

D. Demand Growth

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.¹¹ From 1984 to 1991, interstate switched access minutes of use grew at an annual rate of 11.81 percent,¹² 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 increasing marketing activities (such as advertising) and the introduction of new services. Indeed, in its Notice of Proposed Rulemaking in CC Docket 91-141, 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.¹³

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 shifted outward, due to such non-price factors as marketing and advertising efforts. From the data, we observe that unexplained demand grew approximately 1.91 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.¹⁴

¹¹AT&T, "Long Lines Statistics, 1960-1982."

¹²Federal Communications Commission, "Trends in Telephone Service," February, 1992, Table 24.

¹³NPRM, paragraph 66.

¹⁴If one believes competition began in the 1970s, this comparison of pre and post-divestiture growth rates may seem inappropriate. Nonetheless, if the same comparison is done before and after 1978, the same result appears: unexplained demand grew approximately 1.82 percentage points more slowly in the 1979-91 post-competitive period than in the 1972-1978 period. See Exhibit 3, Table 2A.

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 1991, we still observe slower growth of unexplained demand in both the post-competition period and the post-divestiture 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 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,¹⁵ accounts fully for the demand stimulation actually observed over the period.

E. Conclusions

Consumers have benefitted enormously from lower interstate toll prices and expanded interstate toll demand. However, competition in the interstate toll market is not responsible for either of those benefits. Reductions in the carrier access charges paid by AT&T outweigh AT&T's toll price reductions, and the increase in toll demand is more than explained by changes in toll prices, income and population.

¹⁵Second Report and Order, CC Docket 87-313, released October 4, 1990, Appendix C, paragraph 30.

**THE REDUCTION IN AT&T'S ACCESS CHARGES EXCEEDS
THE REDUCTION IN ITS TOLL PRICES**

In Table 1, we list each date on which a substantial access charge change or AT&T price change occurred, the dollar amount of the access cost reduction experienced by AT&T,¹⁶ and the dollar amount of revenue change forecasted by AT&T as a result of its price change. All data through 9/17/88 were taken from FCC and AT&T filings in the price cap docket.¹⁷ The 7/1/89 and 7/1/90 data were taken from the FCC's report on AT&T's performance under price caps.¹⁸ The 1/1/90 and 1/1/91 data are taken from AT&T filings, as reported by Victor Glass of the National Exchange Carrier Association. The remaining access charge and price changes are taken from AT&T price cap filings.¹⁹

It is unlikely that every AT&T price change or access charge change since AT&T went under price caps on July 1, 1989 is accounted for in Table 1. However, we can check our work by calculating the total AT&T price reduction directly from AT&T's actual price index (API) reported in their latest (May 15, 1992) price cap filing. Table 1A gives the total percentage and dollar annual rate reductions implemented by AT&T since January 1989, July 1989, and July 1990. Evaluated at 1992 demand levels, AT&T price reductions since January 1989 totalled \$1,193.0 million per year; our calculation in Table 1, where each price reduction is evaluated at current demand, shows a total annual rate reduction over the period of \$1,239 million. The small difference in these estimates is due to (i) additional AT&T price changes other than those listed in Table 1 and (ii) the different revenue bases used to evaluate the changes in price. Table 1 shows that during that period, AT&T experienced annual access charge reductions totalling approximately \$2,118 million, evaluated at the concurrent level of demand.

¹⁶At forecasted demand levels that include stimulation from anticipated AT&T rate reductions.

¹⁷FCC, Appendix C, 2nd Further Notice, CC Docket 87-313, 4/17/89, and 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, 7/26/88.

¹⁸FCC, 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, Chart II-B.

¹⁹The 7/1/91 cost and rate change data were taken from AT&T's May 17, 1991 Annual Access Charge Filing and Transmittal No. 3242, filed June 29, 1991. The 12/19/91 data was taken from AT&T Transmittal No. 3734, filed 12/19/91. The 7/1/92 data comes from AT&T's 1992 Annual Price Cap filing dated 5/15/92.

Table 1
Changes in Carrier Access Charges and
Changes in AT&T Interstate Toll Rates
(\$ Million)

Date	Access Charge Change	Other Exogenous Cost Changes	Cumulative Cost Changes	AT&T Price Changes	Cumulative AT&T Price Changes
1/1/84	\$0	\$0	\$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)
1/11/86	\$25		(\$2,783)	\$248	(\$2,141)
2/28/86			(\$2,783)	\$18	(\$2,123)
4/15/86			(\$2,783)	\$72	(\$2,051)
6/1/86	(\$2,000)		(\$4,783)	(\$2,000)	(\$4,051)
1/1/87	(\$1,865)		(\$6,648)	(\$1,865)	(\$5,916)
3/13/87			(\$6,648)	\$18	(\$5,898)
7/1/87	(\$593)		(\$7,241)	(\$593)	(\$6,491)
12/1/87			(\$7,241)	\$77	(\$6,414)
1/1/88	(\$772)	(\$524)	(\$8,537)	(\$772)	(\$7,186)
6/17/88			(\$8,537)	\$28	(\$7,158)
9/17/88			(\$8,537)	\$174	(\$6,984)
7/1/89	(\$776)		(\$9,313)	(\$785)	(\$7,769)
1/1/90	(\$385)	(\$141)	(\$9,839)	(\$267)	(\$8,036)
7/1/90	(\$482)	(\$143)	(\$10,464)	(\$192)	(\$8,228)
1/1/91	\$0	(\$1)	(\$10,595)	(\$84)	(\$8,312)
7/1/91	(\$251)	(\$9)	(\$10,855)	\$18	(\$8,294)
12/19/91	\$97	(\$25)	(\$10,783)	\$71	(\$8,223)
7/1/92	(\$191)	\$110	(\$10,864)	\$0	(\$8,223)
TOTAL	(\$10,131)	(\$733)	(\$10,864)	(\$8,223)	(\$8,223)

Table 1A
AT&T Price Changes Under Price Caps

	1992 API	7/1/90 API	7/1/89 API	1/1/89 API
BASKET 1	0.943	0.943	0.984	1.000
BASKET 2	0.939	0.928	0.973	1.000
BASKET 3	0.979	0.931	0.970	1.000
	1992 BASE REVENUE	7/1/90	7/1/89	1/1/89
BASKET 1	\$17,762	\$0	(\$746)	(\$1,012)
BASKET 2	\$2,935	\$35	(\$102)	(\$179)
BASKET 3	\$96	\$5	\$1	(\$2)
TOTAL	\$20,793	\$40	(\$847)	(\$1,193)
PERCENT	100.00%	0.19%	-4.07%	-5.74%
<p>SOURCE: FCC: 10/90 PRICE CAPS REPORT AT&T: 5/15/92 PRICE CAPS FILING</p>				

**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 risen in nominal terms from 1984 to 1991. In real terms, then, interstate toll rates would have fallen at less than 3.70 percent per year (net of access charge changes), since the GNP-PI for all commodities grew at an annual rate of 3.70 percent from 1984 to 1991.

This rate of decline of real toll rates (net of access charges) is low compared with the 1970s. 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 1983.²⁰ 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 less than an annual rate of 3.70 percent -- about half the annual rate at which they declined in the decade prior to divestiture.

²⁰Between 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.

GROWTH IN DEMAND DUE TO COMPETITION

We compare the decade before divestiture (1972-1982) with the period after divestiture (1984-1988).²¹ In each period, we divide actual demand growth into two parts:

1. predicted growth: a part due to changes in prices, income, and population and
2. unexplained growth: a (residually-measured) part due to other changes--changes in taste, changes in the market place (such as competitive entry) etc.

If competition shifts the demand curve outward due to advertising, the availability of new products or services, or a heightened awareness of the possibility of telephone service, we would expect to see that shift as an increase in unexplained growth.

Using conventional measures of the responsiveness of demand to changes in price, income, and population, we calculate the rate of growth of unexplained demand. In the 1972-82 period, demand was predicted to grow at an annual rate of 4.04 percent. Actual demand growth averaged 8.92 percent, leaving a growth rate of unexplained demand of 4.88 percent. In the 1984-91 period, demand growth was predicted to average 8.83 percent and actual demand growth averaged 11.81 percent. Thus the growth rate of unexplained demand in the 1984-91 period averaged 2.97 percent. Growth in demand unexplained by changes in price, income, and population averaged 1.91 percentage points lower in the 1984-91 period compared with the 1972-82 period. See Table 2. Table 2A provides the same analysis, comparing the pre-ENFIA period with the post-ENFIA period (1972-78 with 1979-91) and obtains the same qualitative result.

One explanation of this reduction in the growth rate of unexplained demand after divestiture is the growth of bypass. Interstate toll demand is measured as interstate switched access demand after divestiture, and the growth of bypass demand--including MEGACOM and WATS-type services--would mask

²¹ Again, we treat the post-divestiture period as the competitive period, although the same analysis as that described below yields the same qualitative results if applied to the 1972-78, 1979-1990 periods. To judge the effects of competition on demand growth, it is useful to note that MCI and Sprint advertising was less than \$5 million in 1980 compared with \$45 million for AT&T (measured in 1986 dollars). Between 1983 and 1984, total annual advertising for AT&T, MCI and Sprint increased from about \$100 million to about \$150 million (in 1986 dollars). See Michael Porter, op. cit., Figure 23.

growth in toll demand after divestiture. To adjust our results for the possibility of bypass, we estimate interstate bypass usage from 1984 through 1991 and add that usage to our measure of switched access demand. Calculation of the bypass adjustment is outlined below. The results are shown in Table 2, where it is evident that adjusting for bypass growth does not reverse our earlier finding: growth in interstate toll demand (adjusted for bypass) unexplained by economic factors averaged 0.81 percentage points lower in the 1984-91 period than in the 1972-82 period.

TABLE 2
UNEXPLAINED EXOGENOUS GROWTH SLOWED AFTER DIVESTITURE

PERIOD	GROWTH IN PRICE	GROWTH IN INCOME/POP	GROWTH IN POP	PRICE EFFECT	INCOME EFFECT	POP EFFECT	TOTAL EFFECT: PREDICTED GROWTH	ACTUAL GROWTH	UNEXPLAINED GROWTH	(INCLUDING BYPASS)	
				ELAS=-0.72	ELAS=0.80	ELAS=1.00	ACTUAL GROWTH			UNEXPLAINED GROWTH	
1972-82	-2.65%	1.28%	1.01%	1.95%	1.02%	1.01%	4.04%	8.92%	4.88%	8.82%	4.88%
1984-91	-8.16%	1.75%	0.95%	6.32%	1.40%	0.95%	8.83%	11.81%	2.97%	12.80%	4.87%
DIFFERENCE	-5.51%	0.47%	-0.07%	4.37%	0.38%	-0.07%	4.79%	2.88%	-1.91%	3.88%	-0.81%

	PPI INTERSTATE TOLL		
	GNP-PI	NOMINAL	REAL
1972	56.3	100.0	196.8
1982	106.0	152.0	152.0
1984	106.3	146.8	137.4
1991	139.5	105.6	75.7
GROWTH			
72-82	7.11%	4.20%	-2.65%
84-91	6.53%	-4.78%	-8.16%

SOURCES: BLS

	LONG LINES MESSAGE VOLUMES AND HOLDING TIMES		
	MESSAGES	HOLDING TIME	MINUTES
1982	1,173,079	6.68	8,070,764
1976	2,714,007	7.84	21,277,815
1972	3,216,910	7.83	25,181,358
1968	6,440,602	8.65	55,711,207
1962	8,827,695	8.67	59,196,116
GROWTH			
1982-82	9.21%		10.40%
1972-82	7.82%		8.92%
1976-80	9.03%		10.10%

SOURCE: LONG LINES STATISTICS 1980-1982

	PER-CAPITA	
	POP	REAL INCOME
1972	209,896	\$4,562
1982	232,171	\$9,725
1984	236,343	\$10,419
1991	252,474	\$11,768
GROWTH		
72-82	1.01%	1.28%
84-91	0.95%	1.75%

SOURCES: 1980 STATISTICAL ABSTRACT TABLES 2,695
1991 STATISTICAL ABSTRACT TABLES 2,703
1980 INCOME: 7/88, 1/92 SURVEY OF CURRENT BUSINESS
1991 - EXTRAPOLATION

	INTERSTATE SWITCHED ACCESS MINUTES		
	USAGE	EST BYPASS	TOTAL
84Q3	37.5	7.9	45.4
86Q3	62.1	16.5	80.6
88Q3	69.7	19.9	89.6
90Q3	77.8	22.2	100.0
91Q3	81.9	24.4	106.3
GROWTH			
1984-88	13.44%	23.65%	15.43%
1984-91	11.81%	17.38%	12.98%

SOURCE: FCC "TRENDS IN TELEPHONE SERVICE" FEBRUARY, 1992, TABLE 24
FCC "MONITORING REPORT," JULY 1991, TABLES 6.1A.3

TABLE 2A
UNEXPLAINED EXOGENOUS GROWTH SLOWED AFTER COMPETITIVE ENTRY

PERIOD	GROWTH IN PRICE	GROWTH IN INCOME/POP	GROWTH IN POP	PHCE	INCOME	POP	TOTAL	ACTUAL GROWTH	UNEXPLAINED GROWTH	(INCLUDING BYPASS)	
				EFFECT	EFFECT	EFFECT	EFFECT: PREDICTED GROWTH			ACTUAL	UNEXPLAINED
				ELAS= -0.72	ELAS= 0.80	ELAS= 1.00					
1972-78	-2.80%	2.16%	0.98%	2.06%	1.73%	0.98%	4.85%	9.95%	5.10%	0.85%	5.10%
1979-91	-5.71%	1.51%	0.96%	4.32%	1.21%	0.96%	6.60%	9.89%	3.28%	10.65%	4.05%
DIFFERENCE	-2.91%	-0.65%	-0.02%	2.26%	-0.52%	-0.02%	1.75%	-0.06%	-1.82%	0.70%	-1.05%

	PPI		
	INTERSTATE TOLL		
	GNP-PPI	NOMINAL	REAL
1972	50.3	100.0	198.8
1978	72.7	121.9	167.7
1979	70.8	120.8	153.3
1989	129.5	100.3	83.6
1991	139.5	105.6	75.7
GROWTH			
72-78	6.33%	3.36%	-2.80%
79-91	4.87%	-1.11%	-5.71%

SOURCES: BLS

	LONG LINES MESSAGE VOLUMES AND HOLDING TIMES		
	MESSAGES	HOLDING TIME	MINUTES
1972	3,216,010	7.63	25,181,358
1978	3,328,034	8.35	44,489,084
1979	3,953,960	8.49	50,549,120
1982	6,827,695	8.67	59,196,116
GROWTH			
1972-78	6.76%		9.95%
1979-1982	4.87%		5.40%

SOURCE: LONG LINES STATISTICS 1960-1982

	PER-CAPITA	
	POP	REAL INCOME
1972	209,896	\$8,562
1978	222,565	\$9,735
1979	225,055	\$9,829
1989	247,350	\$11,531
1991	252,474	\$11,760
GROWTH		
72-78	0.98%	2.16%
79-91	0.96%	1.51%

SOURCES: 1990 STATISTICAL ABSTRACT TABLES 2,095
1991 STATISTICAL ABSTRACT TABLES 2,703
1990 INCOME: 7900, 1992 SURVEY OF CURRENT BUSINESS
1991 - EXTRAPOLATION

	INTERSTATE SWITCHED ACCESS MINUTES		
	USAGE	EST BYPASS	TOTAL
1984-Q3	37.5	7.9	45.4
86Q3	62.1	16.5	80.6
89Q3	69.7	19.9	89.6
90Q3	77.8	22.2	100.0
91Q3	81.9	24.4	106.3
GROWTH			
1984-91	11.81%	17.38%	12.00%
1979-1991	9.89%		10.65%

SOURCE: FCC "TRENDS IN TELEPHONE SERVICE"
FEBRUARY 1991, TABLE 24.

FCC "MONITORING REPORT," JULY 1991, TABLES 6.1.6.3

Bypass Volumes: 1984-91

Total (intrastate plus interstate) bypass minutes were estimated by the RBOCs and GTE in five surveys conducted by the FCC. The results are reported in the FCC Monitoring Report, (July, 1991), Tables 6.1 and 6.3. We multiply those minutes of use by the fraction of minutes which are interstate ($1/(1+0.368) = 0.73$) from the Huber Report) to obtain interstate switched access minutes of use which are bypassed for the years 1988, 1889, and 1990. An estimate for 1984 is calculated by observing the growth rate in special access lines (from the FCC Statistics of Communication Common Carriers, 1984-1991) and assuming the growth rates of special access lines and bypass minutes between 1984 and 1990 are the same. An estimate for 1991 is obtained by extrapolating from the 1990 estimate using the 1988-90 growth rate. See Table 3.²²

**Table 3
Growth in Special Access Lines**

	Special Access Lines
1984	1,128,924
1985	1,320,228
1986	1,760,741
1987	1,995,739
1988	3,192,682
1989	3,037,268
1990	4,035,297
Growth	23.7%

We then add to the bypass minutes the interstate switched access minutes as reported in the FCC Trends in Telephone Service (February 1992), Table 24, to obtain total switched access minutes of use (including bypass minutes). See Tables 2 and 2A.

²²Source: FCC, Statistics of Communications Common Carriers.

**DEMAND STIMULATION FROM SUBSCRIBER LINE CHARGES
AND EXOGENOUS COST CHANGES**

LEC interstate revenue requirements recovered from IXCs fell sharply after divestiture due to the increase in subscriber line charges and to the implementation of several exogenous cost changes. Table 4 shows LEC interstate revenue with and without these exogenous changes.²³

Table 4
Carrier Switched Access Revenue Changes
(\$000)

Period	CCL + TS Revenue (R ₀)	Cumulative Exog Cost Changes	Change in Authorized Rate of Return	Change in CPE and IW Rev Req	SLC Revenue	CCL + TS Revenue R ₁
1984-85	\$14,464,181	\$0	\$0	\$0	(\$1,296,104)	\$15,760,285
1985-86	\$14,955,910	(\$206,574)	\$0	(\$627,112)	(\$4,484,658)	\$20,274,255
1986-87	\$13,669,242	(\$509,107)	(\$191,916)	(\$1,836,941)	(\$3,646,949)	\$19,854,155
1988	\$13,680,660	(\$1,090,281)	(\$343,170)	(\$1,821,257)	(\$4,563,679)	\$21,499,046
1989 (4-12)	\$12,713,833	(\$1,345,326)	(\$352,751)	(\$1,973,689)	(\$5,676,620)	\$22,062,219
1990-91	\$12,148,199	(\$1,744,907)	(\$339,278)	(\$2,409,425)	(\$6,069,004)	\$22,710,813

These reductions in revenue requirements caused interstate carrier access prices to fall and, in turn, caused interstate toll prices to fall. The demand stimulation resulting from the reduction in interstate toll prices can be calculated if the price elasticity of demand for interstate toll service and the

²³Source: United States Telephone Association, Ex Parte in CC Docket 87-313, filed 8/6/09, Tables 2 and 5.

fraction of IXC cost represented by access charges are known. For simplicity, we assume the demand function for LEC interstate switched access usage has a constant elasticity given by β , so that

$$q_i = Ap_i^\beta \quad (i = 1, 0),$$

and

$$R_i = p_i q_i = p_i \times Ap_i^\beta = Ap_i^{\beta+1}.$$

It then follows that:

$$\frac{R_1}{R_0} = \left(\frac{p_1}{p_0} \right)^{\beta+1},$$

so that

$$\frac{p_1}{p_0} = \left(\frac{R_1}{R_0} \right)^{\frac{1}{\beta+1}}.$$

Thus the price change required to obtain a 10 percent revenue change differs from 10 percent. Rather than using a percentage price change calculated in this manner to calculate demand response, we can directly solve for the quantity q_1 which would result from imposing a price increase of the magnitude necessary to increase revenues from R_0 to R_1 :

$$\frac{q_1}{q_0} = \left(\frac{p_1}{p_0} \right)^\beta = \left(\frac{R_1}{R_0} \right)^{\frac{\beta}{\beta+1}},$$

so that

$$q_1 = \left(\frac{R_1}{R_0} \right)^{\frac{\beta}{\beta+1}} \times q_0.$$

The decrease in carrier access revenue due to the reduction in switched access prices caused by the recovery of SLC revenue from end users and the implementation of exogenous cost changes thus causes

an interstate usage increase from q_0 to q_1 . We will take the difference $q_0 - q_1$ as our measure of interstate switched access demand stimulation caused by the implementation of SLCs and exogenous cost changes. Using data from the recent price cap filings, we see that demand stimulation from SLCs and exogenous cost changes accounts for about 4.8 percentage points of annual growth since 1984. See Table 5.²⁴ Annual interstate toll growth averaged about 10.5 percent before divestiture (1962-82) and 11.8

Table 5
Demand Stimulation From SLCs and Exogenous Cost Changes

	BASELINE CL DEMAND (1)	ESTIMATED CL STIM (2)	PERCENT CL STIM (3)	ESTIMATED CL UNSTIM (4)	ANNUAL GROWTH DIFF DUE TO STIM (5)
1984	160,139,810	6,493,672	4.06%	153,646,138	
1988	244,467,327	47,892,584	19.59%	196,574,743	
1989	281,422,756	65,700,270	23.35%	215,722,486	
1990-91	319,437,082	83,216,292	26.05%	236,220,790	
GROWTH:1984-					
1988	11.16%			6.35%	4.80%
1989	11.94%			7.02%	4.91%
1990	12.20%			7.43%	4.77%

percent after divestiture (1984-91).²⁵ Approximately 8 percentage points of the post-divestiture demand growth were due to carrier access charge reductions (stemming from SLCs and exogenous cost changes). Hence regulatory actions by the FCC explain more than the difference in demand growth before and after divestiture.

²⁴Sources: (1) 7/27/90 USTA Ex Parte, CC Docket 87-313, Table 1; (2) 8/6/90 Ex Parte, Table 8; (3) (2)/(1); (4) (1)-(3); and (5) (1)-(4).

²⁵AT&T, "Long Lines Statistics, 1960-1982," and FCC, "Trends in Telephone Service," February 1992.

3

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of)
)
Expanded Interconnection with) CC Docket No. 91-141
Local Telephone Company Facilities) ENF-87-14

AFFIDAVIT OF ALFRED E. KAHN

**THE NECESSARY CONDITIONS OF EFFECTIVE COMPETITION
FOR LOCAL TRANSPORT**

Alfred E. Kahn*

I. INTRODUCTION AND SUMMARY

1. My name is Alfred E. Kahn. I am the Robert Julius Thorne Professor of Political Economy, Emeritus, at Cornell University and Special Consultant to National Economic Research Associates, Inc. My business address is 308 North Cayuga Street, Ithaca, New York 14850. The experience of mine most pertinent to my submission in this proceeding is that I was Chairman of the New York State Public Service Commission between 1974 and 1977 and of the Civil Aeronautics Board between 1977 and 1978; I am the author of the two-volume The Economics of Regulation, published originally by John Wiley & Sons in 1970 and 1971 and reprinted in 1988 by The MIT Press; I have written and testified extensively on the subject of telecommunications regulatory policy and published a book and numerous articles on antitrust policy. I was a member of the Attorney General's National Committee to Study the Antitrust Laws and the National Commission for the Review of Antitrust Laws and Procedures. I attach a copy of my full resumé.

*This affidavit was prepared in collaboration with Drs. Timothy J. Tardiff and William E. Taylor, of National Economic Research Associates, Inc.

2. The Commission has proposed to liberalize its interconnection policies, in order to permit increased competition with the local exchange carriers (LECs) in the provision of special access services. It also asks whether it should adopt similar measures affecting switched access services.¹ The purpose of this affidavit is to comment on the merits of these proposals, spelling out in particular the accompanying conditions necessary if they are to promote the interest of consumers collectively.

3. While I will devote most of my attention to the proposed rules affecting special access services, I emphasize at the outset that the effects of adopting them will not be confined to those services, but will instead have repercussions on the demand for switched services as well, on the much larger revenues that they generate, on the viability of the equal charge rules affecting switched access and therefore on the conditions under which interexchange services generally are provided. The reason for this is that there is some cross-elasticity of demand between switched and special access. Since the proposed rules are likely to make available to a wider range of customers services that bypass the switched access services of the LECs, they threaten ultimately to diminish the ability of the LECs to generate the net revenues from switched access necessary to cover their common costs and contribute to other public policy objectives.

4. The Commission believes that this extension of competition into the LEC network will increase economic welfare in much the same way as competitive entry into interstate toll services. I do not disagree. The latter experience strongly suggests,

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

however, that unless the Commission accompanies its efforts to encourage competitive entry into the provision of access services with changes in the ways it regulates the challenged LECs, not only will the benefits of the competition be very limited, there is a high degree of likelihood it will end up, on balance, doing more harm than good. The reason this danger is so great is that the prices of LEC access services, under current regulation, depart widely from economic costs, and therefore give rise to large opportunities for inefficient entry into the provision of overpriced services and pose corresponding artificial obstacles to entry into competition for underpriced ones.

5. My major conclusion, therefore, is that if the proposed changes are to achieve their purpose, it is essential that the Commission adapt its regulatory policies to eliminate the competitive distortions that would otherwise arise, and ensure that the consequent intensified competition is on the basis of the relative efficiencies of the various contending parties. Specifically, it would be necessary for the Commission to provide not only for (1) open entry for all interested parties but also (2) LEC pricing of the pertinent interconnections at incremental cost plus a contribution element, (3) pricing flexibility for the LECs between a rate cap and an incremental cost-based price floor and (4) reciprocity in interconnection and resale between the LECs and the interconnecting parties.

II. ECONOMIC CONSEQUENCES OF COMPETITION FOR ACCESS TRANSPORT

6. Economists are close to unanimous in believing that wherever it is feasible, effective competition produces results superior to those of comprehensive economic regulation. The potential benefits of introducing competition into regulated

markets generally, and into the provision of special access services specifically, are, essentially, of two major kinds: moving prices into closer correspondence with costs, and dynamic improvements in productive efficiency and in product or service offerings.

7. The regulated rates for special access services are at present based on fully distributed costs, averaged over services and transactions whose true economic costs differ very substantially from one another; as a result, these prices differ widely from marginal or incremental costs. Competition will concentrate on the services whose prices are held above those levels and tend to drive those prices down to the economically proper levels.

8. Competition also tends—unless it is distorted by regulation—to improve the efficiency with which services are provided, by weeding high-cost firms out of the market and by the pressures that it exerts on the survivors, including pressures to improve the quality of their offerings and to be innovative in developing and offering new services and service combinations.

9. It does not follow, however, that piecemeal introduction of competition into the provision of services whose incumbent suppliers remain in substantial respects regulated will necessarily have the same beneficent consequences. The net effect will depend heavily on the nature of the residual constraints on those incumbents and whether, therefore, the enhanced competition is on the basis of the relative efficiencies of the competing parties or is distorted by asymmetrical regulatory restraints on them. I have, therefore, found myself moving in recent years from an earlier opinion that any introduction of competition into regulated industries would probably be beneficial to a recognition that "regulated competition"—which I have referred to elsewhere as "the

uneasy marriage of regulation and competition"²—might actually combine the worst features of both: the familiar evils of cost-plus regulated monopoly, on the one hand, and the inefficient distribution of production among rival suppliers without regard to their relative efficiencies characteristic of competition under cartelization.³

A. The unfavorable effects of piecemeal entry under asymmetrical regulation

10. When free entry is permitted but the incumbents (alone) remain subject to regulatory restrictions, there are almost certain to be unfavorable consequences, offsetting the favorable ones, with the result that economic welfare may well be injured, on balance, rather than improved. While competitive entry may contribute to improvements in productive efficiency, as I have already observed, it may also result in decreases, to the extent that continued regulation prevents the incumbents from lowering prices of the services in which they face competition towards their incremental costs: that makes it possible for entrants with higher costs but lower prices to take over some portion of the market.

11. The asymmetrical regulation of incumbent firms that has these inefficient results takes a variety of forms. The most prominent among these are (a) the requirement that they sell their services, competitive and non-competitive alike, under posted tariffs, which cannot be altered without regulatory approval, typically only with a substantial delay; (b) the requirement that their rates be based on average system-

²See my article with this title in Telematics, September 1984, pp. 1-17.

³See my "Cartels and Trade Associations," Encyclopedia of the Social Sciences (New York: Macmillan, 1968) Vol. 2, pp. 320-25; also my The Economics of Regulation (2 volumes), John Wiley, 1970 and 1971, reprinted by the MIT Press, 1988, pp. xxxiv-xxxvi and Vol. 2, pp. 28-30, 189, 209.

wide costs, which has the effect of making some services improperly vulnerable to entry while potential efficient entrants are excluded from the opportunity to supply the underpriced services; (c) the regulatory prescription of prices in such a way as to recover historic or book costs, which, because of their failure to recognize possibly very large differences between true economic and regulatorily-prescribed depreciation, may differ widely from marginal costs; (d) the prescription of rates based on fully-distributed rather than marginal costs; and (e) requirements upon only the incumbent to provide backup service for its competitors without compensation.⁴

12. The effects of competitive entry on the structure of prices are not necessarily efficient. Where the prevailing pricing structure involves rate averaging, with the effect of above-marginal-cost pricing of some services offset by below-marginal-cost pricing of others, competition for the former services is unequivocally beneficial: it moderates the tendencies of the former prices inefficiently to discourage consumption and of the latter inefficiently to encourage it. Where, however, prices of all services are typically above marginal cost, in order to permit the regulated companies to recover their total costs in situations in which marginal costs are typically below average costs, the tendencies of selective competition to reduce the one and permit or require raising the other are offsetting, in so far as their effects on economic welfare are concerned.⁵

⁴See my The Economics of Regulation, pp. xxxv-xxxvi.

⁵See ibid., Vol I, pp. 169-72; Sylvester Damus, "Ramsey Pricing by U.S. Railroads, Can it Exist?" Journal of Transport Economics and Policy, January 1984, pp. 51-61.

13. This last example of the distortion introduced into relative prices by the selective introduction of competition is a specific manifestation of a more general problem that economists refer to as "second-best." Particularly where prices of various goods or services are interdependent—most obviously, for example, if one is a substitute for the other—movement toward apparently optimal prices (i.e., toward marginal cost) for one may or may not increase social welfare. In the situation before us, the economically significant market is end-to-end interexchange services: switched and special access are only alternative ways of providing parts of those services. While intensified competition in the provision of special access will tend to bring the prices of those services closer to marginal cost, the consequent shift in demand from switched to special access⁶ may—indeed, considering the way in which the former is priced, undoubtedly will—be, in important measure, inefficient. In so doing, competition will aggravate a distortion that already exists under present regulations, which price special access closer to its marginal costs than switched.⁷

14. Under thoroughgoing regulation, with entry blocked, there are two threats to economic efficiency, corresponding to the two potential benefits of competition that I have already described: inefficient pricing (which results in allocative inefficiency) and inadequate pressures or incentives for productive efficiency. Incorrect pricing causes some services to be used too much (beyond the point where the value to the consumer is at least as great as the cost to society of providing the service) and others

⁶Collocation and competition for special access will lower the price and increase the opportunities for dedicated access between end users and IXC POPs, thus expanding the reach of such services.

⁷The record in Docket 78-72 shows that the rates for switched access are several times as great as for special access facilities of comparable capacities.

too little; and, as I have pointed out, it is one of the great virtues of competition, from the economic standpoint, that it tends to undermine such price structures, based on cost averaging. The allocative inefficiency introduced by this kind of average pricing, however, imposes costs only at the margin—that is, only on the amount of usage that is either stimulated or repressed by the inefficient pricing: if the amounts of service consumers demand were not affected by these departures of price from marginal costs, the prices would have caused no loss in economic efficiency. In any event, whatever the elasticity of demand, productive efficiency would be unaffected.⁸

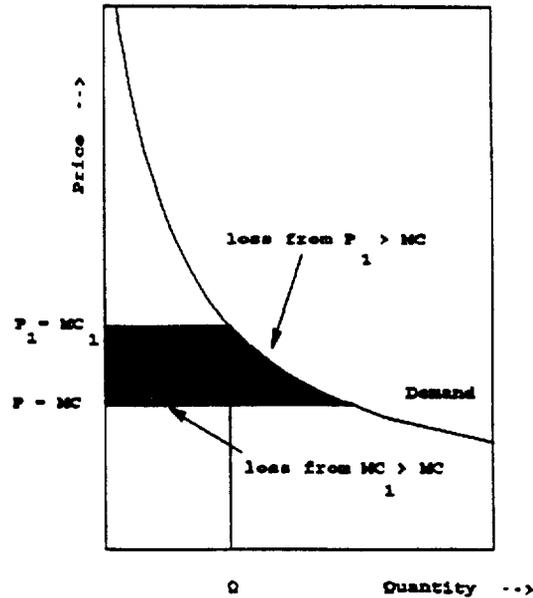
15. In contrast, the production inefficiencies of regulated monopoly, which the pressures of competition may remedy, and the production inefficiencies introduced by competition, if asymmetrical regulation prevents the incumbent firms from responding, have their effects not just at the margin but over the totality of production: efficiency is gained or lost on every unit produced or diverted, not just on the units stimulated or repressed by prices departing from marginal cost. These effects, when output is not provided by the lowest-cost producer, are frequently referred to as "first-order" efficiency losses: as Figure 1 shows, they are typically much larger than allocative efficiency losses, which are for this reason often characterized as "second-order."

16. This is not an argument against liberalizing the conditions of entry, in order to make competition possible, one of whose virtues is the promise it offers of

⁸This is true only as a first approximation: to the extent demand is responsive to price, excessively high prices interfere with the fullest exploitation of potential economies of scale in production and excessively low prices may result in society's incurring diseconomies of scale.

first-order efficiency gains. It is to emphasize, however, that continued regulation of the incumbent firm in the presence of entry can also produce first-order efficiency losses. In these circumstances, the theoretical benefits from permitting entry can be overwhelmed by the inefficiencies inherent in regulation preventing victory in the ensuing competition going to the most efficient supplier.

Figure 1
Welfare Losses from Inefficient Entry



17. The Commission evidently believes that by proceeding sequentially, establishing the conditions for entry only into the smaller market for special access transport before deciding whether and in what ways to do so with respect to switched access transport,⁹ it can minimize the risks of untoward consequences. Before taking that first step, however, it must take into account the cross-elasticity of demand between the two: introduction of competition into the one will induce inefficient shifts by customers from the other; and the repercussions of that shift will be accentuated by the fact that the net revenues (above incremental costs) earned from the additional special access business will be considerably smaller than the net revenues lost on switched access, because, as I have already observed, the markup above incremental

⁹The NPRM, paragraph 71, notes that special access transport services generate \$2.6 billion in revenues and switched access transport services \$4.1 billion for Tier 1 LECs. In contrast, long-distance services in the aggregate generate over \$50 billion annually.

cost on the latter service is much greater than on the former. Services such as MEGACOM and MEGACOM 800 already permit large users of switched interexchange services to circumvent the switched access services of the LECs by using special access to connect to the IXC POP; by allowing CAPs and IXCs to use the LEC central office to aggregate and disaggregate traffic for them, then using their own facilities to transport that traffic to and from the POPs, the proposed rules would make this kind of bypass available to a wider range of customers.¹⁰ The cross-elasticity of demand between the two kinds of services means that if the Commission takes the first step, it will confront increasing pressures upon it to take the second step, as well, in order to halt inefficient migrations of customers from switched to special access. And while it is true, as the Commission suggests, that the potential benefits from the second extension of competition will be greater, simply because the switched access business is larger than the special access, the potential inefficiencies will likewise be greater, if the LECs are restricted in their ability to respond. Moreover, for the reason I have already given, the rate rebalancing that would be necessitated by the entry of competition into switched access will be much larger, both per dollar of sales (because of the larger markup on switched than special access) and in the aggregate (because of the greater size of that business), and so, correspondingly, will be the effects—both

¹⁰The physical similarity between switched and special access, with collocation, will contribute to this migration from the former service to the latter. The alternative providers clearly intend to compete for both services with essentially the same facilities. Once the alternative transport facilities are in place, the distinction between switched and special traffic is simply whether a switching capability is provided, either by the LEC, an IXC, or the new entrant itself. The transition of MCI from a specialized private line provider to a full scale long distance company during the 1970s strongly suggests that artificial boundaries between these services are impossible to maintain.