

1 **4. General Problems with Approach and Inputs**

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3 *Inflation Factors*

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5 **Q. Please discuss Issue AF-0001, regarding the inflation factors included in SWBT's cost**
6 **estimates. Are these factors appropriate?**

7 A. No. SWBT has used inflation factors to extend selected elements of certain studies for several
8 years beyond the basic time frame used in developing the cost study. This does not appear to
9 be a pervasive problem with all of SWBT's studies; however, where inflation factors were
10 used, it doesn't appear that SWBT has adequately considered the offsetting benefits of
11 productivity gains.

12 The telecommunications industry has not experienced substantial upward pressure on
13 costs per unit of service provided to customers, because increases in the cost of inputs (e.g.,
14 wages) have generally been offset by increasing economies of scale and density, as well as the
15 benefits of technological change and other factors that have served to increase productivity
16 within the industry. SWBT proposes to make upward adjustments to its cost studies for
17 inflation without recognizing the offsetting benefits of increased productivity.

18 Productivity is usually described as the ratio of output to a given level of input. Gains (or
19 losses) in productivity are generally measured by the degree to which output is affected by a
20 unit change in a given input (e.g., labor, capital, or other productive resource). Thus, for
21 example, labor productivity is said to be improving if workers take fewer hours to generate the
22 same output.

23 Numerous different factors affect a firm's productivity. Some of the most significant and
24 most interesting factors include technological improvements; shifts from high to low cost inputs;
25 and increased economies of density and scale.

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Q. How do technological improvements affect a firm's productivity?

A. Simply stated, technological advances enable a firm to produce more output per unit of input. In the telecommunications industry, we have seen an explosion of technological improvements as the industry has evolved away from analog technology into digital technology. There have been tremendous improvements in the areas of fiber optic cables, digital multiplexing and transmission systems, operations support computers, digital cross connect systems, digital central office switches, and more. Not only have the prices of these items been declining, as they are increasingly utilized by carriers, their impact becomes more significant. All of these technologies allow the Company to generate more output, (e.g., minutes of use and numbers of access lines in use), per unit of input (e.g., hours of employee time expended).

Q. How is productivity influenced by shifts from one input to another?

A. As certain inputs become cheaper, or increase in price at a slower rate than other inputs, a firm is able to utilize more of the cheaper input, and less of the costly input, while still producing the same level of output. For example, phone companies have been able to gradually reduce their reliance on costly main-frame computers, and increase their use of less costly personal computers and workstations. Furthermore, they have been able to increase their reliance on computers, while reducing their use of costly labor. Unit labor requirements for clerical and related office staff, as well as operators, continue to decline, as computers are increasingly used to perform functions previously handled by employees, or to assist those employees in handling their jobs more quickly and accurately.

1 **Q. You mentioned economies of density and scale. Do you have any evidence that**
2 **average costs per unit of output decline as a telecommunications network expands?**

3 A. Yes. In the course of my work in other jurisdictions, I have developed economic cost estimates
4 that demonstrate this phenomenon, and the trend is clearly downward. Thus, as the firm
5 expands, it will tend to experience a downward trend in its average cost per loop. Switching
6 costs evidence a somewhat similar pattern of declining costs with increased usage volume.
7 However, the rate of decline is not necessarily as rapid.

8 This pattern of declining costs demonstrates that the Company is operating in a
9 declining cost industry. Even if its input prices are increasing, its costs may not be increasing
10 because the uptrend in input costs tends to be offset by the benefits of economies of density and
11 scale, which increase over time, as the total size of the market expands. In the context of this
12 proceeding this is significant, because the cost studies are developed based upon a current (or
13 relatively recent historic) level of output, yet the UNE rates are likely to be charged for several
14 years into the future. Over that future time period, output volumes will increase, and thus the
15 cost per unit (e.g. per minute or per loop) will decline.

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17 **Q. Have any studies been performed to measure changes in productivity in the**
18 **telecommunications industry?**

19 A. Yes. The most extensive studies have been performed for and filed in various federal
20 telecommunications proceedings. Early studies were performed and filed in United States v.
21 AT&T, 552 F. Supp. 131 (D.D.C. 1982). According to the FCC, each of these studies
22 indicated that “the telecommunications industry is a most productive sector of the economy”. [In the Matter of Policy and Rules Concerning Rates for Dominant Carriers, Report and order,
23 April 17, 1989, Docket No. 87-313, FCC 89-91, para. 200]. In concluding that its price cap
24 formula for dominant carriers should include a productivity offset adjustment, the FCC cited
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1 three studies from United States v. AT&T which measured the productivity of Bell companies
2 in the U.S. The first study found that Bell System productivity from 1947 to 1978 was 2.1 %
3 greater than the economy as a whole, and 3.0 % greater from 1966 to 1978. [Id.]. Another
4 study concluded that from 1972 to 1978, the differential was 3.9 %. [Id.]. The third study cited
5 by the FCC found that from 1947 to 1976, productivity within the Bell System increased
6 annually an average of 4.09 %. [Id., para. 201]. Based on these long term studies, the FCC
7 tentatively concluded in 1989 that 2.5 % was the best estimate of LEC productivity. The FCC
8 also tentatively concluded that the productivity offset should include a .5 % “Consumer
9 Productivity Dividend”. [Id., para. 693].

10 In 1990, the FCC considered, in addition to the previous long term studies, an analysis
11 performed by the FCC staff concerning LEC productivity from 1984 and 1989. As mentioned
12 earlier, the FCC concluded that the offset should be increased to either 3.3 % or 4.3 %
13 depending upon the level of profit sharing an LEC chooses. [In the Matter of Policy and Rules
14 Concerning Rates for Dominant Carriers, Second Report and Order, September 19, 1989,
15 Docket No. 87-313, FCC 89-91, para. 74].

16 In 1994, the FCC initiated a docket to review LEC performance under the price cap
17 rules established in 1990. [In re: Price Cap Performance Review for Local Exchange Carriers,
18 CC Docket No. 94-1, FCC 95-132.]. In this docket, the FCC considered several recent
19 studies regarding LEC productivity. The first study, known as the “Christensen” study, was
20 performed for United States Telephone Association (USTA). This study concluded that from
21 1984 to 1992, LEC productivity growth averaged 2.6 % per year. [Id., First Report and
22 Order, p. 50]. The second study, performed by National Economic Research Associates, Inc.
23 (NERA), also on behalf of USTA, essentially reaffirmed the Christensen study. However,
24 several parties commenting on the USTA studies, and using USTA data, concluded the

1 productivity offset should be significantly higher than 2.6 %, with recommendations ranging
2 from 5.0 % to 5.9 %. [Id., para. 102].

3 AT&T submitted its "Direct Model" for estimating LEC productivity, and concluded
4 that LECs achieved an average X-Factor of 5.97 % under price caps. After including
5 additional data, AT&T revised its X-Factor to 5.54 %. [Id., p.61]. AT&T also performed
6 another study to calculate Regional Bell Operating Company (RBOC) productivity, using the
7 method used by the Commission in the original price cap proceeding. Based on its calculations,
8 AT&T asserted that from 1991 to 1993, RBOCs achieved an annual X-Factor of 6.96 %.
9 [Id., p. 62]. Several other parties submitted reports and studies, with X-Factor
10 recommendations ranging from 1.7 % to 5.9 %. [Id., p. 64]. As mentioned earlier, after
11 evaluating this array of evidence, the FCC concluded that a range of 4.0 % to 5.3 % would be
12 appropriate for the X-factor, depending upon the extent of profit sharing if any, that would be
13 applicable. Although this factor is only applied to the interstate jurisdiction, the FCC accepted
14 the arguments of the U.S. Telephone Association (USTA) that it should base its X-factor on the
15 overall industry productivity rate, including both interstate and intrastate services.
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17 **Q. The overall rate of inflation has been very low for several years. Is there any**
18 **evidence that tele com productivity has similarly declined?**

19 A. No. Every indication is that LECs, including SWBT, are continuing to enjoy high levels of
20 increasing productivity. In part these gains are attributable to sustained declines in computer
21 prices per processing unit; in part they reflect growing economies of scale and other beneficial
22 trends. James S. Kahan, a spokesman for SBC, SWBT's parent company, recently explained
23 these phenomena this way: "If you add one million lines to a 10 million-line company, your
24 costs don't increase 10 %." [Wall Street Journal, May 11, 1998, p. A-10.] Investors are
25 particularly bullish on SBC, whose stock price has nearly doubled in the last 14 months--since

1 SCB's merger with PacTel, which is hoped will produce additional productivity gains. [Id.] As
2 reported in the *Wall Street Journal* recently, the potential exists for additional cost savings
3 resulting from the increased scale and scope of SWBT's parent company, due to mergers and
4 acquisitions:

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6 The sheer size of SBC and its purchase orders lets it buy equipment and software for
7 far less than smaller companies pay. "We're paying 30 % less for key components than
8 SNET is," Mr. Kahan noted. [Id.]
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10 **Q. Given continued high productivity and low inflation, what is your recommendation**
11 **concerning SWBT's use of inflation factors in its cost studies?**

12 A. In my opinion, the simplest and most appropriate way to handle this issue is to completely
13 exclude the use of inflation factors. The cost studies should be based upon internally consistent
14 assumptions concerning the volume of demand (e.g. number of minutes or bops), labor wage
15 rates and material costs from a specific recent time period (e.g. 1997). No further inflation
16 adjustment is necessary (e.g. to extend certain aspects of the cost study to 1998 or 1999). If
17 the Commission is persuaded that a different time period should be used (e.g. 1999) then all
18 aspects of the study should be revised to match this alternative time period. For example,
19 demand volumes should be increased to match the alternative time period.

20 In general, I advise against adjusting the studies to reflect inflationary trends. If the
21 Commission were going to accept the use of inflation factors, it would be necessary to take
22 appropriate steps to ensure the cost studies fully reflect the offsetting benefits of increasing
23 productivity over the period being considered with regard to inflation. For example, if wage
24 rates are increased to reflect inflation, one needs to consider whether labor productivity is
25 improving (e.g. due to availability of labor saving technological improvements). The effect of

1 including both inflation and productivity offsets could vary, depending upon the specific items
2 included in a particular study, the specific inflation rate used, and the selected productivity
3 offset. However, it is fair to assume that the overall impact of productivity adjustments would be
4 to largely or entirely offset the impact of inflation. For instance, if a productivity factor of 2%
5 per year were used (a relatively conservative figure), it would completely offset the impact of an
6 inflation factor of up to 2%.

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8 **Q. Have any other regulatory commissions recently questioned the use of inflation factors**
9 **in SWBT cost studies?**

10 A. Yes. In fact, inflation factors of the type proposed by SWBT in this proceeding have recently
11 been rejected in both the Texas and Missouri jurisdictions.