> ... under the price cap plan we adopt today, the need for the beneficial functions served by sharing are outweighed by the benefits of eliminating sharing. First, we consider the X-Factor we adopt today, based on the TFP and input price differential calculations we discuss in Section III and Appendix D, to be a much more reliable measure of incumbent LEC potential productivity gains than the approach we used in the LEC Price Cap Order and the LEC Price Cap Performance Review. Therefore, we have substantially more confidence that the X-Factor we adopt in this Order will flow through a reasonable portion of LEC productivity gains to consumers. *Second, our price cap plan retains the CPD. In light of our significantly increased productivity estimates, we find that the CPD serves an enhanced flow-through function by guaranteeing that access customers receive the first benefits of increased productivity under our no-sharing price cap plan.*[39]

B. Establishing the validity of the Consumer Productivity Dividend.

In the *Remand Further Notice*, the Commission reviews the bases for its original adoption, and subsequent retention, of the CPD:

> 43. In the *LEC Price Cap Order*, the Commission included a CPD of 0.5 percent in the X-Factor offset to ensure that access customers received the first benefits of price caps in the form of reduced rates. This CPD was also included in the X-Factor in subsequent price cap review orders, including the *1997 Price Cap Review Order*, in which it was intended to offset the elimination of sharing requirements. These requirements had compelled price cap LECs to share a portion of their earnings above set percentages with access customers. The sharing requirements were intended to protect consumers against the possibility of an error in the establishment of the X-Factor. Pursuant to the court's remand, the Commission seeks comment on whether to retain the CPD.[40]
>
> 44. In remanding this issue to the Commission, the court specifically questioned the quantification of the CPD.

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[39] *Id.*, at para. 154, (emphasis added).

[40] *Further Notice*, at para. 43, footnotes omitted.

> When the Commission made its decision to include a CPD in the 1997 X-Factor, the record included a study by Strategic Policy Research ("SPR") that addressed the effects of eliminating the sharing requirements. The SPR study found that the LEC price cap plan with sharing requirements produced less than 35 percent of the efficiency incentives of unregulated competition. Those incentives decreased to 18 percent for price cap LECs whose earnings were in the 50-50 sharing category for each year of the four-year review cycle. The results of the SPR study were challenged by the Ad Hoc Telecommunications Users Committee ("Ad Hoc"), but Ad Hoc's own results indicated that sharing substantially reduced efficiency incentives. Ad Hoc's more conservative calculations indicated that elimination of sharing would increase efficiency incentives by at least 17 percent for all LECs, and by 41 percent for LECs in the 50-50 sharing category. We seek comment on the CPD amount justified on the basis of these studies to ensure that the benefits of sharing elimination would be apportioned between LECs and ratepayers. We also seek comment on additional methods for quantifying a CPD designed to ensure that consumers get a reasonable portion of the benefits from the elimination of sharing.[41]

As the Commission correctly explains, the CPD was adopted and is expressly linked to two "incentive-generating" events that have measurable salutary effects on LEC productivity:

- Adoption of price caps regulation vis-a-vis rate of return regulation (the original FCC ILEC price cap plan, which became effective as of July 1, 1991).

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41 *Id.*, at para. 44, footnotes omitted.

- Elimination of earnings sharing and the earnings cap (in the *Fourth Report and Order*, which became effective on and after July 1, 1997).

Both of these policies were adopted and specifically linked to the determination that they would incent more efficient behavior from the LECs. With some eight and a half years of experience, the accuracy of those expectations can be both empirically confirmed and quantified.

1. Adoption of price cap regulation.

The efficiency gains resulting from the original 1991 price cap plan can be measured by comparing LEC productivity for the period immediately prior to the implementation of price cap regulation with that realized by the LECs following adoption of the new incentive regulation system. To do this, Ad Hoc has analyzed LEC productivity for the 1986-1990 period (pre-price caps) and for two alternate post-price caps periods (1991-1995 and 1991-1998). Depending upon the choice of post-price caps time period, productivity gains of between 0.81% and 0.95% can be attributed to the implementation of the original 1991 ILEC price cap system.[42] The efficiency gains resulting from the adoption of the original price cap plan (but not the eliminating of sharing) would be captured in an X-factor calculated over the period 1991-1998, as is Ad Hoc's recommended X-factor result.

2. Projections of increased efficiency under a no-sharing regime.

The Further Notice makes specific reference to 1994 studies conducted by Strategic Policy Research (SPR) and Ad Hoc that addressed the effects of eliminating the sharing requirements and that provide a basis for quantifying the CPD.[43] The SPR study estimated that LECs would enjoy 35% of the efficiency incentives that would exist under a pure price cap plan relative to competitive, unregulated markets, as compared with only 18% of relative efficiency incentives under a price cap plan with 50/50 sharing. (These figures assume a four-year term.) The SPR analysis thus suggested LECs would experience a 17% percentage point increase in relative efficiency incentives (*i.e.*, 35%–18%) in conjunction with the elimination of sharing.[44]

The Ad Hoc study, making appropriate corrections to the SPR study, (to reflect the fact that efficiency gains would only be transitory in competitive markets), estimated that LECs would enjoy 86% of efficiency incentives under a pure price cap plan relative to competitive, unregulated markets, as compared with 69% of relative efficiency incentives under a price cap plan with effective 80/20 sharing, and 45% of relative efficiency incentives under a price cap plan

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42 *See*, Table 1, page 28; *also* Attachment 3, derivation of these figures.

43 *Further Notice* at para. 44.

44 Strategic Policy Research, Regulatory Reform for the Information Age, Providing the Vision, January 11, 1994, App SPR to Southwestern Bell Comments, CC Docket 94-1, Tables 1 and 2 (at 21, 23).

with true 50/50 sharing. (These figures assume a four-year term.) These figures also suggest a 17% increase in relative efficiency incentives for LECs associated with the elimination of sharing under the first sharing scenario, and as much as a 41% increase in efficiency incentives under the second sharing scenario.[45]

However, both the SPR and Ad Hoc studies that are referenced in the *Further Notice*, and that are summarized above, purport to measure increased LEC efficiency incentives relative to an unregulated competitive market benchmark. The results of both analyses tells us only that in the absence of sharing, LECs would theoretically have at least 17% more incentive to be efficient relative to what they would experience operating in a competitive marketplace. Accordingly, the 17% increased efficiency incentive does not directly translate into a comparison of the increased productivity gains LECs would experience with or without sharing.

Other information is needed to perform this translation. The first piece of information is a measure of the efficiency incentives that existed prior to price cap regulation, *i.e.*, under traditional rate of return regulation as practiced by the Commission. The SPR study identifies that percentage to be approximately 14%.[46] Interestingly, this amount is only 4% lower than what SPR identifies as the relative efficiency incentives associated with a price cap plan with sharing [*i.e.*, 18%-14%].

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[45] Reply Comments of the Ad Hoc Telecommunications Users Committee, CC Docket 94-1, June 29, 1994, Table 1, at 16.

[46] SPR Study at 17, 22-23.

The second piece of information that is available is a comparison of actual LEC's productivity performance under rate of return regulation vis-à-vis that under price caps with sharing. As described in the following section (*see* Table 1, page 28), TFP data for the post-divestiture period reveals LEC productivity to be 0.95% higher in the period following introduction of price caps (with sharing) than it was in the prior period under rate of return regulation.

With these pieces of information, one can estimate the increase in LEC productivity associated with the elimination of sharing. The SPR study had determined that efficiency incentives (1) increase by 4% as between RORR and price caps with sharing, and (2) increase by yet another 17% as between price caps with sharing and "pure" price caps without sharing. That is, the jump in efficiency incentives in the second case (price caps with sharing to pure price caps) is 4.25 times the gain in efficiency incentives in the first case (RORR to price caps with sharing). As we have discussed above, the rate of TFP growth increased by 0.95% as between RORR and price caps with sharing (case (1) above); therefore, under an increase in efficiency incentives of 4.25 times that first improvement (case (2) above), one can expect the rate of TFP growth to increase by approximately 4.25 x 0.95, or approximately 4.05% in turn justifying a CPD of that magnitude.

b. Application of the original price cap vs. RORR efficiency gain as a surrogate for the direct measurement of the improvement under the no-sharing regime

The second method that the Committee used to estimate the effect on LEC efficiency of eliminating sharing was to use the measurable effect on LEC productivity associated with the original adoption of price cap regulation as a reasonable approximation of the potential additional efficiency gains associated with the elimination of sharing. These efficiency gains are measured as the observed differential in the X-Factor as between the years preceding and following adoption of price cap regulation. There are again two alternatives for measuring this differential depending on, as discussed above, the choice of either 1995 (the last year in the FCC's original data set) or 1998 (the most recent year for which data is available) as the ending point. In both cases, the starting point is 1986, which is the first year in the FCC's post-divestiture data set. Under this methodology, the X-Factor for the period 1986-1990 is compared against the X-Factor for either the period 1991-1995 or the period 1991-1998, with the difference used to measure the required CPD.

Results for the CPD based upon this method, *i.e.*, the observed productivity differential between pre- and post-price cap periods) and the resulting X-Factor are presented in the table below:[47]

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[47] Attachment 3 to these Comments, provides a more detailed analysis of the resulting X-Factors for the pre- and post- prices cap periods. As noted earlier, the X-Factor results shown here reflect a number of small corrections to the 1999 Staff TFP study. These minor corrections explain any differences between our results and those identified in the FCC study, Appendix B. *See* Attachment 2 for further explanation of the corrections made to the 1999 Staff TFP Study.

Table 1

a Pre-Price Cap Prd	b Pre-Price Cap X	c Post-Price Cap Prd	d** Post-Price Cap X	e=d-b Observed Diff	f=d+e Adj. X
1986-1990	5.33%	1991-1995	6.14%	0.81%	6.94%
1986-1990	5.33%	1991-1998	6.28%	0.95%	7.23%

These empirical results show that the Commission's adopted 0.5% CPD (and the resulting 6.5% X-Factor (with CPD) to be quite conservative. Using the FCC's corrected methodology, the 6.5% no longer represents the "upper bound of the range of reasonableness,"[48] but rather lies significantly below the lower bound. In fact, to the extent that in adopting the "no-sharing" modification to the price cap plan in the *Fourth Report and Order* the Commission considered the quantifications of efficiency gain offered in both the SPR and ETI studies, a substantially larger CPD is warranted.

As explained above, and pursuant to both the SPR and ETI projections, a CPD of as much as 4.0% would have captured all of the salutary effects for ratepayers; a CPD of 2.0% would have captured half of the efficiency gains for ratepayers; a CPD of 0.95% (as supported in the above analysis) would have captured approximately one quarter of the efficiency gains for ratepayers. Continuation of the preexisting 0.5% CPD into the "no-sharing" period represented a highly conservative initiative by the Commission to adopt an alternative mechanism to replace the "flow-through" function of sharing, "which

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[48] *Fourth Report and Order*, at para. 140; *see also Further Notice*, at para. 18.

helped ensure that LEC reductions in unit costs were passed through to their customers."

VI. The Staff Imputed X Study Provides a Valid Alternative Methodology for Estimating the Historical Component of the X-Factor, Particularly Given Past Debate Surrounding the Calculation of an Interstate-Only TFP-based Measure.

In addition to the new 1999 TFP study, the Commission also presents the results of a new staff Imputed X study "[a]s an alternative to either of the TFP methodologies."[49] This new study, as described by the Commission, is "designed to calculate the X Factor that yields the aggregate revenues that would have been generated in a competitive market."[50] As discussed below, the methodology used in the Imputed Study is a particularly useful alternative to the TFP-based methodology in that it provides highly corroborating evidence, but using data - unlike that used in the TFP studies - that is purely interstate in nature.[51]

The Imputed Study is actually comprised of four separate analyses. In the first analysis, the study imposes the remanded 6.5% X-Factor on the price cap LECs' revenues for each year since the inception of price caps in 1991. The study found that had the LECs been operating under a price cap plan with a 6.5% X-Factor over that entire period, the LECs would have achieved an 11.88% rate of return - a figure well in excess of the competitive level.[52] Perhaps more

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49 *Further Notice* at para. 35.

50 *Id.*

51 *See Further Notice* at para 37.

52 *Further Notice*, Appendix C, at 70.

significant in the context of price cap regulation is the implication of this result for LEC prices. Specifically, "[I]f the 6.5% X-Factor had been in effect for the entire price cap period, prices would have been between 10.7 percent and 11.79 percent lower than they actually were in 1998."[53]

In the second analysis, the Imputed Study solves for the X-Factor needed to achieve a 9.65% aggregate rate of return. This particular rate of return was determined to be the competitive rate of return for the price cap LECs in 1995. The X-Factor (as of 1991) needed to achieve that competitive rate of return in 1995 is 7.10%, some 60 basis points higher than the remanded X-Factor.[54] A version of this analysis is also performed without accounting for demand response and including only BOCs. The resulting X-Factor falls to 6.61%, but still in the range of both the remanded X-Factor and the X-Factors estimated in the 1999 TFP study.[55] However, demand response must be considered, and indeed, the failure to do so will bias the resulting X-Factor downward. This is because interstate services are relatively price elastic, which means that any downward change in price will stimulate greater end user demand which in turn will result in additional revenues to offset losses associated with the price decline.[56] Accordingly, properly taking into account demand response, price cap LECs' revenues (and measures of LEC output based on those revenues and

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53 *Id.*, at 68.

54 *Id.*, at 70.

55 *Id.*, at 70-71.

56 *See*, *Further Notice*, Appendix C at 69, footnote 3.

used in the TFP calculation) will not fall as sharply as would superficially be expected in conjunction with a price decrease.

In the third analysis, the Imputed Study solves for the X-Factor that would have needed to be in place since 1991 in order to achieve the competitive aggregate rate of return for price cap LECs in the year 1998, or 8.68%. That X-Factor turns out to be 7.71%.[57] Again, without taking into account demand response (which as noted above is not proper) and limiting the calculation to RBOCs only, the corresponding X-Factor result is 6.97%.[58] As in the previous analysis, even this result falls well above the remanded X-Factor.

Finally, in the fourth analysis, the Imputed Study solves for the X-Factor that achieves the goal of producing the previous year's actual aggregate pre-sharing rate of return. The study finds that in each year the X-Factor would have to be larger than the previous year's X-Factor in order to maintain the previous year's rate of return.[59] Specifically, the required X-Factors rise from 5.5% in 1995 to 8.51% in 1998.[60]

VII. The Staff Imputed X Study Results Validate the Results of the TFP Studies and the Inclusion of a CPD in the X-Factor Calculation.

The various analyses comprising the Imputed Study provide important evidence in support of the notion of an increasing trend in LEC interstate

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57 *Further Notice* Appendix C, at 70.

58 *Id.*

59 *Id.*, at 71.

60 *Id.*, at 71.

productivity. This increasing trend in turn provides strong corroborating support for the upper bound of the range of X-Factor results produced in the TFP studies. In particular, the increase in required X-Factors from 5.5% to 8.51% as demonstrated in the fourth analysis provides strong indication of a continuous growth in productivity by the price cap LECs. Price cap LECs are not only becoming generally more productive each year,[61] but the rate at which productivity gains are occurring has also been generally increasing over time. The Imputed Study concludes, and Ad Hoc concurs, that this finding "suggests that an X-Factor based on an average over the period is likely to underestimate the rate of productivity growth."[62]

Moreover, the results of the Imputed Study also suggest that the remanded X-Factor, which is based upon a TFP result of 6.0 and a 0.5% CPD, is very conservative. Moreover, the resulting rate of return given the remanded 6.5% X-Factor was found to be above the target competitive rate of return such that any claims of confiscation would not be supportable. In addition, the X-Factors estimated in the Imputed Study as being required to achieve a competitive rate of return were higher than those estimated by the 1999 TFP study, such that Commission reliance on the 1999 TFP Study using the post-price cap period would still be conservative. LECs would still be allowed to

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[61] As noted in the Imputed study, the upward trend in productivity, while pronounced, is not monotonic. However, given the complex relationships, the multitude of variables involved, the imperfect nature of available reporting systems, and the focus of the analysis on changes in the data series, year to year variation in the results, including changes in direction, is not surprising.

[62] *Further Notice,* Appendix C, at 71.

achieve rates of return higher than associated with a target competitive return to capital.

VIII. The Imputed Study Offers Many Advantages relative to the Previously Considered Historical Revenue Approach as well as the TFP-based Studies, Most Prominent Among which is the Use of Interstate-Only Data.

While the Imputed Study follows the same rationale as the Historical Revenue Approach or Direct Model previously presented by AT&T and rejected by the Commission,[63] important modifications to the previous model have been made that address the shortcomings of the older model. Specifically, the Imputed Study takes account of the demand stimulation that would occur as price caps are lowered and of the changes to the competitive return to capital.[64]

The Imputed Study offers other specific advantages over the TFP-based studies as well, many of which have been outlined in the Further Notice. First, from an empirical perspective, the Imputed Study relies upon readily available data, and is "computationally simple and easily understandable."[65] Moreover, the imputed model includes all price cap carriers, not just the RBOCs, as is the case with the TFP studies.[66]

In addition, and most significantly, the Imputed Study uses data that reflects the interstate portion of each ILEC's operations, thus correctly modeling that portion of ILEC businesses over which the FCC has regulatory oversight.[67]

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63 *Fourth Report and Order*, at para. 22.

64 *Further Notice*, at para 38.

65 *Id.*, at para. 35.

66 *Id.*, at par. 37.

67 *Id.*, at para. 38.

Throughout the Commission's price cap investigations, Ad Hoc has consistently argued the merits of relying upon interstate-only data.[68]

Finally, as noted in the Further Notice, the imputed method "should have the same incentive effects as the TFP approach or any other method of calculating an X-Factor."[69] For the reasons discussed above, the Imputed Study provides an excellent source of corroborating evidence to be used in conjunction with the results of the total company TFP-based methodology in setting the X-Factor.

IX. The Determination of the Competitive Cost of Capital in the Imputed Study Should Be Consistent With the Cost of Capital Used in the TFP Study and Should Be Based Upon Publicly Available Data.

As identified above, the competitive cost of capital is a critical component of two out of the four analyses performed in the Imputed Study. Specifically, in those two analyses, the study solved for the X-Factor that is required to achieve a pre-determined competitive rate of return for a particular year in the price cap period. The competitive rate of return relied upon in these two analyses is derived by applying an index of bond rates, in particular, the Moody's Baa corporate bond rate, to the rate of return used by the Commission to initialize rates at the inception of price caps.[70]

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68 *Further Notice*, at para. 38. Ad Hoc has stated its opposition to the use of a total company X-Factor on previous occasions. *See*, Reply Comments of The Ad Hoc Telecommunications Users Committee, dated Sept. 2, 1997, regarding CC Docket No. 94-1, *In the Matter of Price Cap Performance Review for Local Exchange Carriers*, Also, Ad Hoc Comments, (1996).

69 *Further Notice,* at para. 35.

70 *Id.,* at para. 40.

This methodology is the same as that used in the 1999 TFP Study to develop a cost of capital input consistent with the level that would be achieved in a competitive market (in order to correct the cited cost of capital anomaly). Ad Hoc believes that consistency between the two methodologies is essential, since the fundamental objective of identifying a competitive cost of capital is the same.

In addition, it is imperative that the calculation of a competitive cost of capital be consistent with the Commission's previously established criteria requiring the calculation of the X-Factor to be "reasonably simple and based on accessible and verifiable data."[71] Compliance with this essential requirement places inherent limitations on the methodologies that can be relied upon by the Commission in calculating a competitive cost of capital, since much of the data that could otherwise be relied upon to calculate relevant trends in the competitive cost of capital would involve proprietary data sources and calculations.

Thus, while Ad Hoc agrees in principle that a method of calculating the cost of capital that takes into account the mix of debt and equity held by the price cap ILECs may yield a more accurate estimate of the trend in the cost of capital, as suggested in the Further Notice at para. 40, Ad Hoc also believes that it may be difficult to find an alternative methodology that satisfies the Commission's criterion of being "reasonably simple and based upon accessible and verifiable data." Ad Hoc has strongly endorsed this criterion in the past as being

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[71] *Fourth Further Notice*, at para. 16.

fundamental to the success of a permanent price cap plan,[72] and continues to do so.

X. Use Of The 1999 Staff Study As The Basis For Represcribing The X-Factor Does Not Eliminate The Need To Include Q And G Factors In The Price Cap Formulae On A Going-Forward Basis, Nor Does It Require Adjustments For Double-Counting.

The Commission seeks comment on how the proposed changes to the price cap index formulae set forth in the *Pricing Flexibility Order*, specifically those relating to the so-called g and q factors, are affected by the changes in methodology incorporated in the new staff X-Factor studies. In particular, the Commission inquires whether the "[t]he staff studies attached herein...may capture in their X-Factor estimates some or all of the effect intended to be captured by the q factor," whether "a q factor is necessary if an X-Factor is adopted that captures its effect," and "how to remove any double counting that might result from the application of both factors."[73]

In Ad Hoc's view, the changes reflected in the new staff studies would not diminish the need to include either a full g or a q factor in the PCI formulation on a going-forward basis. This is because the conditions underlying those factors, namely, growth in demand beyond the LECs' control and growth of traffic sensitive revenue in relation to associated non-traffic sensitive costs will continue to exist on a going-forward basis. If the TFP was recalculated at very frequent (if

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72 *Ad Hoc Comments (1996)*, Attachment: *Establishing the X-Factor for the FCC Long-term LEC Price Cap Plan*, at 5-13.

73 *Further Notice* at 49.

not real time) intervals, then these dynamic conditions could theoretically be captured in the TFP analysis on a going- forward basis. However, this is simply not the case under the Commission's price cap plan. Under the Commission's plan, the TFP once calculated, remains fixed until the next review period. Review periods have been rather infrequent over the course of the LEC price cap plan.

The methodology reflected in the staff studies corrects for a number of errors in the underlying TFP methodology, primarily those relating to the calculation of the cost of capital and the local output index. Those corrections, in and of themselves, do not correct for the dynamic conditions underlying the proposed g and q factors. Accordingly, it is not apparent that specific adjustments to remove double counting are required.

CONCLUSION

In view of the foregoing, Ad Hoc urges the Commission to represcribe an X-Factor of at least 7.23%. This level would still give price cap LECs enormous profit incentives. Indeed, an X-Factor as high as 10.33% would be fully defensible given the price cap LECs' accelerating productivity rate. Lowering, or retaining, the current 6.5% X-Factor would unjustly enrich price cap LECs and probably would produce higher rates for consumers.

Respectfully requested,

James S. Blaszak
Levine, Blaszak, Block & Boothby, LLP
2001 L Street, NW
Suite 900
Washington, DC 20036
(202) 857-2550

Counsel for
The Ad Hoc Telecommunications
Users Committee

Lee L. Selwyn
Patricia Kravtin
Economics and Technology, Inc.
One Washington Mall
Boston, MA 02108-2617
(617) 227-0900

Economic Consultants

January 7, 2000

Certificate of Service

I, Suzanne Takata hereby certify that a true and correct copy of the preceding Comments of the Ad Hoc Telecommunications Committee ("Ad Hoc Committee Comments") in CC Docket No. 94-1 were filed this, the 7th day of January 2000, via hand delivery to the following party. A diskette containing the preceding Ad Hoc Committee Comments formatted in Microsoft Word 5.0 were also served on the party listed below.

Suzanne Takata

ITS
1231 20th Street, NW
Washington, DC 20036

Attachment 1

Attachment 1

Total Company X-Factor Results Calculated Using Alternative Competitive Cost of Capital Indices

Base Case

Year	Moody's Baa Rate Index	Annual Change[1] 1991 = 0	Competitive Cost of Capital	Competitive Cost of Capital Index		U.S. Nonfarm Business Sector TFP Growth Rate	LECs' Output Growth Rate	LECs' Input Growth Rate	LECs' TFP Growth Rate	LECs' TFP Differential	U.S. Nonfarm Business Sector Input Price Growth Rate	LECs' Input Price Growth Rate	Input Price Differential	X-Factor
	A	B	C	D		E	F	G	H	I = +H-E	J	K	L = +J-K	M = +I+L
1985	12.72	-2.33	0.21718	1.00000		-	-	-	-	-	-	-	-	-
1986	10.39	0.19	0.19388	0.89271		1.10166	3.20079	-3.47804	6.67883	5.57716	2.80830	-3.15211	5.96041	11.53757
1987	10.58	0.25	0.19578	0.90146		-0.39920	3.76640	0.58715	3.17925	3.57845	2.53178	1.76258	0.76920	4.34765
1988	10.83	-0.65	0.19828	0.91297		0.29955	6.51199	5.73034	0.78165	0.48210	3.72958	2.14707	1.58251	2.06461
1989	10.18	0.18	0.19178	0.88304		0.19920	4.38736	3.61526	0.77210	0.57290	3.03629	-0.22463	3.26091	3.83381
1990	10.36	-0.56	0.19358	0.89133		-0.69895	4.76136	0.01899	4.74237	5.44133	3.30913	3.88344	-0.57432	4.86701
1991	9.80	0	0.18798	0.86555		-1.41274	2.61222	2.60077	0.01144	1.42418	2.05824	-0.13437	2.19261	3.61679
1992	8.98	-0.82	0.17978	0.82779		1.61294	3.51156	-2.30555	5.81711	4.20417	2.88104	-1.36727	4.24830	8.45248
1993	7.93	-1.05	0.16928	0.77944		0.09995	5.83136	1.61153	4.21982	4.11987	3.71664	-0.64768	4.36432	8.48419
1994	8.62	0.69	0.17618	0.81121		0.39880	5.41556	2.67569	2.73987	2.34107	3.50341	2.22171	1.28171	3.62277
1995	8.20	-0.42	0.17198	0.79187		0.29806	5.98474	0.29912	5.68562	5.38756	1.96268	0.84015	1.12253	6.51009
1996	8.05	-0.15	0.17048	0.78497		1.47713	8.22067	-5.26234	13.48301	12.00588	1.38258	5.65415	-4.27157	7.73431
1997	7.86	-0.19	0.16858	0.77622		0.39024	9.46129	4.48479	4.97650	4.58626	1.89887	-0.22680	2.12567	6.71193
1998	7.22	-0.64	0.16218	0.74675		0.59259	4.94338	-0.53574	5.47913	4.88653	0.71810	0.49561	0.22249	5.10902
Avg. (91-98)										**4.86944**			**1.41076**	**6.28020**

Notes:

Following 1999 Staff Study methodology, the competitive cost of capital index is calculated as follows: For years 1985-1990, the change in the rate index is calculated by subtracting the current year's rate index from the next year's rate index. For years 1992-1998, the change in the rate index is calculated by subtracting the last year's rate index from the current year's rate index. The competitive cost of capital is then calculated for years 1985 - 1990 by subtracting the change in the rate index from the next year competitive cost of capital. For years 1992 - 1998, the change in the rate index is added to the previous year competitive cost of capital. The derived cost of capital index is then used to calculate a revised Property Income w/ Depreciation Series (see table 9, workpaper 1), used in the calculation of TFP.

Sources of displayed data are provided in underlying TFP study work papers, separately available

Attachment 1

Alternative 1

Year	Moody's Aaa Rate Index	Annual Change 1991 = 0	Competitive Cost of Capital	Competitive Cost of Capital Index		U.S. Nonfarm Business Sector TFP Growth Rate	LECs' Output Growth Rate	LECs' Input Growth Rate	LECs' TFP Growth Rate	LECs' TFP Differential	U.S. Nonfarm Business Sector Input Price Growth Rate	LECs' Input Price Growth Rate	Input Price Differential	X-Factor
	A	B	C	D		E	F	G	H	I = +H-E	J	K	L = +J-K	M = +I+L
1985	11.37	-2.35	0.21398	1.00000										
1986	9.02	0.36	0.19048	0.89017		1.10166	3.20079	-3.56490	6.76569	5.66403	2.80830	-3.23259	6.04089	11.70492
1987	9.38	0.33	0.19408	0.90700		-0.39920	3.76640	0.71564	3.05076	3.44996	2.53178	2.15114	0.38064	3.83060
1988	9.71	-0.45	0.19738	0.92242		0.29955	6.51199	5.80904	0.70295	0.40340	3.72958	2.32776	1.40182	1.80522
1989	9.26	0.06	0.19288	0.90139		0.19920	4.38736	3.78196	0.60540	0.40620	3.03629	0.20434	2.83195	3.23815
1990	9.32	-0.55	0.19348	0.90419		-0.69895	4.76136	-0.07801	4.83937	5.53832	3.30913	3.62347	-0.31435	5.22397
1991	8.77	0	0.18798	0.87849		-1.41274	2.61222	2.60916	0.00306	1.41579	2.05824	-0.11321	2.17145	3.58725
1992	8.14	-0.63	0.18168	0.84905		1.61294	3.51156	-2.13062	5.64218	4.02925	2.88104	-0.94401	3.82504	7.85429
1993	7.22	-0.92	0.17248	0.80605		0.09995	5.83136	1.72914	4.10221	4.00226	3.71664	-0.34357	4.06021	8.06247
1994	7.96	0.74	0.17988	0.84064		0.39880	5.41556	2.70472	2.71085	2.31204	3.50341	2.31886	1.18455	3.49659
1995	7.59	-0.37	0.17618	0.82334		0.29806	5.98474	0.35752	5.62722	5.32916	1.96268	0.94920	1.01348	6.34264
1996	7.37	-0.22	0.17398	0.81306		1.47713	8.22067	-5.23155	13.45222	11.97509	1.38258	5.43688	-4.05430	7.92079
1997	7.26	-0.11	0.17288	0.80792		0.39024	9.46129	4.53394	4.92735	4.53711	1.89887	-0.03276	1.93163	6.46874
1998	6.53	-0.73	0.16558	0.77381		0.59259	4.94338	-0.57929	5.52267	4.93007	0.71810	0.29007	0.42803	5.35811
Avg. (91-98)										**4.81635**			**1.32001**	**6.13636**

Notes:

Following 1999 Staff Study methodology, the competitive cost of capital index is calculated as follows: For years 1985-1990, the change in the rate index is calculated by subtracting the current year's rate index from the next year's rate index. For years 1992-1998, the change in the rate index is calculated by subtracting the last year's rate index from the current year's rate index. The competitive cost of capital is then calculated for years 1985 - 1990 by subtracting the change in the rate index from the next year competitive cost of capital. For years 1992 - 1998, the change in the rate index is added to the previous year competitive cost of capital. The derived cost of capital index is then used to calculate a revised Property Income w/ Depreciation Series (see table 9, Workpaper 2), used in the calculation of TFP.

Sources of displayed data are provided in underlying TFP study work papers, separately available

Attachment 1

Alternative 2

Year	10-Year U.S. Treasury Securities Rate Index	Annual Change 1991 = 0	Competitive Cost of Capital	Competitive Cost of Capital Index		U.S. Nonfarm Business Sector TFP Growth Rate	LECs' Output Growth Rate	LECs' Input Growth Rate	LECs' TFP Growth Rate	LECs' TFP Differential	U.S. Nonfarm Business Sector Input Price Growth Rate	LECs' Input Price Growth Rate	Input Price Differential	X-Factor
	A	B	C	D		E	F	G	H	I = +H-E	J	K	L = +J-K	M = +I+L
1985	10.62	-2.94	0.21558	1.00000										
1986	7.68	0.71	0.18618	0.86362		1.10166	3.20079	-4.08015	7.28094	6.17928	2.80830	-4.48887	7.29716	13.47644
1987	8.39	0.46	0.19328	0.89656		-0.39920	3.76640	1.00397	2.76243	3.16163	2.53178	2.95078	-0.41900	2.74263
1988	8.85	-0.36	0.19788	0.91789		0.29955	6.51199	5.92165	0.59034	0.29079	3.72958	2.61391	1.11567	1.40646
1989	8.49	0.06	0.19428	0.90119		0.19920	4.38736	3.85231	0.53505	0.33584	3.03629	0.39894	2.63735	2.97319
1990	8.55	-0.69	0.19488	0.90398		-0.69895	4.76136	-0.06996	4.83132	5.53027	3.30913	3.61312	-0.30400	5.22628
1991	7.86	0	0.18798	0.87197		-1.41274	2.61222	2.49197	0.12025	1.53299	2.05824	-0.40889	2.46713	4.00011
1992	7.01	-0.85	0.17948	0.83254		1.61294	3.51156	-2.33327	5.84483	4.23189	2.88104	-1.43432	4.31536	8.54725
1993	5.87	-1.14	0.16808	0.77966		0.09995	5.83136	1.53023	4.30112	4.20117	3.71664	-0.85684	4.57348	8.77465
1994	7.09	1.22	0.18028	0.83625		0.39880	5.41556	3.13751	2.27805	1.87925	3.50341	3.41588	0.08753	1.96678
1995	6.57	-0.52	0.17508	0.81213		0.29806	5.98474	0.22576	5.75898	5.46091	1.96268	0.61500	1.34768	6.80859
1996	6.44	-0.13	0.17378	0.80610		1.47713	8.22067	-5.16769	13.38836	11.91122	1.38258	5.65085	-4.26827	7.64295
1997	6.35	-0.09	0.17288	0.80193		0.39024	9.46129	4.55234	4.90896	4.51871	1.89887	0.01268	1.88619	6.40490
1998	5.26	-1.09	0.16198	0.75136		0.59259	4.94338	-0.92391	5.86729	5.27470	0.71810	-0.54951	1.26762	6.54231
Avg. (91-98)										**4.87636**			**1.45959**	**6.33594**

Notes:

Following 1999 Staff Study methodology, the competitive cost of capital index is calculated as follows: For years 1985-1990, the change in the rate index is calculated by subtracting the current year's rate index from the next year's rate index. For years 1992-1998, the change in the rate index is calculated by subtracting the last year's rate index from the current year's rate index. The competitive cost of capital is then calculated for years 1985 - 1990 by subtracting the change in the rate index from the next year competitive cost of capital. For years 1992 - 1998, the change in the rate index is added to the previous year competitive cost of capital. The derived cost of capital index is then used to calculate a revised Property Income w/ Depreciation Series (see table 9, Workpaper 3), used in the calculation of TFP.

Sources of displayed data are provided in underlying TFP study work papers, separately available

Attachment 1

Alternative 3

Year	30-Year U.S. Treasury Securities Rate Index	Annual Change 1991 = 0	Competitive Cost of Capital	Competitive Cost of Capital Index		U.S. Nonfarm Business Sector TFP Growth Rate	LECs' Output Growth Rate	LECs' Input Growth Rate	LECs' TFP Growth Rate	LECs' TFP Differential	U.S. Nonfarm Business Sector Input Price Growth Rate	LECs' Input Price Growth Rate	Input Price Differential	X-Factor
	A	B	C	D		E	F	G	H	I = +H-E	J	K	L = +J-K	M = +I+L
1985	10.79	-3.01	0.21448	1.00000										
1986	7.78	0.81	0.18438	0.85966		1.10166	3.20079	-4.17194	7.37272	6.27106	2.80830	-4.65949	7.46779	13.73885
1987	8.59	0.37	0.19248	0.89742		-0.39920	3.76640	1.08368	2.68272	3.08192	2.53178	3.18624	-0.65446	2.42746
1988	8.96	-0.51	0.19618	0.91468		0.29955	6.51199	5.85481	0.65718	0.35763	3.72958	2.42222	1.30736	1.66499
1989	8.45	0.16	0.19108	0.89090		0.19920	4.38736	3.73898	0.64838	0.44918	3.03629	0.07156	2.96473	3.41390
1990	8.61	-0.47	0.19268	0.89836		-0.69895	4.76136	-0.00210	4.76346	5.46242	3.30913	3.84721	-0.53809	4.92433
1991	8.14	0	0.18798	0.87644		-1.41274	2.61222	2.67634	-0.06413	1.34861	2.05824	0.05629	2.00195	3.35056
1992	7.67	-0.47	0.18328	0.85453		1.61294	3.51156	-1.98414	5.49571	3.88277	2.88104	-0.58951	3.47054	7.35331
1993	6.59	-1.08	0.17248	0.80417		0.09995	5.83136	1.58823	4.24313	4.14318	3.71664	-0.70391	4.42055	8.56373
1994	7.37	0.78	0.18028	0.84054		0.39880	5.41556	2.73892	2.67664	2.27784	3.50341	2.40789	1.09552	3.37336
1995	6.88	-0.49	0.17538	0.81769		0.29806	5.98474	0.25245	5.73229	5.43423	1.96268	0.68189	1.28079	6.71501
1996	6.71	-0.17	0.17368	0.80977		1.47713	8.22067	-5.20060	13.42127	11.94414	1.38258	5.55846	-4.17588	7.76826
1997	6.61	-0.10	0.17268	0.80511		0.39024	9.46129	4.54431	4.91699	4.52674	1.89887	-0.01049	1.90936	6.43610
1998	5.58	-1.03	0.16238	0.75708		0.59259	4.94338	-0.86836	5.81174	5.21915	0.71810	-0.40962	1.12772	6.34686
Avg. (91-98)										**4.84708**			**1.39132**	**6.23840**

Notes:

Following 1999 Staff Study methodology, the competitive cost of capital index is calculated as follows: For years 1985-1990, the change in the rate index is calculated by subtracting the current year's rate index from the next year's rate index. For years 1992-1998, the change in the rate index is calculated by subtracting the last year's rate index from the current year's rate index. The competitive cost of capital is then calculated for years 1985 - 1990 by subtracting the change in the rate index from the next year competitive cost of capital. For years 1992 - 1998, the change in the rate index is added to the previous year competitive cost of capital. The derived cost of capital index is then used to calculate a revised Property Income w/ Depreciation Series (see table 9, Workpaper 4), used in the calculation of TFP.

Sources of displayed data are provided in underlying TFP study work papers, separately available