EXHIBIT D

EX PARTE OR LATE FILED

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February 24, 2000

EX PARTE OR LATE FILED

Ms. Magalie Roman Salas
Secretary
Federal Communications Commission
445 Twelfth Street, SW, Room TWB-204
Washington, D.C. 20554

Re: Notice of Written Ex Parte
In the Matter of Access Charge Reform, CC Docket No. 96-262; Price Cap Performance Review for Local Exchange Carriers, CC Docket No. 94-1

Dear Ms. Roman Salas:

Please include a copy of the attached paper in the record of the referenced proceeding.

Two copies of this Notice are being submitted to the secretary of the FCC in accordance with Section 1.1206 of the Commission's rules.

Sincerely,

Attachment

cc: J. Atkinson, C. Barnekov, L. Collier, A. Goldschmidt, R. Lerner, J. McKee, F. Setzer, N. Uri

No. of Copies rec'd 0+1
List A B C D E

SELECTED ISSUES IN CALCULATING THE X-FACTOR

Stephen Friedlander, AT&T

In this ex parte submission, AT&T responds to LEC criticisms of its direct method of calculating the interstate X-factor and its technical correction of the FCC staff's Imputed X Study. In addition, modifications to the cost of capital index used in the FCC's TFP study are proposed, based on recommendations made in the reply comments of AT&T and MCI WorldCom. The modified cost of capital index is then used to calculate revised X-factors, along with calculations that show the impact of alternative cost of capital assumptions.

I. Direct Calculation of the X-Factor

In its comments, AT&T showed that the X-factor can be calculated directly on the basis of the growth rates for LEC output and LEC revenue, along with the economy-wide measures of productivity growth and input price changes. Examination of the FCC's 1997 and 1999 TFP studies revealed that the LEC input price and quantity variables used in those studies effectively cancel out, and that X-factors can thus be calculated more directly by replacing the growth rates for LEC input price and quantity indexes with the growth in LEC revenue. Applying this approach to the FCC's 1997 study yields X-factors that are identical to those calculated in that study. Applying it to the 1999 FCC study results in X-factors that are nearly identical to those obtained by the FCC. (Because of a minor inconsistency in the 1999 study, there is a slight difference between the X-factors calculated by AT&T's direct method and those calculated by the FCC's spreadsheets.[1] This difference is inconsequential, however, and in no way detracts from the validity of the direct method.)

Although AT&T's direct method yields essentially the same X-factors as does the FCC's calculations, there are several advantages to the direct method:

- It properly focuses attention on those variables that actually determine the historical X-factor and eliminates the complex calculations needed to develop indices that have no real bearing on the results. This greatly simplifies the analysis and provides an explanation for the FCC staff's observation that "most measurement errors associated with the price of inputs will tend to cancel out." (*Further Notice*, App. B at 27).

- It addresses the FCC's misgivings about measuring an interstate-only X-factor, since data on interstate output and revenue can just as well be used in place of total output and revenue in the X-factor equation. There is no need to calculate a "theoretically pure" measure of interstate productivity growth. Standard LEC-provided data on interstate returns can then be used to adjust interstate revenue for excess earnings.

[1] As explained in AT&T's comments, the FCC's capital quantity index is based on the computed capital stock for the current year, while the capital rental price is calculated with respect to the prior year's capital stock (Appendix A at 4).

- Limiting the analysis to interstate services produces an X-factor that is more appropriate for regulating those services and avoids the complications inherent in measuring output of other, non-interstate services.

Criticisms of the Direct Method

LEC attempts to criticize AT&T's direct method fall mainly into two categories. (a) The LECs generally repeat their same tired, cliché-ridden arguments against any attempt to determine the X-factor on the basis of interstate data. (b) Other LEC arguments ignore the fact that the direct method is mathematically equivalent to the X-factor calculations performed by the FCC, USTA, and other parties in their TFP studies. Much of the LEC critique is presented in the reply comments of William Taylor submitted by USTA (Attachment 1, pp. 3-10). By ignoring the mathematical equivalence between the X-factor calculations of AT&T and those of the other TFP studies, Taylor's paper does little more than create confusion by portraying AT&T's method as fundamentally different from the other studies.

Taylor's confused logic is reflected in his statement that "AT&T's study does not result in a measure of productivity growth at all" (para. 7), and its "approach is nothing more than the Historical Price Method which...the Commission has already rejected" (para. 10). These statements completely ignore the major implication of AT&T's analysis, that X-factors equivalent to those obtained by the FCC can be calculated directly without measuring the productivity and input price components of the X-factor. That is, it is not essential to explicitly measure productivity growth in order to calculate historical X-factors. As for the Historical Price Method, the FCC's current X-factor calculations do bear some resemblance to those of its Historical Price Method formerly used to prescribe the X-factor, but there are also major differences. These are described more completely in one of the papers cited by Taylor, but need not concern us here.[2]

Taylor further adds to the confusion with his assertion that "...the use of annual growth rates in revenues and output as an LEC output price index produces results that are inconsistent with the very design of price caps" (para. 17). Taylor tries to support this argument by his calculation of the historical price changes implied by subtracting the growth in interstate output from the growth in interstate revenue. Taylor's Table 1 shows that these implicit price reductions were greater than the X-factors that were actually in effect. In other words, the price index implied by the output and revenue data declined by somewhat more than did the price indices used in the price cap mechanism. This is undoubtedly an interesting comparison, but is not pertinent to AT&T's direct method of calculation.

Taylor claims that somehow this "difference in output indices completely invalidates AT&T's method" (para. 19). This is utter nonsense. Once again, Taylor's argument ignores the fact that AT&T's method is mathematically equivalent to that of the FCC. As

[2] Friedlander, Stephen, "The Use of Productivity Studies in Price Cap Regulation: What do the FCC's X-factor Calculations Really Measure?" (pp. 12-13). 18th Annual Conference of the Center for Research in Regulated Industries, Rutgers University, May 27, 1999.

with AT&T's method, X-factors calculated by the FCC and other parties, including USTA, can also be expressed in terms of growth in output minus growth in revenue, using the same measure of interstate output as did AT&T. If there are any biases in measuring interstate output, such biases would distort the X-factors calculated by the FCC, USTA, and others – not just those of AT&T.[3]

It is not surprising that the two types of price indices differ in their behavior over time. As with many other price indices, the price indices used in LEC price cap regulation do not fully reflect price reductions associated with various discount offerings, such as those available for LEC dedicated facilities. When a new volume or term discount plan is offered, it is treated under price caps as a new service (rather than as a reduction in the price of an existing service), and therefore does not reduce the existing level of LEC price indices. Nor does the price index decline when customers migrate to the discounted service or, as Taylor puts it, shift to other alternatives with a lower unit price (Taylor, footnote 11). These occurrences, however, do result in reduced revenue per unit of measured output and are therefore reflected as higher productivity in the FCC's TFP framework. This tendency is one that characterizes TFP studies based on physical measures of output (including those advanced by USTA) and in no way represents a flaw in AT&T's methodology, as implied by Taylor (para. 19).

Taylor's argument thus boils down to the suggestion that there may be some biases in the index of LEC output. This of course is possible, since the output index is based on highly aggregate measures of physical output and necessarily involves a substantial degree of simplification. AT&T is in no position to defend the accuracy of these output measures, which consist entirely of LEC-provided data. If there is any merit to Taylor's argument, it should be directed to his LEC clients and their consultants rather than to AT&T, as only the LECs are capable of producing more accurate and detailed measures of their output.[4]

Use of Interstate Data

Since AT&T's direct method is mathematically equivalent to the FCC study, the only substantive difference between the two approaches is that AT&T uses interstate rather than total company data. The LECs and their consultants predictably repeat their arguments against the use of interstate data, piously declaring that any concept of interstate productivity growth must be "economically meaningless." "...(I)n the presence

[3] Taylor makes another assertion that is particularly baffling. He contends that AT&T's calculations are more sensitive to measurement errors because "errors in measuring input or output prices (or adjusting prices to keep accounting earnings constant) have a larger effect on TFP growth as measured by price rather than quantity" (para. 15). While this may be true in some cases, it clearly does not apply in this situation, in which AT&T's X-factor calculations are mathematically equivalent to those of the FCC and others.

[4] It may be possible for an outside party to develop more detailed measures of LEC output from data filed in their annual TRPs. However, it would certainly be a major undertaking to create an entire historical series for each RBOC from such data, and some of the TRP data could easily be misinterpreted. For all practical purposes, it would be up to the LECs to perform such calculations.

of common costs, productivity growth for a subset of the firm's services (i.e., interstate vs. intrastate) is not defined," proclaims Taylor (Taylor comments, para. 35).

The fact is, however, that firms do not price their products on the basis of total company productivity growth, but on the basis of cost and market trends for individual services, despite the existence of common costs and production functions that may not be "separable." If productivity growth cannot be defined for individual services or subsets of services, then it is not a particularly useful concept for establishing pricing rules.

As AT&T showed in its comments, however, the FCC's TFP framework permits X-factors to be calculated directly without explicitly calculating a "theoretically pure" measure of interstate productivity growth. Reasonable estimates of an interstate-only X-factor can be derived from standard LEC-provided data on their interstate results, based on well-established separations and costing methods. Such data has been used for decades by the LECs to determine service-specific and jurisdiction-specific costs, at both the intrastate and interstate levels. The basic principle underlying separations, that of allocating common costs on the basis of relative use, is widely accepted. To our knowledge, there is no substantive evidence that the costs allocated to interstate access services are understated (compared to other reasonable alternative schemes for allocating costs), causing the profitability of interstate services to be overstated.[5] More importantly, there is no reason to believe that the trend in reported interstate costs over time is biased downward, causing the X-factor to be biased upward.[6]

The fact that separations-based data necessarily contains approximations and potential imperfections has not prevented the LECs from advocating lower X–factors for their intrastate services. Indeed, Taylor himself has played a prominent role in articulating the need for intrastate X-factors to be lower than interstate X-factors. In testimony provided to the North Carolina Utilities Commission, Taylor argued:

> "It is reasonable to expect that productivity growth experienced historically in this market [for interstate access services] would be substantially greater than the

[5] If anything, it is more likely that costs are overallocated to interstate access services. For instance, a study by NYNEX in 1993 showed that the separations rules overallocate approximately $1 billion in costs to the interstate jurisdiction, primarily to the switched access categories of local switchnig, local transport, and carrier common line. The study was based on embedded direct costing guidelines approved by the NY-PSC. See NYNEX New York Service-Specific Cost Study, included in *NYNEX Petition for Waiver in the Matter of NYNEX Transition Plan to Preserve Universal Service in a Competitive Environment*, December 15, 1993 (Exhibit 4).

[6] Taylor's statement that "AT&T claims to have found a method to calculate X without having to allocate costs or revenues to the interstate jurisdiction" (USTA Ex Parte, CC Dockets No. 94-1, 96-262, February 16, 2000) also requires clarification. While it is true that X-factors can be calculated on the basis of interstate revenues and output without having to allocate costs, AT&T believes that more accurate estimates are obtained by adjusting interstate revenues for excess earnings, based on costs allocated to the interstate jurisdiction. As shown in Table 1 below, the interstate X-factor for 1991-98 is 7.67% when no such earnings adjustment is made.

overall rate of productivity growth experienced by local exchange companies in supplying all services."[7]

Taylor further emphasized that:

> "...even if the productivity differential is 5.3 percent per year for interstate access services, this would not imply that a similar productivity differential was appropriate for other components of telephone service. To the contrary, the productivity differential for services in the state jurisdiction must necessarily be less than 5.3 percent per year."[8]

Although Taylor did not advocate the use of intrastate productivity studies for setting intrastate X-factors, as explained in a recent ex parte (USTA, February 16, 2000), he clearly enunciated the need for X-factors to reflect jurisdictional differences in the mix of services being regulated.

State regulatory commissions, for the most part, have embraced this proposition and have incorporated it in their X-factors and other pricing rules. As explained by Lee Selwyn, "to the best of my *knowledge no state has adopted an X-factor that was based upon total company productivity.*[9] Information on state price cap regulation presented by Selwyn shows that the X-factors adopted by state commissions are all substantially below the FCC's 6.5% total company X-factor, ranging from 0% in north Dakota to 5% in Connecticut.[10] Moreover, in those few state that have adopted X-factors of 4% or greater, the X-factor is applied to only a limited number of services, with rates for basic service generally frozen for a number of years (creating an effective X-factor equal to the GDP-PI), as shown in Selwyn's Table 2.

Since LEC interstate revenues amount to only about one third of intrastate revenues, it is incumbent upon the FCC to make its decisions within the context of this broader regulatory framework. If the prevailing regulatory practice is for intrastate X-factors to be somewhat below total company productivity growth, it follows that the interstate X-factor should exceed total company productivity growth.

Use of Data on LEC Earnings

Since it is necessary to make some assumption about the cost of capital, both the imputed X study and AT&T's direct method utilize information on interstate earnings. The LECs object to any use of interstate accounting rates of return, maintaining that such figures are "economically meaningless because earnings analysis done at the interstate level cannot provide any meaningful economic information." (Taylor comments, para. 44). Despite their incessant rhetoric about interstate earnings being based on "arbitrary

[7] Amended Direct and Rebuttal Testimony of Dr. William E. Taylor (Carolina Telephone and Telegraph Co. and Central Telephone Co.), North Carolina Utilities Commission, Docket No. P-7, sub. 825, P-10, sub. 479, February 9, 1996, at 36.
[8] Id., at 38-39.
[9] Ad Hoc reply comments, Statement of Lee L. Selwyn, para. 28.
[10] Selwyn Statement, Table 2.

allocations" that are not "economically meaningful", the LECs fail to provide any substantive explanation of why such allocations are distorted. Their analysis starts with the assumption that interstate earnings data is not economically meaningful and reaches the predictable conclusion that such data is therefore economically meaningless.

For instance, Taylor cites growth in internet-bound traffic, which is classified as local, as a factor that causes interstate earnings to be overstated (Comments, pp. 24-25). "Assigning costs and revenues for internet traffic to the intrastate jurisdiction artificially inflates interstate earnings." This is because "if local minutes grow faster than interstate minutes, fewer fixed costs would be assigned to the interstate jurisdiction, and a jurisdictional earnings analysis would show, incorrectly, higher interstate earnings" (para. 46). To refute this proposition, one need only refer to Taylor's statement on the previous page (para. 40): "Thus, growth in interstate usage leads to lower unit costs and lower prices equally for interstate and intrastate usage." If growth in interstate usage leads to lower unit costs, then so should internet induced growth in intrastate usage. These cost reductions properly apply to all services utilizing the LEC network, both interstate and intrastate, and thereby contribute to the profitability of interstate services.

The other alleged problem with regulatory earnings is that they reflect depreciation rates that are too low. "...(T)he accounting treatment of depreciation for regulated LECs is based on asset lives that are currently too long and have historically been too long, so that LEC accounting profits are overstated relative to economic profits."[11] Use of more realistic, higher depreciation rates would allegedly result in lower LEC earnings, thereby providing a more accurate picture of the LECs' true economic returns.

But this is only half the story. If higher depreciation rates were in effect, the depreciated value of LEC plant ("average net investment") would be much lower, so that rates of return (earnings divided by net investment) would not necessarily be reduced. Indeed, a comparison of LEC earnings on both a financial (10-K) and a regulatory (Form M) basis shows that RBOC earnings reported on a financial basis have generally exceeded their reported regulatory earnings.[12] According to Value Line's estimates for 1999, returns on investment for the RBOCs and GTE are in the 16% to 20.5% range, while returns on equity range from 26% to 32%.[13] Thus, if there is any merit to LEC contentions that earnings based on regulatory accounting do not correspond to true economic earnings, it is that their accounting earning ratios *understate* their economic earnings. Moreover, there is no reason to believe that the upward *trend* in their regulatory rates of return, which is a key factor in this proceeding, necessarily overstates the trend in their economic returns.

The Mix of Interstate Services versus Intrastate Services.

[11] Comments of W.E. Taylor on behalf of U.S.T.A., para. 42.
[12] Statement of Lee L. Selwyn attached to Ad Hoc Reply Comments, para. 12 and Table 1.
[13] Value Line Investment Survey, January 7, 2000, pp. 739, 740, 748, 761, 768.

The higher X for interstate services is based on the fact that the mix of services under FCC regulation differs significantly from that in the intrastate jurisdiction. The example provided by Taylor to refute the notion of interstate productivity is highly misleading because it trivializes the issue. In Taylor's example, a regulated firm supplies two identical services consisting of interstate and intrastate usage (Comments, pp. 19-20). Because the two services are identical, growth in usage leads to lower unit costs for both services, regardless of whether the growth occurs in interstate or intrastate usage. This example, which purports to demonstrate that interstate productivity growth is meaningless, totally misses the point because it ignores differences in the mix of services between jurisdictions. Even though the same services are provided in both interstate and intrastate jurisdictions, the mix of interstate services differs substantially from the mix of intrastate services.[14]

This fact has not been altered by access reform, as several LECs contend. Bell Atlantic, for example, maintains that there is no longer much difference between interstate and intrastate, because "both interstate and intrastate charges are recovered primarily on a per line basis" (Comments, fn. 4). This is only partly true. Although more interstate revenue is recovered on a per line basis as a result of access reform, significant differences between interstate and intrastate still exist. According to USTA, "67% of intrastate revenue is flat rate or line volume related" (Reply comments at 8).[15] By contrast, only about 47% of interstate access revenue is currently recovered on a per line basis.[16] (Now that CCL and TIC charges are almost fully phased out, this percentage is expected to decline in the foreseeable future as long as growth in switched access minutes and special access lines continues to exceed the growth in subscriber lines.) Remaining revenues are obtained primarily from per minute charges, dedicated transport that varies in proportion to the volume of traffic, and special access facilities that have grown by far more than switched access. By ignoring special access and dedicated switched access services, USTA's statement that only about 18% of LEC interstate access revenues are recovered on a minutes of use basis is highly misleading (Reply comments at 14).

The Consumer Productivity Dividend

Taylor faults the analyses of Ad Hoc and AT&T in support of retaining the consumer productivity dividend (CPD), claiming that both Ad Hoc and AT&T erroneously equate changes in incentives to changes in productivity growth (Reply comments, para. 22). Taylor points out that "there is no evidence...that a 10 percent increase in incentives leads to a 10 percent increase in productivity growth."

[14] For further discussion, see Nadiri, M. Ishaq, "The Measurement of Productivity Growth for Interstate Access Services," in Reply Comments of AT&T, CC Docket 94-1, March 1, 1996 (Appendix C).

[16] According to data submitted in connection with the CALLS Proposal, 51.2% of interstate access revenue is recovered on a per line basis, based on July 1999 rates and 1998 demand. (Ex parte letter from Evan R. Grayer, Dockets 94-1, 96-45, 99-249, 96-262; Sept. 1, 1999; page 28 of attachment.) On the basis of further CCLC reductions in July 2000 and projected growth in demand from 1998 to 2000 (based on average growth rates from 1994 to 1998), the 51.2% figure is expected to decline to about 47% this year.

Taylor's criticism is based on a mischaracterization of AT&T's analysis, which does not rely on the assumption that productivity growth is proportional to the increase in incentives. Instead, A&T's analysis rests on the proposition that the increased productivity growth that resulted from adoption of price cap regulation in 1991 is indicative of the acceleration in productivity that could be expected from elimination of sharing. The SPR study cited by AT&T showed that elimination of sharing would increase LEC efficiency incentives by more than the original adoption of price cap regulation with sharing. It is therefore reasonable to assume that elimination of sharing would increase LEC productivity growth by at least as much as had the initial adoption of price cap regulation.

The LECs emphasize that the effect of eliminating sharing on productivity is already incorporated into the X-factor.[17] This is only partly true, since sharing was still in effect during much of the period for which historical X-factors were estimated. In any event, AT&T's analysis recognized that because the LECs' historical productivity growth already reflects some of the benefit of eliminating sharing, it reduced the CPD accordingly to account for this.[18]

Other LEC Criticisms

Finally, we respond to two criticisms made by BellSouth, both of which are based on misinterpreting AT&T's analysis.

First, BellSouth misquotes AT&T when it states that "...AT&T concedes that its approach is essentially the same as its "Performance-Based Model" previously submitted and rejected by the Commission and the Court" (Reply comments at 23). Had BellSouth read AT&T's Appendix A more carefully, it would have realized that the approach AT&T was referring to consisted of an alternative calculation in which AT&T replicated the FCC's TFP study (i.e., the Commission's Option 2 methodology), but used interstate output rather than total company output to calculate TFP growth (AT&T Comments, Appendix A at 8). This calculation produced X-factors very similar to those of the direct method, but was not the same approach as the direct method.

BellSouth also contends that AT&T's estimate of the cost of capital is inconsistent with its prior submission to the Commission in January, 1999, in which AT&T touted a rate of return of 10.57% (Reply comments, at 24).[19] However, AT&T did not present the 10.57% figure as representing the LECs' cost of capital. In AT&T's January 1999 ex parte submission, the objective was not to revise the FCC's 1997 study by incorporating cost of capital estimates for each year. Instead, the 10.57% rate of return figure – based on average returns over the previous five years -- was assumed for 1996 and 1997 merely as a way to avoid the distortion in the cost of capital index caused by substantial increases in RBOC rates of return during those years.

[17] See for example, USTA Reply comments at 16.
[18] AT&T Comments, Appendix C at 5.
[19] Letter from Brian Masterson to the FCC, Dockets 96-262 and 94-1 (2/22/99).

II. AT&T's Correction to the Staff's Imputed X Study

In its comments (Appendix B) AT&T showed that the FCC staff's calculations in Table C-1 of its Imputed X Study failed to account for the price cap "reinitialization" that occurred in July 1997, and therefore, these calculations should be based on an X-factor for 1996 of 6.5% rather than 5.3%. Taylor contends that this assertion is incorrect because actual operating revenues in that year (i.e., the 7/96 to 7/97 tariff year) were based on an X-factor of 5.3% rather than 6.5% (Reply comments, para. 47).

Taylor's criticism reflects a misunderstanding of what the FCC's calculations in Table C-1 are intended to accomplish. The objective of these calculations is to estimate the level of revenue and earnings for the years 1995 and 1998 that would have resulted from alternative X-factors being in effect since 1991 – not the revenues realized in each year of the study, as Taylor states (para. 48). Because of the reinitialization adjustment that occurred in July 1997, price cap indices as of July 1997 and thereafter were calculated based on an X-factor of 6.5% included in the 1996 price cap adjustment. Revenues and earnings for 1998 are a function of the price cap indices established in July 1997 and July 1998. Because both of these indices were calculated on the basis of a 6.5% X-factor applied in July 1996, the 1996 X-factor used in Table C-1 should be 6.5%.

Taylor makes a similar criticism of the FCC's treatment of the price cap reinitialization that occurred in 1995 (para. 48-49). Because the price cap indices in effect during 1998 reflected the 1995 reinitialization, there is no merit to Taylor's criticism insofar as the revenues and earnings for 1998 are concerned. For 1995, however, the situation is somewhat more complicated. Revenues for the first half of 1995 reflect the price cap indices established in July 1994, while revenues for the second half of 1995 are based on the August 1995 price cap indices.[20] The August 1995 indices reflected the FCC's 1995 reinitialization adjustment, whereas the July 1994 indices did not. This makes it more complicated to model LEC revenues for 1995. Thus, if there is any merit to Taylor's criticism of the FCC, it is only applicable to the first half of 1995 and does not apply to 1998 revenues and those for the second half of 1995.

III. Further X-Factor Analysis

This section proposes several modifications to the cost of capital index used in the FCC's TFP study, as presented in the reply comments of AT&T and MCI WorldCom. The modified cost of capital index is then used to calculate revised X-factors, along with calculations that show the impact of alternative cost of capital measures.

The FCC's Capital Cost Index

In their reply comments, AT&T and MCI both suggested modifications to the FCC's cost of capital index, in which property income is adjusted to remove excess LEC

[20] The effective date of the 1995 annual access tariff filing was postponed from July 1 to August 1, another factor that complicates the revenue calculations for 1995.

earnings. These suggestions are based on two propositions that should be incorporated in the FCC's methodology:

- First, the only component of property income that should be adjusted is the portion that represents return on equity, along with income taxes on that return. The remaining components of property income – depreciation, interest expense, and other taxes – consist of costs that were actually incurred by the LECs and need not be adjusted.[21]

- Second, it is important that variations in the cost of capital be properly reflected in calculating the capital cost index. Because the cost of capital is measured in terms of return on investment, the competitive cost of capital figures should be applied to average net investment to obtain the level of earnings associated with that cost of capital.

These principles can be implemented via the following steps that represent a synthesis of the MCI WorldCom and AT&T recommendations:

1. Use the "competitive ROR" calculated by MCI in Table B-7A of its reply comments, which is based on:

   - The LECs' actual cost of debt, as shown in ARMIS 43-02.

   - The LECs' actual debt/equity ratios, as computed from ARMIS 43-02 and Form M data.

   - The cost of equity for 1989 is the implied cost of equity from the FCC's 11.25% prescription order (i.e., 13.19%). For other years, it is equal to this amount adjusted by the change in Moody's Baa bond return relative to its value for 1989.

   The resulting weighted average cost of capital, or "competitive ROR," is 11.53% in 1990, 11.25% in 1991, and declines to 8.89% in 1998. The trend from 1990 to 1998 is very similar to that of AT&T's capital cost (11.25% to 8.63%) and that computed by the FCC (11.25% to 8.68%).

2. The "competitive ROR" is then applied to the LECs' average net investment (from ARMIS 43-01 reports) to calculate the level of earnings corresponding to the cost of capital. That is, the earnings component of "property income" generates an ROR equal to the competitive ROR, as AT&T did in its analysis.

3. Income taxes are adjusted based on the 39% marginal tax rate used by the FCC, by multiplying the change in earnings by the factor [.39/(1-.39)], as AT&T did in its reply comments.

[21] A comparable suggestion was made by Gollop (USTA Comments, Attachment 2), who applied his adjustment only to the earnings component of property income in his TFP study done for USTA.

These calculations are shown in the attached worksheets. MCI WorldCom's calculation of the competitive rate of return (ROR) is shown on Table B-7A. The competitive ROR is then used to obtain adjusted interstate revenue in Table B-2, which is used to calculate interstate X-factors in Table B-15. The competitive ROR is also used in Table B-8A to develop the cost of capital index, which is used to calculate adjusted property income in Table B-10. The adjusted total factor payments in Table B-10 are then used for the direct calculation of total company X-factors in Table B-15.

The key assumption underlying these cost of capital calculations is that the equity risk premium, as measured by the differential between the cost of equity and Baa bonds, has been constant over time. Because it is generally believed that the equity risk premium has declined in recent years, this is a conservative assumption. Available evidence generally supports the proposition that the risk premium is more likely to have declined during the nineties than to have remained constant. A declining equity risk premium is often cited as a major factor behind the currently high level of stock market valuations. The lower risk premium has been attributed to the reduced volatility of corporate earnings and equity returns, increased liquidity in the stock market, and the greater willingness of investors to assume the risks of stock ownership.[22]

Blanchard, for instance, presents evidence that the risk premium has declined to 2 to 3 percent in recent years,[23] while Rappaport states that the relative risk of bonds has increased over the past two decades, thereby lowering risk premiums to a range of 3 to 5 percent.[24] More recently, the Wall Street Journal noted that traditional measures of value are failing to explain current stock prices in part because, "the so-called risk premium has declined, as investors become more comfortable holding stocks."[25] There is little evidence, on the other hand, that the equity risk premium has risen during the past 8 to 10 years, as implied by the cost of capital estimates presented by Vander Weide and Gollop.[26]

Results

X-factors resulting from this approach, based on the assumption of a constant risk premium, are shown in Table 1, which shows the X-factors associated with a variety of alternative cost of capital assumptions. Table 1 shows how estimated X-factors for 1991 to 1998 are affected by the trend in the assumed cost of capital from 1990 to 1998.[27]

[22] See, for example, McIntyre, K.H. and Brian Nottage, "Equity Risk Premium," *Regional Financial Review*, September 1999, pp. 17-22.

[23] Blanchard, Oliver, "Movements in the Equity Premium", *Brookings Papers on Economic Activity*, 75 (2) 1993.

[24] Rappaport, Alfred, *Creating Shareholder Value*, The Free Press, New York, 1998.

[25] Clements, Jonathan, "Value Judgment: Getting a Handle on Stocks' Worth," *Wall Street Journal*, January 11, 2000, p. C-1.

[26] USTA Comments, Attachments 2 and 5.

[27] Average X-factors for the 1991-98 period are based on trends in the data from 1990 to 1998. (The 1991 X-factor is based on data for 1990 and 1991.)

TABLE 1

X-FACTORS FOR 1991-1998

Based on alternative cost of capital assumptions

	Total company X	Interstate X	1990 ROR	1998 ROR
USTA Comments	3.29		10.30%	19.00%
No adjustment	4.78		10.30%	15.43%
No adjustment		7.67	12.63%	15.40%
Constant 11.25% ROR	6.16	8.35	11.25%	11.25%
Constant risk premium	6.89	9.16	11.53%	8.89%
AT&T cost of capital	6.88	9.14	11.25%	8.63%
1999 FCC study	6.33		9.31%	6.49%

Except for USTA and 1999 FCC studies, X-factors are based on direct calculation.

Interstate X-factors do not include adjustment for excess employee benefits

Except for USTA, total company X-factors include adjustment for excess employee benefits.

Table 2. Average Interstate X-Factors Based on Direct Calculation (From Table B-15)

	AT&T Cost of Capital (Reply Comments)	Revised FCC Cost of Capital (2/17 Ex Parte)
1986 to 1995	10.554	10.597
1987 to 1995	11.781	11.828
1988 to 1995	11.834	11.887
1989 to 1995	11.702	11.763
1990 to 1995	12.107	12.178
1991 to 1995	10.327	10.570
Mean:	11.384	11.471
Median:	11.742	11.796
1986 to 1998	9.773	9.724
1987 to 1998	10.628	10.575
1988 to 1998	10.562	10.503
1989 to 1998	10.343	10.278
1990 to 1998	10.462	10.390
1991 to 1998	9.143	9.161
Mean:	10.152	10.105
Median:	10.402	10.334

AT&T cost of capital based on ROR of 11.25% in 1990 and 8.63% in 1998.

Revised FCC cost of capital based on Baa bond yield and constant equity risk premium.

No adjustment for excess employee benefits.

Table B-1. LEC Interstate Revenue ($) - 1985-1998

Year	End User Revenue	Interstate Switched Access Revenue	Special Access Revenue	Total Interstate Revenue
1985	$1,499,413,893	$10,906,203,190	$1,960,688,644	$14,366,305,727
1986	$2,400,475,814	$10,484,265,170	$2,574,800,716	$15,459,541,700
1987	$3,090,639,929	$9,611,996,187	$2,657,677,439	$15,360,313,555
1988	$3,604,221,000	$9,662,529,000	$2,539,698,000	$15,806,448,000
1989	$4,398,692,000	$9,092,575,000	$2,253,922,000	$15,745,189,000
1990	$4,679,142,000	$8,595,750,000	$2,209,064,000	$15,483,956,000
1991	$4,828,177,000	$8,514,130,000	$2,119,037,000	$15,461,344,000
1992	$4,963,262,000	$8,650,880,000	$2,153,565,000	$15,767,707,000
1993	$5,244,094,000	$8,999,065,000	$2,097,997,000	$16,341,156,000
1994	$5,589,662,000	$9,293,783,000	$2,217,125,000	$17,100,570,000
1995	$5,770,285,000	$9,332,869,000	$2,529,667,000	$17,632,821,000
1996	$5,930,960,000	$9,409,639,000	$3,070,598,000	$18,411,197,000
1997	$6,268,026,000	$8,763,815,000	$3,851,028,000	$18,882,869,000
1998	$7,807,872,000	$7,275,241,000	$4,815,249,000	$19,898,362,000

Source: Federal Communications Commission, *Statistics of Communication Common Carriers* [various years]

Table B-2. LEC Revenue ($) by Type of Service[1] - 1985-1998

Year	Local Service Revenue	Intrastate Toll and Intrastate Access Service Revenue	Interstate Service Revenue (A)	Total Revenue (B)
1985	$26,960,554,164	$13,047,095,682	$14,366,305,727	$54,373,955,573
1986	$28,626,174,049	$13,538,946,795	$15,459,541,700	$57,624,662,544
1987	$29,150,842,991	$14,166,723,124	$15,360,313,555	$58,677,879,670
1988	$29,226,988,000	$14,994,975,000	$15,806,448,000	$60,028,411,000
1989	$29,973,157,000	$14,868,219,000	$15,745,189,000	$60,586,565,000
1990	$30,699,085,000	$15,014,729,000	$15,483,956,000	$61,197,770,000
1991	$32,059,008,000	$14,522,276,000	$15,461,344,000	$62,042,628,000
1992	$33,359,990,000	$14,225,181,000	$15,767,707,000	$63,352,878,000
1993	$34,598,957,000	$14,496,831,000	$16,341,156,000	$65,436,944,000
1994	$35,758,637,000	$14,355,983,000	$17,100,570,000	$67,215,190,000
1995	$37,684,860,000	$13,123,225,000	$17,632,821,000	$68,440,906,000
1996	$40,523,387,000	$12,987,476,000	$18,411,197,000	$71,922,060,000
1997	$42,460,592,000	$12,308,613,000	$18,882,869,000	$73,652,074,000
1998	$44,993,354,000	$11,978,176,000	$19,898,362,000	$76,869,892,000

[1]This excludes miscellaneous services

Source: Federal Communications Commission, *Statistics of Communication Common Carriers* [various years]

Adjusted Interstate Service Revenue based on revised FCC capital cost index

Interstate Earnings (B)	Interstate ANI (C)	Interstate ROR (B/C)	Competitive ROR (D)	Competitive Earnings (E=C*D)	Earnings Adjustment (F=E-B)	Tax Adjustment (G=0 64*F)	Adjusted Interstate Revenue (A-F-G)	Growth Rate (%)
							$14,366,305,727	
							$15,459,541,700	7 33408
							$15,360,313,555	-0.64393
							$15,806,448,000	2.86308
							$15,745,189,000	-0.38831
$3,252,800	$25,752,912	12.63%	11.53%	$2,969,311	-$283,489	-$181,246	$15,019,220,739	-4.72041
$3,065,010	$25,191,906	12.17%	11.25%	$2,834,089	-$230,921	-$147,637	$15,082,786,665	0.42234
$3,290,715	$24,875,599	13.23%	10.50%	$2,611,938	-$678,777	-$433,969	$14,654,960,541	-2 87753
$3,467,862	$24,759,133	14.01%	9.69%	$2,399,160	-$1,068,702	-$683,264	$14,589,190,043	-0 44980
$3,446,525	$24,779,745	13.91%	9.84%	$2,438,327	-$1,008,198	-$644,581	$15,447,790,540	5.71851
$3,506,389	$25,461,013	13.77%	9.59%	$2,441,711	-$1,064,678	-$680,691	$15,887,452,008	2.80636
$3,756,542	$26,132,272	14.38%	9.34%	$2,440,754	-$1,315,788	-$841,236	$16,254,173,436	2.28201
$3,779,276	$25,827,956	14.63%	9.34%	$2,412,331	-$1,366,945	-$873,943	$16,641,981,532	2.35788
$3,990,567	$25,911,261	15.40%	8.89%	$2,303,511	-$1,687,056	-$1,078,602	$17,132,703,786	2.90606

Column D from MCI Reply Comments, Table B-7A

Table B-3. Interstate Output Index - 1985-1998

Year	End User Revenue Share	Interstate Switched Access Revenue Share	Special Access Revenue Share	Number of Access Lines	Number of Switched Access Minutes	Number of Special Access Lines	Lapseyres Output Index	Paasche Output index	Fisher Ideal Output Index	Fisher Ideal Chained Output Index	Growth Rate (%)
1985	0.10437	0.75915	0.13648	92,671,959	156,853,820,000	1,230,590	1	1	1	1	
1986	0.15527	0.67817	0.16655	95,333,884	157,302,701,000	1,664,101	1.05325	1.05225	1.05275	1.05275	5.14068
1987	0.20121	0.62577	0.17302	98,228,585	173,154,171,000	1,764,445	1.08310	1.07881	1.08095	1.13797	7.78433
1988	0.22802	0.61130	0.16067	98,270,787	187,663,836,000	2,701,817	1.14444	1.11496	1.12961	1.28546	12.18682
1989	0.27937	0.57748	0.14315	101,190,050	210,406,134,000	2,448,090	1.06577	1.05892	1.06234	1.36560	6.04719
1990	0.30219	0.55514	0.14267	103,857,988	231,960,296,000	3,518,005	1.12909	1.11450	1.12177	1.53188	11.49069
1991	0.31227	0.55067	0.13705	107,383,807	246,710,182,000	5,151,699	1.11181	1.09486	1.10330	1.69013	9.83068
1992	0.31477	0.54865	0.13658	108,938,065	262,187,655,000	6,033,139	1.06252	1.06026	1.06139	1.79388	5.95758
1993	0.32091	0.55070	0.12839	112,196,681	278,173,161,000	10,153,615	1.13615	1.10262	1.11926	2.00781	11.26657
1994	0.32687	0.54348	0.12965	115,264,861	298,342,017,323	13,824,365	1.09512	1.08680	1.09095	2.19043	8.70504
1995	0.32725	0.52929	0.14346	119,887,506	334,981,582,000	16,107,677	1.10127	1.09992	1.10060	2.41077	9.58520
1996	0.32214	0.51108	0.16678	125,333,996	363,445,050,000	20,775,150	1.10141	1.10071	1.10106	2.65441	9.62733
1997	0.33194	0.46411	0.20394	131,618,657	387,587,696,669	24,479,958	1.07984	1.08181	1.08083	2.86896	7.77268
1998	0.39239	0.36562	0.24199	136,170,133	407,903,661,000	31,620,187	1.09529	1.09406	1.09467	3.14057	9.04564

Source: Federal Communications Commission, *Statistics of Communication Common Carriers* (various years) and Federal Communications Commission, *Monitoring Reports* (various years)

Table B-4. Total LEC Output Index - 1985-1998

Year	Revenue Share - Local	Revenue Share - Intrastate Toll	Revenue Share - Interstate	Local DEMs (000)	Intrastate DEMS (000)	Interstate Fisher Ideal Chained Output Index	Lapseyres Output Index	Paasche Output index	Fisher Ideal Output Index	Fisher Ideal Chained Output Index	Growth Rate (%)
1985	0.4958	0.2400	0.2642	1,380,145,900	164,191,177	1	1	1	1	1	
1986	0.4968	0.2350	0.2683	1,396,014,000	173,173,536	1.05275	1.03277	1.03229	1.03253	1.03253	3.20079
1987	0.4968	0.2414	0.2618	1,404,776,000	183,597,411	1.13797	1.03898	1.03779	1.03838	1.07216	3.76640
1988	0.4869	0.2498	0.2633	1,469,781,200	191,904,837	1.28546	1.06784	1.06673	1.06729	1.14430	6.51199
1989	0.4947	0.2454	0.2599	1,496,826,800	207,298,177	1.36560	1.04541	1.04429	1.04485	1.19562	4.38736
1990	0.5016	0.2453	0.2530	1,514,588,700	217,913,904	1.53188	1.05008	1.04745	1.04877	1.25393	4.76136
1991	0.5167	0.2341	0.2492	1,512,946,987	219,713,721	1.69013	1.02762	1.02531	1.02647	1.28711	2.61222
1992	0.5266	0.2245	0.2489	1,558,762,543	224,278,538	1.79388	1.03581	1.03567	1.03574	1.33311	3.51156
1993	0.5287	0.2215	0.2497	1,640,600,472	227,540,869	2.00781	1.06059	1.05950	1.06005	1.41316	5.83136
1994	0.5320	0.2136	0.2544	1,719,329,169	235,362,364	2.19043	1.05570	1.05560	1.05565	1.49180	5.41556
1995	0.5506	0.1917	0.2576	1,802,545,593	246,926,539	2.41077	1.06184	1.06151	1.06167	1.58381	5.98474
1996	0.5634	0.1806	0.2560	1,955,027,929	263,719,641	2.65441	1.08566	1.08571	1.08568	1.71951	8.22067
1997	0.5765	0.1671	0.2564	2,179,309,093	273,526,580	2.86896	1.09204	1.09229	1.09217	1.87800	8.81648
1998	0.5853	0.1558	0.2589	2,275,450,746	296,776,339	3.14057	1.06391	1.06307	1.06349	1.99723	6.15546

Source: Federal Communications Commission, *Statistics of Communication Common Carriers* [various years] and Federal Communications Commission, *Monitoring Reports* [various years]

Table B-5. Price of Labor - 1985-1998

Year	Labor Compensation ($)	Number of Employees	ARMIS Salaries+Wages ($000)	ARMIS Benefits ($000)	Ratio	Excess Benefits ($)	Adjusted Labor Compensation ($)	Labor Price (original) ($)	Labor Price (adjusted) ($)	Labor Price Index (original) ($)	Labor Price Index (adjusted) ($)	Labor Price - % Change (original)	Labor Price - % Change (adjusted)
1985	16,991,572,326	504,113					16,991,572,326	33,705.88008	33,705.88008	1.00000	1.00000		
1986	16,728,435,454	482,698					16,728,435,454	34,656.11097	34,656.11097	1.02819	1.02819	2.78018%	2.78018%
1987	16,978,905,847	477,714					16,978,905,847	35,541.98824	35,541.98824	1.05447	1.05447	2.52407%	2.52407%
1988	17,030,359,791	466,827	15,033,849	3,636,033	0.19475	0	17,030,359,791	36,481.09426	36,481.09426	1.08234	1.08234	2.60794%	2.60794%
1989	16,910,850,694	461,149	14,977,589	3,669,768	0.19680	0	16,910,850,694	36,671.12082	36,671.12082	1.08797	1.08797	0.51954%	0.51954%
1990	17,586,868,921	443,105	15,230,268	3,768,099	0.19834	0	17,586,868,921	39,690.07102	39,690.07102	1.17754	1.17754	7.91115%	7.91115%
1991	17,186,211,200	414,457	15,038,534	4,537,703	0.23180	622,455,600	16,563,755,600	41,466.81369	39,964.95559	1.23025	1.18570	4.37924%	0.69019%
1992	17,160,988,000	411,167	14,976,159	4,920,448	0.24730	941,126,600	16,219,861,400	41,737.26977	39,448.35408	1.23828	1.17037	0.65011%	-1.30106%
1993	17,955,026,000	395,639	15,479,969	5,918,883	0.27660	1,639,112,600	16,315,913,400	45,382.34603	41,239.39602	1.34642	1.22351	8.37267%	4.44017%
1994	17,154,284,000	367,196	15,085,400	6,539,928	0.30242	2,214,862,400	14,939,421,600	46,718.96859	40,685.14254	1.38602	1.20706	2.89843%	-1.35310%
1995	16,203,522,000	346,843	15,088,974	5,677,574	0.27340	1,524,264,400	14,679,257,600	46,717.16598	42,322.48481	1.38602	1.25564	0.00042%	3.94555%
1996	18,457,448,000	338,040	15,337,179	5,140,712	0.25104	1,045,133,800	17,412,314,200	54,601.37262	51,509.62667	1.61994	1.52821	15.59473%	19.64502%
1997	17,451,673,000	338,177	15,368,125	4,395,933	0.22253	445,121,400	17,006,551,600	51,605.14464	50,288.90670	1.53104	1.49199	-5.64377%	-2.39842%
1998	18,128,861,000	338,404	15,302,883	4,263,993	0.21792	350,617,800	17,778,243,200	53,571.65104	52,535.55868	1.58939	1.55865	3.73987%	4.37057%

Source: Federal Communications Commission, *Statistics of Communication Common Carriers* (various years) and ARMIS Reports 43-02, Table 1 B

Table B-6. Capital Stock Adjustments and the Average Rate of Depreciation - 1985-1998
(Dollar Amounts shown in 000)

Year	TPIS.BOY A	Capital Additions B	TPIS.EOY C	Capital Retires D=A+B-C	Adjustment Factor E	Adjusted Capital Additions F=B*E	Adjusted TPIS.EOY G=A+F-D	Depreciation Accruals H	Adjusted Depreciation Rate (%) I=H/((A+G)/2)
1985	138,879,365	15,001,998	149,061,793	4,819,570	0.888	13,321,774	147,381,569	10,241,376	7.15527%
1986	149,061,793	14,842,725	159,010,189	4,894,329	0.888	13,180,340	157,347,804	11,826,961	7.71971%
1987	159,010,189	14,138,370	168,505,114	4,643,445	0.888	12,554,873	166,921,617	13,311,655	8.16837%
1988	168,505,114	14,284,742	175,860,216	6,929,640	1	14,284,742	175,860,216	13,134,992	7.62852%
1989	175,860,216	13,283,569	182,978,381	6,165,404	1	13,283,569	182,978,381	13,420,810	7.48014%
1990	182,978,381	14,476,334	187,168,695	10,286,020	1	14,476,334	187,168,695	13,439,933	7.26194%
1991	187,168,695	14,527,049	192,034,545	9,661,199	1	14,527,049	192,034,545	13,200,593	6.96228%
1992	192,034,545	14,611,866	196,411,915	10,234,496	1	14,611,866	196,411,915	13,337,581	6.86714%
1993	196,411,915	14,860,116	203,082,418	8,189,613	1	14,860,116	203,082,418	14,032,782	7.02527%
1994	203,082,418	14,717,999	209,325,562	8,474,855	1	14,717,999	209,325,562	14,863,196	7.20801%
1995	209,325,562	15,374,568	217,430,207	7,269,923	1	15,374,568	217,430,207	15,358,553	7.19782%
1996	217,430,207	18,026,150	227,317,120	8,139,237	1	18,026,150	227,317,120	16,252,281	7.30855%
1997	227,317,120	18,253,199	236,896,179	8,674,140	1	18,253,199	236,896,179	16,667,034	7.18077%
1998	236,896,179	18,553,791	248,970,288	6,479,682	1	18,553,791	248,970,288	17,154,619	7.06145%
								avg[1](85-98)	7.30180%
								var[2](85-98)	0.00111%

[1] avg denotes the arithmetic mean of the series

[2] var denotes the variance of the series.

Source: FCC Form M

Table B-7. Quantity of Capital for 1985-1998 and the Imputed Cost of Capital for 1991
(Dollar amounts shown in 000)

Year	Benchmark Capital Stock	Adjusted Capital Additions	BEA Composite Asset Price Index	Capital Stock Quantity	Capital Stock Quantity Index	Property Income w/ Depreciation	Imputed Cost of Capital
1984				103,903,095			
1985	109,602,959	13,321,774	1	109,602,959	1	23,445,593,794	
1986		13,180,340	1.01048	114,643,584	1.04599	26,792,578,943	
1987		12,554,873	1.02734	118,493,306	1.08111	27,701,751,800	
1988		14,284,742	1.03047	123,703,569	1.12865	26,866,209,000	
1989		13,283,569	1.07018	127,083,465	1.15949	25,845,853,000	
1990		14,476,334	1.08973	131,088,425	1.19603	25,584,541,000	
1991		14,527,049	1.10222	134,696,416	1.22895	24,641,357,000	0.18798
1992		14,611,866	1.10830	138,045,138	1.25950	26,477,135,000	
1993		14,860,116	1.11231	141,325,020	1.28943	26,914,823,000	
1994		14,717,999	1.11766	144,174,284	1.31542	26,366,385,000	
1995		15,374,568	1.11481	147,438,176	1.34520	27,166,096,000	
1996		18,026,150	1.11862	152,787,121	1.39401	30,414,808,000	
1997		18,253,199	1.11764	157,962,762	1.44123	30,679,731,000	
1998		18,553,791	1.11769	163,028,757	1.48745	33,830,949,286	

Source: Federal Communications Commission, *Statistics of Communication Common Carriers* [various years]

Table B-7A. Computation of Competitive LEC Rate of Return

	Moody's Baa return	Competitive Cost of Equity	% Equity	Cost of Debt	Competitive ROR
	a	b	c	d	e
1985	12.72	15.73	0.5934	8.81	12.92%
1986	10.39	13.40	0.5934	8.81	11.53%
1987	10.58	13.59	0.5934	8.81	11.65%
1988	10.83	13.84	0.5934	8.81	11.79%
1989	10.18	13.19	0.5948	8.81	11.42%
1990	10.36	13.37	0.5964	8.82	11.53%
1991	9.80	12.81	0.5959	8.95	11.25%
1992	8.98	11.99	0.5968	8.30	10.50%
1993	7.93	10.94	0.5903	7.88	9.69%
1994	8.62	11.63	0.5774	7.38	9.84%
1995	8.20	11.21	0.5656	7.47	9.59%
1996	8.05	11.06	0.5619	7.14	9.34%
1997	7.86	10.87	0.5599	7.39	9.34%
1998	7.22	10.23	0.5496	7.26	8.89%

Sources: column b for 1989 is the implied cost of equity from the FCC's 11.25 prescription; for the remaining years, it is the 1989 amount adjusted by the change in column a

column c is computed from ARMIS 43-02 and Form M data; 1988 and prior is based on the 1988 data

column d is the cost of debt in the 11.25 prescription for 1989 and prior years, and is the cost of debt from ARMIS after that

column e is the weighted average of columns b and d, where column c is the weight on column b

FROM MCI Reply Comments (1/24/2000)

Table B-8A. Capital Input Price Index (Revised FCC version)

Year	RBOC Return Data ($000) Return A	ANI B	ROR C = A/B	Moody's Baa bond Rate D	Competitive ROR E	Competitive Earnings F = B*E	Earnings Adjustment G = F-A	Tax Adjustment H = .64*G	Property Income w/Depreciation I	Adjusted Property Income J = I+G+H	Capital Stock Quantity K	Imputed Cost of Capital L = J/K	Cost of Capital Index
1985				12.72					23,445,593,794	23,445,593,794	103,903,095		
1986				10.39					26,792,578,943	26,792,578,943	109,602,959	0.22565	1
1987				10.58					27,701,751,800	27,701,751,800	114,643,584	0.24445	1.08333
1988				10.83					26,866,209,000	26,866,209,000	118,493,306	0.24163	1.07084
1989				10.18					25,845,853,000	25,845,853,000	123,703,569	0.22673	1.00480
1990	10,277,946	99,794,449	10.30%	10.36	11.53%	11,506,300	1,228,354	785,341	25,584,541,000	27,598,236,032	127,083,465	0.20893	0.92593
1991	10,050,605	99,131,005	10.14%	9.80	11.25%	11,152,238	1,101,633	704,323	24,641,357,000	26,447,312,840	131,088,425	0.21717	0.96241
1992	11,135,204	99,566,078	11.18%	8.98	10.50%	10,454,438	-680,766	-435,244	26,477,135,000	25,361,125,475	134,696,416	0.20175	0.89410
1993	10,016,139	99,153,787	10.10%	7.93	9.69%	9,608,002	-408,137	-260,940	26,914,823,000	26,245,745,886	138,045,138	0.18828	0.83441
1994	10,620,974	98,219,551	10.81%	8.62	9.84%	9,664,804	-956,170	-611,322	26,366,385,000	24,798,892,899	141,325,020	0.19012	0.84257
1995	10,376,177	95,418,745	10.87%	8.20	9.59%	9,150,658	-1,225,519	-783,529	27,166,096,000	25,157,047,878	144,174,284	0.17547	0.77764
1996	12,171,358	97,648,324	12.46%	8.05	9.34%	9,120,353	-3,051,005	-1,950,642	30,414,808,000	25,413,161,216	147,438,176	0.17449	0.77328
1997	12,880,975	95,159,717	13.54%	7.86	9.34%	8,887,918	-3,993,057	-2,552,938	30,679,731,000	24,133,735,210	152,787,121	0.17236	0.76386
1998	14,175,185	91,891,168	15.43%	7.22	8.89%	8,169,125	-6,006,060	-3,839,940	33,830,949,286	23,984,949,016	157,962,762	0.15796	0.70001
											163,028,757	0.15184	0.67290

Column E from MCI Reply Comments, Table B-7A

Table B-9. Materials Input Quantity - 1985-1998

Year	Materials Price Index A	Adjusted Total Operating Expense ($) B	Depreciation and Amortization Expense ($) C	Adjusted Employee Compensation ($) D	Materials Expense ($) E=B-C-D	Materials Quantity F=E/A	Materials Quantity Index
1985	1.00000	40,953,072,435	10,024,710,656	16,991,572,326	13,936,789,453	13,936,789,453	1.00000
1986	1.03135	42,424,084,849	11,592,001,248	16,728,435,454	14,103,648,147	13,674,938,815	0.98121
1987	1.05353	44,293,127,430	13,316,999,560	16,978,905,847	13,997,222,023	13,286,021,303	0.95331
1988	1.08639	46,809,139,000	13,646,937,000	17,030,359,791	16,131,842,209	14,849,006,812	1.06545
1989	1.12623	48,600,813,000	13,860,101,000	16,910,850,694	17,829,861,306	15,831,456,546	1.13595
1990	1.17203	49,544,744,000	13,931,515,000	17,586,868,921	18,026,360,079	15,380,459,612	1.10359
1991	1.20494	50,278,593,400	13,499,778,000	16,563,755,600	20,215,059,800	16,776,818,597	1.20378
1992	1.23480	49,757,498,400	13,822,882,000	16,219,861,400	19,714,755,000	15,965,949,951	1.14560
1993	1.25535	51,127,522,400	14,244,514,000	16,315,913,400	20,567,095,000	16,383,554,387	1.17556
1994	1.29144	53,702,000,600	15,068,058,000	14,939,421,600	23,694,521,000	18,347,364,957	1.31647
1995	1.32167	55,306,829,600	15,556,284,000	14,679,257,600	25,071,288,000	18,969,400,834	1.36110
1996	1.36140	56,839,360,200	16,377,242,000	17,412,314,200	23,049,804,000	16,930,956,368	1.21484
1997	1.39550	59,284,530,600	16,758,832,000	17,006,551,600	25,519,147,000	18,286,740,953	1.31212
1998	1.43074	60,485,635,200	17,306,863,000	17,778,243,200	25,400,529,000	17,753,482,651	1.27386

Source: Materials price index comes from the Input/Output Tables compiled by the Bureau of Economic Analysis of the U.S. Department of Commerce, depreciation and amortization expense data come from the *Statistics of Communication Common Carriers* , and the other values are derived as detailed in the text.

Table B-10. Factor of Production Shares of Total Payments - 1985-1998
Revised FCC cost of capital index

Year	Adjusted Labor Compensation ($)	Adjusted Property Income w/ Depreciation ($)	Adjusted Material Payments ($)	Adjusted Total Factor Payments ($)	Labor Share	Capital Share	Materials Share	Factor Payments ($) Growth Rate
1985	16,991,572,326	23,445,593,794	13,936,789,453	54,373,955,573	0.31249	0.43119	0.25631	
1986	16,728,435,454	26,792,578,943	14,103,648,147	57,624,662,544	0.29030	0.46495	0.24475	5.80654
1987	16,978,905,847	27,701,751,800	13,997,222,023	58,677,879,670	0.28936	0.47210	0.23854	1.81122
1988	17,030,359,791	26,866,209,000	16,131,842,209	60,028,411,000	0.28370	0.44756	0.26874	2.27551
1989	16,910,850,694	25,845,853,000	17,829,861,306	60,586,565,000	0.27912	0.42659	0.29429	0.92552
1990	17,586,868,921	27,598,236,032	18,026,360,079	63,211,465,032	0.27822	0.43660	0.28518	4.24125
1991	16,563,755,600	26,447,312,840	20,215,059,800	63,226,128,240	0.26198	0.41830	0.31973	0.02319
1992	16,219,861,400	25,361,125,475	19,714,755,000	61,295,741,875	0.26462	0.41375	0.32163	(3.10073)
1993	16,315,913,400	26,245,745,886	20,567,095,000	63,128,754,286	0.25845	0.41575	0.32580	2.94660
1994	14,939,421,600	24,798,892,899	23,694,521,000	63,432,835,499	0.23552	0.39095	0.37354	0.48053
1995	14,679,257,600	25,157,047,878	25,071,288,000	64,907,593,478	0.22616	0.38758	0.38626	2.29830
1996	17,412,314,200	25,413,161,216	23,049,804,000	65,875,279,416	0.26432	0.38578	0.34990	1.47986
1997	17,006,551,600	24,133,735,210	25,519,147,000	66,659,433,810	0.25513	0.36205	0.38283	1.18333
1998	17,778,243,200	23,984,949,016	25,400,529,000	67,163,721,216	0.26470	0.35711	0.37819	0.75367

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

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	Fisher Ideal Chained Input Quantity Index	Growth Rate (%)
1985	0.31249	0.43119	0.25631	504,113	1.00000	1.00000	1	1	1	1	
1986	0.29030	0.46495	0.24475	482,698	1.04599	0.98121	1.00174	1.00289	1.00231	1.00231	0.23097
1987	0.28936	0.47210	0.23854	477,714	1.08111	0.95331	1.00565	1.00536	1.00551	1.00784	0.54947
1988	0.28370	0.44756	0.26874	466,827	1.12865	1.06545	1.04223	1.04223	1.04223	1.05040	4.13623
1989	0.27912	0.42659	0.29429	461,149	1.15949	1.13595	1.02656	1.02687	1.02672	1.07846	2.63658
1990	0.27822	0.43660	0.28518	443,105	1.19603	1.10359	0.99414	0.99369	0.99391	1.07189	-0.61056
1991	0.26198	0.41830	0.31973	414,457	1.22895	1.20378	1.01992	1.02010	1.02001	1.09334	1.98139
1992	0.26462	0.41375	0.32163	411,167	1.25950	1.14560	0.99287	0.99165	0.99226	1.08488	-0.77696
1993	0.25845	0.41575	0.32580	395,639	1.28943	1.17556	1.00825	1.00787	1.00806	1.09363	0.80279
1994	0.23552	0.39095	0.37354	367,196	1.31542	1.31647	1.02885	1.03036	1.02961	1.12600	2.91759
1995	0.22616	0.38758	0.38626	346,843	1.34520	1.36110	1.00846	1.00804	1.00825	1.13529	0.82160
1996	0.26432	0.38578	0.34990	338,040	1.39401	1.21484	0.96681	0.96571	0.96626	1.09699	-3.43192
1997	0.25513	0.36205	0.38283	338,177	1.44123	1.31212	1.04119	1.04205	1.04162	1.14265	4.07769
1998	0.26470	0.35711	0.37819	338,404	1.48745	1.27386	1.00062	0.99991	1.00027	1.14295	0.02667

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

Table B-13. Total LEC Input Price Index - 1985-1998

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	Fisher Ideal Chained Input Price Index	Growth Rate (%)
1985	0.31249	0.43119	0.25631	1.00000	1	1.00000	1	1	1	1	
1986	0.29030	0.46495	0.24475	1.02819	1.08333	1.03135	1.05278	1.05392	1.05335	1.05335	5.19735
1987	0.28936	0.47210	0.23854	1.05447	1.07084	1.05353	1.00733	1.00677	1.00705	1.06077	0.70253
1988	0.28370	0.44756	0.26874	1.08234	1.00480	1.08639	0.98597	0.98621	0.98609	1.04602	-1.40072
1989	0.27912	0.42659	0.29429	1.08797	0.92593	1.12623	0.97620	0.97610	0.97615	1.02107	-2.41383
1990	0.27822	0.43660	0.28518	1.17754	0.96241	1.17203	1.05175	1.05137	1.05156	1.07372	5.02757
1991	0.26198	0.41830	0.31973	1.18570	0.89410	1.20494	0.97894	0.97902	0.97898	1.05115	-2.12395
1992	0.26462	0.41375	0.32163	1.17037	0.83441	1.23480	0.97661	0.97534	0.97598	1.02590	-2.43170
1993	0.25845	0.41575	0.32580	1.22351	0.84257	1.25535	1.02141	1.02102	1.02121	1.04767	2.09920
1994	0.23552	0.39095	0.37354	1.20706	0.77764	1.29144	0.97386	0.97522	0.97454	1.02099	-2.57916
1995	0.22616	0.38758	0.38626	1.25564	0.77328	1.32167	1.01603	1.01564	1.01584	1.03716	1.57111
1996	0.26432	0.38578	0.34990	1.52821	0.76386	1.36140	1.05598	1.05552	1.05575	1.09498	5.42515
1997	0.25513	0.36205	0.38283	1.49199	0.70001	1.39550	0.97025	0.97100	0.97063	1.06282	-2.98123
1998	0.26470	0.35711	0.37819	1.55865	0.67290	1.43074	1.00704	1.00629	1.00666	1.06990	0.66417

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

Table B15. Direct Calculation of the LECs' Price Cap X-Factor (excluding the Consumer Productivity Dividend) - 1985-1998
Based on Revised FCC Cost of Capital Index

Year	U.S. Nonfarm Business Sector TFP Growth Rate (%) A	U.S. Nonfarm Business Sector Input Price Growth Rate (%) B	LECs' Output Growth Rate (%) C	LECs' Adjusted Revenue Growth Rate (%) D	Total Company X factor (%) E=C-D-A+B	LECs' Interstate Output Growth Rate (%) F	LECs' Adjusted Interstate Revenue Growth Rate (%) G	Interstate X factor (%) H=F-G-A+B	GDPPI Growth (new series) I	Interstate X-factor (%) based on new GDPPI J=F-G+I	Interstate X-factor with CPD removed for 1996-98 K=H-1.5
1986	1.10166	2.80830	3.20079	5.80654	-0.89912	5.14068	7.33408	-0.48677	2.2	0.00660	-0.48677
1987	-0.39920	2.53178	3.76640	1.81122	4.88616	7.78433	-0.64393	11.35924	2.9	11.32826	11.35924
1988	0.29955	3.72958	6.51199	2.27551	7.66650	12.18682	2.86308	12.75377	3.4	12.72374	12.75377
1989	0.19920	3.03629	4.38736	0.92552	6.29892	6.04719	-0.38831	9.27259	3.9	10.33550	9.27259
1990	-0.69895	3.30913	4.76136	4.24125	4.52819	11.49069	-4.72041	20.21918	3.9	20.11110	20.21918
1991	-1.41274	2.05824	2.61222	0.02319	6.06000	9.83068	0.42234	12.87932	3.4	12.80834	12.87932
1992	1.61294	2.88104	3.51156	-3.10073	7.88039	5.95758	-2.87753	10.10321	2.2	11.03511	10.10321
1993	0.09995	3.71664	5.83136	2.94660	6.50145	11.26657	-0.44980	15.33307	2.7	14.41637	15.33307
1994	0.39880	3.50341	5.41556	0.48053	8.03964	8.70504	5.71851	6.09114	2.1	5.08653	6.09114
1995	0.29806	1.96268	5.98474	2.29830	5.35106	9.58520	2.80636	8.44346	2.1	8.87884	8.44346
1996	1.47713	1.38258	8.22067	1.47986	6.64626	9.62733	2.28201	7.25077	1.8	9.14533	5.75077
1997	0.39024	1.89887	8.81648	1.18333	9.14177	7.77268	2.35788	6.92342	1.7	7.11479	5.42342
1998	0.59259	0.71810	6.15546	0.75367	5.52730	9.04564	2.90606	6.26508	1.2	7.33957	4.76508
				avg[2](86-98)	5.97143			9.72365		10.02539	9.37750
				var[3](86-98)	5.59574			23.75299		21.64493	26.16740
				avg(91-98)	6.89348			9.16118		9.47811	8.59868
				var(91-98)	1.56219			9.97363		8.47694	13.14257
				avg(86-95)	5.63132			10.59682		10.67304	10.59682
				var(86-95)	6.08842			27.52466		26.07299	27.52466
				avg(91-95)	6.76651			10.57004		10.44504	10.57004
				var(91-95)	1.08690			10.56400		10.57429	10.56400

[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); U.S. Department of Commerce, *Survey of Current Business*, Table 6 (GDP-PI); Table B-4, Table B-11, and Table B-13.