

ORIGINAL

BEFORE THE
FLORIDA PUBLIC SERVICE COMMISSION
DIRECT TESTIMONY OF
PROFESSOR BRADFORD CORNELL
ON BEHALF OF
AT&T COMMUNICATIONS OF THE SOUTHERN STATES, INC.
AND
MCI TELECOMMUNICATIONS COMPANY
AND
MCI METRO ACCESS TRANSMISSION SERVICES, INC.

Docket No: 960833-TP/960846-TP/971140-TP

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I.

INTRODUCTION & QUALIFICATIONS

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Q. PLEASE STATE YOUR FULL NAME AND BUSINESS ADDRESS.

A. My name is Bradford Cornell and my business address is FinEcon, 10877 Wilshire Blvd., Los Angeles, California 90024.

Q. WHAT IS YOUR OCCUPATION?

A. I am a Professor of Finance and Director of the Bank of America Research Center at the Anderson Graduate School of Management at UCLA. In addition, I am President of FinEcon, a firm which provides financial economic consulting services to corporations, law firms and government agencies.

Q. WHAT IS YOUR EDUCATIONAL AND PROFESSIONAL BACKGROUND?

A. I graduated from Stanford University with an A.B. degree in 1970. Subsequently, I received my M.S. in Statistics in 1974 and my Ph.D. in Financial Economics in 1975 also from Stanford. Since 1975 I have been a professor of finance and I have been at UCLA since 1979. In that capacity I have authored over sixty professional articles, many of which deal directly or indirectly with the cost of capital. The cost

1 of capital is covered in detail in my book, *Corporate Valuation*, published by
2 Business One Irwin. I have also recently published an article entitled "Estimating
3 the Cost of Equity Capital" which discusses the most current cost of capital theories
4 and research since the publication of *Corporate Valuation*. In addition to my
5 teaching and research, I have served as an expert witness in securities and
6 commercial litigation, including cases that focus on the cost of capital. A more
7 detailed summary of my experience is contained in the resume attached as Exhibit
8 BC-1.

9
10 **II.**

11 **PURPOSE**

12
13 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS CASE?**

14
15 **A.** I have been asked to estimate the forward-looking economic cost of capital that
16 should be used in determining for BellSouth Florida, a subsidiary of BellSouth
17 Corp., the forward-looking cost of providing unbundled network elements to retail
18 providers of local telephone service (including the provision of such network
19 elements by BellSouth to its own retail operation). As stated below the midpoint of
20 my cost of capital range for BellSouth Telecommunications is 9.43%.

1 III.

2 SUMMARY OF TESTIMONY/RECOMMENDATIONS

3
4 Q. PLEASE SUMMARIZE THE BASIC APPROACH OF YOUR TESTIMONY.

5
6 A. My testimony involves applying the basic formula for the weighted average cost of
7 capital ("WACC"), given as equation (1) below, to estimate the cost of capital.

8
9 Q. SUMMARIZE THE WACC FORMULA AND EXPLAIN HOW IT IS
10 APPLIED.

11
12 A. The WACC formula is given by

13
$$\text{WACC} = w_d * k_d + w_e * k_e \quad (1)$$

14 where,

15 w_d = the fraction of debt in the capital structure,

16 k_d = the forward-looking cost of debt,

17 w_e = the fraction of equity in the capital structure,

18 k_e = the forward-looking cost of equity.

19
20 To apply the formula I estimate the forward-looking cost of both debt and equity
21 using methodologies that are well accepted by both financial economists and
22 regulators. In addition, I estimate the appropriate capital structure mix of debt and
23 equity capital. With these inputs, the WACC can be calculated from equation (1).

1 Q. WHAT IS THE ESTIMATE FOR COST OF CAPITAL YOU
2 CALCULATED FROM EQUATION (1)?

3

4 A. I estimate the cost of capital to be in the range of 8.80 to 10.07 percent. The
5 average of this range is 9.43 percent.

6

7 Q. HOW IS THE REMAINDER OF YOUR TESTIMONY ORGANIZED?

8

9 A. The remainder of my testimony is divided into six sections. Section IV discusses
10 the fundamental relationship between risk and the cost of capital in light of both
11 financial theory and widely-cited court decisions. Section V addresses the cost of
12 debt that should be employed. Section VI develops several approaches to
13 estimating the cost of equity capital. Section VII addresses the question of
14 determining the appropriate capital structure to use when calculating the WACC
15 and presents my estimates of the WACC. Section VIII discusses why the cost of
16 capital I have calculated for BellSouth, based on the public data available for
17 BellSouth and similar local service providers at the holding company level is likely
18 to overstate the relevant cost of capital for the provision of network elements.
19 Finally, Section IX presents a summary of my conclusions.

20

21

IV.

22

THE RELATIONSHIP BETWEEN RISK AND THE COST OF CAPITAL

1 Q. WHAT IS THE RELATION BETWEEN THE RISK OF AN INVESTMENT
2 AND THE COST OF CAPITAL?

3

4 A. Financial research has shown conclusively that investors are risk averse.
5 Consequently, the greater the risk of a business the higher the expected return that
6 investors require to invest in the business. From the standpoint of a company, this
7 means that riskier businesses will have higher costs of
8 capital.

9

10 Q. HAVE THE COURTS RECOGNIZED THIS RELATION BETWEEN RISK
11 AND RETURN?

12

13 A. Yes. The relation between risk and return is a centerpiece in decisions dealing with
14 the fair rate of return for regulated businesses. In *Bluefield Water Works v. Public*
15 *Service Commission*, 262 U.S. 679,692 (1923) the Supreme Court said:

16 "A public utility is entitled to such rates as will permit it to earn a
17 return... equal to that generally being made at the same time and in the
18 same general part of the country on investments in other business
19 undertakings which are attended by corresponding risks and
20 uncertainties..."

21

22 The Court went on to say:

1 “The return should be reasonably sufficient to assure confidence in
2 the financial soundness of the utility and should be adequate, under
3 efficient economical management, to maintain and support its credit
4 and enable it to raise the money necessary for the proper discharge of
5 its public duties.” Id. at 693.

6
7 In *Federal Power Commission v. Hope Natural Gas Company*, 320 U.S. 591,603
8 (1944), the Supreme Court stated:

9 “The return to the equity owner should be commensurate with returns
10 on investments in other enterprises having corresponding risks. That
11 return, moreover, should be sufficient to assure confidence in the
12 financial integrity of the enterprise, so as to maintain its credit and to
13 attract capital.”

14
15 **Q. ARE THE PRINCIPLES YOU HAVE CITED FROM THESE SUPREME**
16 **COURT DECISIONS CONSISTENT WITH THE PROVISIONS OF THE**
17 **TELECOMMUNICATIONS ACT OF 1996 (the 1996 Act)?**

18
19 **A. Yes. Section 251(c)(3) of the 1996 Act indicates that incumbent local exchange**
20 **carriers have the duty to provide to any requesting telecommunications carrier**
21 **access to unbundled network elements at rates, terms and conditions that are just,**
22 **reasonable and nondiscriminatory. Section 252(d) further provides that a State**
23 **commission shall determine just and reasonable rates for network elements based**

1 on the cost (determined without reference to a rate-of-return or other rate-based
2 proceeding) of providing the interconnection or network element and may include a
3 reasonable profit. The provision for a reasonable profit as an element of total cost
4 is consistent with the opinions of the Supreme Court in both the Hope and Bluefield
5 cases. A utility's reasonable profit is essentially a true economic return
6 commensurate with the risk its business. In order to achieve this, the pricing of
7 utility services and products must be based on true economic costs.

8
9 **Q. ARE ECONOMIC COSTS FORWARD-LOOKING OR BACKWARD-**
10 **LOOKING?**

11
12 A. Economic costs are forward-looking. To better understand this, one must put
13 oneself in the shoes of a current investor. For example, if an investor today were to
14 consider an investment in BellSouth's common stock, which is fundamentally a
15 claim on the net assets BellSouth uses to conduct its varied businesses, such
16 investor would only be willing to pay the market value of those assets. An asset
17 amounts to a capacity to generate future cash flows. Therefore, an investor today
18 would not care what historical costs were spent to acquire or build BellSouth's
19 assets. The market value of any asset is a function of the time pattern of cash flows
20 expected to be derived from it and the riskiness of the business endeavor. In
21 essence then, the asset's market value represents its economic cost.

22

1 **Q. DOES THE FCC PROVIDE GUIDANCE AS TO HOW TO IMPLEMENT**
2 **THE CONCEPT OF ECONOMIC COSTS?**

3
4 A. Yes. While the Eighth Circuit Court of Appeals has opined that the FCC is not
5 empowered to mandate network element prices under the 1996 Act,¹ the FCC's
6 First Report & Order, Docket No. 96-98 (the FCC Order), provides a thorough
7 discussion and analysis of the meaning of forward-looking economic costs for
8 purposes of implementing the provisions of the 1996 Act which can be considered
9 by State commissions.² The FCC adopts the concept of "total service long-run
10 incremental costs", defines its application to network elements rather than services
11 as "total element long run incremental costs" (TELRIC), and provides for a fair
12 allocation of shared and common costs to network elements. State commissions
13 have generally adopted practices consistent with the FCC's guidance on economic
14 costs.

15
16 The meaning of true economic costs according to TELRIC is as follows: the
17 pricing of network elements must be based on true forward-looking incremental
18 costs (including the cost of capital) which are necessary to provide the elements,
19 not on costs which have been expended in the past and may not represent the costs
20 that the utility will actually incur in the future. (It should be noted that, although
21 the principles cited in the above-mentioned Supreme Court decisions are
22 analogous to TELRIC, in practice state utility regulation has focused on the

1 recovery of embedded costs. The traditional embedded cost methodology is not
2 consistent with TELRIC.)

3

4 The concept of normal profit is embodied in forward-looking costs because the
5 forward-looking cost of capital, i.e. the cost of obtaining debt and equity financing,
6 is one of the forward-looking costs of providing the network elements. Consistent
7 with the correct analysis provided in the FCC Order, this Commission should reject
8 the use of either embedded costs (FCC Order ¶704), which represent historical,
9 “sunk” investments, or internal “hurdle rates” used by local exchange operators to
10 evaluate projects which exceed the market cost of capital (FCC Order ¶689) as
11 being inconsistent with a forward-looking economic costing methodology.

12

13 **Q. WHAT ARE THE FUNDAMENTAL DETERMINANTS OF INVESTMENT**
14 **RISK?**

15

16 A. There are two fundamental sources of risk: operating risk and financial risk.
17 Operating risk arises from the actual operation of the business. It is affected by
18 factors such as competition, technological change, customer acceptance of a
19 company’s products, variation in the costs of producing the company’s products
20 and the like. (As I discuss later in my testimony, however, operating risks which
21 an investor can diversify away are not compensated with a risk premium
22 according to capital market theory. In this segment of my testimony I explain all

1 types of operating risks that a company faces, including both diversifiable and
2 nondiversifiable risk.) Financial risk is determined by the amount of debt in a
3 company's capital structure. Taking on more debt increases fixed financial
4 charges, thereby increasing the risk that the firm will not be able to meet its
5 financial obligations. The total risk investors face is determined by the
6 combination of operating risk and financial risk.

7
8 **Q. ARE OPERATING RISK AND FINANCIAL RISK RELATED?**

9
10 A. Yes. In an effort to control the total risk that investors face, companies manage
11 their capital structures in a manner that leads to a relation between operating risk
12 and financial risk. In particular, companies that face a great deal of operating risk,
13 like high technology firms, limit the debt they issue to prevent total risk from
14 becoming too large. On the other hand, firms that face little operating risk, like
15 regulated utilities, can benefit by using a good deal of low-cost debt without raising
16 total risk to an unacceptable level.

17
18 **Q. HOW DO YOU ACCOUNT FOR BILLSOUTH'S BUSINESS AND**
19 **FINANCIAL RISK IN ESTIMATING COST OF CAPITAL?**

20
21 A. I apply the WACC formula to the closest comparable companies for which public
22 market data is available. The problem is that public data for key variables, such as
23 stock prices, are available only at the holding company level. Therefore, the

1 comparable companies that must be used are diversified firms. These firms operate
2 many businesses, most of which are riskier than the business in question in this
3 case. Further discussion of this risk issue is postponed until the final section of my
4 testimony. At this juncture, I proceed by using data at the holding company level.
5

6 **Q. WHAT COMPARABLES DO YOU USE IN THIS TESTIMONY?**

7
8 A. The comparable companies selected were derived from the list of telephone
9 operating companies in Standard and Poor's Industry Survey. These companies
10 are presented along with some descriptive information in Exhibit BC-2, and include
11 the seven regional Bell Holding companies ("RBHCs"), and the larger independent
12 telephone companies. Among the independents, Century Telephone Enterprise,
13 Inc. and Lincoln Communications were excluded because they have less than
14 500,000 access lines in service and are an order of magnitude smaller than the
15 RBHCs. Telephone and Data Systems was excluded because a majority of its
16 operations are focused on higher-risk endeavors rather than the more traditional
17 telephone and network operations. Frontier Corp. was excluded because 69% of its
18 revenues are derived from unregulated long-distance operations and only 29% from
19 local service.
20

21 **V.**

22 **THE COST OF DEBT CAPITAL**

1 **Q. HOW DO YOU ESTIMATE THE COST OF DEBT?**

2

3 A. Because debt payments are fixed, the cost of debt can be computed directly and
4 with a high degree of accuracy.⁵ For this reason, I use only BellSouth to compute
5 the cost of debt. It is not necessary to use a large sample of companies because of
6 the small measurement error.

7

8 **Q. WHAT IS THE COST OF DEBT THAT YOU USE?**

9

10 A. The best estimate of the cost of debt is the weighted average cost over all of
11 BellSouth's outstanding issues, including the debt of the holding company and
12 any subsidiaries. Standard & Poor's Bond Guide ("Bond Guide") provides
13 information on the face value and current yields to maturity on individual bonds.
14 (The Bond Guide does not always cover all outstanding issues if there are many.
15 It appears that the smaller and shorter term obligations may be excluded. Because
16 interest rates on longer term obligations are generally higher, excluding the
17 smaller and shorter term obligations would have the effect of overstating the cost
18 of debt slightly.)

19

20 The data from the Bond Guide are presented in Exhibit BC-3. For all of
21 BellSouth's major debt issues the Exhibit shows the bond rating, the face value
22 and the yield to maturity. The yield to maturity is a forward-looking cost of debt

1 that measures the rate that BellSouth would have to pay if the bonds were issued
2 at the measurement date, and reflects investors' expectations regarding the future
3 returns on these publicly-traded bonds. (Theoretically, the yield-to-maturity on
4 debt overstates the forward-looking cost of debt because of default risk. The
5 problem raised by risky debt is that only the promised yield is observable, but it is
6 the expected return that is required to estimate the cost of debt. Although the
7 expected return and the default premium sum to the promised yield, neither the
8 expected return nor the default premium can be observed directly. Because of this
9 default risk, the debt cost of capital is actually the yield-to-maturity minus the
10 expected default loss. The default risk of telephone holding company bonds is
11 considered to be minimal and hence is ignored for purposes of this analysis.)

12
13 The Exhibit shows that the weighted average cost of debt for BellSouth is 7.06
14 percent.

15
16 Consequently, I use **7.06 percent** as the cost of debt in my WACC analysis.

17 18 VI.

19 THE COST OF EQUITY CAPITAL

20
21 **Q. WHAT MAKES THE COST OF EQUITY CAPITAL MORE DIFFICULT**
22 **TO ESTIMATE THAN THE COST OF DEBT?**

1 A. The cost of debt can be computed directly because both the face value of debt and
2 the contractual payments a company agrees to make are fixed. In the case of
3 equity, however, there is no face value and dividends are paid at the discretion of
4 management depending upon business conditions. In addition, the dividend stream
5 does not terminate at a known point. For these reasons, there is no simple way to
6 compute the cost of equity capital and more complex approaches must be
7 employed.

8

9 **Q. WHAT METHODS DO YOU USE TO ESTIMATE THE COST OF EQUITY**
10 **CAPITAL IN THIS CASE?**

11

12 A. I used two basic methods for estimating the cost of capital. The first is the
13 discounted cash flow, or "DCF", method that has been widely adopted by the courts
14 and regulatory agencies in rate of return hearings. Second, I use the capital asset
15 pricing model, or "CAPM". In various forms, the CAPM is the most widely
16 employed theoretical model, other than DCF, for estimating the cost of capital.
17 Methods based on the CAPM are sometimes referred to as "risk premium" methods
18 because the model provides an estimate of the risk premium associated with
19 investing in specific issues of common stock.

20

21 **Q. PLEASE EXPLAIN THE BASIC DCF METHOD.**

22

1 A. The DCF method is based on the realization that the price of a share of stock, P,
2 equals the present value of all future dividends expected to be received on that
3 share, discounted at the cost of common equity. Mathematically, the DCF model is
4 written,

$$5 \quad P = \text{Div}_1 / (1+k) + \text{Div}_2 / (1+k)^2 + \text{Div}_3 / (1+k)^3 + \dots, \quad (2)$$

6 where Div_1 is the expected dividend in year 1, Div_2 is the expected dividend in
7 year 2, etc.

8
9 The cost of common equity is arrived at by solving the DCF equation for the cost of
10 capital, k. There are two obstacles that make it difficult to solve the equation.

11 First, the number of terms in the equation is infinite. Second, dividends must be
12 forecast for every future year. To surmount these obstacles, simplifying
13 assumptions must be made about the behavior of future dividends.

14
15 **Q. WHAT ARE THE SIMPLIFYING ASSUMPTIONS THAT ARE**
16 **EMPLOYED IN THE CONTEXT OF THE DIVIDEND GROWTH MODEL?**

17
18 A. One of the simplest assumptions that can be made is that future dividends will grow
19 *forever*, at a constant rate, g, i.e. the growth rate can be maintained in perpetuity. In
20 that case the DCF equation simplifies to,

$$21 \quad P = \text{Div}_1 / (1+k) + \text{Div}_1 * (1+g) / (1+k)^2 + \text{Div}_1 * (1+g)^2 / (1+k)^3 + \dots,$$

1 which can be solved for k. The solution is well known to be,

$$2 \quad k = \text{Div}_1 / P + g .$$

3

4 **Q. DID YOU USE THE CONSTANT GROWTH DCF EQUATION GIVEN**
5 **ABOVE IN ESTIMATING THE COST OF CAPITAL FOR YOUR SAMPLE**
6 **OF TELEPHONE COMPANIES?**

7

8 A. No. Once again a problem is raised by the fact that modern telephone companies
9 are composed of a variety of businesses, some of which are expected to grow at
10 rates of 30 percent or more in the short run. Such high growth rates are clearly not
11 sustainable into perpetuity, so that the simple constant growth model cannot be
12 applied unless one modifies the growth rate or adopts some mitigating assumption.
13 Stewart Myers and Lynda Borucki state that “[f]orecasted growth rates are
14 obviously not constant forever. Variable-growth DCF models, which distinguish
15 short- and long-term growth rates, should give more accurate estimates of the cost
16 of equity. Use of such models guards against naïve projection of short-run earnings
17 changes into the indefinite future.”⁴

18

19 **Q. HOW DO YOU APPLY THE DCF MODEL?**

20

21 A. I use a three-stage version. (There are numerous formulations of the DCF model
22 of varying complexity. Damodaran, for example, describes several different DCF

1 models in his book. It should be noted that what he calls the "three-stage model"
2 is different from the model we employ. Damodaran's "H Model" is more
3 comparable to the model that we use.) The first stage lasts five years because that
4 is the longest horizon over which analysts forecasts of growth are available. The
5 second stage is assumed to last 15 years. During this stage the growth rate falls
6 from the high level of the first five years to the growth rate of the U.S. economy
7 by the end of year 20. From the twentieth year onward the growth rate is set equal
8 to the growth rate for the economy because rates greater than that cannot be
9 sustained into perpetuity. A perpetual growth rate that exceeded the growth rate of
10 the economy would illogically imply that eventually the whole economy would be
11 comprised of nothing but telephone companies.

12

13 **Q. WHAT DATA ARE USED TO ESTIMATE DIVIDEND GROWTH DURING**
14 **THE FIRST FIVE YEARS?**

15

16 A. To estimate growth rates during the first five years I use the Value Line dividend
17 forecasts for 1997 and individual company earnings forecast data from Institutional
18 Brokers' Estimate System ("IBES") as of January 17, 1997. To compile the IBES
19 data, over 2000 analysts are surveyed each month regarding their estimates of five-
20 year earnings growth rates for a wide variety of major American companies. These
21 analysts represent over 100 different securities firms. The forecasts are tabulated

1 and widely distributed to subscribers, including most large institutional investors,
2 such as pension funds, banks, and insurance companies.

3
4 By relying on the IBES data, which is for earnings, I am implicitly assuming that
5 dividends and earnings will grow at approximately the same rate over the five-year
6 horizon. There are no growth forecasts beyond a five-year horizon. That is why an
7 assumption must be made about how the growth rate behaves after that. As stated
8 above, I assume that it converges to the long-run aggregate growth rate of the U.S.
9 economy over the succeeding 15 years.

10
11 **Q. WHAT IS A REASONABLE ESTIMATE FOR LONG-RUN GROWTH IN**
12 **THE AGGREGATE ECONOMY?**

13
14 A. The long-term growth forecast was derived by averaging the long-term GNP
15 growth forecasts obtained from the Wharton Econometric Forecasting Associates
16 (“WEFA”) Group and from Ibbotson Associates. The WEFA Group is an
17 econometric forecasting organization, formed in 1987 through a merger of WEFA
18 and Chase Econometrics. Ibbotson Associates is widely-known in the fields of
19 finance and valuation as one of the leading providers of securities returns data and
20 publications. As of January 13, 1997, WEFA predicted an average nominal GNP
21 growth rate of 4.82% from 1997 through 2020. As of December 31, 1996, Ibbotson
22 and Associates forecast long-term inflation to be 4.4% annually and long-term real
23 GNP growth rate to be 3.1%. Compounding these two forecasts, Ibbotson

1 predicted a nominal GNP growth rate of 7.5%. Given the magnitude of the
2 difference, I decided to take the average of the two forecasts, 6.16%, rather than
3 choose a single GNP forecast.

4

5 **Q. DO YOU APPLY THE DCF MODEL JUST TO BELLSOUTH AS YOU DID**
6 **IN ESTIMATING THE COST OF DEBT?**

7

8 A. No. Consistent with financial practice, I use the DCF model to estimate cost of
9 equity for all of the companies selected as likely comparables to BellSouth, in
10 addition to estimating a DCF cost of equity for BellSouth.

11

12 **Q. WHY IS IT A GOOD IDEA TO APPLY THE DCF MODEL TO A NUMBER**
13 **OF COMPANIES, NOT JUST THE COMPANY WHOSE COST OF**
14 **COMMON EQUITY YOU ARE TRYING TO ESTIMATE?**

15

16 A. Estimating future growth for a company always involves some uncertainty
17 because no analyst can be expected to have perfect foresight. In some cases, the
18 growth rate may be overestimated and in other cases it may be underestimated.
19 On average, over a group of similar companies, these estimation errors tend to
20 cancel out so that the average growth rate for the group is estimated more
21 accurately than the growth rate for any individual company. (I refer to estimation
22 error and the desirability of using averages in several discussions in this paper.
23 The following excerpt from *A Guide to Econometrics*, (3rd Edition, The MIT

1 Press, Cambridge, MA, 1992) by Peter Kennedy summarizes in the purpose for
2 using larger samples: “The sampling distribution of most estimators changes as
3 the sample size changes. The sample mean statistic, for example, has a sampling
4 distribution that is centered over the population mean but whose variance
5 becomes smaller as the sample size becomes larger. In many cases it happens that
6 a biased estimator becomes less and less biased as the sample size becomes larger
7 and larger— as the sample size becomes larger its sampling distribution changes,
8 such that the mean of its sampling distribution shifts closer to the true value of the
9 parameter being estimated.” (pg. 18))

10
11 Consequently, I apply the DCF method to all the telephone companies in the
12 previously-selected sample.

13
14 **Q. HOW IS THE DCF COST OF EQUITY CAPITAL COMPUTED?**

15
16 **A.** Given the market price of a company’s stock, the current dividend, and the
17 forecast growth rates during each of the three stages, equation (2) can be solved
18 iteratively for k . The iterative solution is the estimate of the cost of equity capital.
19 (I utilize an annual DCF model because telephone operating companies receive
20 payments for the use of their network elements on a monthly basis, and
21 consequently, are able to reinvest their cash flows on an approximate monthly
22 basis. Thus, the effective rate that the telephone companies receive is the allowed

1 rate -- as determined in interconnection proceedings-- compounded monthly,
2 regardless of the fact that telephone companies only pay dividends quarterly.
3 Consequently, the use of a DCF cost of equity determined using the annual
4 formula is conservatively high.)

5

6 **Q. WHAT IS YOUR DCF ESTIMATE OF THE COST OF EQUITY CAPITAL?**

7

8 A. Exhibit BC-4 presents the DCF estimates of the cost of equity capital derived from
9 the three-stage model for the telephone company sample. The estimates range from
10 a low of 8.97 percent to a high of 12.21 percent. The cost of equity capital for
11 BellSouth is estimated to be 10.99 percent, based on a value-weighted average of
12 the equity cost of capital for all Telephone Holding Companies (THC's) (excluding
13 BellSouth) and the cost of capital for BellSouth itself. The table below shows how
14 this cost of equity capital was computed:

15

WEIGHTED AVERAGE DCF COST OF EQUITY FOR BELLSOUTH			
	Weight	Rate	Weighted Cost
Average (excluding BellSouth)	.75	11.07	8.30
BellSouth	.25	10.74	2.69
Weighted Cost of Equity			10.99

16

1 **Q. WHY DO YOU USE A WEIGHTED AVERAGE TO COMPUTE**
2 **BELLSOUTH'S DCF COST OF EQUITY?**

3
4 A. There is a trade-off between two considerations. First, because the DCF approach,
5 like any approach, estimates the cost of equity capital with error, it is wise to use an
6 average. This is because in the averaging process errors tend to cancel with
7 overestimates offsetting underestimates. However, the DCF method does not have
8 a mechanism to adjust for differences in risk caused by differing capital structures
9 employed by the firms in the sample. Therefore, of all the individual companies in
10 the sample, BellSouth provides the best estimate of BellSouth's own cost of capital.
11 In light of these two considerations, I feel a weighted average which assigns a $\frac{3}{4}$
12 weight to the average excluding BellSouth and a $\frac{1}{4}$ weight to BellSouth is the best
13 estimate. Using this procedure, BellSouth is given a significantly larger weight
14 than any of the other companies in the sample, but a smaller weight than the
15 aggregate of all the comparables.

16
17 **Q. WHAT OTHER METHODS DID YOU USE TO ESTIMATE THE COST OF**
18 **EQUITY?**

19
20 A. I also used the capital asset pricing model ("CAPM").

21
22 **Q. WHAT ARE CAPITAL ASSET PRICING MODELS?**

1 A. Capital asset pricing models are mathematical formulas designed to quantify the
2 trade-off between risk and return. Professor William Sharpe was awarded the
3 Nobel Prize for developing the first capital asset pricing. Here I employ several
4 updated variants of Professor Sharpe's model.

5

6 **Q. HOW DOES THE CAPITAL ASSET PRICING MODEL (CAPM) WORK?**

7

8 A. The CAPM is designed to give the risk premium, that is the premium over the rate
9 on Treasury securities, required to induce investors to hold specific issues of
10 common stock. The standard CAPM is given by equation (3),

11
$$\text{Company risk premium} = \text{Company "beta"} * \text{Market risk premium.}(3)$$

12

13 To apply the CAPM for a given company, it is necessary to estimate both that
14 company's beta and the market risk premium.

15

16 **Q. WHAT IS A COMPANY'S BETA?**

17

18 A. The beta coefficient measures the systematic risk of investing in a company's
19 equity. The CAPM is built upon the insight that investors will be rewarded for
20 bearing only those risks, called systematic risks, that cannot be eliminated by
21 diversification. To understand the difference between systematic and non-
22 systematic risk, consider a hypothetical investment in Apple Computer. The risks

1 associated with this investment can be seen as arising from two sources. First,
2 there are risks that are unique to Apple. Will Apple design competitive products?
3 Will computer users accept Apple's new operating system? Second, there are risks
4 that affect all common stocks. Will the economy enter a recession? Will war break
5 out in the Middle East?

6
7 The risks that are unique to Apple can be eliminated by diversification. An investor
8 who invests only in Apple will suffer significant losses if Apple's new products are
9 a failure, but an investor who holds Apple along with hundreds of other securities
10 will hardly notice the impact on the value of his or her portfolio if Apple's new
11 products fail. Therefore, risks that are unique to Apple are said to be non-
12 systematic.

13
14 On the other hand, market-wide risks cannot be eliminated by diversification. If the
15 economy enters a recession and stock prices fall across the board, investors holding
16 hundreds of securities fare no better than investors who put all their money in
17 Apple computer. Thus, economy-wide risks are systematic.

18
19 The CAPM says that only systematic risks, as measured by beta, are associated
20 with a risk premium. Non-systematic risks are not associated with premiums
21 because they can be eliminated by diversification.

22
23 This concept is particularly important for the determination of cost of capital

1 because the risk that a company will lose customers to competition -- such as a
2 network leasing company or a local exchange company -- is a diversifiable risk
3 which does not increase the risk premium according to capital market theory.⁵
4

5 **Q. HOW DO YOU CALCULATE BETA?**

6
7 A. Beta is typically calculated by a procedure called regression analysis. In regression
8 analysis, the returns on the subject stock (the dependent variable), are regressed
9 against the returns of a market portfolio of stocks (frequently the S&P 500) to
10 estimate statistically the degree that the independent variable movements in the
11 market portfolio have caused the returns of the subject company. Using this
12 statistical tool, therefore, the sensitivity of a stock to movements in the market can
13 be estimated. This sensitivity is what determines beta. In this case, I used Dow
14 Jones Beta Analytics software to obtain betas computed on five years of monthly
15 return data through December 31, 1996 for BellSouth and the comparable
16 companies. Dow Jones Beta Analytics is a common source for betas used by
17 finance professionals. Returns on the S&P 500 were used as the market proxy.
18 Because beta is measured with error, the average beta over all the comparables is a
19 more accurate indicator of the true beta than any individual estimate of beta.

20
21 Betas can also be calculated over other time periods and using different observation
22 intervals. For examples, for newer smaller companies one year of daily data are

1 often used to measure beta. This is because the true underlying beta is likely to be
2 changing for such companies and because five years of data are often not available.

3 The drawback is that the shorter sample period and more frequent observation
4 interval increase measurement error. In this case I concluded that the sample
5 companies were sufficiently large, established and stable that it was more
6 appropriate to use five years of monthly data, which is consistent with the
7 methodology used by many institutional providers of betas, including Merrill
8 Lynch, S&P Compustat and Wilshire Associates.

9
10 While technological and legislative change has impacted the telecommunications
11 industry, it is equally clear from publicly available information that such change
12 has been anticipated and considered over time by industry participants, financial
13 analysts and credit-rating agencies. The THC's trade very efficiently, so risks that
14 are anticipated are impounded in the THC's stock prices rapidly and fairly. (To
15 address the question of whether the 5-year betas are sufficiently forward-looking, I
16 also obtained predicted betas calculated by BARRA, which are discussed later.)

17
18 Before averaging individual betas it is necessary to take account of the fact that the
19 various comparable companies have differing amounts of debt in their capital
20 structures. The amount of a company's debt leverage affects the riskiness of its
21 stock returns and thereby its beta. To take account of this, a two-step procedure is
22 used to estimate the average beta. First, the raw betas (i.e. betas computed using
23 the Dow Jones software without accounting for capital structure differences) are

1 estimated for each of the sample companies. Second, the raw betas are “unlevered”
2 using standard financial economic formulas and based on the market value
3 debt/equity ratios of each respective company as of December 31, 1996. The
4 formula for “unlevering” a raw, or “levered” beta is,

$$5 \quad B_u = B_L / [1 + (1 - T_c) \times D/E] \quad (4)$$

6 where,

7 B_u = the “unlevered” beta,

8 B_L = the “levered” beta,

9 E = the value of the sample company’s equity;

10 T_c = the corporate tax rate (typically an average rate for the sample);

11 D = the value of the sample company’s debt.

12
13 This puts all the betas on comparable terms so that they can be averaged.

14
15 Once the average has been estimated, the beta for any individual company is
16 estimated by “re-levering” using a simple variant of formula (4) which solves for
17 B_L , the “levered” beta.

18
19 **Q. WHAT IS YOUR ESTIMATE OF BETA?**

20
21 A. My raw (levered) estimates of beta are presented in Exhibit BC-5. They vary
22 from a high of 1.38 to a low of 0.48 on a levered basis. As I discussed above,
23 however, the betas must be unlevered first to adjust for the different amount of

1 debt leverage employed by the individual companies before calculating an
2 average. Exhibit BC-5 also shows the unlevered betas and their average. The
3 average unlevered beta for the entire sample is 0.66. (Note that the judgmental
4 weighting which I utilized in estimating the average DCF cost of equity is not
5 necessary because betas can be unlevered to adjust for the capital structure
6 leverage of the companies in the sample.) The average unlevered beta is re-
7 levered using the formula discussed above to take BellSouth's 1996 capital
8 structure into account, arriving at a beta of **0.77** for BellSouth.

9
10 **Q. IS THERE OTHER INFORMATION THAT SUPPORTS THE BETA**
11 **ESTIMATE THAT YOU USE IN YOUR ANALYSIS?**

12
13 A. Yes. In addition to the betas obtained from Dow Jones Beta Analytics, I obtained
14 predicted betas from BARRA. BARRA (formerly Rosenberg Associates) is an
15 internationally known financial consulting firm providing risk measurement
16 services to investment managers, corporations, consultants, securities dealers and
17 traders, and master custodians. The predicted betas are developed using
18 sophisticated financial modeling techniques which account for factors which impact
19 the future risk of a company. Unlike conventional regression betas, therefore, the
20 BARRA betas do not rely solely on historical stock returns and explicitly consider
21 forward-looking projections. Copeland, Koller and Murrin recommend the use of
22 BARRA predicted betas.⁶ The BARRA predicted betas for the sample telephone

1 holding companies are generally lower than the ones obtained from Dow Jones
2 Beta Analytics. The predicted BARRA beta for BellSouth is 0.72 which is lower
3 than the beta of 0.77 that I have calculated for BellSouth.

4
5 **Q. HOW DOES THE BETA RISK OF THE COMPANIES IN YOUR SAMPLE**
6 **COMPARE WITH THE BETA RISK OF COMMON STOCK**
7 **GENERALLY?**

8
9 A. By definition, the beta of all common stock generally (in other words, the beta of
10 the market) is 1.0. Therefore, it appears that the beta of telephone stocks is less
11 than that of common stocks generally. This is corroborated by betas obtained for
12 THC stocks from Value Line. This means that investments in telephone company
13 stocks are less risky than investments in typical industrial companies.
14 Consequently, the cost of capital for telephone companies should also be less than
15 it is for the average industrial stock.

16
17 **Q. WHAT DOES YOUR BETA ANALYSIS IMPLY THE COST OF EQUITY**
18 **CAPITAL SHOULD BE IN THIS CASE?**

19
20 A. Beta alone is insufficient for estimating the cost of equity capital. To apply the
21 CAPM it is also necessary to estimate the market risk premium.

22

1 **Q. WHAT IS THE MARKET RISK PREMIUM?**

2 A. The risk premium on the market is the amount of added expected return that
3 investors require to hold a broad portfolio of common stocks (a proxy for the
4 market as a whole) instead of risk-free Treasury securities.

5

6 **Q. WHAT TREASURY SECURITIES ARE USED TO MEASURE THE RISK**
7 **PREMIUM?**

8

9 A. Because there are over 100 issues of Treasury securities, some convention is
10 required. Commonly, the risk premium is measured over both short-term Treasury
11 bills with a maturity of one to three months and long-term Treasury bonds with a
12 maturity of 10 to 30 years. In this study, I use one-month Treasury bills and 20-
13 year Treasury bonds using Ibbotson Associates' and Jeremy Siegel's data going
14 back to 1802.

15

16 **Q. HOW IS THE MARKET RISK PREMIUM ESTIMATED?**

17

18 A. The market risk premium can be estimated two ways. First, the DCF approach can
19 be applied to the market as a whole. Second, the premium can be estimated by
20 examining historical data on the difference between the return on a broad portfolio
21 of common stocks and associated Treasury securities.

22

1 **Q. HOW CAN THE DCF MODEL BE USED TO ESTIMATE THE MARKET**
2 **RISK PREMIUM?**

3

4 A. Two steps are required to estimate the market risk premium using the DCF model.
5 The first step is to compute the DCF expected return (another word for the cost of
6 equity) for the market as a whole. Deducting the risk-free rate from the expected
7 return gives the market risk premium.

8

9 **Q. WHAT IS THE DCF ESTIMATE OF THE EXPECTED RETURN ON THE**
10 **MARKET?**

11

12 A. The starting point for estimating the expected return on the market is the S&P 500
13 index. The sample is then limited to those S&P 500 companies that pay a
14 dividend of at least 3 percent on the grounds that the DCF approach may be less
15 accurate for companies that pay small dividends. (All of the companies in the
16 telephone sample pay dividends greater than three percent except Cincinnati Bell.)
17 The sample includes large companies for which the data is considered to be
18 reliable for purposes of DCF estimates. For the selected companies, the three-
19 stage DCF model is applied in the same fashion as it was applied to the sample of
20 telephone companies. Finally, the individual DCF estimates for the sample
21 companies are averaged. This average, which comes out to be 11.26 percent, is
22 used as an estimate of the expected return on the market as a whole.

1 Q. GIVEN THE EXPECTED RETURN ON THE MARKET HOW DO YOU
2 CALCULATE THE MARKET RISK PREMIUM?

3

4 A. The market risk premium is computed by subtracting the risk-free rate from the
5 expected return. In the case of the 20-year Treasury bond this is straightforward.
6 The calculations are shown in Exhibit BC-6. The Exhibit shows that as of
7 December 1996, the 20-year bond yield was 6.73 percent. Subtracting 6.73 from
8 11.26 percent gives a market risk premium over long-term Treasury bonds of 4.53
9 percent.

10

11 In the case of one-month Treasury bills the situation is more complicated. Because
12 the goal of the analysis is to estimate the long-run cost of capital, using a one-
13 month interest rate can be misleading. A more appropriate choice is the average
14 return on one-month Treasury bills that is expected to obtain over the long-term.
15 This can be calculated using the following two-step procedure. First, compute the
16 long-run historical difference between the return on one-month Treasury bills and
17 the return on 20-year Treasury bonds. Second, subtract that historical difference
18 from the current yield on 20-year bonds. The difference gives a forward-looking
19 market estimate of the average expected yield on one-month Treasury bills over the
20 next 20 years. Exhibit BC-7 shows that the average expected one-month Treasury
21 bill rate over the long run is 5.36 percent as of December 31, 1996. Subtracting this
22 rate from the expected return on the market gives a market risk premium over
23 Treasury bills of 5.90 percent as shown in Exhibit BC-6.

1 **Q. WHAT IS YOUR HISTORICAL ESTIMATE OF THE MARKET RISK**
2 **PREMIUM?**

3
4 A. The historical risk premium is defined as the historical difference between the
5 return on the stock market and the risk-free rate. The proper estimate of the market
6 risk premium is a question that is disputed among both academics and practitioners
7 with regard to two primary issues. First, when analyzing historical data, should an
8 arithmetic or geometric average be used to calculate the historical average risk
9 premium? Second, over what period should the average be computed to accurately
10 capture the risk premium expected in the future? Specifically, should the entire
11 sample period back to 1802 be used, should the sample period be limited to post-
12 1926 when more complete data became available, should only post-war data be
13 employed because the role of government in the economy has changed
14 fundamentally since the great depression, or should even more recent data be used?
15 With regard to the type of average, many academic authors favor the arithmetic
16 over the geometric.⁷ Others, however, recommend using the geometric average
17 because arithmetic averages are biased by the measurement period.^{8,9} With regard
18 to the sample period for computing the average risk premium, Ibbotson argues that
19 a long data series is required so that the equity risk premium is not unduly
20 influenced by very good or very poor short-term results. The 1996 Yearbook
21 published by Ibbotson Associates suggests that the post-1926 data compiled therein
22 provides a representative period of returns that can occur under diverse economic

1 circumstances.¹⁰ However, Ibbotson has recently cautioned that the long-run stock
2 market returns calculated by his firm may not prove predictive. He believes that
3 the U.S. is not as risky as it was in 1925, suggesting that lower returns will be
4 experienced in the future. Ibbotson also states that his historical averages overstate
5 the forward-looking cost of equity because of survivorship bias.¹¹ For example,
6 the U.S. stock market survived despite the Great Depression. As of 1925, however,
7 there existed a risk that the stock market would be entirely wiped out—as happened
8 in Germany, Japan, China and Russia. If these countries were included in an
9 average, historical returns would be much lower.¹²

10
11 Siegel presents convincing evidence that the risk premium was abnormally high
12 after the U.S. went off the gold standard in 1944 based on an analysis of data going
13 back to 1802. He notes that the current equity premium appears to be returning to
14 the 2 - 3 percent range that existed before the second world war.¹³ Blanchard also
15 presents evidence that the risk premium has declined to 2 to 3 percent in recent
16 years and argues that either the DCF approach should be employed in place of
17 relying on an average or more recent data should be used.¹⁴

18
19 In light of these questions, Exhibits BC-6 and BC-8 present both DCF estimates of
20 the market risk premium and historical averages computed using both arithmetic
21 and geometric averages calculated over various periods of time.

1 Q. GIVEN THE INFORMATION IN EXHIBITS BC-6 AND BC-8, WHAT IS
2 THE BEST MEASURE OF THE MARKET RISK PREMIUM?

3

4 A. Taking account of all the information in Exhibits BC-6 and BC-8, I conclude that
5 the reasonable estimates of the market risk premium are 7.5 percent over one-
6 month Treasury bills and 5.5 percent over 20-year Treasury bonds. These estimates
7 are conservative (i.e., on the high side) in the sense that they are above the average
8 premiums observed in a majority of the periods, including the full sample, and are
9 greater than those implied by the DCF analysis. Also, Damodaran uses a 5.5% risk
10 premium over 20-year Treasury bonds, while Copeland, Koller & Murrin
11 recommend using a 5 to 6 percent risk premium.¹⁵ Additional information
12 indicating that my choice is conservative is provided by the statement of a
13 correspondent for Forbes magazine, who indicated that “[t]o venture into the
14 volatile stock market instead of cozying up to bonds, investors rightfully expect a
15 superior return from stocks. In fact, they expect to beat the bond return by four full
16 percentage points— something called the risk premium on stocks...”¹⁶ Moreover,
17 in its 1990 Rate Represcription Order, the FCC agreed with the position of the
18 Consumer Coalition that the risk premiums used by the LEC’s experts were
19 unrealistically high, particularly when compared to those used by financial analysts.
20 The FCC cites the Consumer Coalition expert’s testimony that “...the Wall Street
21 analyst reports, relied upon by the RHCs to support their positions on other issues,
22 use much smaller risk premiums, ranging from 2.0% to 5.4%.”¹⁷

1 Q. GIVEN YOUR ESTIMATES OF BETA AND THE MARKET RISK
2 PREMIUM WHAT IS THE APPROPRIATE ESTIMATE OF THE COST
3 OF EQUITY CAPITAL?

4
5 A. To review, the CAPM says that,

6 Cost of equity capital = Risk-free rate + Beta * Market risk premium.

7

8 Applying this equation using the long-run, expected, one-month Treasury bill rate
9 as the measure of the risk free rate gives:

10 Cost of equity capital = 5.36% + 0.77 * 7.5% = 11.14%.

11

12 Notice that in the preceding equation the expected long run Treasury bill rate over
13 the next 20 years is used, not the current one-month Treasury bill rate.

14

15 Applying the CAPM equation using the 20-year Treasury bond as the measure of
16 the risk free rate gives:

17 Cost of equity capital = 6.73% + 0.77 * 5.5% = 10.97%.

18

19 This estimate is close to that obtained using Treasury bills as the measure of the
20 risk-free rate. In light of these results, I use the average of the two, **11.05** percent,
21 as the CAPM estimate of the cost of equity capital.

1 **Q. HOW DO YOUR CAPM RESULTS COMPARE WITH YOUR DCF**
2 **ESTIMATES OF THE COST OF EQUITY CAPITAL?**

3
4 A. Given the difficulty of estimating the cost of equity capital, a difference of only 6
5 basis points between the two estimates is reassuring.

6
7 **Q. COMBINING THE TWO METHODS, WHAT IS THE COST OF EQUITY**
8 **CAPITAL FOR BELLSOUTH?**

9
10 A. The two estimates of the cost of equity capital produced a range of 10.99 to 11.05
11 percent. I feel the best overall estimate is approximately the average of the three-
12 stage DCF and CAPM cost of equity estimates. The cost of equity capital that I use
13 in the WACC calculations is **11.02** percent.

14
15 **VII.**

16 **CAPITAL STRUCTURE AND THE WACC**

17
18 **Q. WHAT IS MEANT BY THE “CAPITAL STRUCTURE” OF A BUSINESS?**

19
20 A. Most American businesses are financed by a combination of equity (common
21 stock) and debt (including bonds and bank loans). The capital structure refers to
22 the fraction of debt and equity used to finance a business. In terms of the WACC

1 formula presented at the outset, the capital structure is determined by the financing
2 weights, w_e and w_d .

3

4 **Q. IS THE CAPITAL STRUCTURE RELATED TO THE RISK OF A**
5 **BUSINESS?**

6

7 A. Yes. As discussed earlier, companies that face greater operating risk tend to take
8 on less debt. For example, most computer software and biotechnology companies
9 typically have virtually no debt in their capital structure.

10

11 **Q. HOW DO YOU ESTIMATE THE CAPITAL STRUCTURE FOR A**
12 **PARTICULAR BUSINESS?**

13

14 A. The goal is to estimate the long-run target financing weights that a rational,
15 informed management team would employ.¹⁸ If there are companies participating
16 in comparable business activities, the accepted solution is to use their observed
17 capital structure as the starting point. In this case, however, the comparables are all
18 riskier than the business activity in question (the network element leasing business)
19 because of the necessity to use data that are only available at the holding company
20 level.

21

22 Alan Shapiro states that:

1 “[i]n multiproduct firms, the requirement that projects be of
2 homogeneous risk is more likely to be met for divisions
3 than for the company as a whole. This suggests that the use
4 of a divisional cost of capital may be valid in some cases in
5 which the use of a companywide cost of capital would be
6 inappropriate. Conglomerate firms that compete in a
7 variety of different product markets ... often estimate
8 separate divisional costs of capital that reflect both the
9 differential risks and the differential debt capacity of each
10 division.

11
12 The estimation of these divisional costs of capital is tricky.
13 All the firm observes is its overall cost of capital, which is a
14 weighted average of its divisional costs of capital.”¹⁹

15
16 For now I proceed using the holding company information because of the data
17 limitation.

18
19 **Q. WHAT ARE THE CAPITAL STRUCTURE WEIGHTS FOR YOUR**
20 **SAMPLE OF COMPANIES?**

21

1 A. The current capital structures for my sample of companies is shown in Exhibit BC-
2 9. Notice that the comparison depends on whether book value or market value
3 weights are used. At this juncture, there remains a debate among academics,
4 practitioners, and forensic experts regarding the choice between book and market
5 weights. In traditional rate of return hearings, capital structure is typically presented
6 in terms of book value weights.

7
8 The average book value debt weight for the sample companies is 56 percent as of
9 December 31, 1996. BellSouth's own debt weight is 44 percent. In terms of
10 market value weights, however, the debt weights are lower. The average for the
11 full sample is 24 percent and BellSouth's debt weight is 20 percent. However,
12 market value debt weights of the holding companies probably understate long-run
13 target debt weights in the capital structure of the network element leasing business
14 as discussed in detail in Section VIII below. Consequently, in this case it is
15 inappropriate to rely solely on current market value capital structure weights of the
16 Telephone Holding Companies when calculating the WACC for the network
17 element leasing business. Therefore, I apply the WACC formula using both book
18 and market weights to establish a range.

19

20 **Q. WHAT CAPITAL STRUCTURES WEIGHTS DO YOU USE IN YOUR**
21 **SAMPLE?**

22

1 A. Given the dispersion in capital structure weights, I use the average weights in my
2 WACC calculations. Both book and market averages are employed to establish a
3 range.

4

5 **Q. GIVEN YOUR PRECEDING TESTIMONY, WHAT IS AN APPROPRIATE**
6 **RANGE FOR THE WEIGHTED AVERAGE COST OF CAPITAL FOR**
7 **BELLSOUTH?**

8

9 A. The table below computes the WACC from the estimates of the cost of debt, the
10 cost of equity and the capital structure developed in my preceding testimony.

11

WACC Based On Average Book Debt Weight

	<u>Weight</u>	<u>Rate</u>	<u>Weighted cost</u>
Equity	0.44	11.02	4.85
Debt	0.56	7.06	3.95
WACC			8.80

16

17

WACC Based On Average Market Value Weight

	<u>Weight</u>	<u>Rate</u>	<u>Weighted cost</u>
Equity	0.76	11.02	8.37
Debt	0.24	7.06	1.70
WACC			10.07

21

1 **Q. WOULD IT AFFECT YOUR ESTIMATE SIGNIFICANTLY IF YOU USED**
2 **BELLSOUTH'S OWN EQUITY MARKET VALUE WEIGHT OF 80%**
3 **RATHER THAN THE AVERAGE EQUITY MARKET VALUE WEIGHT?**

4

5 A. No. If the 80% equity weight was used in the WACC calculation, BellSouth's
6 estimated WACC would be 10.22%.

7

8 **Q. OVERALL WHAT DO YOU CONCLUDE IS A FAIR ESTIMATE OF THE**
9 **COST OF CAPITAL?**

10

11 A. I believe a fair estimate is the midpoint of my range. Averaging 8.80 and 10.07, the
12 midpoint comes to 9.43 percent.

13

14 **Q. IS THIS ESTIMATE OF THE COST OF CAPITAL FORWARD**
15 **LOOKING?**

16

17 A. Yes. The cost of debt is estimated from the yields to maturity of BellSouth's bonds
18 obtained from the Bond Guide, which represent the forward looking returns that
19 investors would expect to earn on these bonds.²⁰ The DCF model used for
20 estimating the cost of equity employs forward-looking growth projections made by
21 analysts and forecasting organizations. The CAPM model as I have employed it
22 here uses some current U.S. Treasury bond rates, which impound forward-looking

1 expectations, as one of its two return components. The CAPM model by necessity
2 uses historical information to estimate a company's riskiness, through the
3 calculation of a beta, and to estimate the market risk premium, which is assumed to
4 generally prevail into the future. Regarding these issues, I have considered forward
5 looking predicted BARRA betas and current research regarding the forward-
6 looking equity risk premium.

7
8 **VIII.**

9 **POTENTIAL UPWARD BIAS IN THE ESTIMATED COST OF CAPITAL**

10
11 **Q. IS THERE ANY REASON TO BELIEVE THAT THE COST OF CAPITAL**
12 **RANGE YOU HAVE CALCULATED IS ON THE HIGH SIDE?**

13
14 **A.** Yes. Modern diversified corporations like BellSouth operate dozens of different
15 businesses, some of which are more risky than others. Consequently, the operating
16 risk of the corporation is a weighted average of the risks of all the constituent
17 businesses.

18
19 **Q. WHAT IS THE BUSINESS FOR WHICH THE COST OF CAPITAL IS**
20 **BEING ESTIMATED IN THIS CASE?**

21
22 **A.** The business for which the cost of capital is being estimated in this case is
23 essentially the business of "leasing" local exchange telephone network elements

1 to retail providers. More specifically, BellSouth will be required to make
2 available to retail providers the same unrestricted access to its network elements
3 that it currently provides to its own retail arm. This leasing of network facilities,
4 some of which may have natural monopoly aspects, should have relatively low
5 risk compared to many of the risky business endeavors being pursued by the
6 telephone holding companies. BellSouth's risky business undertakings include
7 domestic cellular and personal communications service, advertising and
8 publishing. In addition, BellSouth has invested in wireless telephone systems in
9 Argentina, Australia, Chile, Denmark, Germany, India, Israel, New Zealand,
10 Panama, Peru, Uruguay and Venezuela. BellSouth is also an equity investor in
11 wireless data communications networks in the United States, the United
12 Kingdom, the Netherlands, Belgium and Singapore. (The credit-rating agencies
13 have noted the increasing risk-profile of the telephone holding companies in
14 comparison to core telephone operations. For example, Standard & Poor's states
15 in its Global Sector Review (November 1996, p. 288) that "[p]artially offsetting
16 the solid position of its local exchange companies is the higher-risk profile of
17 GTE's diversified activities, including its wireless and international ventures.") I
18 understand that there is currently very little facilities-based competition, and
19 wide-spread facilities-based competition may take years to develop. The FCC
20 believes that unbundled network elements and interconnection services are
21 bottleneck, monopoly services that do not now face significant competition (FCC
22 Order ¶702). Further, increased demand spurred by competition may result in a
23 more extensive use of local telephone companies' networks even as competing

1 facilities are eventually constructed. There is thus little threat that local telephone
2 companies' network facilities will remain idle.

3

4 **Q. HAVE ANY TELEPHONE HOLDING COMPANIES MADE COMMENTS**
5 **TO THE PUBLIC REGARDING BENEFITS TO BE DERIVED FROM THE**
6 **PROVISION OF NETWORK ELEMENTS TO COMPETITIVE LOCAL**
7 **EXCHANGE COMPANIES?**

8

9 A. Yes. At its internet site (see Exhibit BC-10), Bell Atlantic has stated that the
10 business of providing network elements represents a revenue opportunity for the
11 company, in that there would now be many more users of its network without the
12 need to make additional capital expenditures. Bell Atlantic's statements to the
13 public indicate that the network element leasing business is subject to much less
14 risk than its retail local exchange business in the environment created by the
15 Telecommunications Act of 1996.

16

17 **Q. WHAT RISKS ARE ASSOCIATED WITH THE BUSINESS OF "LEASING"**
18 **OF UNBUNDLED NETWORK ELEMENTS?**

19

20 A. There is still the risk of regulation itself. The rate of return a network is allowed
21 to earn depends on the outcome of proceedings such as this and remains
22 somewhat uncertain. That risk can be substantially reduced if this Commission

1 adopts compensatory forward-looking pricing rules that tell investors that
2 telephone holding companies will have the opportunity to recover all efficiently-
3 incurred costs on a forward-looking basis. In addition, there remains some risk
4 that consumers, particularly business users, will bypass the network as other
5 alternatives become available. (However, under capital market theory,
6 competitive risks are not relevant for computing the cost of capital because they
7 can be diversified away.) These risks, however, are substantially less than the
8 risks faced by telephone holding companies' other businesses, some of which are
9 (or may soon be) subject to competition.

10

11 **Q. IS THERE A SIMPLE WAY TO DISTINGUISH THE BUSINESS OF**
12 **LEASING THE NETWORK FROM PROVIDING LOCAL SERVICE?**

13

14 A. Yes. Think of integrated telephone holding companies, including BellSouth, as
15 being composed of separate business units. One business unit owns the network
16 and leases network elements to all local service providers, including both
17 competitors and the telephone companies' other business units that are involved in
18 the provision of local service. Whereas those BellSouth units involved in providing
19 local service are in businesses that (if prices are set appropriately in these
20 proceedings) will be faced with new competitors, the unit involved in leasing the
21 network which all the competitors need to use has virtual monopoly power and
22 faces much less risk. The sample of companies used in my analysis for which the

1 cost of debt and equity are estimated is composed of diversified telephone
2 companies. As stressed earlier, these companies operate a variety of businesses,
3 virtually all of which face a great deal more operating risk than leasing a local
4 exchange network. This has been clearly recognized by financial analysts and the
5 bond rating agencies. The company to which the WACC should be applied,
6 however, is one which is involved exclusively in leasing network facilities. Under
7 these circumstances, using a higher debt weight than the current market value
8 weights for the sample companies is one way to take account of this problem. The
9 higher debt weight may be more representative of the target capital structure for the
10 low-risk network element leasing business.

11

12 **Q. HAVE YOU SEEN ANY INFORMATION TO THE PUBLIC WHICH**
13 **CONFIRMS THE REASONABLENESS OF YOUR COST OF CAPITAL**
14 **RANGE?**

15

16 A. Yes. Salomon Brothers in its January 1996 report "Regional Bell Operating
17 Companies—Opportunities Ring ... While Danger Calls" stated that "[b]ased on
18 our estimates, the RBHCs currently have an average weighted cost of capital of
19 approximately 8.6%. In order to value the RBHCs on a level playing field, we used
20 the same discount rate in each DCF. Specifically, we used a discount rate of 10%,
21 which we believe should be the minimum return an investor would expect in order
22 to entice him to invest in a security, despite the fact this is slightly above the cost of
23 capital." Also, as part of its proposed merger with NYNEX, Bell Atlantic

1 submitted to its shareholders a joint proxy statement/prospectus on September 18,
2 1996 in which Bell Atlantic's investment advisor, Merrill Lynch, performed a DCF
3 analysis of the two companies' relative market values, estimating a discount rate in
4 the range of 8 to 10 percent for the telephone company portion of its portfolio of
5 businesses.

6
7 **Q. SHOULD THE COST OF CAPITAL ESTIMATE ACCOUNT FOR**
8 **QUARTERLY COMPOUNDING?**

9
10 A. No. Telephone operating companies receive payments for the use of their network
11 elements on a monthly basis, and consequently, are able to reinvest their cash flows
12 on an approximate monthly basis. This is a more frequent basis than investors
13 receive their quarterly dividends from the telephone holding companies. Thus, the
14 effective rate that the telephone companies receive is the allowed rate— as
15 determined in this hearing— compounded monthly, regardless of the fact that
16 BellSouth pays dividends to investors quarterly. If the Commission allows a rate
17 which is estimated using a quarterly compounding DCF model, BellSouth will get
18 an effective rate compounded both quarterly (as allowed) and monthly (as actually
19 received). To be precise, therefore, if quarterly compounding is allowed, the cost
20 of equity would also have to be decompounded to account for the fact that
21 BellSouth will be able to reinvest its proceeds on a monthly basis. The net effect
22 would result in a lower allowed rate than the annual DCF cost of equity proposed

1 by me. Consequently, the use of a DCF cost of equity determined using the annual
2 formula is conservatively high.

3

4 **Q. SHOULD THE COST OF CAPITAL ESTIMATE BE INCREASED FOR**
5 **EQUITY FLOTATION COSTS?**

6

7 A. No. BellSouth is a large Fortune 500 company whose stock trades in an efficient
8 market. As part of the process of arriving at the day-to-day prices for BellSouth's
9 stock, the market is anticipating future events which affect the cash flows that
10 BellSouth will earn. This process clearly includes the anticipation of future cash
11 expenditures, including financing costs for both debt and equity which reduce
12 BellSouth's cash flows. Because the price of BellSouth's stock has accounted for
13 flotation costs already, an estimation of the cost of equity using the DCF model
14 accurately reflects the required return of investors. Adding a flotation cost
15 adjustment would in effect double count the cost of financing.

16

17 **Q. IF YOUR THEORETICAL ARGUMENT REGARDING FLOTATION**
18 **COSTS IS CORRECT, WHY HAS THERE BEEN SO MUCH DISCUSSION**
19 **ON THIS ISSUE IN THE TRADITIONAL REGULATORY RATE**
20 **HEARING CONTEXT?**

21

22 A. The regulatory context is really a different issue. In the regulatory world, a main
23 purpose is to identify costs which can be charged back to the ratepayers by the

1 telephone operating company. Equity flotation costs have often been disallowed
2 because it would not be fair to burden current ratepayers with all of those costs if
3 the equity capital would be utilized indefinitely. One way that parties have tried to
4 “amortize” these costs so that they could be recovered by the telephone company is
5 to make the flotation cost adjustment to the allowed return, which would in effect
6 charge it back to ratepayers perpetually in very small increments. This is not the
7 issue for this proceeding. In this case, I am interested in the forward-looking cost
8 of capital which fairly compensates for the riskiness of the business. Because
9 BellSouth’s stock trades efficiently, the market has assessed its prospective cash
10 flows, including financing costs, to arrive at its estimate of the fair price.
11 Consequently, the DCF derived cost of equity estimate is the proper measure for
12 determining forward looking cost of capital.

13
14 **Q. ARE THERE ALSO SPECIFIC PRACTICAL REASONS WHY A**
15 **FLOTATION COST ADJUSTMENT WOULD NOT BE APPROPRIATE**
16 **FOR BELL SOUTH?**

17
18 **A.** Yes, there are two practical reasons. Over the past few years BellSouth has not
19 issued common stock. Given the high level of equity in its market capital structure,
20 there is no reason to expect large equity financings in the foreseeable future.
21 Second, even if it intends to make large equity offerings, BellSouth has made the
22 discretionary decision to pay large dividends to its shareholders. These dividends
23 could alternatively be used to finance BellSouth’s projects. Given this, it does not

1 appear that the CLEC's should be charged a premium if BellSouth decides to raise
2 capital with external instead of internal funds.

3

4

IX.

5

CONCLUDING SUMMARY

6

7 **Q. COULD YOU SUMMARIZE THE MAIN CONCLUSIONS OF YOUR**
8 **TESTIMONY.**

9

10 A. Using publicly-available data and accepted finance procedures I have estimated that
11 the weighted average cost of capital for a diversified telephone holding company is
12 in a range between 8.80 and 10.07 with a best point estimate of 9.43 percent.

13 However, I have also stressed that this is an upward-biased estimate of the cost of
14 capital that should be used in this case. In this case, the company in question is not
15 a diversified holding telephone company, but a company in the more specialized
16 (and less risky) business of providing network elements.

17

18 **Q. DOES THAT CONCLUDE YOUR TESTIMONY?**

19 A. Yes.

20

21

22

2 Endnotes:

- 3
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41 York, NY, 1995, at p. 251.

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Personal Information

Birth date: November 20, 1947

Marital status: Married, 5 children

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Education

Ph.D. Financial Economics, Stanford University, 1975
M.S. Statistics, Stanford University, 1974
A.B. (Interdepartmental) Physics, Philosophy and Psychology, Stanford University, 1970

Teaching Positions & Professional Positions

1987-Present: Professor of Finance and Director of the Bank of America Research Center,
Anderson Graduate School of Management, UCLA

1990-Present: President, FinEcon: Financial Economic Consulting

1988-1990: Vice-President and Director of the Securities Litigation Group, Economic
Analysis Corporation

1979-1986: Assistant and Associate Professor of Finance, UCLA

1983-1984: Visiting Professor of Finance, California Institute of Technology

1977-1979: Assistant Professor of Finance, University of Southern California

1975-1977: Assistant Professor of Finance, University of Arizona

Courses Taught

Corporate Valuation
The Law and Finance of Corporate Acquisitions and Restructurings
Corporate Financial Theory
The Theory of Finance in the UCLA Law School
Security Valuation and Investments
A wide variety of executive and community education programs

Special Education Programs Include

The U.S. Business School in Prague - Special Finance Program, Summer 1991
The Nissan Program for Historically Black Colleges, Director, Summer 1989
The Lead Program for Business Education of Minority High School Students, 1987-Present

Consulting and Professional Activities

Selected Service at UCLA

Twice chairman of finance department
Twice Vice-Chairman of the Anderson School
Three time member of the staffing and promotion committee

Service to Scholarly Journals and Organizations

Served as an associate editor for a variety of scholarly and business journals including: the *Journal of Finance*, *Journal of International Business Studies*, *Journal of Business and Economics*, *Journal of Financial Research*, *Journal of Futures Markets*, and the *Investment Management Review*.

Served as a reviewer for numerous finance and economics journals including: the *American Economic Review*, *Journal of Political Economy*, *Journal of Financial Economics*, *Journal of Business*, *Journal of Financial and Quantitative Analysis*, and the *Review of Economics and Statistics*.

Memberships in Professional Societies

American Finance Association 1973-Present
Member of Board of Directors, 1987-1989
Western Finance Association 1973-Present
Member of Board of Directors, 1982-1985
Vice-President, 1987
American Economic Association 1973-Present
American Bar Association 1995-Present
American Statistical Association 1992-Present
International Association of Financial Engineers 1993-Present
American Law and Economics Association 1995-Present
Human Behavior and Evolution Society 1995-Present

Research Evaluation

Project reviewer for the National Science Foundation: 1979-Present
Program committee for the Western Finance Association: 1982-1988

Selected Board and Committee Memberships

Chairman, Mayor Riordan's Blue Ribbon Commission on Los Angeles' Municipal Investments
Pension Policy Board, The Aerospace Corporation: 1985-Present
Forms Engineering Corporation: 1976-Present
Trustee, Kellow Trust: 1982-1991

Selected Consulting Clients

Merrill Lynch (Obtained futures brokers license, owned a seat of the International Monetary Market of the Chicago Mercantile Exchange)
Chase Manhattan Bank
Thrifty Corporation
Wynn Oil
Resorts International

Expert Witness

Numerous cases involving the application of financial economics

Media Experience

Occasional author for the *Wall Street Journal* and the *Los Angeles Times*
Occasional commentator for local television and radio stations
Lecturer on valuation theory, appraisal practice and securities pricing

Books

Cornell, B., 1996, **Social Decoding and Ethnic Discrimination**, revising draft for possible publication by the University of Chicago Press.

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Awards and Honors

Cited as one of the ten most prolific research authors in the field of finance, in **Most Frequent Contributors To The Finance Literature**, by Jean Louis Heck and Phillip L. Cooley, *Financial Management*, Autumn, 1980.

Financial Management Association Prize for Applied Research: 1987
Institute for Quantitative Research in Finance, Research Grant: 1984
Center for the Study of Futures Markets, Research Grant: 1983
Center for the Study of Futures Markets, Research Grant: 1981
Chicago Mercantile Exchange, Research Grant: 1979

Phi Beta Kappa, Stanford University, 1970
Graduated with distinction, Stanford University, 1970

Telephone Holding Companies

Company	Market Value of Equity at 12/31/96 (\$ mil)	1996 Revenues (\$ mil)	1996 Book Value of Plant (\$ mil)	Access Lines in Service (mil)
<i><u>RBHC's</u></i>				
Ameritech	33,295	14,900	14,125	19.3
Bell Atlantic	28,432	13,125	16,340	20.1
BellSouth	40,234	19,000	22,400	21.9
NYNEX	21,160	13,600	17,300	17.1
Pacific Telesis	15,575	9,600	12,185	16.2
SBC Communications	31,315	13,900	13,800	14.6
U.S. West Comm.	15,428	10,000	13,900	15.1
<i><u>Large Independent Telephone Holding Companies</u></i>				
ALLTEL	5,949	3,175	3,180	1.6
Cincinnati Bell	4,154	1,560	985	0.9
GTE	43,637	21,350	22,780	25.9
SNET	2,547	1,945	1,585	2.0

Sources: Standard & Poor's Industry Survey; Dow Jones News Retrieval; GTE 1996 Annual Report; Value Line Investment Survey, January 10, 1997.

BellSouth Bond Yields

	S&P DEBT RATING	Debt Outstanding at Par (mil \$)	Yield to Maturity as of 12/31/96
<u>BellSouth Capital Funding (Issued under support agreement w/BellSouth)</u>			
Nts 9 1/4s '98	AAA	115	6.59%
Deb 6.04s 2026	AAA	300	6.09%
<u>BellSouth Telecommunications</u>			
Deb 5 7/8s 2009	AAA	350	6.91%
Deb 7s 2025	AAA	300	7.24%
Deb 8 1/4s 2032	AAA	250	7.83%
Deb 7 7/8s 2032	AAA	300	7.70%
Deb 7 1/2s 2033	AAA	300	7.61%
Deb 6 3/4s 2033	AAA	400	7.47%
Deb 7 5/8s 2035	AAA	300	7.68%
Deb 5.85s 2045	AAA	300	6.11%
Deb 7s 2095	AAA	500	7.69%
Nts 6 1/2s 2000	AAA	275	6.23%
Nts 6 1/4s 2003	AAA	450	6.54%
Nts 6 3/8s 2004	AAA	200	6.63%
Nts 7s 2005	AAA	150	6.77%
Nts 6 1/2s 2005	AAA	300	6.87%
<u>South Central Bell Tel (Now BellSouth Telecommunications)</u>			
Deb 7 3/8s 2012	AAA	100	7.48%
<u>Southern Bell Tel. & Tel (Now BellSouth Telecommunications)</u>			
Deb 5s '97	AAA	75	7.14%
Deb 4 3/8s '98	AAA	70	6.17%
Deb 4 3/4s 2000	AAA	100	6.42%
Deb 4 3/8s 2001	AAA	75	6.74%
Deb 4 3/8s 2003	AAA	70	6.73%
Deb 6s 2004	AAA	100	6.97%
Deb 7 3/8s 2010	AAA	150	7.43%
Deb 7 5/8s 2013	AAA	350	7.52%
Weighted Average:			7.06%

Source: Standard & Poor's Bond Guide, January 1997.

**3-Stage DCF Model Estimates of Cost of Equity
For Telephone Holding Companies**

Company	Stock Price as of 12/31/96	1997 Dividend per Value Line	5-year I/B/E/S Forecast Growth Rate	Sustainable Growth Rate	Cost of Equity (15-yr Linear Convergence)
BellSouth	\$40.50	\$1.55	8.41%	6.16%	10.74%
Ameritech	\$60.63	\$2.26	8.86%	6.16%	10.78%
Bell Atlantic	\$64.75	\$2.94	7.98%	6.16%	11.38%
NYNEX	\$48.13	\$2.36	6.60%	6.16%	11.23%
Pacific Telesis	\$36.75	\$1.26	3.88%	6.16%	8.97%
SBC Communications	\$51.88	\$1.80	10.03%	6.16%	10.87%
U.S. West	\$32.25	\$2.14	4.88%	6.16%	12.21%
ALLTEL	\$31.38	\$1.12	10.43%	6.16%	11.15%
Cincinnati Bell	\$61.63	\$0.80	19.50%	6.16%	10.10%
GTE	\$45.38	\$1.96	9.17%	6.16%	11.59%
SNET	\$38.88	\$1.80	6.25%	6.16%	10.82%
VALUE-WEIGHTED AVERAGE (excluding BellSouth):					11.07%
VALUE-WEIGHTED AVERAGE (including BellSouth):					11.01%

Sources: Dow Jones News Retrieval; Value Line, Inc.; I/B/E/S.

**Estimated Betas For the Comparable Companies
(60 Monthly Observations -- Period Ending 12/31/96)**

Ticker Symbol	Company	Levered Beta ¹	Unlevered Beta
AIT	Ameritech	0.96	0.84
BEL	Bell Atlantic	0.80	0.67
BLS	BellSouth	0.63	0.55
NYN	NYNEX	0.71	0.55
PAC	Pacific Telesis	1.06	0.85
SBC	SBC Communications	0.65	0.56
USW	U.S. West	0.72	0.57
AT	ALLTEL	0.48	0.40
CSN	Cincinnati Bell	1.38	1.28
GTE	GTE	0.87	0.71
SNG	SNET	0.78	0.58
Assumed Tax Rate:		36%	
Value-Weighted Average Unlevered Beta			0.66
Re-levering of Average Unlevered Beta Using BellSouth's Capital Structure			0.77

¹ The Levered Beta is measured relative to the S&P 500.

Sources: Dow Jones Beta Analytics and Exhibit 9.

Risk Premium Computed from DCF Expected Market Return

	Expected Long- Run Yield As Of December 1996	Expected Return on Stock Market	Implied Risk Premium
1-Month Treasury Bill	5.36%	11.26%	5.90%
20-Year Treasury Bond	6.73%	11.26%	4.53%

Sources: I/B/E/S; Ibbotson Associates; The WEFA Group.

Expected Long-Run One-Month Treasury Bill Yield For December 1996

Calculation of Historical Term Premium for Long-Term Treasury Bonds over One-Month Treasury Bills

<u>Average Long-Term Treasury Bond Return</u>	<u>Average One-Month Treasury Bill Return</u>	<u>Historical Term Premium</u>
5.10%	- 3.73%	= 1.37%

Estimation of Long-Run Treasury Bill Yield Based on Historical Term Premium

<u>Long-Term Treasury Bond Yield December 1996</u>	<u>Historical Term Premium</u>	<u>Long-Run Expected Treasury Bill Yield December 1996</u>
6.73%	- 1.37%	= 5.36%

Sources: Dimensional Fund Advisors; Federal Reserve Weekly Bulletin.

Stock Market Premium Analysis

<u>Year</u>	<u>Stock Returns</u>	<u>One-month Treasury Bill Returns</u>	<u>Long-Term Treasury Bond Total Returns</u>
Period	Arithmetic Average	Arithmetic Average	Arithmetic Average
1802-1996	9.67% ⁽¹⁾	4.30%	5.01%
1926-1996	12.67% ⁽²⁾	3.78%	5.45%
1945-1996	13.80% ⁽²⁾	4.76%	5.79%
1951-1996	13.64% ⁽²⁾	5.29%	6.16%
1971-1996	13.84% ⁽²⁾	6.94%	9.80%

<u>Period</u>	<u>Stock Premium Over Bills</u>	<u>Stock Premium Over Bond Total Returns</u>
1802-1996	5.37%	4.66%
1926-1996	8.89%	7.22%
1945-1996	9.03%	8.00%
1951-1996	8.35%	7.48%
1971-1996	6.90%	4.04%

<u>Year</u>	<u>Stock Returns</u>	<u>One-month Treasury Bill Returns</u>	<u>Long-Term Treasury Bond Total Returns</u>
Period	Geometric Average	Geometric Average	Geometric Average
1802-1996	8.28% ⁽¹⁾	4.20%	4.79%
1926-1996	10.71% ⁽²⁾	3.73%	5.08%
1945-1996	12.57% ⁽²⁾	4.72%	5.33%
1951-1996	12.39% ⁽²⁾	5.25%	5.65%
1971-1996	12.61% ⁽²⁾	6.91%	9.16%

<u>Period</u>	<u>Stock Premium Over Bills</u>	<u>Stock Premium Over Bond Total Returns</u>
1802-1996	4.07%	3.49%
1926-1996	6.98%	5.63%
1945-1996	7.86%	7.25%
1951-1996	7.14%	6.74%
1971-1996	5.71%	3.46%

⁽¹⁾ Jeremy J. Siegel, "Stocks for the Long-Run", (New York: Irwin), 1994.

⁽²⁾ *Stocks, Bonds, Bills and Inflation, 1996 Yearbook*, Ibbotson Associates, Chicago, Illinois.

⁽³⁾ 1996 returns are from Dimensional Fund Advisors.

Capital Structure of Telephone Holding Companies

Company	Short-Term Debt	Long-Term Debt	BASED ON BOOK VALUE			BASED ON MARKET VALUE		
			Total Debt	Preferred Stock	Common Equity	Total Debt	Preferred Stock	Common Equity
BellSouth	9%	35%	44%	0%	56%	20%	0%	80%
Ameritech	16%	33%	49%	0%	51%	19%	0%	81%
Bell Atlantic	14%	38%	52%	0%	48%	22%	0%	78%
NYNEX	3%	56%	59%	0%	41%	31%	0%	69%
Pacific Telesis	6%	64%	69%	0%	31%	28%	0%	72%
SBC Communications	12%	39%	51%	0%	49%	19%	0%	81%
U.S. West	8%	52%	60%	0%	39%	29%	0%	71%
ALLTEL	1%	45%	46%	0%	54%	23%	0%	77%
Cincinnati Bell	20%	25%	44%	0%	56%	11%	0%	89%
GTE	10%	59%	68%	0%	32%	26%	0%	74%
SNET	13%	67%	80%	0%	20%	35%	0%	65%
Value-Weighted Average:			56%	0%	44%	24%	0%	76%

Sources: Companies' SEC Forms 10-K for 1996; market value of common equity based on closing stock price as of December 31, 1996.

Exhibit _____

Docket Nos: 960833-TP/960846-TP/971140-T

B. Cornell Exhibit BC-10

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Network Services Strategic Overview

Bell Atlantic's core network services business is an extremely valuable asset, generating significant cash flows and outstanding capital returns. We foresee continued strong earnings growth fueled by solid business volumes, increasing demand for new services, and continuing cost improvements.

Revenue Components		Revenue by Lines of Business	
Local	36%	Consumer	33%
Access	20%	Carrier	21%
Toll	11%	Small Business	15%
Value Added	11%	Large Business	13%
Directory Publishing	9%	Directory	9%
Other	5%	Public + Operator	6%
		Federal Systems	3%

Revenue of \$12.3 billion in 1995
 Targeting 5% revenue growth in 1996

While the Telecommunications Act of 1996 will accelerate the opening of our local markets to competition, it also removes the artificial barriers that have kept us out of other attractive markets, providing a clear path to entry into new businesses like long distance.

This industry convergence creates a whole new set of business opportunities for companies that can package and market services across the whole range of services demanded by the marketplace. Our landline network platform provides the best and most efficient delivery architecture for the widest range of new services and margin opportunities, especially as our modernization program migrates our network to an ATM switched digital broadband full service platform.

The ability to package and market services will

expand the "total pie, particularly as it relates to high-margin services. In the next five to ten years, we expect to see dramatic increases in penetration rates for value-added telephony services, second lines, data connectivity, and video services.

At Bell Atlantic, we are uniquely positioned to put together a full complement of services. The key to our success in the new, open marketplace will be focusing on the high end of the market, not necessarily overall market share. While there are incremental margin opportunities for these services today on a stand-alone basis, the key to profitability in the future will be the margin per customer created by marketing a full package of differentiated services to both residential and business customers.

Growth Strategies

1. Revenue Stimulation
2. New Market Opportunities
3. Network Optimization
4. Improve Cost Structure

1. Revenue Stimulation

A top priority of the network business in 1996 will be achievement of a five percent revenue growth target. We intend to build on the momentum achieved in 1995, with a special emphasis on marketing and product development.

- We will continue to drive growth in existing residential services by stimulating the market with promotional and marketing programs designed to increase penetration.
- We will continue to promote sales of secondary residential lines, targeting more than 600,000 additional lines in 1996.
- We plan to launch a series of new products and services in the residential market, including voice activation and Internet access.
- In the small business area, sales of our customized Centrex -- Custopak -- are expected to continue strong growth in 1996. In large business, demand for fast-packet services and network integration continues to be driven by increasing use of enterprise networks and the popularity of the world wide web.

2. New Market Opportunities

Data Connectivity

The emergence of the World Wide Web, the popularity of on-line services, and the increase in the number of people teleworking and utilizing collaborative computing are expected to drive growth in the data connectivity market through the rest of the

decade.

We are addressing these market needs through the existing switched public network, currently with bandwidth enhancements such as ISDN. Ultimately, the capabilities of the switched digital broadband full service network will provide the platform for meeting longer-term market requirements for high bandwidth connectivity.

We are targeting between three and four million secondary lines in service by the end of the century -- which would represent a penetration of 30 to 35 percent of the residential market. We are also targeting more than one million ISDN lines in service by the year 2000.

Long Distance

The opening of the \$70 billion long distance market represents a dramatic expansion of our market potential and a significant opportunity to create shareholder value. In addition to giving us immediate entry into markets outside our region, the Telecommunications Act of 1996 gives us the opportunity to pursue long distance business in markets outside our region immediately, and provides a detailed path for market entry in-region in the 1997-98 time frame.

Out-of-region, we are selectively targeting markets where we have a distinct opportunity for success and profitability, either because of a favorable regulatory situation, brand equity, or an existing wireless presence. Our goal is to gather the necessary expertise and capabilities needed for in-region entry.

In-region, we believe our ability to gain market share profitably will be a result of the following:

- Strong brand name and sizable customer base.
- Expected capital expenditures of only \$200 to \$300 million to enable our network to carry long distance traffic within the region, thereby avoiding interconnection charges.
- Roughly 40% of originating long distance calls within the mid-Atlantic region also terminate within our territory.

We are planning to capture at least 20 percent of the \$10 billion in-region market within five years of entry.

Video Services

The market opportunity in video services is driven by the fact that people simply want better alternatives to today's cable television and video rentals. The cable market in our region is estimated at \$4 billion, and video rentals are estimated at \$2 billion.

Video is a natural extension of our network

business. Fundamentally, there is no difference between transmitting digital video than any other kind of digitized content. The same broadband network that we are building to serve the voice and data markets will also serve the video market. We are the only telephone company in the country to be doing this today with the first commercial video network anywhere in the nation in Dover Township, New Jersey.

3. Network Optimization

Throughout our network, we have many of the technologies in place to address these new market opportunities. As we complete the final stage of modernization -- the last mile to the customer premise -- we will be able to support the broad range of customer requirements in the areas of voice, data, and video services.

The economics of fiber to the curb are becoming increasingly favorable relative to copper for basic telephony, with comparable capital costs and significantly lower operating costs. Equally attractive are the low variable costs for the addition of broadband data, second lines, and video capabilities, as demand warrants. In this manner, we will optimize returns on our investment base by extending the life of existing facilities, maximizing the penetration potential of transport and vertical services, and minimizing unit costs.

Another opportunity to optimize utilization of our network is a result of the opening of the local marketplace by the Telecommunications Act of 1996. We believe that competition will expand the market in local exchange as it did in long distance -- stimulating total market growth as a result of new entrants.

By selling our network services in a wholesale environment, we can achieve new revenues on our platform without new capital investment, while preserving efficiencies of scale and scope. Our formula is simple -- make our transport and value-added services so attractive that carriers would rather buy from us than build these capabilities on their own. We believe we are well positioned to preserve network margins using the wholesale channel -- our access prices today are among the lowest in the country, and deep discounting below retail is not required under the legislation.

4. Improve Cost Structure

In the area of expense controls, we already have the lowest cash expense per access line in our industry at \$320. We will continue to drive that number lower through continued workforce reductions and the deployment of new operating systems and cost-effective technologies.