at about 2.6 percent annually from 1972 to 1983, which was a period in which interstate costs were increasing due to changes in separations generated by the Ozark formula. If we held the interstate NTS allocation fixed at its 1972 level, real interstate revenues would have grown 3.68 percentage points more slowly (per year) from 1972 to 1983.[18] Thus, adjusting for the change in the interstate NTS allocation, we find that real interstate toll rates would have fallen at an annual rate of 6.28 percent (6.28 = 2.6 + 3.68) from 1972 to 1983. Since divestiture, real interstate toll rates (net of access charge changes) have declined at an annual rate of 3.6 percent -- about half the annual rate at which they declined in the decade prior to divestiture.

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[17] Although competition in switched services technically dates from 1974 or 1978 (when Execunet began and when Execunet was approved), it had little observable effect in the 1970s. Real interstate MTS prices fell at an annual rate of 4.8 percent between 1972 and 1974 and at 2.2 percent during the post-Execunet period from 1974 to 1983. The big price change often ascribed to competition is the post-divestiture toll price reductions which averaged about 9 percent in real terms from 1984-90. We show that these post-divestiture price reductions were not attributable to the competition experienced in the post-divestiture toll market.

[18] Between 1972 and 1982, the subsidy from interstate toll for the Bell System (in the form of non-traffic sensitive cost allocations) increased from $1.570 billion to $7.690 billion. (C.L. Weinhaus and A.G. Oettinger, Behind the Telephone Debates, Norwood, New Jersey: Ablex Publishing Corporation, 1988, p. 81.) At the same time, Bell System interstate revenues increased from $6.493 billion to $21.8 billion. (FCC, Form M (Monthly Report No. 1), various years) If the interstate NTS allocation had been held constant between 1972 and 1982, interstate revenues would have increased from $6.493 billion to $15.68 billion (where 15.68 = 21.8 - 7.690 + 1.570). Annual growth in interstate revenues thus was 12.88 percent, and annual growth in interstate revenue net of NTS allocation changes was 9.22 percent. The difference in the annual growth rate of revenue accounted for by the change in NTS cost allocation was thus 3.68 percentage points.