MCI Communications Corporation

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Washington, DC 20006

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January 7, 2000

Magalie Roman Salas
Office of the Secretary
Federal Communications Commission
445 12th Street, S.W.
Room TW-B204
Washington, D.C. 20554

Re: **CC Docket No. 94-1; Price Cap Performance Review for Local Exchange Carriers**
CC Docket No. 96-262; Access Charge Reform

Dear Ms. Salas:

Enclosed herewith for filing are the original and four (4) copies of MCI WorldCom, Inc.'s Comments in the above-captioned proceeding.

Please acknowledge receipt by affixing an appropriate notation on the copy of the Comments furnished for such purpose and remit same to the bearer.

Sincerely yours,

Chris Frentrup

Chris Frentrup
Senior Economist
1801 Pennsylvania Ave, NW
Washington, DC 20006
(202) 887-2731

MCI Telecommunications Corporation

Enclosure

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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Price Cap Performance Review for Local Exchange Carriers	)	CC Docket No. 94-1
	)	
	)	
Access Charge Reform	)	CC Docket No. 96-262
	)	

COMMENTS OF
MCI WORLDCOM, INC.

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Senior Economist
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MCI WorldCom, Inc.

January 7, 2000

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SUMMARY

Any examination of the X factor used in the Commission's price cap plan must start from the incontrovertible fact that the price cap LECs as a group have been able to achieve significant and continuing increases in earnings since price cap regulation began. Given this fact, it seems clear that the Commission has been excessively conservative in setting the X factor in the past. There are several reasons that the TFP-based X factor set by the Commission in the past has been too low. The Commission should address those issues, and set the X factor at a level that will ensure that ratepayers receive their share of the cost reductions achieved by the LECs.

Specifically, the Commission should use both its revised TFP study and its imputed X factor study in setting a reasonable range of X factors for the interstate price cap plan. To the extent it is feasible, the results of the two methodologies should be reconciled. However, because both studies necessarily require that some simplifying assumptions be made, it is unlikely that the two types of studies can be revised to provide completely consistent results. The Commission should use the result of both studies to set a reasonable range for the X factor, and select an X factor that captures the LECs ability to achieve productivity in the interstate jurisdiction. Based on the Commission's studies, this would imply an X factor somewhere between 7.2 and 10.0 percent. Given the LECs' historic ability to achieve the productivity goals that have been set by the Commission while continuing to achieve increasing earnings, MCI WorldCom urges the Commission

to select an X factor from the higher levels of the reasonable range that results from its two studies.

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	)	

COMMENTS OF MCI WORLDCOM, INC.

MCI WorldCom, Inc. (MCI WorldCom) hereby submit its comments regarding issues raised in the Further Notice of Proposed Rulemaking released on November 15, 1999, in the above-captioned docket.[1]

I. INTRODUCTION

In 1997, the Commission adopted a productivity offset, or X factor, of 6.5 percent for use in the price cap indexes for local exchange carriers.[2] This X factor reflected the sum of the combined differential in total factor productivity (TFP) and input price growth rate between the price cap local exchange carriers (LECs) and the economy as a whole. In response to several petitions for review, the United

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1 *Price Cap Performance Review for Local Exchange Carriers*, Further Notice of Proposed Rulemaking, CC Docket Nos. 94-1 and 96-262, FCC 99-345 (rel. November 15, 1999) ("*Price Cap Further Notice*" or "*FNPRM*").

2 See *Price Cap Performance Review for Local Exchange Carriers*, Fourth Report and Order in CC Docket No. 94-1 and Second Report and Order in CC Docket No. 96-262, 12 FCC Rcd 16642 (1997) ("*1997 Price Cap Review Order*")

States Court of Appeals for the District of Columbia Circuit reversed and remanded this decision to the Commission.[3] However, that Court also issued a stay of its mandate until April 1, 2000, to allow the Commission time to conduct the instant proceeding.[4]

The Commission seeks comment on several issues regarding the X factor. First, it asks whether it should set the X factor based on the reasonable range it determined in the *1997 Price Cap Review Order*. Second, the Commission asks whether it must set the X factor based on the data that were available to it in 1997, or whether it can and should also examine more recent data. Third, the Commission seeks comment on three new staff studies. The first study makes some methodological revisions to the TFP study performed in the 1997 performance review, using data for the same time period as was used in the 1997 study. The second study uses this revised methodology, but extends the time period of analysis through 1998, the most recent period for which data are available. The Commission's third staff study computes the X factor that would have been necessary to ensure that the LECs earned a competitive rate of return in the interstate jurisdiction. The Commission seeks comment on whether it should rely on one of these studies to set the X factor going forward. Finally, the

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3 *USTA v. FCC*, 188 F. 3d 521 (D.C. Cir. 1999)

4 *USTA v. FCC*, Nos. 97-1469 *et al.*, (D.C. Cir. June 21, 1999)

Commission seeks comment on setting the Consumer Productivity Dividend (CPD) to offset the elimination of the sharing requirement.

II. PREVIOUS X FACTORS SET BY THE COMMISSION HAVE BEEN TOO LOW

Any examination of the X factor used in the Commission's price cap plan must start from one incontrovertible fact - the LECs as a group have been able to achieve significant and continuing increases in earnings since price cap regulation began. Even though the LECs' true cost of capital has fallen since the beginning of price caps, overall price cap LEC earnings have risen from their 11.25 percent target at the start of price caps to over 16 percent in 1998. These increases have been relatively constant, at about 0.6 percentage points per year, and have occurred even in those years when the Commission revised the X factor and required a one-time adjustment to give retroactive effect to the X factor change. They have also occurred even though the Commission has liberalized its allowed depreciation rates, which has acted to lower reported LEC earnings.

Given this fact, it seems clear that the Commission has been excessively conservative in setting the X factor in the past. As discussed infra, there are several reasons that the TFP-based X factor set by the Commission in the past has been too low. The Commission should now address those issues, and set the X factor at a level that will ensure that ratepayers receive their share of the cost reductions achieved by the LECs.

III. THE COMMISSION CAN AND SHOULD RELY ON ALL DATA CURRENTLY AVAILABLE TO RESET THE X FACTOR

There is no logical reason why the Commission should consider only the data that was available to it at the time to set the X factor for 1997. The data previously examined by the Commission covered the period from 1985 to 1995. Today, data through 1998 is available to the Commission. The TFP analyses performed in the 1997 performance review and in this FNPRM both examine the LECs' performance over an extended period of time. The additional years of data provide further confirmation of the LECs' ability to achieve productivity gains. In fact, the additional years analyzed in the staff studies demonstrate what one would expect; the LECs have responded to the incentives provided by price caps, and especially by the removal of sharing, and have continued to outstrip TFP gains in the economy as a whole. Use of all the data available will ensure that the LECs' ability to exceed economy-wide TFP is reflected in the price cap indexes.

Similarly, there is no legal restriction on the Commission that would prevent its considering data beyond that examined in its original 1997 decision. In its remand, the court set no limit on the Commission's ability to examine any relevant data. Furthermore, in both reviews of the price cap plan to date, the Commission has made retroactive adjustments to the LEC price cap indexes to reflect new information regarding productivity. In its first price cap review decision effective in 1995, the Commission determined that it had underestimated price cap LEC productivity since the beginning of price cap regulation, and required the price cap

LECs to adjust their indexes to reflect the Commission's new estimate of productivity. Similarly, after its second price cap review in 1997, the Commission required all price cap LECs to reflect the newly adopted X factor of 6.5 percent retroactively to 1996. Thus the Commission has ample precedent for using information beyond that then known to reset past indexes.

IV. THE COMMISSION HAS CORRECTLY IDENTIFIED SEVERAL SOURCES OF POTENTIAL BIAS IN ITS PREVIOUS TFP STUDY

Any TFP study necessarily makes a number of simplifying assumptions, both to make the computations tractable and to reflect the limitations of the existing data. In its original TFP study in 1997, the Commission computed the growth in LEC TFP by taking the difference between the growth rates of an index of LEC outputs and inputs. Because the LECs offer a number of different state and interstate services, measuring the growth rate of outputs necessarily required some averaging of several different growth rates. To achieve this averaging, the Commission employed an index of outputs, which assumed that the growth in interstate demand could be captured by the growth in access lines, switched access minutes, and special access lines. The growth rate in the demand for services sold on the State side of LEC operations - a category that encompasses local calling, intraLATA toll, CLASS services (such as Caller ID, Call Waiting, and Call Forwarding), and others - was captured by computing an average growth of local calls and intrastate Dial Equipment Minutes (DEMs).

Similarly, in computing the growth rate of LEC inputs, the Commission's

original TFP study computed the average growth in labor, capital, and materials inputs. Data on labor and material inputs is available directly in the ARMIS reports. Data on capital expenditures was computed as the difference between revenues and the expenditures on labor and materials.

Use of this method for computing TFP led to several biases in the estimate of the X factor, many of which have previously been noted in this docket by MCI WorldCom and other parties. The updated TFP study that the Commission has included with the instant FNPRM discusses several of these sources of bias, and corrects those that can be corrected based on the publicly available data.

a. Capital Costs Must Reflect Costs, Not Earnings

First, as the updated TFP study correctly notes, the original study's decision to treat capital costs as a residual after labor and materials costs were determined implied that any increases in the LECs' rate of return, whether those increases were due to increased efficiency or to monopoly power or to an X factor that was set too low, would result in a lower X factor being computed in any subsequent TFP study. Since this would lead to the absurd result that an X factor set too low would imply that an even lower X-factor were needed, some adjustment of capital costs is needed to ensure that the X factor is set properly.

The updated TFP study makes this correction by adjusting the cost of capital for the change in the Moody's Baa bond index. Since the starting rates for price caps were set under rate of return principles to earn the authorized rate of return of 11.25 percent, the first year of price caps (1991) is assumed to reflect a

competitive level of earnings. In all other years, the competitive cost of capital is assumed in the updated TFP study to be the cost of capital in 1991 adjusted by the change in the Moody's bond rate between 1991 and the year in question.

MCI WorldCom believes that some such adjustment for capital costs is necessary. Total factor productivity analyses assume that each factor is being used at an efficient level, and that its cost is the economic cost. If whatever level of earnings the LEC is able to obtain is the measure of the economic cost of capital, then no price cap regulation is necessary. In that case, whatever the LEC charged would be reasonable, because the price would be determined in the marketplace. Of course, given the LECs' continuing market power, neither economic theory nor the law supports such a proposition. Because the LECs' achieved earnings do not necessarily represent the economic cost of capital, the Commission must alter its TFP analysis to reflect only the true economic cost of capital.

Recognizing that one must use the economic cost of capital, however, does not determine how one should compute that cost. Since the Commission has not continually updated its cost of capital determination each year, it cannot simply rely on its finding that the cost of capital in 1990 was 11.25 percent. Indeed, as several filings in this and other dockets by MCI WorldCom and others have shown, the LECs' cost of capital has fallen substantially since 1990.[5] Thus, some measure

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[5] See, e.g., Direct Case of the General Services Administration filed January 19, 1999 in CC Docket No. 98-166 (supporting a cost of capital based on 1998 data of 9.27 percent): Responsive Submission of AT&T Corp, filed March 16, 1999 in CC Docket No. 98-166 (supporting a cost of capital based on 1998 data of 8.63 percent); MCI Comments in CC Docket Nos. 96-262, 94-1, and RM-9210, filed October 26, 1998

must be found to determine how the competitive cost of capital has changed over time.

The Commission's proposed use of the absolute change in the Moody's Baa bond index rate should give a reasonable approximation of changes in the cost of capital. First, as the Commission notes, the changes in this index are very highly correlated with the changes in several other indexes of capital costs, indicating that these indexes are all measuring the same thing. Second, it is reasonable to expect that all capital costs move in a synchronized manner, because the capital markets are extremely open. If any individual bond or equity market provided a greater return, capital would readily flow to that market until the returns were equalized. For these reasons, it is reasonable to assume that the LECs' cost of capital has moved (in absolute terms) in concert with changes in the Moody's Baa corporate bond rate.

Even with this correction, however, the X factor is likely to be understated. The above-cost earnings that the LECs have been able to reflect in their rates under price caps have repressed demand. Since the LECs' earnings have been continually growing under price caps, the effect of this demand repression has

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at Appendix C (supporting a cost of capital based on 1998 data of 9.1 percent); MCI Comments in AAD 96-28 and AAD 95-172, filed March 11, 1996 at Attachment A (supporting a cost of capital based on 1995-1996 data of 9.48 percent); MCI Comments in CC Docket Nos. 94-1, filed May 9, 1994 at Appendix A (supporting a cost of capital based on 1993-1994 data of 9.54 percent).

increased each year, which has resulted in a lower demand growth rate. This slower demand growth rate results in a lower TFP and thus in a lower X factor.

b. Local Dial Equipment Minutes are a Better Measure of Local Usage than the Number of Calls

The second major source of bias in its original TFP study that the Commission corrects is the use of the number of calls to measure the growth in local output. So long as the average length of a call was relatively constant, use of calls rather than minutes as the measure of local output would have little effect. However, if calls are increasing in length - and the Commission notes that they have been since 1992 - then using number of calls as the measure of outputs will understate the growth in the use of the LECs' equipment. Making this modification to the TFP study is therefore necessary to accurately reflect the LECs' increased output.[6]

c. One-time Labor Costs Must also be Removed to Accurately Reflect LEC Cost of Labor

As the Commission notes, one of the LECs' responses to the incentives of price cap regulation has been to reduce its work force. This has been achieved, in part, by increasing the number of employee buyouts and early retirement plans. These have resulted in higher reported costs, as the LECs have in general taken

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[6] This effect is also analogous to the issue discussed by the Commission (at Appendix A, page 29) regarding increases in capacity utilization. The Commission notes that increases in capacity utilization, which are not captured in the TFP study, should cause an increase in TFP. In this case, the local equipment is being used more intensively, and thus should result in an increase in productivity. Using minutes rather than number of calls as the measure of output captures one aspect of the increase in capacity utilization, and thus more accurately reflects LEC TFP.

one-time charges on their books to reflect these costs. If no adjustment to the LECs' labor expenses were made, LEC cost per employee would appear higher than it actually is, and LEC TFP would be improperly reduced. A properly designed TFP study must include an adjustment to the labor cost such as the Commission proposes.

d. Use of Total Company Rather than Interstate Results Introduces a Significant Source of Bias

The Commission once again addresses the issue of whether use of total company TFP results in a biased estimate of the productivity that the LECs will be able to achieve for their interstate services. Noting that interstate services have grown much faster than intrastate services, the Commission states that, in the presence of economies of density, this would imply that interstate TFP is higher than total company TFP.[7] The Commission also notes that most of the productivity enhancements in the LEC network are related to reductions in switching and transmission costs, due to the increased use of electronics in both of these segments.[8] Since interstate services are more heavily weighted toward these two than intrastate services are, it is likely that interstate productivity growth is greater than total company productivity growth.

As the Commission's data shows, interstate demand has grown, on average, about 3.5 percentage points per year faster than total company outputs. This by

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[7] Appendix A at page 26.

[8] Id.

itself should give the Commission pause in claiming, as it has in the past, that there is no bias in using total company TFP in the price cap formula. If inputs are used in the same proportions in both intrastate and interstate services, this would imply that the X factor should be 3.5 percentage points higher than the Commission found for total company results.

It is highly unlikely that interstate and intrastate services use a vastly different input mix. MCI WorldCom has created a Table B-14, displayed in Appendix A of these comments, that uses the Commission's model to compute an interstate TFP, based on the data reported in the Commission's model. Changing the TFP to reflect only interstate outputs results in an X factor of 9.58 to 9.73, depending on the period examined. This is roughly 3.5 percentage points above the Commission's total company X factor, as would be expected.

The Commission suggests that interstate services are probably slightly more capital-intensive than intrastate services. The effect of this on the interstate X factor can be examined by varying the relative weights of the inputs used. For example, if one assumes that capital has a 10 percentage point higher share of the inputs (and labor and materials each have a 5 percentage point lower share) in interstate services than in total company services, the interstate X factor (i.e., the X factor computed using interstate demand growth and the assumed input mix) is 9.72 (for 1986 through 1998) or 9.85 (for 1991 through 1998).[9] Thus, if the

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[9] Revised Tables B-10 through B-14 are provided for this case in Appendix A. Table B-1 through B-9 remain unaffected by this change.

Commission is correct about the relative use of inputs between state and interstate services, use of the total company input mix yields a very conservatively low estimate of the interstate TFP.

The limits on the effect on the interstate TFP of varying each of the three types of inputs - labor, capital, and materials - can be measured by setting the weight of each input in succession equal to 1 (and the weight of the other inputs to 0) in Tables B-10, B-11, and B-13 of the Commission's model. These modifications, along with the interstate results in Table B-14, are also presented in Appendix A. Of those three limiting cases, the interstate X factor computed when Materials are the only input is the lowest of the three. However, even in that case, the interstate X factor is 7.22 (for 1986 through 1998) or 7.80 percent (for 1991 through 1998). This clearly exceeds the total company X factor of 6.02 to 6.33 reported by the Commission. It is clear that the interstate X factor must be higher than the total company X factor.

Of course, interstate services also use Labor and Capital as inputs. However, the interstate X factors that result when each of these inputs is assumed to be the only input are even higher than the X factor that results when Materials is assumed to be the only input. For Labor alone, the interstate X factor is 10.8, and for Capital alone, the interstate X factor is 10.4 to 10.5 percent. These results imply that the interstate X factor must be at least 7.2 percent, and is very likely much higher, in the range of 10.0 percent.

V. THE COMMISSION'S IMPUTED X STUDY PROVIDES FURTHER SUPPORT FOR A HIGHER INTERSTATE X

In addition to its revised TFP study, the Commission also presents an imputed X study. This study computes the X factor that would have been needed in each year of the price cap plan (since 1991) to ensure that the LECs achieved a competitive rate of return. Through 1995, the study finds, an X factor of 7.10 percent would have enabled the LECs to achieve the competitive rate of return. Through 1998, an X factor of 7.71 percent would have been necessary. The study also examined, year by year, what X factor would have been needed to maintain the LECs' rate of return at the same level as in the previous year. These X factors have generally trended upward over time, with the factors ranging from 5.5 in 1992 to 8.51 in 1998.

Combined with the total company TFP results obtained by the Commission, these results confirm what MCI WorldCom and others have long maintained; total company TFP is a biased estimator of interstate productivity. The Commission should consider the results of both these studies, and select an X factor that will ensure that interstate ratepayers face rates that will reflect the LECs' costs. This will require an X factor that substantially exceeds the current 6.5 percent.

VI. CONCLUSION

For the reasons stated herein, the Commission should use both its revised TFP study and its imputed X factor study in setting a reasonable range of X factors for the interstate price cap plan. To the extent it is feasible, the results of the two

methodologies should be reconciled. However, because both studies necessarily require that some simplifying assumptions be made, it is unlikely that the two types of studies can be revised to provide completely consistent results. The Commission should use the result of both studies to set a reasonable range for the X factor, and select an X factor that captures the LECs ability to achieve productivity in the interstate jurisdiction. Based on the existing studies, this would imply an X factor somewhere between 7.2 and 10.0 percent. Given the LECs' historic ability to achieve the productivity goals that have been set by the Commission while continuing to achieve increasing earnings, MCI WorldCom urges the Commission to select an X factor from the higher levels of the reasonable range that results from its two studies.

Respectfully submitted,

MCI WorldCom, Inc.

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1801 Pennsylvania Avenue, N.W.
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January 7, 2000

STATEMENT OF VERIFICATION

I have read the foregoing and, to the best of my knowledge, information, and belief, there is good ground to support it, and it is not interposed for delay. I verify under penalty of perjury that the foregoing is true and correct. Executed on January 7, 2000.

Chris Frentrup
1801 Pennsylvania Avenue, NW
Washington, DC 20006
(202 887-2731

CERTIFICATE OF SERVICE

I, Carolyn McTaw, do hereby certify that on this 7th day of January, 2000, I caused a copy of the foregoing Comments of MCI WorldCom, Inc. to be served upon each of the parties listed on the attached Service List by U.S. First Class mail, postage prepaid.

Carolyn McTaw

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APPENDIX A

Table B-14. Summary of the Components of the LECs' Interstate Price Cap X-Factor (excluding the Consumer Productivity Dividend) - 1985-1998

Year	U.S. Nonfarm Business Sector TFP Growth Rate (%) A	LECs' Interstate Output Growth Rate (%) B	LECs' Input Growth Rate (%) C	LECs' TFP Growth Rate (%) D=B-C	TFP Differential (%) E=D-A	U.S. Nonfarm Business Sector Input Price Growth Rate (%) F	LECs' Input Price Growth Rate (%) G	Input Price Differential (%) H=F-G	X-factor (%) I=E+H	Previous X-factor[1] (%) J
1986	1.10166	5.14124	-3.47804	8.61929	7.51762	2.80830	-3.15211	5.96041	13.47803	-0.5
1987	-0.39920	7.78933	0.58715	7.20218	7.60138	2.53178	1.76258	0.76920	8.37058	5
1988	0.29955	12.18692	5.73029	6.45663	6.15708	3.72958	2.14711	1.58246	7.73955	5
1989	0.19920	6.04746	3.61531	2.43215	2.23295	3.03629	-0.22468	3.26096	5.49391	7.9
1990	-0.69895	11.49017	0.01899	11.47118	12.17014	3.30913	3.88344	-0.57432	11.59582	8.8
1991	-1.41274	9.82672	2.60077	7.22595	8.63869	2.05824	-0.13437	2.19261	10.83130	5.8
1992	1.61294	5.96276	-2.30555	8.26831	6.65537	2.88104	-1.36727	4.24830	10.90367	3.4
1993	0.09995	11.26732	1.61153	9.65579	9.55584	3.71664	-0.64768	4.36432	13.92016	4.7
1994	0.39880	8.70060	2.67569	6.02491	5.62610	3.50341	2.22171	1.28171	6.90781	5.4
1995	0.29806	9.59051	0.29912	9.29139	8.99333	1.96268	0.84015	1.12253	10.11586	6.8
1996	1.47713	9.62802	-5.26234	14.89036	13.41323	1.38258	5.65415	-4.27157	9.14166	
1997	0.39024	10.29437	4.48479	5.80958	5.41933	1.89887	-0.22680	2.12567	7.54500	
1998	0.59259	8.32647	-0.22988	8.55635	7.96376	0.71810	0.18976	0.52834	8.49210	
				avg[2](86-98)	7.84191			1.73774	9.57965	
				var[3](86-98)	7.79499			6.01377	5.83875	
				avg(91-98)	8.28321			1.44899	9.73219	
				var(91-98)	5.82265			6.38164	4.36427	
				avg(86-95)	7.51485			2.42082	9.93567	5.23
				var(86-95)	6.33418			3.57882	6.91218	5.93
				avg(91-95)	7.89387			2.64189	10.53576	5.22
				var(91-95)	2.24047			1.98155	5.00304	1.29

[1] X-factor reported in the 1997 Price Cap Review Order

[2] avg denotes the arithmetic mean of the series

[3] var denotes the variance of the series.

Source: Bureau of Labor Statistics' Multifactor Productivity Table 2: Private Nonfarm Business: Productivity and Related Indexes (annual and quarterly tables), Table B-4, Table B-11, and Table B-13.

Table B-10. Factor of Production Shares of Total Payments - 1985-1998 with Capital Share increased 10%

Year	Adjusted Labor Compensation ($)	Adjusted Property Income w/ Depreciation ($)	Adjusted Material Payments ($)	Adjusted Total Factor Payments ($)	Labor Share	Capital Share	Materials Share
1985	16,991,572,326	22,565,162,887	13,593,421,399	53,150,156,613	0.26969	0.52455	0.20576
1986	16,728,435,454	21,249,282,358	11,941,762,479	49,919,480,291	0.28511	0.52567	0.18922
1987	16,978,905,847	22,444,356,821	11,946,837,981	51,370,100,649	0.28052	0.53691	0.18256
1988	17,030,359,791	23,494,269,571	14,816,785,832	55,341,415,194	0.25773	0.52453	0.21773
1989	16,910,850,694	23,723,261,704	17,002,050,701	57,636,163,099	0.24341	0.51160	0.24499
1990	17,586,868,921	24,600,191,719	17,642,463,859	59,829,524,499	0.24395	0.51117	0.24488
1991	16,563,755,600	24,641,357,000	20,215,059,800	61,420,172,400	0.21968	0.50119	0.27913
1992	16,219,861,400	24,215,058,885	18,832,545,315	59,267,465,601	0.22367	0.50857	0.26776
1993	16,317,325,400	23,367,601,637	20,182,266,668	59,867,193,705	0.22256	0.49032	0.28712
1994	14,939,421,600	24,897,946,640	23,121,830,040	62,959,198,280	0.18729	0.49546	0.31725
1995	14,679,257,600	24,794,383,988	24,146,320,315	63,619,961,904	0.18073	0.48973	0.32954
1996	17,412,314,200	25,134,534,757	20,990,497,435	63,537,346,392	0.22405	0.49559	0.28036
1997	17,006,551,600	25,756,101,085	23,598,931,333	66,361,584,018	0.20627	0.48812	0.30561
1998	17,912,372,200	25,617,623,505	22,849,831,946	66,379,827,651	0.21985	0.48592	0.29423

Source: Federal Communications Commission, *Statistics of Communication Common Carriers*, [various years] with adjustments as described in the text.

Table B-11. Total LEC Input Quantity Index - 1985-1998 with Capital Share increased 10%

Year	Labor Share	Capital Share	Materials Share	Labor Quantity	Capital Quantity Index	Materials Quantity Index	Lapseyres Input Quantity Index	Paasche Input Quantity Index	Fisher Ideal Input Quantity Index
1985	0.26969	0.52455	0.20576	504,113	1	1	1	1	1
1986	0.28511	0.52567	0.18922	482,698	1.04599	0.85179	0.98217	0.97803	0.98010
1987	0.28052	0.53691	0.18256	477,714	1.08111	0.83421	1.01080	1.01079	1.01079
1988	0.25773	0.52453	0.21773	466,827	1.12865	1.00332	1.05422	1.05572	1.05497
1989	0.24341	0.51160	0.24499	461,149	1.15949	1.11057	1.03447	1.03548	1.03498
1990	0.24395	0.51117	0.24488	443,105	1.19603	1.10737	1.00589	1.00500	1.00545
1991	0.21968	0.50119	0.27913	414,457	1.22895	1.23419	1.02634	1.02767	1.02700
1992	0.22367	0.50857	0.26776	411,167	1.25950	1.12198	0.98534	0.98403	0.98468
1993	0.22256	0.49032	0.28712	395,639	1.28943	1.18270	1.01813	1.01769	1.01791
1994	0.18729	0.49546	0.31725	367,196	1.31542	1.31710	1.02651	1.02844	1.02748
1995	0.18073	0.48973	0.32954	346,843	1.34520	1.34400	1.00731	1.00688	1.00710
1996	0.22405	0.49559	0.28036	338,040	1.39401	1.13425	0.96175	0.96123	0.96149
1997	0.20627	0.48812	0.30561	338,177	1.44123	1.24404	1.04402	1.04498	1.04450
1998	0.21985	0.48592	0.29423	345,317	1.48745	1.17488	1.00302	1.00233	1.00268

Source: Table B-10, Federal Communications Commission, *Statistics of Communication Common Carriers* [various years] Table B-7, and Table B-9.

Table B-12. Summary of the Components of the LECs' Price Cap X-Factor (excluding the Consumer Productivity Dividend) - 1985-1998 with Capital Share increased 10%

Year	U.S. Nonfarm Business Sector TFP Growth Rate (%) A	LECs' Output Growth Rate (%) B	LECs' Input Growth Rate (%) C	LECs' TFP Growth Rate (%) D=B-C	TFP Differential (%) E=D-A	U.S. Nonfarm Business Sector Input Price Growth Rate (%) F	LECs' Input Price Growth Rate (%) G	Input Price Differential (%) H=F-G	X-factor (%) I=E+H	Previous X-factor[1] (%) J
1986	1.10166	3.19605	-2.00995	5.20600	4.10434	2.80830	-4.57784	7.38614	11.49048	-0.5
1987	-0.39920	3.77278	1.07364	2.69914	3.09834	2.53178	1.62752	0.90426	4.00260	5
1988	0.29955	6.51206	5.35142	1.16064	0.86109	3.72958	1.99001	1.73957	2.60066	5
1989	0.19920	4.38743	3.43803	0.94940	0.75020	3.03629	-0.76428	3.80056	4.55076	7.9
1990	-0.69895	4.76633	0.54314	4.22319	4.92215	3.30913	3.38210	-0.07298	4.84917	8.8
1991	-1.41274	2.60625	2.66458	-0.05833	1.35441	2.05824	-0.60107	2.65931	4.01372	5.8
1992	1.61294	3.51287	-1.54355	5.05642	3.44348	2.88104	-1.87035	4.75139	8.19487	3.4
1993	0.09995	5.83669	1.77533	4.06136	3.96141	3.71664	-1.55450	5.27115	9.23255	4.7
1994	0.39880	5.40941	2.71064	2.69877	2.29997	3.50341	2.54784	0.95557	3.25554	5.4
1995	0.29806	5.99104	0.70712	5.28392	4.98586	1.96268	0.28597	1.67671	6.66257	6.8
1996	1.47713	8.21585	-3.92697	12.14282	10.66569	1.38258	4.43297	-3.05039	7.61530	
1997	0.39024	9.46257	4.35386	5.10871	4.71846	1.89887	-0.34271	2.24157	6.96004	
1998	0.59259	5.37440	0.26731	5.10709	4.51450	0.71810	-0.47681	1.19491	5.70941	
				avg[2](86-98)	3.82153			2.26598	6.08751	
				var[3](86-98)	6.00453			6.38554	6.13955	
				avg(91-98)	4.49297			1.96253	6.45550	
				var(91-98)	6.80506			5.76278	3.64233	
				avg(86-95)	2.97812			2.90717	5.88529	5.23
				var(86-95)	2.28183			4.94892	7.61668	5.93
				avg(91-95)	3.20902			3.06283	6.27185	5.22
				var(91-95)	1.60884			2.85051	5.36273	1.29

[1] X-factor reported in the 1997 Price Cap Review Order

[2] avg denotes the arithmetic mean of the series

[3] var denotes the variance of the series.

Source: Bureau of Labor Statistics' Multifactor Productivity Table 2: Private Nonfarm Business: Productivity and Related Indexes (annual and quarterly tables), Table B-4, Table B-11, and Table B-13.

Table B-13. Total LEC Input Price Index - 1985-1998 with Capital Share increased 10%

Year	Labor Share	Capital Share	Materials Share	Labor Price Index	Capital Price Index	Materials Price Index	Lapseyres Input Price Index	Paasche Input Price Index	Fisher Ideal Input Price Index
1985	0.26969	0.52455	0.20576	1	1	1	1	1	1
1986	0.28511	0.52567	0.18922	1.02819	0.89271	1.03135	0.95778	0.95274	0.95525
1987	0.28052	0.53691	0.18256	1.05447	0.90146	1.05353	1.01651	1.01631	1.01641
1988	0.25773	0.52453	0.21773	1.08234	0.91297	1.08639	1.01996	1.02024	1.02010
1989	0.24341	0.51160	0.24499	1.08797	0.88304	1.12623	0.99213	0.99264	0.99239
1990	0.24395	0.51117	0.24488	1.17754	0.89133	1.17203	1.03480	1.03400	1.03440
1991	0.21968	0.50119	0.27913	1.18570	0.86555	1.20494	0.99378	0.99424	0.99401
1992	0.22367	0.50857	0.26776	1.17037	0.82779	1.23480	0.98221	0.98073	0.98147
1993	0.22256	0.49032	0.28712	1.22361	0.77944	1.25535	0.98493	0.98422	0.98458
1994	0.18729	0.49546	0.31725	1.20706	0.81121	1.29144	1.02523	1.02638	1.02581
1995	0.18073	0.48973	0.32954	1.25564	0.79187	1.32167	1.00315	1.00258	1.00286
1996	0.22405	0.49559	0.28036	1.52821	0.78497	1.36140	1.04487	1.04579	1.04533
1997	0.20627	0.48812	0.30561	1.49199	0.77622	1.39550	0.99619	0.99697	0.99658
1998	0.21985	0.48592	0.29423	1.53897	0.74675	1.43074	0.99568	0.99481	0.99524

Source: Table B-10, Table B-5, Table B-8, and Table B-9.

Table B-14. Summary of the Components of the LECs' Interstate Price Cap X-Factor (excluding the Consumer Productivity Dividend) - 1985-1998 with Capital Share increased 10%

Year	U.S. Nonfarm Business Sector TFP Growth Rate (%) A	LECs' Interstate Output Growth Rate (%) B	LECs' Input Growth Rate (%) C	LECs' TFP Growth Rate (%) D=B-C	TFP Differential (%) E=D-A	U.S. Nonfarm Business Sector Input Price Growth Rate (%) F	LECs' Input Price Growth Rate (%) G	Input Price Differential (%) H=F-G	X-factor (%) I=E+H	Previous X-factor[1] (%) J
1986	1.10166	5.14124	-2.00995	7.15119	6.04953	2.80830	-4.57784	7.38614	13.43567	-0.5
1987	-0.39920	7.78933	1.07364	6.71569	7.11489	2.53178	1.62752	0.90426	8.01915	5
1988	0.29955	12.18692	5.35142	6.83550	6.53595	3.72958	1.99001	1.73957	8.27552	5
1989	0.19920	6.04746	3.43803	2.60943	2.41022	3.03629	-0.76428	3.80056	6.21079	7.9
1990	-0.69895	11.49017	0.54314	10.94703	11.64598	3.30913	3.38210	-0.07298	11.57301	8.8
1991	-1.41274	9.82672	2.66458	7.16214	8.57488	2.05824	-0.60107	2.65931	11.23419	5.8
1992	1.61294	5.96276	-1.54355	7.50631	5.89337	2.88104	-1.87035	4.75139	10.64476	3.4
1993	0.09995	11.26732	1.77533	9.49198	9.39203	3.71664	-1.55450	5.27115	14.66318	4.7
1994	0.39880	8.70060	2.71064	5.98996	5.59115	3.50341	2.54784	0.95557	6.54673	5.4
1995	0.29806	9.59051	0.70712	8.88340	8.58534	1.96268	0.28597	1.67671	10.26205	6.8
1996	1.47713	9.62802	-3.92697	13.55499	12.07785	1.38258	4.43297	-3.05039	9.02747	
1997	0.39024	10.29437	4.35386	5.94051	5.55026	1.89887	-0.34271	2.24157	7.79184	
1998	0.59259	8.32647	0.26731	8.05916	7.46657	0.71810	-0.47681	1.19491	8.66147	
				avg[2](86-98)	7.45293			2.26598	9.71891	
				var[3](86-98)	6.39578			6.38554	5.98447	
				avg(91-98)	7.89143			1.96253	9.85396	
				var(91-98)	4.45896			5.76278	5.39009	
				avg(86-95)	7.17933			2.90717	10.08650	5.23
				var(86-95)	5.73864			4.94892	7.11370	5.93
				avg(91-95)	7.60735			3.06283	10.67018	5.22
				var(91-95)	2.41609			2.85051	6.68645	1.29

[1] X-factor reported in the 1997 Price Cap Review Order

[2] avg denotes the arithmetic mean of the series

[3] var denotes the variance of the series.

Source: Bureau of Labor Statistics' Multifactor Productivity Table 2: Private Nonfarm Business: Productivity and Related Indexes (annual and quarterly tables), Table B-4, Table B-11, and Table B-13.

Table B-10. Factor of Production Shares of Total Payments - 1985-1998 with Material as only input

Year	Adjusted Labor Compensation ($)	Adjusted Property Income w/ Depreciation ($)	Adjusted Material Payments ($)	Adjusted Total Factor Payments ($)	Labor Share	Capital Share	Materials Share
1985	16,991,572,326	22,565,162,887	13,593,421,399	53,150,156,613	0.00000	0.00000	1.00000
1986	16,728,435,454	21,249,282,358	11,941,762,479	49,919,480,291	0.00000	0.00000	1.00000
1987	16,978,905,847	22,444,356,821	11,946,837,981	51,370,100,649	0.00000	0.00000	1.00000
1988	17,030,359,791	23,494,269,571	14,816,785,832	55,341,415,194	0.00000	0.00000	1.00000
1989	16,910,850,694	23,723,261,704	17,002,050,701	57,636,163,099	0.00000	0.00000	1.00000
1990	17,586,868,921	24,600,191,719	17,642,463,859	59,829,524,499	0.00000	0.00000	1.00000
1991	16,563,755,600	24,641,357,000	20,215,059,800	61,420,172,400	0.00000	0.00000	1.00000
1992	16,219,861,400	24,215,058,885	18,832,545,315	59,267,465,601	0.00000	0.00000	1.00000
1993	16,317,325,400	23,367,601,637	20,182,266,668	59,867,193,705	0.00000	0.00000	1.00000
1994	14,939,421,600	24,897,946,640	23,121,830,040	62,959,198,280	0.00000	0.00000	1.00000
1995	14,679,257,600	24,794,383,988	24,146,320,315	63,619,961,904	0.00000	0.00000	1.00000
1996	17,412,314,200	25,134,534,757	20,990,497,435	63,537,346,392	0.00000	0.00000	1.00000
1997	17,006,551,600	25,756,101,085	23,598,931,333	66,361,584,018	0.00000	0.00000	1.00000
1998	17,912,372,200	25,617,623,505	22,849,831,946	66,379,827,651	0.00000	0.00000	1.00000

Source: Federal Communications Commission, *Statistics of Communication Common Carriers*, [various years] with adjustments as described in the text.

Table B-11. Total LEC Input Quantity Index - 1985-1998 with Material as only input

Year	Labor Share	Capital Share	Materials Share	Labor Quantity	Capital Quantity Index	Materials Quantity Index	Lapseyres Input Quantity Index	Paasche Input Quantity Index	Fisher Ideal Input Quantity Index
1985	0.00000	0.00000	1.00000	504,113	1	1	1	1	1
1986	0.00000	0.00000	1.00000	482,698	1.04599	0.85179	0.85179	0.85179	0.85179
1987	0.00000	0.00000	1.00000	477,714	1.08111	0.83421	0.97936	0.97936	0.97936
1988	0.00000	0.00000	1.00000	466,827	1.12865	1.00332	1.20271	1.20271	1.20271
1989	0.00000	0.00000	1.00000	461,149	1.15949	1.11057	1.10690	1.10690	1.10690
1990	0.00000	0.00000	1.00000	443,105	1.19603	1.10737	0.99712	0.99712	0.99712
1991	0.00000	0.00000	1.00000	414,457	1.22895	1.23419	1.11452	1.11452	1.11452
1992	0.00000	0.00000	1.00000	411,167	1.25950	1.12198	0.90908	0.90908	0.90908
1993	0.00000	0.00000	1.00000	395,639	1.28943	1.18270	1.05413	1.05413	1.05413
1994	0.00000	0.00000	1.00000	367,196	1.31542	1.31710	1.11363	1.11363	1.11363
1995	0.00000	0.00000	1.00000	346,843	1.34520	1.34400	1.02042	1.02042	1.02042
1996	0.00000	0.00000	1.00000	338,040	1.39401	1.13425	0.84394	0.84394	0.84394
1997	0.00000	0.00000	1.00000	338,177	1.44123	1.24404	1.09680	1.09680	1.09680
1998	0.00000	0.00000	1.00000	345,317	1.48745	1.17488	0.94441	0.94441	0.94441

Source: Table B-10, Federal Communications Commission, *Statistics of Communication Common Carriers* [various years] Table B-7, and Table B-9.

Table B-12. Summary of the Components of the LECs' Price Cap X-Factor (excluding the Consumer Productivity Dividend) - 1985-1998 with Material as only input

Year	U.S. Nonfarm Business Sector TFP Growth Rate (%) A	LECs' Output Growth Rate (%) B	LECs' Input Growth Rate (%) C	LECs' TFP Growth Rate (%) D=B-C	TFP Differential (%) E=D-A	U.S. Nonfarm Business Sector Input Price Growth Rate (%) F	LECs' Input Price Growth Rate (%) G	Input Price Differential (%) H=F-G	X-factor (%) I=E+H	Previous X-factor[1] (%) J
1986	1.10166	3.19605	-16.04129	19.23734	18.13568	2.80830	3.08686	-0.27857	17.85711	-0.5
1987	-0.39920	3.77278	-2.08529	5.85806	6.25727	2.53178	2.12778	0.40400	6.66127	5
1988	0.29955	6.51206	18.45784	-11.94578	-12.24533	3.72958	3.07157	0.65801	-11.58732	5
1989	0.19920	4.38743	10.15596	-5.76853	-5.96773	3.03629	3.60137	-0.56508	-6.53281	7.9
1990	-0.69895	4.76633	-0.28868	5.05501	5.75396	3.30913	3.98615	-0.67703	5.07694	8.8
1991	-1.41274	2.60625	10.84267	-8.23641	-6.82367	2.05824	2.76925	-0.71101	-7.53468	5.8
1992	1.61294	3.51287	-9.53206	13.04493	11.43199	2.88104	2.44792	0.43311	11.86511	3.4
1993	0.09995	5.83669	5.27124	0.56545	0.46550	3.71664	1.65054	2.06610	2.53160	4.7
1994	0.39880	5.40941	10.76294	-5.35353	-5.75233	3.50341	2.83435	0.66907	-5.08326	5.4
1995	0.29806	5.99104	2.02166	3.96938	3.67132	1.96268	2.31382	-0.35114	3.32018	6.8
1996	1.47713	8.21585	-16.96797	25.18381	23.70668	1.38258	2.96175	-1.57917	22.12751	
1997	0.39024	9.46257	9.23924	0.22333	-0.16692	1.89887	2.47392	-0.57505	-0.74197	
1998	0.59259	5.37440	-5.71932	11.09372	10.50113	0.71810	2.49355	-1.77545	8.72567	
				avg[2](86-98)	3.76673			-0.17555	3.59118	
				var[3](86-98)	99.89418			0.96618	92.72703	
				avg(91-98)	4.62921			-0.22794	4.40127	
				var(91-98)	90.61363			1.38674	81.52121	
				avg(86-95)	1.49267			0.16475	1.65741	5.23
				var(86-95)	78.84832			0.67129	77.93219	5.93
				avg(91-95)	0.59856			0.42123	1.01979	5.22
				var(91-95)	44.44923			0.92914	47.12490	1.29

[1] X-factor reported in the 1997 Price Cap Review Order

[2] avg denotes the arithmetic mean of the series

[3] var denotes the variance of the series.

Source: Bureau of Labor Statistics' Multifactor Productivity Table 2: Private Nonfarm Business: Productivity and Related Indexes (annual and quarterly tables), Table B-4, Table B-11, and Table B-13.

Table B-13. Total LEC Input Price Index - 1985-1998 with Material as only input

Year	Labor Share	Capital Share	Materials Share	Labor Price Index	Capital Price Index	Materials Price Index	Lapseyres Input Price Index	Paasche Input Price Index	Fisher Ideal Input Price Index
1985	0.00000	0.00000	1.00000	1	1	1	1	1	1
1986	0.00000	0.00000	1.00000	1.02819	0.89271	1.03135	1.03135	1.03135	1.03135
1987	0.00000	0.00000	1.00000	1.05447	0.90146	1.05353	1.02151	1.02151	1.02151
1988	0.00000	0.00000	1.00000	1.08234	0.91297	1.08639	1.03119	1.03119	1.03119
1989	0.00000	0.00000	1.00000	1.08797	0.88304	1.12623	1.03667	1.03667	1.03667
1990	0.00000	0.00000	1.00000	1.17754	0.89133	1.17203	1.04067	1.04067	1.04067
1991	0.00000	0.00000	1.00000	1.18570	0.86555	1.20494	1.02808	1.02808	1.02808
1992	0.00000	0.00000	1.00000	1.17037	0.82779	1.23480	1.02478	1.02478	1.02478
1993	0.00000	0.00000	1.00000	1.22361	0.77944	1.25535	1.01664	1.01664	1.01664
1994	0.00000	0.00000	1.00000	1.20706	0.81121	1.29144	1.02875	1.02875	1.02875
1995	0.00000	0.00000	1.00000	1.25564	0.79187	1.32167	1.02341	1.02341	1.02341
1996	0.00000	0.00000	1.00000	1.52821	0.78497	1.36140	1.03006	1.03006	1.03006
1997	0.00000	0.00000	1.00000	1.49199	0.77622	1.39550	1.02505	1.02505	1.02505
1998	0.00000	0.00000	1.00000	1.53897	0.74675	1.43074	1.02525	1.02525	1.02525

Source: Table B-10, Table B-5, Table B-8, and Table B-9.

Table B-14. Summary of the Components of the LECs' Interstate Price Cap X-Factor (excluding the Consumer Productivity Dividend) - 1985-1998 with Material as only input

Year	U.S. Nonfarm Business Sector TFP Growth Rate (%) A	LECs' Interstate Output Growth Rate (%) B	LECs' Input Growth Rate (%) C	LECs' TFP Growth Rate (%) D=B-C	TFP Differential (%) E=D-A	U.S. Nonfarm Business Sector Input Price Growth Rate (%) F	LECs' Input Price Growth Rate (%) G	Input Price Differential (%) H=F-G	X-factor (%) I=E+H	Previous X-factor[1] (%) J
1986	1.10166	5.14124	-16.04129	21.18253	20.08087	2.80830	3.08686	-0.27857	19.80230	-0.5
1987	-0.39920	7.78933	-2.08529	9.87462	10.27382	2.53178	2.12778	0.40400	10.67782	5
1988	0.29955	12.18692	18.45784	-6.27091	-6.57047	3.72958	3.07157	0.65801	-5.91246	5
1989	0.19920	6.04746	10.15596	-4.10850	-4.30771	3.03629	3.60137	-0.56508	-4.87278	7.9
1990	-0.69895	11.49017	-0.28868	11.77884	12.47780	3.30913	3.98615	-0.67703	11.80077	8.8
1991	-1.41274	9.82672	10.84267	-1.01594	0.39680	2.05824	2.76925	-0.71101	-0.31421	5.8
1992	1.61294	5.96276	-9.53206	15.49482	13.88188	2.88104	2.44792	0.43311	14.31500	3.4
1993	0.09995	11.26732	5.27124	5.99608	5.89613	3.71664	1.65054	2.06610	7.96223	4.7
1994	0.39880	8.70060	10.76294	-2.06234	-2.46115	3.50341	2.83435	0.66907	-1.79208	5.4
1995	0.29806	9.59051	2.02166	7.56885	7.27079	1.96268	2.31382	-0.35114	6.91965	6.8
1996	1.47713	9.62802	-16.96797	26.59598	25.11885	1.38258	2.96175	-1.57917	23.53968	
1997	0.39024	10.29437	9.23924	1.05513	0.66489	1.89887	2.47392	-0.57505	0.08983	
1998	0.59259	8.32647	-5.71932	14.04579	13.45319	0.71810	2.49355	-1.77545	11.67774	
				avg[2](86-98)	7.39813			-0.17555	7.22258	
				var[3](86-98)	85.66402			0.96618	79.68891	
				avg(91-98)	8.02767			-0.22794	7.79973	
				var(91-98)	72.92363			1.38674	65.41451	
				avg(86-95)	5.69388			0.16475	5.85862	5.23
				var(86-95)	68.85632			0.67129	68.03797	5.93
				avg(91-95)	4.99689			0.42123	5.41812	5.22
				var(91-95)	32.34111			0.92914	34.54563	1.29

[1] X-factor reported in the 1997 Price Cap Review Order

[2] avg denotes the arithmetic mean of the series

[3] var denotes the variance of the series.

Source: Bureau of Labor Statistics' Multifactor Productivity Table 2: Private Nonfarm Business: Productivity and Related Indexes (annual and quarterly tables), Table B-4, Table B-11, and Table B-13.

Table B-10. Factor of Production Shares of Total Payments - 1985-1998 with Labor as only inpu

Year	Adjusted Labor Compensation ($)	Adjusted Property Income w/ Depreciation ($)	Adjusted Material Payments ($)	Adjusted Total Factor Payments ($)	Labor Share	Capital Share	Materials Share
1985	16,991,572,326	22,565,162,887	13,593,421,399	53,150,156,613	1.00000	0.00000	0.00000
1986	16,728,435,454	21,249,282,358	11,941,762,479	49,919,480,291	1.00000	0.00000	0.00000
1987	16,978,905,847	22,444,356,821	11,946,837,981	51,370,100,649	1.00000	0.00000	0.00000
1988	17,030,359,791	23,494,269,571	14,816,785,832	55,341,415,194	1.00000	0.00000	0.00000
1989	16,910,850,694	23,723,261,704	17,002,050,701	57,636,163,099	1.00000	0.00000	0.00000
1990	17,586,868,921	24,600,191,719	17,642,463,859	59,829,524,499	1.00000	0.00000	0.00000
1991	16,563,755,600	24,641,357,000	20,215,059,800	61,420,172,400	1.00000	0.00000	0.00000
1992	16,219,861,400	24,215,058,885	18,832,545,315	59,267,465,601	1.00000	0.00000	0.00000
1993	16,317,325,400	23,367,601,637	20,182,266,668	59,867,193,705	1.00000	0.00000	0.00000
1994	14,939,421,600	24,897,946,640	23,121,830,040	62,959,198,280	1.00000	0.00000	0.00000
1995	14,679,257,600	24,794,383,988	24,146,320,315	63,619,961,904	1.00000	0.00000	0.00000
1996	17,412,314,200	25,134,534,757	20,990,497,435	63,537,346,392	1.00000	0.00000	0.00000
1997	17,006,551,600	25,756,101,085	23,598,931,333	66,361,584,018	1.00000	0.00000	0.00000
1998	17,912,372,200	25,617,623,505	22,849,831,946	66,379,827,651	1.00000	0.00000	0.00000

Source: Federal Communications Commission, *Statistics of Communication Common Carriers*, [various years] with adjustments as described in the text.

Table B-11. Total LEC Input Quantity Index - 1985-1998 with Labor as only input

Year	Labor Share	Capital Share	Materials Share	Labor Quantity	Capital Quantity Index	Materials Quantity Index	Lapseyres Input Quantity Index	Paasche Input Quantity Index	Fisher Ideal Input Quantity Index
1985	1.00000	0.00000	0.00000	504,113	1	1	1	1	1
1986	1.00000	0.00000	0.00000	482,698	1.04599	0.85179	0.95752	0.95752	0.95752
1987	1.00000	0.00000	0.00000	477,714	1.08111	0.83421	0.98967	0.98967	0.98967
1988	1.00000	0.00000	0.00000	466,827	1.12865	1.00332	0.97721	0.97721	0.97721
1989	1.00000	0.00000	0.00000	461,149	1.15949	1.11057	0.98784	0.98784	0.98784
1990	1.00000	0.00000	0.00000	443,105	1.19603	1.10737	0.96087	0.96087	0.96087
1991	1.00000	0.00000	0.00000	414,457	1.22895	1.23419	0.93535	0.93535	0.93535
1992	1.00000	0.00000	0.00000	411,167	1.25950	1.12198	0.99206	0.99206	0.99206
1993	1.00000	0.00000	0.00000	395,639	1.28943	1.18270	0.96223	0.96223	0.96223
1994	1.00000	0.00000	0.00000	367,196	1.31542	1.31710	0.92811	0.92811	0.92811
1995	1.00000	0.00000	0.00000	346,843	1.34520	1.34400	0.94457	0.94457	0.94457
1996	1.00000	0.00000	0.00000	338,040	1.39401	1.13425	0.97462	0.97462	0.97462
1997	1.00000	0.00000	0.00000	338,177	1.44123	1.24404	1.00041	1.00041	1.00041
1998	1.00000	0.00000	0.00000	345,317	1.48745	1.17488	1.02111	1.02111	1.02111

Source: Table B-10, Federal Communications Commission, *Statistics of Communication Common Carriers* [various years] Table B-7, and Table B-9.

Table B-12. Summary of the Components of the LECs' Price Cap X-Factor (excluding the Consumer Productivity Dividend) - 1985-1998 with Labor as only input

Year	U.S. Nonfarm Business Sector TFP Growth Rate (%) A	LECs' Output Growth Rate (%) B	LECs' Input Growth Rate (%) C	LECs' TFP Growth Rate (%) D=B-C	TFP Differential (%) E=D-A	U.S. Nonfarm Business Sector Input Price Growth Rate (%) F	LECs' Input Price Growth Rate (%) G	Input Price Differential (%) H=F-G	X-factor (%) I=E+H	Previous X-factor[1] (%) J
1986	1.10166	3.19605	-4.34092	7.53698	6.43532	2.80830	2.78018	0.02812	6.46344	-0.5
1987	-0.39920	3.77278	-1.03790	4.81067	5.20988	2.53178	2.52407	0.00771	5.21758	5
1988	0.29955	6.51206	-2.30535	8.81741	8.51786	3.72958	2.60794	1.12164	9.63950	5
1989	0.19920	4.38743	-1.22375	5.61118	5.41198	3.03629	0.51954	2.51675	7.92873	7.9
1990	-0.69895	4.76633	-3.99144	8.75778	9.45673	3.30913	7.91115	-4.60203	4.85471	8.8
1991	-1.41274	2.60625	-6.68375	9.29001	10.70275	2.05824	0.69019	1.36805	12.07079	5.8
1992	1.61294	3.51287	-0.79698	4.30985	2.69691	2.88104	-1.30106	4.18210	6.87901	3.4
1993	0.09995	5.83669	-3.84973	9.68642	9.58647	3.71664	4.44882	-0.73218	8.85429	4.7
1994	0.39880	5.40941	-7.46064	12.87006	12.47125	3.50341	-1.36176	4.86517	17.33642	5.4
1995	0.29806	5.99104	-5.70235	11.69339	11.39533	1.96268	3.94555	-1.98287	9.41246	6.8
1996	1.47713	8.21585	-2.57080	10.78665	9.30952	1.38258	19.64502	-18.26244	-8.95293	
1997	0.39024	9.46257	0.04052	9.42205	9.03181	1.89887	-2.39842	4.29729	13.32910	
1998	0.59259	5.37440	2.08934	3.28506	2.69247	0.71810	3.09996	-2.38186	0.31061	
				avg[2](86-98)	7.91679			-0.73650	7.18029	
				var[3](86-98)	9.20349			32.83661	38.20023	
				avg(91-98)	8.48581			-1.08084	7.40497	
				var(91-98)	12.31576			49.47628	59.97710	
				avg(86-95)	8.18845			0.67725	8.86569	5.23
				var(86-95)	8.84308			7.16842	12.29161	5.93
				avg(91-95)	9.37054			1.54005	10.91059	5.22
				var(91-95)	12.01458			7.12809	13.07276	1.29

[1] X-factor reported in the 1997 Price Cap Review Order

[2] avg denotes the arithmetic mean of the series

[3] var denotes the variance of the series.

Source: Bureau of Labor Statistics' Multifactor Productivity Table 2: Private Nonfarm Business: Productivity and Related Indexes (annual and quarterly tables), Table B-4, Table B-11, and Table B-13.

Table B-13. Total LEC Input Price Index - 1985-1998 with Labor as only input

Year	Labor Share	Capital Share	Materials Share	Labor Price Index	Capital Price Index	Materials Price Index	Lapseyres Input Price Index	Paasche Input Price Index	Fisher Ideal Input Price Index
1985	1.00000	0.00000	0.00000	1	1	1	1	1	1
1986	1.00000	0.00000	0.00000	1.02819	0.89271	1.03135	1.02819	1.02819	1.02819
1987	1.00000	0.00000	0.00000	1.05447	0.90146	1.05353	1.02556	1.02556	1.02556
1988	1.00000	0.00000	0.00000	1.08234	0.91297	1.08639	1.02642	1.02642	1.02642
1989	1.00000	0.00000	0.00000	1.08797	0.88304	1.12623	1.00521	1.00521	1.00521
1990	1.00000	0.00000	0.00000	1.17754	0.89133	1.17203	1.08233	1.08233	1.08233
1991	1.00000	0.00000	0.00000	1.18570	0.86555	1.20494	1.00693	1.00693	1.00693
1992	1.00000	0.00000	0.00000	1.17037	0.82779	1.23480	0.98707	0.98707	0.98707
1993	1.00000	0.00000	0.00000	1.22361	0.77944	1.25535	1.04549	1.04549	1.04549
1994	1.00000	0.00000	0.00000	1.20706	0.81121	1.29144	0.98647	0.98647	0.98647
1995	1.00000	0.00000	0.00000	1.25564	0.79187	1.32167	1.04024	1.04024	1.04024
1996	1.00000	0.00000	0.00000	1.52821	0.78497	1.36140	1.21707	1.21707	1.21707
1997	1.00000	0.00000	0.00000	1.49199	0.77622	1.39550	0.97630	0.97630	0.97630
1998	1.00000	0.00000	0.00000	1.53897	0.74675	1.43074	1.03149	1.03149	1.03149

Source: Table B-10, Table B-5, Table B-8, and Table B-9.

Table B-14. Summary of the Components of the LECs' Interstate Price Cap X-Factor (excluding the Consumer Productivity Dividend) - 1985-1998 with Labor as only input

Year	U.S. Nonfarm Business Sector TFP Growth Rate (%) A	LECs' Interstate Output Growth Rate (%) B	LECs' Input Growth Rate (%) C	LECs' TFP Growth Rate (%) D=B-C	TFP Differential (%) E=D-A	U.S. Nonfarm Business Sector Input Price Growth Rate (%) F	LECs' Input Price Growth Rate (%) G	Input Price Differential (%) H=F-G	X-factor (%) I=E+H	Previous X-factor[1] (%) J
1986	1.10166	5.14124	-4.34092	9.48217	8.38051	2.80830	2.78018	0.02812	8.40863	-0.5
1987	-0.39920	7.78933	-1.03790	8.82723	9.22643	2.53178	2.52407	0.00771	9.23414	5
1988	0.29955	12.18692	-2.30535	14.49227	14.19272	3.72958	2.60794	1.12164	15.31436	5
1989	0.19920	6.04746	-1.22375	7.27121	7.07201	3.03629	0.51954	2.51675	9.58876	7.9
1990	-0.69895	11.49017	-3.99144	15.48161	16.18057	3.30913	7.91115	-4.60203	11.57854	8.8
1991	-1.41274	9.82672	-6.68375	16.51048	17.92322	2.05824	0.69019	1.36805	19.29126	5.8
1992	1.61294	5.96276	-0.79698	6.75974	5.14680	2.88104	-1.30106	4.18210	9.32890	3.4
1993	0.09995	11.26732	-3.84973	15.11705	15.01710	3.71664	4.44882	-0.73218	14.28492	4.7
1994	0.39880	8.70060	-7.46064	16.16124	15.76244	3.50341	-1.36176	4.86517	20.62761	5.4
1995	0.29806	9.59051	-5.70235	15.29287	14.99480	1.96268	3.94555	-1.98287	13.01193	6.8
1996	1.47713	9.62802	-2.57080	12.19882	10.72168	1.38258	19.64502	-18.26244	-7.54076	
1997	0.39024	10.29437	0.04052	10.25385	9.86361	1.89887	-2.39842	4.29729	14.16090	
1998	0.59259	8.32647	2.08934	6.23713	5.64453	0.71810	3.09996	-2.38186	3.26267	
				avg[2](86-98)	11.54819			-0.73650	10.81168	
				var[3](86-98)	17.35220			32.83661	47.92282	
				avg(91-98)	11.88427			-1.08084	10.80343	
				var(91-98)	20.09519			49.47628	74.04688	
				avg(86-95)	12.38966			0.67725	13.06690	5.23
				var(86-95)	18.01238			7.16842	16.71196	5.93
				avg(91-95)	13.76887			1.54005	15.30892	5.22
				var(91-95)	19.72679			7.12809	17.24657	1.29

[1] X-factor reported in the 1997 Price Cap Review Order

[2] avg denotes the arithmetic mean of the series

[3] var denotes the variance of the series.

Source: Bureau of Labor Statistics' Multifactor Productivity Table 2: Private Nonfarm Business: Productivity and Related Indexes (annual and quarterly tables), Table B-4, Table B-11, and Table B-13.

Table B-10. Factor of Production Shares of Total Payments - 1985-1998 with Capital as only input

Year	Adjusted Labor Compensation ($)	Adjusted Property Income w/ Depreciation ($)	Adjusted Material Payments ($)	Adjusted Total Factor Payments ($)	Labor Share	Capital Share	Materials Share
1985	16,991,572,326	22,565,162,887	13,593,421,399	53,150,156,613	0.00000	1.00000	0.00000
1986	16,728,435,454	21,249,282,358	11,941,762,479	49,919,480,291	0.00000	1.00000	0.00000
1987	16,978,905,847	22,444,356,821	11,946,837,981	51,370,100,649	0.00000	1.00000	0.00000
1988	17,030,359,791	23,494,269,571	14,816,785,832	55,341,415,194	0.00000	1.00000	0.00000
1989	16,910,850,694	23,723,261,704	17,002,050,701	57,636,163,099	0.00000	1.00000	0.00000
1990	17,586,868,921	24,600,191,719	17,642,463,859	59,829,524,499	0.00000	1.00000	0.00000
1991	16,563,755,600	24,641,357,000	20,215,059,800	61,420,172,400	0.00000	1.00000	0.00000
1992	16,219,861,400	24,215,058,885	18,832,545,315	59,267,465,601	0.00000	1.00000	0.00000
1993	16,317,325,400	23,367,601,637	20,182,266,668	59,867,193,705	0.00000	1.00000	0.00000
1994	14,939,421,600	24,897,946,640	23,121,830,040	62,959,198,280	0.00000	1.00000	0.00000
1995	14,679,257,600	24,794,383,988	24,146,320,315	63,619,961,904	0.00000	1.00000	0.00000
1996	17,412,314,200	25,134,534,757	20,990,497,435	63,537,346,392	0.00000	1.00000	0.00000
1997	17,006,551,600	25,756,101,085	23,598,931,333	66,361,584,018	0.00000	1.00000	0.00000
1998	17,912,372,200	25,617,623,505	22,849,831,946	66,379,827,651	0.00000	1.00000	0.00000

Source: Federal Communications Commission, *Statistics of Communication Common Carriers*, [various years] with adjustments as described in the text.

Table B-11. Total LEC Input Quantity Index - 1985-1998 with Capital as only input

Year	Labor Share	Capital Share	Materials Share	Labor Quantity	Capital Quantity Index	Materials Quantity Index	Lapseyres Input Quantity Index	Paasche Input Quantity Index	Fisher Ideal Input Quantity Index
1985	0.00000	1.00000	0.00000	504,113	1	1	1	1	1
1986	0.00000	1.00000	0.00000	482,698	1.04599	0.85179	1.04599	1.04599	1.04599
1987	0.00000	1.00000	0.00000	477,714	1.08111	0.83421	1.03358	1.03358	1.03358
1988	0.00000	1.00000	0.00000	466,827	1.12865	1.00332	1.04397	1.04397	1.04397
1989	0.00000	1.00000	0.00000	461,149	1.15949	1.11057	1.02732	1.02732	1.02732
1990	0.00000	1.00000	0.00000	443,105	1.19603	1.10737	1.03151	1.03151	1.03151
1991	0.00000	1.00000	0.00000	414,457	1.22895	1.23419	1.02752	1.02752	1.02752
1992	0.00000	1.00000	0.00000	411,167	1.25950	1.12198	1.02486	1.02486	1.02486
1993	0.00000	1.00000	0.00000	395,639	1.28943	1.18270	1.02376	1.02376	1.02376
1994	0.00000	1.00000	0.00000	367,196	1.31542	1.31710	1.02016	1.02016	1.02016
1995	0.00000	1.00000	0.00000	346,843	1.34520	1.34400	1.02264	1.02264	1.02264
1996	0.00000	1.00000	0.00000	338,040	1.39401	1.13425	1.03628	1.03628	1.03628
1997	0.00000	1.00000	0.00000	338,177	1.44123	1.24404	1.03387	1.03387	1.03387
1998	0.00000	1.00000	0.00000	345,317	1.48745	1.17488	1.03207	1.03207	1.03207

Source: Table B-10, Federal Communications Commission, *Statistics of Communication Common Carriers* [various years] Table B-7, and Table B-9.

Table B-12. Summary of the Components of the LECs' Price Cap X-Factor (excluding the Consumer Productivity Dividend) - 1985-1998 with Capital as only input

Year	U.S. Nonfarm Business Sector TFP Growth Rate (%) A	LECs' Output Growth Rate (%) B	LECs' Input Growth Rate (%) C	LECs' TFP Growth Rate (%) D=B-C	TFP Differential (%) E=D-A	U.S. Nonfarm Business Sector Input Price Growth Rate (%) F	LECs' Input Price Growth Rate (%) G	Input Price Differential (%) H=F-G	X-factor (%) I=E+H	Previous X-factor[1] (%) J
1986	1.10166	3.19605	4.49637	-1.30031	-2.40198	2.80830	-11.34898	14.15728	11.75530	-0.5
1987	-0.39920	3.77278	3.30284	0.46993	0.86914	2.53178	0.97524	1.55654	2.42568	5
1988	0.29955	6.51206	4.30317	2.20890	1.90934	3.72958	1.26889	2.46069	4.37003	5
1989	0.19920	4.38743	2.69559	1.69184	1.49263	3.03629	-3.33321	6.36950	7.86213	7.9
1990	-0.69895	4.76633	3.10280	1.66353	2.36249	3.30913	0.93422	2.37490	4.73739	8.8
1991	-1.41274	2.60625	2.71514	-0.10888	1.30385	2.05824	-2.93560	4.99384	6.29770	5.8
1992	1.61294	3.51287	2.45572	1.05715	-0.55579	2.88104	-4.46029	7.34133	6.78553	3.4
1993	0.09995	5.83669	2.34816	3.48853	3.38858	3.71664	-6.01814	9.73479	13.12336	4.7
1994	0.39880	5.40941	1.99605	3.41336	3.01456	3.50341	3.99532	-0.49191	2.52265	5.4
1995	0.29806	5.99104	2.23861	3.75243	3.45437	1.96268	-2.41287	4.37555	7.82992	6.8
1996	1.47713	8.21585	3.56366	4.65218	3.17505	1.38258	-0.87605	2.25863	5.43368	
1997	0.39024	9.46257	3.33137	6.13120	5.74095	1.89887	-1.12079	3.01966	8.76061	
1998	0.59259	5.37440	3.15673	2.21767	1.62508	0.71810	-3.87047	4.58857	6.21365	
				avg[2](86-98)	1.95217			4.82610	6.77828	
				var[3](86-98)	3.74069			13.89169	9.27841	
				avg(91-98)	2.64333			4.47756	7.12089	
				var(91-98)	3.03680			8.48420	8.10310	
				avg(86-95)	1.48372			5.28725	6.77097	5.23
				var(86-95)	3.04772			16.85538	11.45624	5.93
				avg(91-95)	2.12111			5.19072	7.31183	5.22
				var(91-95)	2.40320			11.65383	11.65680	1.29

[1] X-factor reported in the 1997 Price Cap Review Order

[2] avg denotes the arithmetic mean of the series

[3] var denotes the variance of the series.

Source: Bureau of Labor Statistics' Multifactor Productivity Table 2: Private Nonfarm Business: Productivity and Related Indexes (annual and quarterly tables), Table B-4, Table B-11, and Table B-13.

Table B-13. Total LEC Input Price Index - 1985-1998 with Capital as only input

Year	Labor Share	Capital Share	Materials Share	Labor Price Index	Capital Price Index	Materials Price Index	Lapseyres Input Price Index	Paasche Input Price Index	Fisher Ideal Input Price Index
1985	0.00000	1.00000	0.00000	1	1	1	1	1	1
1986	0.00000	1.00000	0.00000	1.02819	0.89271	1.03135	0.89271	0.89271	0.89271
1987	0.00000	1.00000	0.00000	1.05447	0.90146	1.05353	1.00980	1.00980	1.00980
1988	0.00000	1.00000	0.00000	1.08234	0.91297	1.08639	1.01277	1.01277	1.01277
1989	0.00000	1.00000	0.00000	1.08797	0.88304	1.12623	0.96722	0.96722	0.96722
1990	0.00000	1.00000	0.00000	1.17754	0.89133	1.17203	1.00939	1.00939	1.00939
1991	0.00000	1.00000	0.00000	1.18570	0.86555	1.20494	0.97107	0.97107	0.97107
1992	0.00000	1.00000	0.00000	1.17037	0.82779	1.23480	0.95638	0.95638	0.95638
1993	0.00000	1.00000	0.00000	1.22361	0.77944	1.25535	0.94159	0.94159	0.94159
1994	0.00000	1.00000	0.00000	1.20706	0.81121	1.29144	1.04076	1.04076	1.04076
1995	0.00000	1.00000	0.00000	1.25564	0.79187	1.32167	0.97616	0.97616	0.97616
1996	0.00000	1.00000	0.00000	1.52821	0.78497	1.36140	0.99128	0.99128	0.99128
1997	0.00000	1.00000	0.00000	1.49199	0.77622	1.39550	0.98885	0.98885	0.98885
1998	0.00000	1.00000	0.00000	1.53897	0.74675	1.43074	0.96203	0.96203	0.96203

Source: Table B-10, Table B-5, Table B-8, and Table B-9.

Table B-14. Summary of the Components of the LECs' Interstate Price Cap X-Factor (excluding the Consumer Productivity Dividend) - 1985-1998 with Capital as only input

Year	U.S. Nonfarm Business Sector TFP Growth Rate (%) A	LECs' Interstate Output Growth Rate (%) B	LECs' Input Growth Rate (%) C	LECs' TFP Growth Rate (%) D=B-C	TFP Differential (%) E=D-A	U.S. Nonfarm Business Sector Input Price Growth Rate (%) F	LECs' Input Price Growth Rate (%) G	Input Price Differential (%) H=F-G	X-factor (%) I=E+H	Previous X-factor[1] (%) J
1986	1.10166	5.14124	4.49637	0.64488	-0.45679	2.80830	-11.34898	14.15728	13.70049	-0.5
1987	-0.39920	7.78933	3.30284	4.48649	4.88569	2.53178	0.97524	1.55654	6.44223	5
1988	0.29955	12.18692	4.30317	7.88376	7.58421	3.72958	1.26889	2.46069	10.04490	5
1989	0.19920	6.04746	2.69559	3.35186	3.15266	3.03629	-3.33321	6.36950	9.52216	7.9
1990	-0.69895	11.49017	3.10280	8.38737	9.08632	3.30913	0.93422	2.37490	11.46122	8.8
1991	-1.41274	9.82672	2.71514	7.11159	8.52432	2.05824	-2.93560	4.99384	13.51817	5.8
1992	1.61294	5.96276	2.45572	3.50704	1.89410	2.88104	-4.46029	7.34133	9.23543	3.4
1993	0.09995	11.26732	2.34816	8.91916	8.81921	3.71664	-6.01814	9.73479	18.55399	4.7
1994	0.39880	8.70060	1.99605	6.70455	6.30574	3.50341	3.99532	-0.49191	5.81384	5.4
1995	0.29806	9.59051	2.23861	7.35191	7.05384	1.96268	-2.41287	4.37555	11.42939	6.8
1996	1.47713	9.62802	3.56366	6.06435	4.58722	1.38258	-0.87605	2.25863	6.84585	
1997	0.39024	10.29437	3.33137	6.96300	6.57275	1.89887	-1.12079	3.01966	9.59241	
1998	0.59259	8.32647	3.15673	5.16974	4.57715	0.71810	-3.87047	4.58857	9.16572	
				avg[2](86-98)	5.58357			4.82610	10.40968	
				var[3](86-98)	7.50392			13.89169	11.00353	
				avg(91-98)	6.04179			4.47756	10.51935	
				var(91-98)	4.58964			8.48420	14.29413	
				avg(86-95)	5.68493			5.28725	10.97218	5.23
				var(86-95)	9.44642			16.85538	12.49655	5.93
				avg(91-95)	6.51944			5.19072	11.71016	5.22
				var(91-95)	6.20670			11.65383	18.21534	1.29

[1] X-factor reported in the 1997 Price Cap Review Order

[2] avg denotes the arithmetic mean of the series

[3] var denotes the variance of the series.

Source: Bureau of Labor Statistics' Multifactor Productivity Table 2: Private Nonfarm Business: Productivity and Related Indexes (annual and quarterly tables), Table B-4, Table B-11, and Table B-13.

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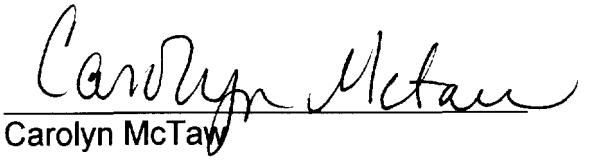

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