continues to stimulate and to accelerate network usage growth.[20] And because this incremental usage can be supported at extremely low incremental cost, overall LEC productivity is significantly enhanced.

(d) *Competition, if it occurs as NRF LECs predict, will also work to constrain prices and stimulate greater overall efficiency than has occurred in the past.* Finally, the very competition about which the NRF LECs express so much concern will work to stimulate further demand growth and efficiency gains. This has certainly been the case with respect to the competitive long distance market: As previously noted, since the onset of serious competition following the divestiture and the initiation of "equal access" to LEC networks, AT&T's absolute growth in demand for inter-exchange services more than offset the absolute loss of traffic to competitors, and the average price of interexchange carrier service, per minute of use, has decreased by a greater amount than the decline in per-minute switched access rates that has occurred since the inception of the FCC's access charge regime in 1984.

Elimination of sharing requires a higher X factor than would be indicated where sharing of excess earnings is retained.

Q. Why is it necessary to make an upward adjustment in the X factor when sharing is eliminated?

A. Recall from our earlier discussion that there are three components to the X factor — the LEC productivity growth rate, the LEC input price differential, and the consumer

20. For example, a recent article in *The New York Times* cites the rapid growth of "telephone banking" in Great Britain and predicts similar development in the US. "500,000 Clients, No Branches — Phone Banking Catches On," *The New York Times*, September 3, 1995, p. F-1. As more and more formerly "face-to-face" transactions are converted to telephonic and data interactions, demand growth for LEC services can reasonably be expected to exceed historic levels.

dividend. If sharing is eliminated, the consumer dividend component should be increased so as to capture for consumers a portion of the potential efficiency gains that would otherwise be subject to sharing on an ongoing basis.

Q. Is there precedent for this type of adjustment?

A. Yes, there is. In its initial LEC price cap system adopted in CC Docket 87-313, the FCC offered LECs the option of accepting greater sharing with a lower X factor, or less sharing with a higher X factor. Specifically, the FCC offered two alternative X factor/sharing combinations:[21]

X factor	Sharing obligation
3.3%	50/50 beginning at 12.25% ROR, 100% above 16.25%
4.3%	50/50 beginning at 13.25% ROR, 100% above 17.25%

Again in its price cap review decision in CC Docket 94-1, the FCC once again presented LECs with the choice of progressively less sharing in exchange for progressively higher offset factors. Here, the Commission offered LECs three alternative combinations of X factors and sharing requirements:[22]

X factor	Sharing obligation
4.0%	50/50 sharing above 12.25% ROR, 100% sharing above 13.25%
4.7%	50/50 sharing above 12.25% ROR, 100% sharing above 16.25%
5.3%	No sharing, no earnings cap

21. FCC CC Docket No. 87-313, *Second Report and Order*, October 4, 1990 (LEC Price Cap order), at paras. 123-126.

22. FCC CC Docket 94-1, *First Report and Order*, released April 7, 1995, at paras. 220-222.

In offering these options, the FCC has specifically and consistently tied the level of the X factor to the degree of sharing to which the price cap LEC would be subject.

> Sharing requirements can be established so as to dissuade carriers from selecting options lower than their own actual X factors. Although we would prefer in the long-term to find some other method of encouraging each LEC towards the highest X factor, and thus the lowest rates, it can sustain, the record to date in this proceeding is insufficient to enable us to determine whether any substitute would have the same efficacy. We will, therefore, set the sharing zones in our interim plan so as to provide incentives for carriers to select appropriate X factors. As noted above, we seek to structure sharing zones to provide for greater rate reductions and to move carriers toward a pure price cap option.[23]

Q. Should this same principle be applied in the Commission's current review of the NRF?

A. Yes. If sharing is eliminated on an optional basis as it is in the FCC system, LECs electing the "no-sharing" option should be required to accept a higher overall X factor; if sharing is eliminated outright, then the X factor should be increased to reflect that modification to the prevailing price cap regime.

Q. What adjustment should be made to the X factor in the event that sharing is eliminated, either optionally or outright?

A. In this testimony, I am making several recommendations for modification to the X factor to reflect current productivity conditions and the less-than-inflationary increases in LEC input prices that have been experienced during the post-divestiture period. Separate and apart from those adjustment, which I discuss below, if sharing is eliminated either optionally or outright, an additional change is required. The present NRF sharing scheme is similar to the lowest X factor option (4.0%) in the FCC's revision, whereas the no-sharing option in the FCC plan requires an X factor of 5.3%. That relationship represents

23. *Id.*, para. 219.

the *bare minimum* differential, and nothing less should be applied here. I would note that the FCC did not make any other adjustments to account for the elimination of sharing, such as rate base revaluation or rate level reinitialization, which the CPUC should do. However, elimination of sharing should, at the very least, be compensated by increasing the X factor by no less than 1.3 percentage points.

MODIFYING THE NRF TO REFLECT PRODUCTIVITY GROWTH AND INPUT PRICE TRENDS

The X factor formula must include the post-divestiture LEC productivity growth *plus* a LEC input price differential *plus* an appropriate "stretch factor," in order to mirror the efficiency incentives found in competitive markets and to ensure ratepayer protections.

Q. Dr. Selwyn, does the present NRF rate adjustment mechanism — i.e., the X factor — accurately capture the forward-looking productivity and cost conditions that the NRF LECs will confront in the future?

A. No, it does not. The present NRF is producing excessive earnings for both LECs by failing to adequately capture the input price and productivity growth conditions that they each confront. Accordingly, several important adjustments should be made to the X factor (in addition to those related to the possible elimination of sharing) in order to correct for these shortcomings.

As I have discussed, the fundamental objective of the NRF price adjustment mechanism is to reflect the efficiency incentives found in competitive markets and to ensure ratepayer protections against excessive prices and monopolistic practices where price-constraining competition is not yet present. As such, it is critical that the X factor formula include an appropriate representation of all of the attributes of a competitive marketplace, namely:

1. the ***productivity growth rate*** for local exchange carriers, reflecting the fact that historically LECs have experienced higher than average growth in productivity relative to the economy as a whole, that has resulted in lower than average telephone price increases — and even decreases — relative to economy-wide inflation rates;

2. the *differential between the economy-wide inflation rate GDP-PI and the rate of price changes in LEC inputs*, reflecting the fact that in the period since divestiture (when fundamental changes occurred in the structure of the LEC industry) LEC input prices are rising at a consistently slower rate than overall economy-wide price changes as reflected in the GDP-PI; and

3. a *"stretch factor"* or "consumer dividend" that confers some portion of the efficiency gains expressly attributable to incentive regulation upon LEC ratepayers, and that compensates consumers for accepting the risks commensurate with the level of sharing/earnings constraint that is incorporated into the rate adjustment mechanism.

Q. What is the relevant time frame for measuring the various components of the X factor?

A. Ideally, the X factor should be based upon *forward-looking* price and productivity trends, not long-term historical conditions. To the extent that such forecasts may be difficult to obtain, only the most recent period, i.e., the post-divestiture time frame (1984-forward), should be used in estimating productivity growth rates and input price differentials. The use of longer-term input price relationships — which has been advocated by the two NRF LECs and by other LECs as well — presents a misleading indication of *current* conditions in the input factor markets and is fundamentally inconsistent with recent productivity studies commissioned by the LECs in connection with FCC and state price cap proceedings.

This Commission should adopt the use of an input price differential based upon post-divestiture experience in setting the X factor, as the FCC did in its 1994 price caps review.

Q. What do you mean by the term "input price differential" as used in the development of the X factor?

A. As I have stated, the "input price differential" represents the difference between the economy-wide inflation rate GDP-PI and the rate of price changes in LEC inputs. As I have noted, LEC input prices are rising at a consistently slower rate than overall economy-wide price changes as reflected in the GDP-PI.

Q. Didn't this Commission explicitly reject the notion of an input-price differential in D.94-06-011?

A. In D.94-06-011, the Commission did reject inclusion of an input-price differential in the calculation of the productivity adjustment. However, its rejection of an input price differential in that case was explicitly tied to the Commission's rejection of the use of "California LEC specific cost changes" in determining the productivity adjustment.[24] The input price differential adopted by the FCC subsequent to D.94-06-11, and which I am recommending be used now by this Commission, does not involve California company-specific data. As discussed above, the input price differential is based upon the very same national industry-wide input price data developed and applied by Dr. Christensen in the studies prepared for USTA to measure LEC productivity growth for use in the X-factor in a price cap regime not substantially different from the one under examination here.

Q. Has additional research and analysis been undertaken on the subject of LEC productivity and the determination of the X factor since the 1992 California NRF review proceeding?

24. D.94-06-011, at 12-14.

A. Yes. In February, 1994, the FCC initiated the first review of its LEC Price Caps system, which went into effect for Tier 1 LECs in January, 1991.[25] In May, 1994, the United States Telephone Association (USTA), the trade group that represents the local exchange carrier industry, submitted a study of LEC productivity undertaken by Dr. Laurits Christensen and his firm, Christensen Associates.[26] USTA's (and the LECs') positions with respect to the X factor for the FCC price cap review proceeding were based upon the Christensen study.

Q. Does the FCC agree that it is appropriate to incorporate an input price differential into a TFP-based X factor?

A. Yes, it does. Based on the record in CC Docket 94-1, the FCC concluded that it is appropriate to incorporate the same post-divestiture input price data into a TFP-based X factor as was used in the development of the TFP itself, and indeed reflected such an input price differential in its "no sharing" X factor option of 5.3%. As recognized by the FCC:

> If the trend in LEC input costs is consistent with the performance of the national economy as a whole, that trend should be reflected in the GNP-PI factor used to adjust PCIs annually. ***But, if the inflation factor does not accurately reflect changes in the carrier's input costs, an X Factor based on productivity changes***

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25. FCC ***Notice of Proposed Rule Making***, CC Docket 94-1, released February 16, 1994. I participated extensively in both the original LEC price cap proceeding, CC Docket 87-313, and in the 1994 review proceeding, CC Docket 94-1, on behalf of the Ad Hoc Telecommunications Users Committee.

26. L. Christensen, P. Schoech, and M. Meitzen, "Productivity of the Local Operating Telephone Companies Subject to Price Cap Regulation," Christensen Associates, submitted as Attachment 6 to the *Comments of the United States Telephone Association*, FCC CC Docket 94-1, May 9, 1994 ("Christensen May 1994 Study" or "Christensen Study").

> *alone will not capture the full extent of the differences between changes in LEC unit costs and the economy-wide inflation adjustment.*[27]

Q. Does the FCC specifically address the appropriateness of using a short-run (i.e., post-divestiture) versus long-run (e.g., 30-40 year) input price differential?

A. Yes. FCC Common Carrier Bureau economists C. Anthony Bush and Mark Uretsky analyzed the issue of relying on short-run (post-divestiture) versus long-run data to forecast the future trend in LEC input prices quantitatively. The results of their analysis are incorporated into the FCC's Price Cap Review decision[28] at Appendix F, which I have reproduced as Appendix 2 to my testimony.

Q. What did the Bush/Uretsky analysis conclude with respect to the input price issue?

A. Bush/Uretsky performed an econometric analysis to test whether the post-divestiture period differed to a statistically significant extent from the pre-divestiture period with respect to LEC input prices. Based upon numerous statistical tests of the data, they (and the FCC) concluded that pre-divestiture input price conditions should be discarded and that the X factor should include an input price adjustment derived from Christensen's TFP data for the same period as Christensen's measure of LEC TFP:

> Based on these considerations, we believe that an input price differential based on long-run, pre-divestiture data is not a reasonable basis on which to calculate the input price differential for the post-divestiture period. *We believe that the input price differential for the post-divestiture period should be calculated using*

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27. *In the Matter of Price Cap Performance Review for Local Exchange Carriers*, FCC CC Docket No. 94-1, *First Report and Order*, Released April 7, 1995 (FCC Price Cap Review decision), paras. 160-161 (emphasis supplied).

28. C. Anthony Bush and Mark Uretsky, "Input Prices and Total Factor Productivity," *Id.*, Appendix F. This document is reproduced as Appendix 2 to my testimony.

> *post-divestiture data. In particular, we believe that the input price differential for the 1984-1990 period should be based on data from that period.*[29]

Bush/Uretsky also addressed and dismissed USTA's assertions that short-run (i.e., post-divestiture) measures of the input price differential are inaccurate and therefore should not be relied upon in calculating the X factor. They concluded:

> Based on the record before us, we have no reason to conclude that the measurement problem that NERA describes affects the calculation of input price differential for the 1984-1990 period.
>
> In summary, USTA's economic consultants' descriptions of problems in measuring changes in post-divestiture input prices fails to convince us that the problems are serious enough to warrant rejection of the measurements for use in calculating an X factor.[30]

Q. What time period was relied upon by the LECs in the Christensen/USTA productivity studies?

A. Dr. Christensen confined his study to the post-divestiture period (1984-1992) and thus produced *post-divestiture* productivity results. However, in transforming the TFP results from this post-divestiture study into an X factor, USTA relied upon *long-term* input price trends.

Q. Do you agree with the choice of the post-divestiture time period for analyzing LEC TFP?

A. Yes. Fundamental industry changes took place at the time of the break-up of the former Bell System rendering pre-divestiture experience largely non-comparable to conditions in the post-divestiture period. For the post-divestiture period 1984 to 1992, the Christensen

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29. *Id.*, Appendix F, at 14 (emphasis supplied).

30. *Id.*, Appendix F, at 11.

study indicates a nationwide LEC Total Factor Productivity ("TFP") growth rate of 2.6%. TFP represents the difference between rate of output quantity growth and the rate of input quantity growth.[31]

Q. Did Dr. Christensen also develop input price data for this same post-divestiture period?

A. Yes. Dr. Christensen also developed and applied input price data in his productivity study, which also spanned only the post-divestiture period. For the same 1984 to 1992 period, the Christensen Study indicates LEC input prices grew at an annual rate of only 1.1% as compared with the much larger annual GDP-PI growth rate of 3.7%, as was illustrated in Figure 4 on page 29.[32] The input price differential, i.e, the difference between the rate of growth of LEC input prices and the annual changes in GDP-PI, is 2.6%.[33]

Q. Did USTA apply the 2.6% input price differential based on the input price data developed in the Christensen study for the post-divestiture period when it presented its X factor proposal to the FCC?

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31. See "An Empirical Estimate of the LEC Price Cap 'X Factor' based upon Historic National LEC Productivity and Input Price Trends," by Dr. Lee L. Selwyn and Dr. David J. Roddy ("ETI Study"), prepared for the Ad Hoc Telecommunications Users Committee, June 1994, Table 5, p. 8 (citing Christensen May 1994 Study and Christensen June 1994 Data), reproduced as Appendix 3 to this testimony.

32. See Appendix 3 *infra*, ETI Study, Table 7, at 10.

33. It is purely a coincidence that the productivity rate and the input price differential for the period 1984 to 1992 take on the same value of 2.6%. Put another way, the nominal 1.1% annual increase in LEC input prices translates into an annual decrease in the real price of LEC inputs of 2.6%.

A. No, it did not. USTA and its economic consultants[34] reject outright the use of an input price differential based upon the post-divesture experience, despite the irrefutable facts that (1) Dr. Christensen's own study develops and incorporates the very same post-divestiture LEC input price data in the calculation of the LEC TFP for that same period,[35] and (2) LEC input price data for the post-divestiture period shows a clear pattern of input price growth that is much smaller than the annual GDP-PI growth rate.

Q. Do Christensen and NERA dispute the incorporation of input price effects in the development of the X factor?

A. No, they do not. They argue, however, that economy-wide input price growth, rather than post-divestiture LEC-specific input price growth, should be utilized.

Q. What is the basis for this contention?

A. Christensen and NERA argue that the short-run differential between LEC and economy-wide input prices that has occurred during the post-divestiture period is anomalous and should be ignored. They contend that the X factor should incorporate the long-run difference between LEC and economy-wide input prices, which they claim to be zero.[36] And since, in their view, the long-run measure of the input price differential is zero, their

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34. USTA relied upon the same consultants that Pacific Bell has used or is using in California — Dr. William Taylor of NERA (who appeared as a witness in A.92-05-004) and Dr. Christensen (who is appearing as a witness in the present proceeding).

35. Indeed, had Dr. Christensen applied the same long-term input price data in his productivity study as he contends should be applied to the calculation of the input price differential, he would have calculated a substantially greater (by the magnitude of the post-divestiture input price differential) productivity growth rate for LECs during the post-divestiture period. See Appendix 3, *infra*, Technical Appendix, p.18.

36. See USTA *Ex Parte* Filing to the FCC in CC Docket 94-1 dated February 1, 1995, at 9-10.

calculation of the X factor implicitly uses the *differential* TFP, i.e., the difference between LEC TFP growth and economy-wide TFP growth, as a means of reflecting economy-wide input price growth.[37] Rather than recognizing LEC input price growth as *below* the economy-wide inflation rate, these formulaic machinations have the effect of setting LEC input prices *above* the economy-wide inflation rate.[38]

Q. Do you agree with this approach?

A. No, I do not. The LEC input price differential (vis-a-vis GDP-PI) should be incorporated into the X factor on the basis of post-divestiture conditions and not long-term historical experience, *just as it was in the Christensen TFP study.*

Q. Can you explain further the basis for your position?

A. In competitive markets, any differential in the cost of industry inputs vis-a-vis the economy-wide inflation rate will be flowed through in the price of the industry's outputs in addition to any productivity gains being experienced in the industry, *and even if there are no other productivity gains.* While the effects of productivity and input prices

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37. *Id.*

38. USTA's economic consultants asserted the proper measure of the X factor over the 1984-1992 period was 1.7%, or the difference between the LEC TFP growth of 2.6% and US economy-wide TFP growth of 0.9. This construct assumes (without proof) that LEC inputs do not benefit from economy-wide productivity growth, and are therefore experiencing price growth that exceeds GDP-PI by the aggregate economy-wide productivity growth rate. In other words, if GDP-PI, which is a measure of *output* price growth, is increasing at an average of 3.7% annually, and as a measure of *output price* growth reflects the economy-wide productivity growth rate of 0.9%, then economy-wide input prices must (they reason) be growing at 3.7% *plus* 0.9%, or 4.6%. In fact, LEC input prices are growing at only 1.1%; therefore, the Christensen/NERA "analysis" has the effect of understating combined LEC and supplier productivity growth by some 3.5%. See Appendix 3, *infra*, at 12; Appendix 2, *infra*, at 5.

operate in similar ways in competitive markets, they are distinct components and their respective impacts on the price of a firm's product are cumulative.[39]

In the price cap system, input price changes are supposed to be captured through the use of an external inflation index, such as the GDP-PI, which is then offset to capture LEC productivity gains reflective of historical experience. However, because the GDP-PI is a measure of *output* price changes and not input price changes, the GDP-PI must be converted into an input price index.

In the case of the telecommunications industry, LEC input prices are growing far more slowly than input prices confronting the overall economy. Accordingly, the appropriate way to capture LEC input price changes is by including an input price differential in the X-factor formula. Failure to capture the appropriate input price differential in the X-factor creates a windfall gain for the NRF LECs in the amount of that differential, something that could not occur in a competitive market.[40]

The phenomenon of slower growth in input prices in the telecommunications industry is due, in part, to the substantial productivity and technological gains being experienced in those segments of the telecommunications industry that supply equipment and other capital resources to the LECs as well as to the capital intensiveness of the local exchange telephone business and telecommunications generally. The telecommunications equipment market has become highly competitive in the post-divestiture environment,

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39. See Appendix 3, *infra*, ETI Study at 5-7; also Appendix 2, *infra*, Bush/Uretsky Analysis, at 1.

40. Note also that in a competitive market the relevant time frame for reflecting any input price effects is clearly the short run. If the price of grapefruits falls due to seasonal supply effects, that condition is reflected and repeated at all supermarkets, because each knows that if it doesn't lower the retail price, its competitors will. For this purpose, the long term trend in the price of grapefruits — or of any other input — is essentially immaterial.

since the MFJ's "manufacturing restriction" was imposed and Bell Operating Companies could no longer purchase inputs internally, but instead had to acquire inputs at arm's length prices from outside suppliers. Hence, pre-divestiture input price data is not comparable to post-divestiture input price data. The Christensen/NERA argument that there is no long-term differential between LEC input prices and GDP-PI is based upon 30-40 year trends, not upon data limited to the post-divestiture period.

It is important to note that all parties in the FCC price cap review, including USTA and its economic consultants, Christensen and NERA, agree with the fundamental principles that in competitive markets changes in output prices reflect changes in input prices as well as changes in TFP, and that in order to replicate the results of a competitive market, the X factor must reflect input price changes as well as TFP changes.[41] The problem with USTA and its consultants, however, is that having conceded these basic principles, they go on to argue unconvincingly that the X factor should ignore post-divestiture measurements of LEC input price changes.

Q. As I understand it, part of your concern with the Christensen study stems from its use of post-divestiture input price data and the seemingly inconsistent USTA reliance upon *long-term* input price trends in transforming the TFP results into the X factor. What if the Christensen study had also relied upon the same long-term input price relationship that USTA and its economic consultants claim is relevant for the TFP-to-X factor conversion?

41. See Appendix 2, *infra*, Bush/Uretsky Analysis at 1.

A. Interestingly, had Christensen used the economy-wide input price growth rate in his TFP study, the resulting estimate would have been considerably greater than the 2.6% value he reported. Here's why.

Recall that TFP represents the growth in output quantities relative to the growth in input quantities. Slightly simplifying for purposes of discussion, if output quantity grows by 6% while input quantity grows by 2%, TFP growth is 4%. That is, it takes only a 2% increase in inputs to produce a 6% increase in outputs.

Now, because firms like LECs utilize numerous inputs and produce numerous outputs, a direct measurement of the respective *quantities* is typically not possible. Instead, these quantities are developed by dividing the change in the *monetary* (total dollar expenditures) amounts by a price index. Thus, to determine the change in output quantity, one takes year-over-year dollar sales and divides that value by the corresponding year-over-year change in LEC output prices. Similarly, to determine the change in input quantity, one takes year-over-year expenditures on inputs (capital, labor, materials) and divides that value by the corresponding year-over-year change in LEC input prices. This is the reason that Christensen must develop an input price index in order to perform his TFP calculations.

All other things being equal, if the growth in input quantity is reduced while holding the growth in output quantity constant, the TFP would be increased. Thus, if in the above example, inputs remained unchanged (growth = 0%) while outputs grew at 6% as before, TFP would be calculated as 6%. If Christensen had used the long-term LEC input price

relationship that USTA posits in his TFP calculations, he would have shown lower input quantity growth than had actually taken place. This is because the same *dollar expenditure on inputs* would now be deflated by a higher input price inflation rate than had actually occurred during the relevant post-divestiture period, implying slower overall input quantity growth. This, in turn, would have resulted in a higher TFP estimate, because the same increase in LEC output quantity would have been accomplished over a (now smaller) increase in LEC input quantities.

Q. Can you estimate the magnitude of this effect?

A. Yes. Roughly speaking, had Christensen used long-term input price series *consistently* in both his TFP study and in the X factor calculation, the TFP result would have been roughly 5.5% — virtually the same as the combined effect of TFP and short-run LEC input price changes that I believe should be used in developing the X factor. Appendix 4 to my testimony explains and summarizes these calculations. The FCC came to the same conclusion in its analysis. The problem is that by applying inconsistent input price relationships, Dr. Christensen and USTA are "cherry-picking" parameters to maximize the LECs' financial gains, not to produce an economically valid result.

Recent "updates" and "corrections" to the original Christensen study do not remedy any of its deficiencies, and in fact contain numerous unexplained modifications to the original data upon which the earlier study had relied.

Q. Dr. Selwyn, shortly before the FCC's Price Caps review decision was issued, USTA submitted a modified proposal that would permit LECs to set the X factor in a substan-

tially different manner. In its decision, the FCC indicated that it would seek further comments on USTA's proposal. Are you familiar with USTA's submission?

A. Yes. Very near the end of the FCC proceeding, USTA submitted a proposal to the FCC which would permit LECs the option of setting the X factor as an annually adjusted moving average.[42] The FCC did not adopt or even examine this plan, but did indicate that it will seek further comments on the USTA proposal in a Further Notice of Proposed Rulemaking (FNPRM) that would be issued later.[43]

Q. Do you have an opinion on the USTA "moving average" proposal?

A. Yes, I do. Significantly, the USTA moving average proposal does nothing to address or correct the *fundamental deficiency* inherent in the original USTA position. USTA continues to maintain, incorrectly, that post-divestiture LEC input prices should not be used in calculating the X factor, but fails to provide any compelling explanation for that position or to justify its self-serving and inconsistent use of economy-wide input price movements. Thus, separate and apart from the USTA proposal to replace the fixed X-factor with one restated annually based upon five-year moving average LEC and economy-wide TFPs, the methodology that USTA uses to calculate the X-factor is still incorrect.

Moreover, just two days prior to the January 18, 1995 date of its *ex parte* filing, USTA received from Dr. Christensen a *totally revised* LEC TFP study, cited by USTA in Note (1) at Attachment 1, page 4 of its January 18 submission.[44] The new January, 1995

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42. See USTA *Ex Parte* Filing to the FCC in CC Docket 94-1 dated January 18, 1995.

43. FCC CC Docket No. 94-1 Price Cap Review decision, para. 154.

44. The January 16, 1995 Christensen Study that was cited in USTA's January 18, 1995 *ex parte* filing in CC Docket 94-1 was transmitted to the FCC on January 20, 1995.

Christensen study appears to constitute a major revision of the earlier work, including pervasive and significant modifications to the underlying historical data for the same 1984-1992 time period included in the original study. Based upon information provided by Pacific Bell in response to a DRA data request,[45] and confirmed in Pacific Bell's September 5, 1995 response to a CCLTC data request,[46] Pacific is planning to sponsor the "revised" Christensen study in the present CPUC proceeding.

Q. Should the revised Christensen study be accepted as offered?

A. No, it should not. The January, 1995 study appears to mysteriously narrow the gap between LEC and economy-wide input price growth rates for the 1984-1992 time period.[47] However, since an increase in LEC TFP (which would normally follow from an increase in LEC input prices) would be contrary to USTA's financial interests, the new study appears also to incorporate other revisions whose effect is to leave the overall LEC TFP result essentially unchanged, even though the study and/or the underlying data upon which it was based have been radically altered. Thus, there appear to be a number of serious flaws in the revised data used by Christensen.

First, "corrections" and "updates" filed with the FCC in January have never been adequately explained or justified. Second, some of the data provided to the FCC in January reveals serious and unexplained anomalies that appear to overstate input price growth and hence understate the input price differential. For example, as "corrected" in

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45. See Memorandum dated August 24, 1995 from Martin G. Lyons/Hassan Mirza (DRA) to Dennis Evans (Pacific Bell), re: DR HM001: Christensen Study Update/Explanations.

46. Pacific Bell Response to CCLTC First Set of Information Requests, Request II (Part A).

47. Specifically, the input price growth rate in the 1994 study was 1.1% (i.e., GDP-PI minus 2.6%), whereas the corresponding figure from the 1995 study was 2.2% (i.e., GDP-PI minus 1.5%). (Annual GDP-PI growth for the 1984-92 period was 3.7%.)

the January *ex parte* filing, the Telephone Price Index (TPI) for Bell Atlantic's Central Office Equipment (COE) increased by 49% from the 1984 base year to 1992, while the COE TPI for Southwestern Bell and the LEC composite decreased by 9.3% and 7.3%, respectively over that same period. In CCLTC's First Set of Information Requests, CCLTC asked Pacific Bell to provide an explanation of this and other apparent anomalies; however, Pacific Bell declined to do so.[48]

Q. Taking into account the three components of the X factor formula you have identified above, what X factor are you recommending be adopted by the Commission as part of this NRF review?

A. My recommendation to the Commission is that the X factor be increased to at least 5.7% to reflect the combination of

(a) 2.6% TFP growth;
(b) 2.6% input price differential vis-a-vis GDP-PI; plus
(c) a 0.5% consumer productivity dividend.

As described above, both the 2.6% productivity factor growth and the 2.6% input price differential are derived directly from Christensen studies prepared for USTA and submitted in the FCC's Price Cap proceeding.[49] The 0.5% stretch factor is based on the

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48. See Pacific Bell's Response dated September 5, 1995 to CCLTC First Set of Information Requests, Requests Nos. VI, VII, IX, and X.

49. The FCC expressly rejected the development of an *interstate-only* X factor, relying instead on "total company" results. Because interstate demand growth is considerably greater than intrastate growth, it is likely that were separate productivity growth rate calculations made for intrastate and interstate services, the latter would be considerably greater. Thus, unless the state commission adopts the same kind of "total company" X factor as the FCC, price cap LECs will realize a windfall, because they would be subject to a total company

(continued...)

Commission's finding in D.94-06-11.[50] My recommendation for a 5.7% X factor assumes no change in the present sharing arrangement, i.e., sharing beginning at 150 basis points above the market-based rate of return. As I discuss earlier in my testimony, in the absence of sharing, the X factor would have to be increased by a minimum of 1.3%, bringing the total composite X factor to 7.0%. Any value below 5.7% with sharing (7.0% without sharing) would constitute a transfer of wealth form ratepayers to LECs, undermining the policy of price cap regulation.

Pacific's ability to operate under an X factor greater than the 5% currently in effect in California is confirmed by its election of 5.3% in the interstate jurisdiction.

Q. Is there reason for the Commission to expect that an X factor higher than the current 5% would be reasonable for ratepayers and achievable by the NRF LECs?

A. Yes, indeed. In the interstate jurisdiction, when given the choice of X factors ranging from 4.0% to 5.3%, Pacific Bell elected to accept the higher X factor option in order to

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49. (...continued)
offset in the interstate jurisdiction (where a jurisdiction-specific factor would be greater), while in the state they would be subject to a jurisdiction-specific X factor where the total company value would be greater.

50. See CPUC D.94-06-11, at 42, citing D.89-10-031 at 229. 33 CPUC 2d 43, 158.

> As clearly articulated by the Commission in adopting a 50 basis point stretch factor in D. 94-06-11:
>
> > Contrary to Pacific's assertion, the "stretch factor" was not a one-time feature. As we declared in the Phase II decision, some amount of stretching is integral to our view that in order 'to maintain strong efficiency incentives and to protect ratepayers" the productivity adjustment should be a goal "to strive for rather than merely a reflection of past achievements or even a simple continuation of more recent trends."

obtain the no-sharing, no-earnings-constraint capability. GTEC, however, elected the 4.0%, maximum sharing option.

Q. What can be inferred about Pacific's earnings expectations based upon its FCC X factor election?

A. In the May 9 filing required by the FCC's April 7, 1995 *First Report and Order* in CC Docket 94-1, Pacific (along with four other RBHCs[51] and a number of the GTE operating companies,[52] which file separately) elected the 5.3% X factor, no sharing, no earnings cap option. Pacific's acceptance of the 5.3% X factor option reveals an expectation that the Company anticipates interstate earnings in excess of a 14.55% ROI. This can be determined deductively as follows:

- Pacific's net interstate rate base is approximately $2.5-billion. Its interstate revenues are approximately $1.76-billion.

- The difference between the 4.7% and 5.3% X factor options, 0.6%, translates roughly into a revenue differential of $10.5-million. By giving up $10.5-million in revenue, Pacific gains the right to unlimited earnings.

51. The RBHCs electing the 5.3% X factor were Ameritech, Bell Atlantic, BellSouth, and Southwestern Bell.

52. GTE-California elected the 4.0% option.

- The effective earnings "cap" under the 4.7% X factor option is 14.25%.[53] If Pacific were to earn 16.25% under this option, it would be required to return in the form of a sharing credit 200 out of the 400 basis points of earnings in excess of 12.25%. Earnings in excess of 16.25% would be refunded in their entirety.

- The "give-up" of the $10.5-million in revenues constitutes a before-tax decrease in realized rate of return of approximately 0.4%, or about 0.3% on an after-tax basis. If Pacific's net after-tax interstate earnings *with the 4.7% X factor* are expected to exceed 14.55% ROR, the Company should elect the 5.3%, no sharing, no earnings cap option, as it has done.

- In fact, it is likely that Pacific's earnings expectations are even greater than this "break-even" level, because by electing the no-sharing option, Pacific gives up, in addition to some $10.5-million in earnings, the "low end" protection against a severe and sustained earnings shortfall that comes along with the sharing obligation. Also, it should be recognized that Pacific's action brings with it the risk that its federal election may be cited as support for a higher *Intrastate* X factor, as in fact I have just done here. It is thus unlikely that Pacific would have elected the 5.3% X factor if the financial gains therefrom are merely marginal.

If Pacific had expected its interstate ROR to fall below or even slightly above 14.55%, it would have been financially better off electing the 4.7%, rather than the 5.3% option.

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53. Under the 4.7% option, LECs are required to share half of their earnings between 12.25% and 16.25%, and 100% of earnings in excess of 16.25%. If actual earnings (before sharing) were 16.25%, the LEC would be required to return 200 basis points as a sharing credit. Hence, the effect of this structure is to cap earnings at 200 basis points below the 16.25% level, i.e., at 14.25%.

Consequently, one can infer that Pacific's expectations are for its earnings to be at least 14.55%.[54]

The New Regulatory Framework as it presently exists has achieved its goals and, except for the increase in the X factor that is required to capture the effects of falling real input costs and growing productivity, the basic structure of the NRF should be retained.

Q. What is your overall recommendation with respect to revisions to the NRF?

A. As I have shown, the current X factor of 5% — and the even lower values that were adopted as part of the GTEC settlement — are too small to sufficiently capture the less-than-inflationary input cost growth and the substantial productivity gains that can be expected in the future, and should be increased to at least 5.7% under the present NRF structure. If the Commission determines that sharing and earnings limits should be eliminated either optionally or in general, a further increase in the X factor by not less than an additional 1.3% is required to avoid creating a windfall for the LECs and to assure adequate participation by monopoly services ratepayers in the gains that the NRF LECs have achieved and will continue to realize from exploitation of the network resources whose acquisition was largely underwritten by monopoly ratepayers under RORR. The NRF as it is presently constituted can and will accommodate the development of local competition while at the same time continuing to protect ratepayers where competition is not yet present and/or effective. As such, no fundamental change in the overall structure and operation of the NRF is either required or appropriate at the present time.

Q. Does this conclude your direct testimony at this time?

A. Yes, it does.

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54. Note also that the election is for one year only; therefore, it is not necessary to consider multi-year effects in making this calculation.

Appendix 1