BEFORE

THE FLORIDA PUBLIC SERVICE COMMISSION

DIRECT TESTIMONY

OF

JOHN I. HIRSHLEIFER

ON BEHALF OF

AT&T COMMUNICATIONS OF THE SOUTHERN STATES, INC.

AND

MCI WORLDCOM, INC.

DOCKET NO. 990649-TP

June 8, 2000

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| 1 | | **DIRECT TESTIMONY OF** |
| 2 | | **JOHN I. HIRSHLEIFER** |
| 3 | | **ON BEHALF OF** |
| 4 | | **AT&T COMMUNICATIONS OF THE SOUTHERN STATES, INC. AND** |
| 5 | | **MCI WORLDCOM, INC.** |
| 6 | | **DOCKET NO. 990649-TP** |
| 7 | | |
| 8 | | |
| 9 | | **I. INTRODUCTION & QUALIFICATIONS** |
| 10 | | |
| 11 | Q. | **PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.** |
| 12 | A. | My name is John I. Hirshleifer and my business address is Charles River |
| 13 | | Associates, Inc., 10877 Wilshire Blvd., Los Angeles, California 90024. |
| 14 | | |
| 15 | Q. | **WHAT IS YOUR OCCUPATION?** |
| 16 | A. | I am a Principal at Charles River Associates, Inc. (CRA), an international |
| 17 | | financial and economic consulting firm. |
| 18 | | |
| 19 | Q. | **WHAT IS YOUR EDUCATIONAL AND PROFESSIONAL** |
| 20 | | **BACKGROUND?** |
| 21 | A. | I graduated from the University of California at Los Angeles with an B.A. |
| 22 | | degree in 1976. Subsequently, I received my M.B.A. in finance in 1980 |
| 23 | | from UCLA's Anderson Graduate School of Management. I worked at Price |
| 24 | | Waterhouse from 1980 to 1984 and I am a certified public accountant in the |
| 25 | | State of California. From 1985 through 1990 I was the due diligence officer |

| 1 | | of Transamerica Financial Resources, Inc. (TFR), the broker-dealer |
|---|---|---|
| 2 | | subsidiary of Transamerica Corporation. While at Transamerica I held the |
| 3 | | registered representative, securities principal and financial and operations |
| 4 | | principal licenses, and ultimately became TFR's treasurer and chief financial |
| 5 | | officer. From 1991 through 1999 I was Vice President and Director of |
| 6 | | Research of FinEcon, a firm which provided financial economic consulting |
| 7 | | services to corporations, law firms and government agencies. At FinEcon I |
| 8 | | was responsible for numerous engagements involving securities, valuation |
| 9 | | and cost of capital issues. In 1999, FinEcon merged with CRA. As a |
| 10 | | Principal with CRA, my duties are substantially similar to those I held at |
| 11 | | FinEcon. In the past several years, I have provided cost of capital testimony |
| 12 | | in numerous state proceedings regarding the provision of unbundled |
| 13 | | network elements ("UNEs") to competing local exchange carriers and the |
| 14 | | provision of universal service, and have testified in the FCC's current |
| 15 | | proceeding regarding the represcription of rates for the provision of |
| 16 | | interstate access services.[1] I also co-authored an article entitled "Estimating |
| 17 | | the Cost of Equity", which was published in the Autumn 1997 issue of |
| 18 | | *Contemporary Finance Digest*. My resume is attached as Exhibit JH-1. |
| 19 | | |
| 20 | | **II. PURPOSE** |
| 21 | | |
| 22 | Q. | **WHAT IS THE PURPOSE OF YOUR TESTIMONY?** |
| 23 | A. | I have been asked by AT&T and MCI WorldCom *to estimate the forward-* |
| 24 | | looking economic cost of capital that should be used in determining |
| 25 | | BellSouth's and GTE's forward-looking economic costs to provide UNEs. |

2

| 1 | | As stated below, the midpoint of my cost of capital range for the provision |
|---|---|---|
| 2 | | of UNEs is **8.54 percent** for BellSouth and **8.66 percent** for GTE. |
| 3 | | |

**III. SUMMARY OF TESTIMONY/RECOMMENDATIONS**

6 Q. **PLEASE SUMMARIZE THE BASIC APPROACH OF YOUR**

7 **TESTIMONY.**

8 A. My testimony involves applying the basic formula for the weighted average

9 cost of capital ("WACC"), given as equation (1) below, to estimate the cost

10 of capital.

11

12 Q. **SUMMARIZE THE WACC FORMULA AND EXPLAIN HOW IT IS**

13 **APPLIED.**

14 The WACC formula is given by,

$$WACC = w_d{}^*k_d + w_e{}^*k_e \qquad (1)$$

16 where,

17 $w_d$ = the fraction of debt in the capital structure,

18 $k_d$ = the forward-looking cost of debt,

19 $w_e$ = the fraction of equity in the capital structure,

20 $k_e$ = the forward-looking cost of equity.

21 To apply the formula I estimate the forward-looking cost of both debt and

22 equity using methodologies that are well accepted by both financial

23 economists and regulators. In addition, I estimate the appropriate capital

24 structure mix of debt and equity capital. With these inputs, the WACC can

25 be calculated from equation (1).

3

1    **Q.   WHAT IS THE ESTIMATE FOR COST OF CAPITAL YOU**

2        **CALCULATED FROM EQUATION (1)?**

3   A.   I estimate the cost of capital to be in the range of 8.12 to 8.96 percent for

4        BellSouth's provision of UNEs. The midpoint average of this range is **8.54**

5        percent. The range for GTE's provision of UNEs is 8.24 to 9.09 percent

6        with a midpoint average of **8.66** percent.

7

8   **Q.   HOW IS THE REMAINDER OF YOUR TESTIMONY**

9        **ORGANIZED?**

10   A.   The remainder of my testimony is divided into six sections. Section IV

11        discusses the fundamental relationship between risk and the cost of capital.

12        Section V addresses the cost of debt that should be employed. Section VI

13        discusses several approaches to estimating the cost of equity capital.

14        Section VII addresses the question of determining the appropriate capital

15        structure to use when calculating the WACC, and presents my estimates of

16        the WACC. Section VIII discusses why the cost of capital I have calculated

17        for BellSouth and GTE, based on the public data available for companies at

18        the holding company level, is likely to overstate the relevant cost of capital

19        for the leasing of UNEs. Finally, Section IX presents a summary of my

20        conclusions.

21

4

1     IV. THE RELATIONSHIP BETWEEN RISK AND THE COST OF CAPITAL

2

3 Q. WHAT IS THE RELATION BETWEEN THE RISK OF AN

4       INVESTMENT AND THE COST OF CAPITAL?

5 A. Financial research has shown conclusively that investors are risk averse.

6       Consequently, the greater the risk of a business, the higher the expected

7       return that investors require to invest in the business. From the standpoint

8       of a company, this means that riskier businesses will have higher costs of

9       capital.

10

11 Q. WHAT ARE THE FUNDAMENTAL DETERMINANTS OF

12       INVESTMENT RISK?

13 A. There are two fundamental sources of risk: operating risk and financial risk.

14       Operating risk arises from the actual operation of the business. It is affected

15       by factors such as competition, technological change, customer acceptance

16       of a company's products, variation in the costs of producing the company's

17       products and the like.[2] Financial risk is determined by the amount of debt in

18       a company's capital structure. Taking on more debt increases fixed

19       financial charges, thereby increasing the risk that the firm will not be able to

20       meet its financial obligations. The total risk investors face is determined by

21       the combination of operating risk and financial risk.

22

23 Q. ARE OPERATING RISK AND FINANCIAL RISK RELATED?

24 A. Yes. In an effort to control the total risk that investors face, companies

25       manage their capital structures in a manner that leads to a relation between

5

| 1 | | operating risk and financial risk. In particular, companies that face a great |
| 2 | | deal of operating risk, like high technology firms, limit the debt they issue |
| 3 | | to prevent total risk from becoming too large. On the other hand, firms that |
| 4 | | face little operating risk, like regulated utilities, can benefit by using a good |
| 5 | | deal of low-cost debt without raising total risk to an unacceptable level. |
| 6 | | |
| 7 | Q. | **HOW DO YOU ACCOUNT FOR COMPANIES' BUSINESS AND** |
| 8 | | **FINANCIAL RISK IN ESTIMATING COST OF CAPITAL?** |
| 9 | A. | I apply the WACC formula to the closest comparable companies for which |
| 10 | | public market data is available. The problem is that public data for key |
| 11 | | variables, such as stock prices, are available only at the holding company |
| 12 | | level. Therefore, the comparable companies that must be used are |
| 13 | | diversified firms. These firms operate many businesses, most of which are |
| 14 | | riskier than the business in question in this case. Further discussion of this |
| 15 | | risk issue is postponed until the final section of my testimony. At this |
| 16 | | juncture, I proceed by using data at the holding company level. |
| 17 | | |
| 18 | Q. | **WHAT COMPARABLES DO YOU USE IN THIS TESTIMONY?** |
| 19 | A. | The comparable companies selected were derived from the list of telephone |
| 20 | | operating companies in Standard and Poor's Industry Survey. These |
| 21 | | companies are presented along with some descriptive information at Exhibit |
| 22 | | JH-2, and include the four regional Bell holding companies ("RBHCs"), and |
| 23 | | the larger independent telephone companies. Among the independents, |
| 24 | | Aliant Communications (formerly Lincoln Communications) was excluded |
| 25 | | because it has less than 500,000 access lines in service and is an order of |

6

| 1 | | magnitude smaller than the RBHCs. Telephone and Data Systems was |
| 2 | | excluded because only 27% of its revenues derive from traditional telephone |
| 3 | | and network operations, while 64% of revenues come from its high-risk |
| 4 | | cellular operations. Frontier Corp. was excluded because 72% of its |
| 5 | | revenues are derived from unregulated long-distance and integrated service |
| 6 | | operations and only 27% from local service. Cincinnati Bell (now |
| 7 | | BroadWing Inc.) was excluded because it has ceased paying dividends (to |
| 8 | | focus on investing in higher-growth businesses) and because I/B/E/S did not |
| 9 | | have an analyst growth estimate. |
| 10 | | |
| 11 | | **V. THE COST OF DEBT CAPITAL** |
| 12 | | |
| 13 | Q. | **HOW DO YOU ESTIMATE THE COST OF DEBT?** |
| 14 | A. | Because debt payments are fixed, the cost of debt can be computed directly |
| 15 | | and with a high degree of accuracy.[3] For this reason, I am able to utilize the |
| 16 | | costs of debt on the outstanding debt securities for BellSouth and GTE. It is |
| 17 | | not necessary to use a large sample of companies to estimate the cost of |
| 18 | | debt for the individual company because of the small measurement error. |
| 19 | | |
| 20 | Q. | **WHAT IS THE COST OF DEBT THAT YOU USE?** |
| 21 | A. | The best estimate of the cost of debt is the weighted average cost over all of |
| 22 | | the subject company's outstanding issues, including the debt of the holding |
| 23 | | company and any subsidiaries. Standard & Poor's Bond Guide ("Bond |
| 24 | | Guide") provides information on the face value and current yields to |
| 25 | | maturity on individual bonds.[4] |

7

1            The data from the Bond Guide are presented in Exhibits JH-3a and

2    JH3-b. For both of the companies' major debt issues the exhibits show the

3    bond rating, the face value and the yield to maturity. The yield to maturity

4    is a forward-looking cost of debt that measures the rate that the company

5    would have to pay if the bonds were issued at the measurement date, and

6    reflects investors' expectations regarding the future returns on these

7    publicly-traded bonds.[5] The exhibits show that the weighted average cost of

8    debt is 7.16 percent for BellSouth and 7.25 for GTE. Consequently, I use

9    **7.16 percent** as the cost of debt of BellSouth and **7.25 percent** as the cost

10    of debt of GTE in my WACC analysis.

11

12                    **VI. THE COST OF EQUITY CAPITAL**

13

14  **Q.**  **WHAT MAKES THE COST OF EQUITY CAPITAL MORE**

15       **DIFFICULT TO ESTIMATE THAN THE COST OF DEBT?**

16  **A.**  The cost of debt can be computed directly because both the face value of

17     debt and the contractual payments a company agrees to make are fixed. In

18     the case of equity, however, there is no face value and dividends are paid at

19     the discretion of management depending upon business conditions. In

20     addition, the dividend stream does not terminate at a known point. For

21     these reasons, there is no simple way to compute the cost of equity capital

22     and more complex approaches must be employed.

23

24  **Q.**  **WHAT METHODS DO YOU USE TO ESTIMATE THE COST OF**

25       **EQUITY CAPITAL IN THIS CASE?**

8

1    A.    I used two basic methods for estimating the cost of capital. The first is the

2          discounted cash flow ("DCF") method. Second, I use the capital asset

3          pricing model, or "CAPM". In various forms, the CAPM is the most widely

4          employed theoretical model, other than DCF, for estimating the cost of

5          capital. Methods based on the CAPM are sometimes referred to as "risk

6          premium" methods because the model provides an estimate of the risk

7          premium associated with investing in specific issues of common stock.

8

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

10   A.    The DCF method is based on the realization that the price of a share of

11         stock, P, equals the present value of all future dividends expected to be

12         received on that share, discounted at the cost of common equity.

13         Mathematically, the DCF model is written,

14   $$P = Div_1 / (1+k) + Div_2 / (1+k)^2 + Div_3 / (1+k)^3 + \ldots, \qquad (2)$$

15         where $Div_1$ is the expected dividend in year 1, $Div_2$ is the expected

16         dividend in year 2, etc.

17                 The cost of common equity is arrived at by solving the DCF

18         equation for the cost of capital, k. There are two obstacles that make it

19         difficult to solve the equation. First, the number of terms in the equation is

20         infinite. Second, dividends must be forecast for every future year. To

21         surmount these obstacles, simplifying assumptions must be made about the

22         behavior of future dividends.

9

1 **Q. WHAT ARE THE SIMPLIFYING ASSUMPTIONS THAT ARE**

2 **EMPLOYED IN THE CONTEXT OF THE DIVIDEND GROWTH**

3 **MODEL?**

4 A. One of the simplest assumptions that can be made is that future dividends

5 will grow *forever*, at a constant rate, g, i.e. the growth rate can be

6 maintained in perpetuity. In that case the DCF equation simplifies to,

7 $$P = Div_1 / (1+k) + Div_1 * (1+g) / (1+k)^2 + Div_1 * (1+g)^2 / (1+k)^3 +$$

8 ... ,

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

10 $$k = Div_1 / P + g.$$

11

12 **Q. DID YOU USE THE CONSTANT GROWTH DCF EQUATION**

13 **GIVEN ABOVE IN ESTIMATING THE COST OF CAPITAL FOR**

14 **YOUR SAMPLE OF TELEPHONE COMPANIES?**

15 A. No. Once again a problem is raised by the fact that modern telephone

16 companies are composed of a variety of businesses, some of which— such

17 as wireless telephony and high-speed internet access— are expected to grow

18 at rates of 25 percent or more in the short run. Such high growth rates are

19 clearly not sustainable into perpetuity, so that the simple constant growth

20 model cannot be applied unless one modifies the growth rate or adopts some

21 mitigating assumption. Stewart Myers and Lynda Borucki state that:

22        [f]orecasted growth rates are obviously not constant

23        forever. Variable-growth DCF models, which distinguish

24        short- and long-term growth rates, should give more

10

1  accurate estimates of the cost of equity. Use of such

2  models guards against naïve projection of short-run

3  earnings changes into the indefinite future.[6]

4  In addition, Ibbotson Associates state that:

5  The reason it is difficult to estimate the perpetual growth

6  rate of dividends, earnings, or cash flows is that these

7  quantities do not in fact grow at stable rates forever.

8  Typically it is easier to forecast a company-specific or

9  project-specific growth rate over the short run than over the

10  long run. To produce a better estimate of the equity cost of

11  capital, one can use a two stage DCF model... For the

12  resulting cost of capital estimate to be useful, the growth

13  rate over the latter period should be sustainable indefinitely.

14  An example of an indefinitely sustainable growth rate is the

15  expected long-run growth rate of the economy.[7]

16  Sharpe,[8] Alexander and Bailey state that:

17  Over the last 30 years, dividend discount models (DDMs)

18  have achieved broad acceptance among professional

19  common stock investors...

20  Valuing common stock with a DDM technically requires an

21  estimate of future dividends over an infinite time horizon.

22  Given that accurately forecasting dividends three years

23  from today, let alone 20 years in the future, is a difficult

11

1  proposition, how do investment firms actually go about

2  implementing DDMs?

3  One approach is to use constant or two-stage dividend

4  growth, models, as described in the text.   However,

5  although such models are relatively easy to apply,

6  institutional investors typically view the assumed dividend

7  growth assumptions as overly simplistic.   Instead, these

8  investors generally prefer three-stage models, believing that

9  they provide the best combination of realism and ease of

10  application.

11  ...[M]ost three-stage DDMs make standard assumptions

12  that all companies in the maturity stage have the same

13  growth rates, payout ratios and return on equity.[9]

14  Damodaran states that:

15  While the Gordon growth model is a simple and powerful

16  approach to valuing equity, its use is limited to firms that

17  are growing at a *stable growth rate*...

18  The second issue relates to what growth rate is reasonable

19  as a *stable growth rate*. Again, the assumption in the model

20  that this growth rate will last forever establishes rigorous

21  constraints on *reasonableness*.   A firm cannot in the long

22  term grow at a rate significantly greater than the growth

23  rate in the economy in which it operates.   Thus, a firm that

12

| | |
|---|---|
| 1 | grows at 12% forever in an economy growing at 6% will |
| 2 | eventually become larger than the economy. In practical |
| 3 | terms, the stable growth rate cannot be larger than the |
| 4 | nominal (real) growth rate in the economy in which the |
| 5 | firm operates, if the valuation is done in nominal (real) |
| 6 | terms... |
| 7 | ...If a firm is likely to maintain a few years of above-stable |
| 8 | growth rates, an approximate value for the firm can be |
| 9 | obtained by adding a premium to the stable growth rate, to |
| 10 | reflect the above-average growth in the initial years. Even |
| 11 | in this case, the flexibility that the analyst has is limited. |
| 12 | The sensitivity of the model to growth implies that the |
| 13 | stable growth rate cannot be more than 1% or 2% above the |
| 14 | growth rate in the economy. If the deviation becomes |
| 15 | larger, the analyst will be better served by using a two-stage |
| 16 | or a three-stage model to capture the supernormal or above- |
| 17 | average growth and restricting the use of the Gordon |
| 18 | growth model to when the firm becomes truly stable.[10] |
| 19 | Copeland, Koller and Murrin echo these observations, stating that "[f]ew |
| 20 | companies can be expected to grow faster than the economy for long |
| 21 | periods of time."[11] |
| 22 | |
| 23 | **Q.   HOW DO YOU APPLY THE DCF MODEL?** |

13

1   A.    I use a three-stage version.[12] The first stage lasts five years because that is

2           the longest horizon over which analysts forecasts of growth are available.

3           The second stage is assumed to last 15 years. During this stage the growth

4           rate falls from the high level of the first five years to the growth rate of the

5           U.S. economy by the end of year 20. From the twentieth year onward the

6           growth rate is set equal to the growth rate for the economy because rates

7           greater than that cannot be sustained into perpetuity. A perpetual growth

8           rate that exceeded the growth rate of the economy would illogically imply

9           that eventually the whole economy would be comprised of nothing but

10          telephone companies.

11

12   Q.   **WHAT DATA ARE USED TO ESTIMATE DIVIDEND GROWTH**

13          **DURING THE FIRST FIVE YEARS?**

14   A.    To estimate growth rates during the first five years I use the Value Line

15           dividend forecasts for the year 2000, and individual company earnings

16           forecast data from Institutional Brokers' Estimate System ("I/B/E/S") as of

17           September 1999 for the subsequent four years. To compile the I/B/E/S data,

18           more than 7,000 financial analysts representing over 800 research

19           organizations provide I/B/E/S with research on 18,000 stocks in 56

20           countries. In the U.S. alone, I/B/E/S receives estimates for 6000 companies

21           from over 240 research firms.[13]

22           By relying on the I/B/E/S data, which is for earnings, I am implicitly

23           assuming that dividends and earnings will grow at approximately the same

24           rate over the five-year horizon. There are no growth forecasts beyond a

25           five-year horizon. That is why an assumption must be made about how the

14

| | | |
|---|---|---|
| 1 | | growth rate behaves after that. As stated above, I assume that it converges |
| 2 | | to the long-run aggregate growth rate of the U.S. economy over the |
| 3 | | succeeding 15 years. |
| 4 | | |
| 5 | Q. | **WHAT IS A REASONABLE ESTIMATE FOR LONG-RUN** |
| 6 | | **GROWTH IN THE AGGREGATE ECONOMY?** |
| 7 | A. | The long-term growth forecast was derived by averaging the long-term GNP |
| 8 | | growth forecasts obtained from the Wharton Econometric Forecasting |
| 9 | | Associates ("WEFA") Group and from Ibbotson Associates. The WEFA |
| 10 | | Group is an econometric forecasting organization, formed in 1987 through a |
| 11 | | merger of WEFA and Chase Econometrics. Ibbotson Associates is widely |
| 12 | | known in the fields of finance and valuation as one of the leading providers |
| 13 | | of securities returns data and publications. As of September 1999, WEFA |
| 14 | | predicted an average nominal GNP growth rate of 4.40% from 1999 through |
| 15 | | 2025. As of September 1999, Ibbotson Associates forecast long-term |
| 16 | | inflation to be 2.60% annually. By adding this inflation forecast to the |
| 17 | | historical long-term real GNP growth rate of 3.28%, Ibbotson Associates |
| 18 | | predicted a nominal GNP growth rate of 5.88%. I take the average of the |
| 19 | | two forecasts, 5.14%, rather than choose a single GNP forecast. |
| 20 | | |
| 21 | Q. | **DO YOU APPLY THE DCF MODEL TO EACH INDIVIDUAL** |
| 22 | | **COMPANY AS YOU DID IN ESTIMATING THE COST OF DEBT?** |
| 23 | A. | No. Consistent with financial practice, I use the DCF model to estimate cost |
| 24 | | of equity for all of the companies selected as likely comparables, in addition |
| 25 | | to estimating a DCF cost of equity for the individual companies. |

15

1   Q.   **WHY IS IT A GOOD IDEA TO APPLY THE DCF MODEL TO A**

2       **NUMBER OF COMPANIES, NOT JUST THE COMPANY WHOSE**

3       **COST OF COMMON EQUITY YOU ARE TRYING TO ESTIMATE?**

4   A.   Estimating future growth for a company always involves some uncertainty

5       because no analyst can be expected to have perfect foresight. In some cases,

6       the growth rate may be overestimated and in other cases it may be

7       underestimated. On average, over a group of similar companies, these

8       estimation errors tend to cancel out so that the average growth rate for the

9       group is estimated more accurately than the growth rate for any individual

10      company.[14] Consequently, I apply the DCF method to all the telephone

11      companies in the previously selected sample.

12

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

14   A.   Given the market price of a company's stock, the current dividend, and the

15      forecast growth rates during each of the three stages, equation (2) can be

16      solved iteratively for k. The iterative solution is the estimate of the cost of

17      equity capital.[15]

18

19   Q.   **WHAT IS YOUR DCF ESTIMATE OF THE COST OF EQUITY**

20       **CAPITAL?**

21   A.   Exhibit JH-4 presents the DCF estimates of the cost of equity capital

22      derived from the three-stage model for the telephone company sample. The

23      estimates range from a low of 7.86 percent to a high of 9.44 percent.[16]

24         The DCF cost of equity capital for BellSouth is estimated to be 8.62

25      percent, based on a value-weighted average of the equity cost of capital for

16

1     all telephone holding companies (excluding BellSouth) and the cost of

2     capital for BellSouth itself. Using the same method for GTE yields a cost

3     of equity of 8.72%. The tables below show how these weighted average

4     costs of equity capital were computed:

5

**WEIGHTED AVERAGE DCF COST OF EQUITY FOR BELLSOUTH**

|  | Weight | Rate | Weighted Cost |
|---|---|---|---|
| Average (excluding BellSouth) | .75 | 8.87 | 6.65 |
| BellSouth | .25 | 7.86 | 1.97 |
| **Weighted Cost of Equity** | | | **8.62** |

6

**WEIGHTED AVERAGE DCF COST OF EQUITY FOR GTE**

|  | Weight | Rate | Weighted Cost |
|---|---|---|---|
| Average (excluding GTE) | .75 | 8.66 | 6.49 |
| GTE | .25 | 8.91 | 2.23 |
| **Weighted Cost of Equity** | | | **8.72** |

7

8 Q. **WHY DO YOU USE A WEIGHTED AVERAGE TO COMPUTE**

9     **BELLSOUTH'S AND GTE'S DCF COST OF EQUITY?**

10 A. There is a trade-off between two considerations. First, because the DCF

11     approach, like any approach, estimates the cost of equity capital with error,

12     it is wise to use an average. This is because in the averaging process errors

13     tend to cancel with overestimates offsetting underestimates. However, the

14     DCF method does not have a mechanism to adjust for differences in risk

15     caused by differing capital structures employed by the firms in the sample.

17

1   For example, of all the <u>individual companies</u> in the sample, BellSouth

2   provides the best estimate of BellSouth's own cost of capital. In light of

3   these two considerations, I feel a weighted average which assigns a ¾

4   weight to the average excluding BellSouth and a ¼ weight to BellSouth is

5   the best estimate. Using this procedure, BellSouth is given a significantly

6   larger weight than any of the other companies in the sample, but a smaller

7   weight than the aggregate of all the comparables.

8

9   Q.   **WHAT OTHER METHODS DID YOU USE TO ESTIMATE THE**

10       **COST OF EQUITY?**

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

12

13  Q.   **WHAT ARE CAPITAL ASSET PRICING MODELS?**

14  A.   Capital asset pricing models are mathematical formulas designed to quantify

15       the trade-off between risk and return. Professor William Sharpe was

16       awarded the Nobel Prize for developing the first capital asset pricing model.

17       Here I employ several updated variants of Professor Sharpe's model.

18

19  Q.   **HOW DOES THE CAPITAL ASSET PRICING MODEL (CAPM)**

20       **WORK?**

21  A.   The CAPM is designed to give the risk premium, that is the premium over

22       the rate on Treasury securities, required to induce investors to hold specific

23       issues of common stock. The standard CAPM is given by equation (3),

24            Company risk premium = Company "beta" • Market risk premium.

25            (3)

**18**

1      To apply the CAPM for a given company, it is necessary to estimate both

2      that company's beta and the market risk premium.

3

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

5   A.   The beta coefficient measures the systematic risk of investing in a

6        company's equity. The CAPM is built upon the insight that investors will

7        be rewarded for bearing only those risks, called systematic risks, that cannot

8        be eliminated by diversification. To understand the difference between

9        systematic and non-systematic risk, consider a hypothetical investment in

10       Apple Computer. The risks associated with this investment can be seen as

11       arising from two sources. First, there are risks that are unique to Apple.

12       Will Apple design competitive products? Will computer users accept

13       Apple's new operating system? Second, there are risks that affect all

14       common stocks. Will the economy enter a recession? Will war break out in

15       the Middle East?

16            The risks that are unique to Apple can be eliminated by

17       diversification. An investor who invests only in Apple will suffer

18       significant losses if Apple's new products are a failure, but an investor who

19       holds Apple along with hundreds of other securities will hardly notice the

20       impact on the value of his or her portfolio if Apple's new products fail.

21       Therefore, risks that are unique to Apple are said to be non-systematic.

22            On the other hand, market-wide risks cannot be eliminated by

23       diversification. If the economy enters a recession and stock prices fall

24       across the board, investors holding hundreds of securities fare no better than

19

| 1 | investors who put all their money in Apple computer. Thus, economy-wide |
| 2 | risks are systematic. |

3    The CAPM says that only systematic risks, as measured by beta, are

4    associated with a risk premium. Non-systematic risks are not associated

5    with premiums because they can be eliminated by diversification.

6    This concept is particularly important for the determination of cost of

7    capital because the risk that a company will lose customers to competition --

8    such as a network leasing company losing business to competing facilities

9    providers -- is a diversifiable risk which does not increase the risk premium

10   according to capital market theory.[17]

11

12  Q.  HOW DO YOU CALCULATE BETA?

13  A.  Beta is typically calculated by a procedure called regression analysis. In

14      regression analysis, the returns on the subject stock (the dependent

15      variable), are regressed against the returns of a market portfolio of stocks

16      (frequently the S&P 500) to estimate statistically the degree that the

17      independent variable movements in the market portfolio have caused the

18      returns of the subject company. Using this statistical tool, therefore, the

19      sensitivity of a stock to movements in the market can be estimated. This

20      sensitivity is what determines beta. In this case, I calculated the betas based

21      on five years of monthly return data through September 30, 1999 for

22      BellSouth, GTE and the comparable companies. Returns on the S&P 500

23      were used as the market proxy. Because beta is measured with error, the

24      average beta over all the comparables is a more accurate indicator of the

25      true beta than any individual estimate of beta.

20

1    Betas can also be calculated over other time periods and using

2    different observation intervals. For examples, for newer smaller companies

3    one year of daily data are often used to measure beta. This is because the

4    true underlying beta is likely to be changing for such companies and

5    because five years of data are often not available. The drawback is that the

6    shorter sample period and more frequent observation interval increase

7    measurement error. In this case I concluded that the sample companies

8    were sufficiently large, established and stable that it was more appropriate

9    to use five years of monthly data, which is consistent with the methodology

10   used by many institutional providers of betas, including Merrill Lynch, S&P

11   Compustat and Wilshire Associates.[18]

12   While technological and legislative change has impacted the

13   telecommunications industry, it is equally clear from publicly available

14   information that such change has been anticipated and considered over time

15   by industry participants, financial analysts and credit-rating agencies. The

16   telephone holding companies trade very efficiently, so risks that are

17   anticipated are impounded in the telephone holding companies' stock prices

18   rapidly and fairly.[19]

19   Before averaging individual betas it is necessary to take account of

20   the fact that the various comparable companies have differing amounts of

21   debt in their capital structures. The amount of a company's debt leverage

22   affects the riskiness of its stock returns and thereby its beta. To take

23   account of this, a two-step procedure is used to estimate the average beta.

24   First, the raw betas (i.e. betas computed by regressing each company's

25   return against the return of the S&P 500) are estimated for each of the

21

| 1 | | sample companies. Second, the raw betas are "unlevered" using standard |
| 2 | | financial economic formulas and based on the market value debt/equity |
| 3 | | ratios of each respective company as of September 30, 1999. The formula |
| 4 | | for "unlevering" a raw, or "levered" beta is, |

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

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

11 sample);

12       $D$ = the value of the sample company's debt.

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

14       Once the average has been estimated, the beta for any individual

15 company is estimated by "re-levering" using a simple variant of formula (4)

16 which solves for $B_L$, the "levered" beta.

17

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

19 **A.** My raw (levered) estimates of beta are presented in Exhibit JH-5. They

20 vary from a high of 0.82 to a low of 0.35 on a levered basis. As I discussed

21 above, however, the betas must be unlevered first to adjust for the different

22 amount of debt leverage employed by the individual companies before

23 calculating an average. Exhibit JH-5 also shows the unlevered betas and

24 their average. The average unlevered beta for the entire sample is 0.59.[20]

25 The average unlevered beta is re-levered using the formula discussed above

22

1      to take BellSouth's September 30, 1999 capital structure into account,

2      arriving at a beta of **0.66** for BellSouth. Re-levering using GTE's

3      September 30, 1999 capital structure arrives at a beta of **0.69** for GTE.

4

5  Q.  **IS THERE OTHER INFORMATION THAT SUPPORTS THE BETA**

6      **ESTIMATE THAT YOU USE IN YOUR ANALYSIS?**

7  A.  Yes. In addition to the betas I calculated by regressing each company's

8      return against the S&P 500, I obtained predicted betas from BARRA.

9      BARRA (formerly Rosenberg Associates) is an internationally known

10     financial consulting firm providing risk measurement services to investment

11     managers, corporations, consultants, securities dealers and traders, and

12     master custodians. The predicted betas are developed using sophisticated

13     financial modeling techniques which account for factors which impact the

14     future risk of a company. Unlike conventional regression betas, therefore,

15     the BARRA betas do not rely solely on historical stock returns and

16     explicitly consider forward-looking projections. Copeland, Koller and

17     Murrin recommend the use of BARRA predicted betas.[21] The predicted

18     BARRA beta before any unlevering and averaging adjustment is 0.69 for

19     BellSouth and 0.68 for GTE as of September 30, 1999. These are close to

20     the relevered betas of 0.66 for BellSouth and 0.69 for GTE that I have

21     calculated. If I were to instead use the BARRA predicted betas for the

22     telephone holding companies in my sample, the value-weighted unlevered

23     beta would be 0.64, again, close to the 0.59 I have calculated using

24     historical betas. Using these BARRA predicted betas would have the affect

23

| 1 | | of raising my recommended weighted average cost of capital for BellSouth |
| 2 | | to 8.67% and for GTE to 8.79%, increases of 13 basis points. |
| 3 | | |
| 4 | Q. | HOW DOES THE BETA RISK OF THE COMPANIES IN YOUR |
| 5 | | SAMPLE COMPARE WITH THE BETA RISK OF COMMON |
| 6 | | STOCK GENERALLY? |
| 7 | A. | By definition, the beta of all common stock generally (in other words, the |
| 8 | | beta of the market) is 1.0. Therefore, it appears that the beta of telephone |
| 9 | | stocks used in the sample is less than that of common stocks generally. This |
| 10 | | means that investments in the sample telephone company stocks are less |
| 11 | | risky than investments in typical industrial companies. Consequently, the |
| 12 | | cost of capital for telephone companies should also be less than it is for the |
| 13 | | average industrial stock. |
| 14 | | |
| 15 | Q. | WHAT DOES YOUR BETA ANALYSIS IMPLY THE COST OF |
| 16 | | EQUITY CAPITAL SHOULD BE IN THIS CASE? |
| 17 | A. | Beta alone is insufficient for estimating the cost of equity capital. To apply |
| 18 | | the CAPM it is also necessary to estimate the market risk premium. |
| 19 | | |
| 20 | Q. | WHAT IS THE MARKET RISK PREMIUM? |
| 21 | A. | The risk premium on the market is the amount of added expected return that |
| 22 | | investors require to hold a broad portfolio of common stocks (a proxy for |
| 23 | | the market as a whole) instead of risk-free Treasury securities. |
| 24 | | |

24

| 1 | Q. | WHAT TREASURY SECURITIES ARE USED TO MEASURE THE |
| | | RISK PREMIUM? |

1 Q. WHAT TREASURY SECURITIES ARE USED TO MEASURE THE

2 RISK PREMIUM?

3 A. Because there are over 100 issues of Treasury securities, some convention is

4 required. Commonly, the risk premium is measured over both short-term

5 Treasury bills with a maturity of one to three months and long-term

6 Treasury bonds with a maturity of 10 to 30 years. In this study, I use one-

7 month Treasury bills and 20-year Treasury bonds using Ibbotson

8 Associates' and Jeremy Siegel's data going back to 1802.

9

10 Q. HOW IS THE MARKET RISK PREMIUM ESTIMATED?

11 A. The market risk premium can be estimated two ways. First, the DCF

12 approach can be applied to the market as a whole. Second, the premium can

13 be estimated by examining historical data on the difference between the

14 return on a broad portfolio of common stocks and associated Treasury

15 securities.

16

17 Q. HOW CAN THE DCF MODEL BE USED TO ESTIMATE THE

18 MARKET RISK PREMIUM?

19 A. Two steps are required to estimate the market risk premium using the DCF

20 model. The first step is to compute the DCF expected return (another word

21 for the cost of equity) for the market as a whole. Deducting the risk-free

22 rate from the expected return gives the market risk premium.

23

24 Q. WHAT IS THE DCF ESTIMATE OF THE EXPECTED RETURN ON

25 THE MARKET?

1    A.    The starting point for estimating the expected return on the market is the

2          S&P 500 index. The sample is then limited to those S&P 500 companies

3          that pay a dividend of at least 1.5% on the grounds that the DCF approach

4          may be less accurate for companies that pay small dividends.[22] The

5          exclusion of companies paying dividends under 1.5% is conservative,

6          having the effect of increasing the estimated return on the market by about

7          150 basis points. The sample includes large companies for which the data is

8          considered to be reliable for purposes of DCF estimates. For the selected

9          companies, the three-stage DCF model is applied in the same fashion as it

10         was applied to the sample of telephone companies. Finally, the individual

11         DCF estimates for the sample companies are averaged on a market-value

12         basis. This average, which comes out to be **9.55%**, is used as an estimate of

13         the expected return on the market as a whole.

14

15   Q.    **GIVEN THE EXPECTED RETURN ON THE MARKET HOW DO**

16         **YOU CALCULATE THE MARKET RISK PREMIUM?**

17   A.    The market risk premium is computed by subtracting the risk-free rate from

18         the expected return. In the case of the 20-year Treasury bond this is

19         straightforward. The calculations are shown in Exhibit JH-6. The exhibit

20         shows that as of September 1999, the 20-year bond yield was 6.47 percent.

21         Subtracting 6.47 from 9.55 percent gives a market risk premium over long-

22         term Treasury bonds of 3.08 percent.

23             In the case of one-month Treasury bills the situation is more

24         complicated. Because the goal of the analysis is to estimate the long-run

25         cost of capital, using a one-month interest rate can be misleading. A more

26

| 1 | | appropriate choice is the average return on one-month Treasury bills that is |
| 2 | | expected to obtain over the long-term. This can be calculated using the |
| 3 | | following two-step procedure. First, compute the long-run historical |
| 4 | | difference between the return on one-month Treasury bills and the return on |
| 5 | | 20-year Treasury bonds. Second, subtract that historical difference from the |
| 6 | | current yield on 20-year bonds. The difference gives a forward-looking |
| 7 | | market estimate of the average expected yield on one-month Treasury bills |
| 8 | | over the next 20 years. Exhibit JH-7 shows that the average expected one- |
| 9 | | month Treasury bill rate over the long run is 4.90 percent as of September |
| 10 | | 30, 1999. Subtracting this rate from the expected return on the market gives |
| 11 | | a market risk premium over Treasury bills of 4.65 percent as shown in |
| 12 | | Exhibit JH-6. |
| 13 | | |
| 14 | Q. | WHAT IS YOUR HISTORICAL ESTIMATE OF THE MARKET |
| 15 | | RISK PREMIUM? |
| 16 | A. | The historical risk premium is defined as the historical difference between |
| 17 | | the return on the stock market and the risk-free rate. The proper estimate of |
| 18 | | the market risk premium is a question that is disputed among both |
| 19 | | academics and practitioners with regard to two primary issues. First, when |
| 20 | | analyzing historical data, should an arithmetic or geometric average be used |
| 21 | | to calculate the historical average risk premium? Second, over what period |
| 22 | | should the average be computed to accurately capture the risk premium |
| 23 | | expected in the future? Specifically, should the entire sample period back to |
| 24 | | 1802 be used, should the sample period be limited to post-1926 when more |
| 25 | | complete data became available, should only post-war data be employed |

27

1     because the role of government in the economy has changed fundamentally

2     since the great depression, or should even more recent data be used?  With

3     regard to the type of average, many academic authors favor the arithmetic

4     over the geometric.[23]  Others, however, recommend using the geometric

5     average because arithmetic averages are biased by the measurement period,

6     and because empirical studies of stock market returns show negative serial

7     correlation of returns over time.[24,25]  With regard to the sample period for

8     computing the average risk premium, Ibbotson argues that a long data series

9     is required so that the equity risk premium is not unduly influenced by very

10    good or very poor short-term results.  The 1998 Yearbook published by

11    Ibbotson Associates suggests that the post-1926 data compiled therein

12    provides a representative period of returns that can occur under diverse

13    economic circumstances.[26]  However, Ibbotson has cautioned that the long-

14    run stock market returns calculated by his firm may not prove predictive.

15    He believes that the U.S. is not as risky as it was in 1925, suggesting that

16    lower returns will be experienced in the future.[27]  Ibbotson also states that

17    his historical averages overstate the forward-looking cost of equity because

18    of survivorship bias.[28] For example, the U.S. stock market survived despite

19    the Great Depression.  As of 1925, however, there existed a risk that the

20    stock market would be entirely wiped out—as happened in Germany, Japan,

21    China and Russia.  If these countries were included in an average, historical

22    returns would be much lower.[29]

23       Based on an analysis of data going back to 1802, Siegel presents

24    convincing evidence that the risk premium was abnormally high after the

25    U.S. went off the gold standard resulting from unanticipated inflation which

28

| 1 | | reduced the real returns on bonds. He notes that the current equity premium |
| 2 | | appears to be returning to the 2 - 3 percent range that existed before the |
| 3 | | second world war.[30] Blanchard also presents evidence that the risk premium |
| 4 | | has declined to 2 to 3 percent in recent years and argues that either the DCF |
| 5 | | approach should be employed in place of relying on an average or more |
| 6 | | recent data should be used.[31] Similarly, Rappaport opposes the use of long- |
| 7 | | term averages. He states that the relative risk of bonds has increased over |
| 8 | | the past two decades, thereby lowering risk premiums to a range from 3 to 5 |
| 9 | | percent.[32] More recently, the Wall Street Journal noted that traditional |
| 10 | | measures of value are failing to explain current stock prices in part because, |
| 11 | | "the so-called risk premium has declined, as investors become more |
| 12 | | comfortable holding stocks."[33] |
| 13 | | In light of these questions, Exhibits JH-6 and JH-8 present both DCF |
| 14 | | estimates of the market risk premium and historical averages computed |
| 15 | | using both arithmetic and geometric averages calculated over various |
| 16 | | periods of time. |
| 17 | | |
| 18 | Q. | **GIVEN THE INFORMATION IN EXHIBITS JH-6 AND JH-8, WHAT** |
| 19 | | **IS THE BEST MEASURE OF THE MARKET RISK PREMIUM?** |
| 20 | A. | Taking account of all the information in Exhibits JH-6 and JH-8, I conclude |
| 21 | | that the reasonable estimates of the market risk premium are 7.5 percent |
| 22 | | over one-month Treasury bills and 5.5 percent over 20-year Treasury bonds. |
| 23 | | These estimates are conservative (i.e., on the high side) in the sense that they |
| 24 | | are above the average premiums observed in half of the periods, including |
| 25 | | the full sample, and are greater than those implied by the DCF analysis. |

1    From a Wall Street perspective, Merrill Lynch estimated the market

2    risk premium over the 20-year Treasury yield to be 3.82% as of April-end

3    2000. This is 168 basis points lower than the 5.50% market risk premium

4    over long-term Treasuries which I used in my study. In addition, J.P.

5    Morgan used an equity risk premium of 5.00% over the long bond rate for

6    its CAPM calculation in its October 15, 1998 Telecommunications Review.

7

8  Q. **GIVEN YOUR ESTIMATES OF BETA AND THE MARKET RISK**

9     **PREMIUM WHAT IS THE APPROPRIATE ESTIMATE OF THE**

10    **COST OF EQUITY CAPITAL?**

11 A.  To review, the CAPM says that,

12    $$\text{Cost of equity capital} = \text{Risk-free rate} + \text{Beta} \cdot \text{Market risk premium.}$$

13    Applying this equation using the long-run, expected, one-month Treasury

14    bill rate as the measure of the risk free rate gives:

15    $$\text{BellSouth's cost of equity capital} = 4.90\% + 0.66 \cdot 7.5\% = 9.85\%;$$

16    $$\text{GTE's cost of equity capital} = 4.90\% + 0.69 \cdot 7.5\% = 10.08\%;$$

17    Notice that in the preceding equation the expected long run Treasury bill

18    rate over the next 20 years is used, not the current one-month Treasury bill

19    rate.

20    Applying the CAPM equation using the 20-year Treasury bond as

21    the measure of the risk free rate gives:

22    $$\text{BellSouth's cost of equity capital} = 6.47\% + 0.66 \cdot 5.5\% = 10.10\%;$$

23    $$\text{GTE's cost of equity capital} = 6.47\% + 0.69 \cdot 5.5\% = 10.27\%;$$

| 1 | | In light of these results, I use the average of the two as the CAPM estimate |
|---|---|---|
| 2 | | of the cost of equity capital: **9.98 percent** for BellSouth and **10.17 percent** |
| 3 | | for GTE. |
| 4 | | |
| 5 | Q. | **HOW DO YOUR CAPM RESULTS COMPARE WITH YOUR DCF** |
| 6 | | **ESTIMATES OF THE COST OF EQUITY CAPITAL?** |
| 7 | A. | The CAPM-derived costs of equity are on average about 130 basis points |
| 8 | | higher than the DCF costs of equity.  Given the difficulty of estimating the |
| 9 | | cost of equity capital, I take an average of the two methods (see Exhibit JH- |
| 10 | | 9). |
| 11 | | |
| 12 | Q. | **COMBINING THE TWO METHODS, WHAT IS THE COST OF** |
| 13 | | **EQUITY CAPITAL FOR BELLSOUTH AND GTE?** |
| 14 | A. | The two estimates of the cost of equity capital produced a range for |
| 15 | | BellSouth of 8.62 to 9.98 percent and a range for GTE of 8.72 to 10.17.  I |
| 16 | | feel the best overall estimate is approximately the average of the three-stage |
| 17 | | DCF and CAPM cost of equity estimates. The cost of equity capital that I |
| 18 | | use in the WACC calculations is therefore **9.30 percent** for BellSouth and |
| 19 | | **9.45 percent** for GTE. |
| 20 | | |
| 21 | | **VII.  CAPITAL STRUCTURE AND THE WACC** |
| 22 | | |
| 23 | Q. | **WHAT IS MEANT BY THE "CAPITAL STRUCTURE" OF A** |
| 24 | | **BUSINESS?** |

31

1   A.   Most American businesses are financed by a combination of equity

2       (common stock) and debt (including bonds and bank loans). The capital

3       structure refers to the fraction of debt and equity used to finance a business.

4       In terms of the WACC formula presented at the outset, the capital structure

5       is determined by the financing weights, $w_e$ and $w_d$.

6

7   Q.   **IS THE CAPITAL STRUCTURE RELATED TO THE RISK OF A**

8       **BUSINESS?**

9   A.   Yes. As discussed earlier, companies that face greater operating risk tend to

10      take on less debt.

11

12   Q.   **HOW DO YOU ESTIMATE THE CAPITAL STRUCTURE FOR A**

13      **PARTICULAR BUSINESS?**

14   A.   The goal is to estimate the long-run target financing weights that a rational,

15      informed management team would employ.[34] If there are companies

16      participating in comparable business activities, the accepted solution is to

17      use their observed capital structure as the starting point. In this case,

18      however, the comparables are all riskier than the business activity in

19      question (the provision of unbundled network elements) because of the

20      necessity to use data that are only available at the holding company level.

21          Alan Shapiro states that:

22           "[i]n multiproduct firms, the requirement that

23           projects be of homogeneous risk is more likely to be

24           met for divisions than for the company as a whole.

25           This suggests that the use of a divisional cost of

| 1 | | capital may be valid in some cases in which the use |
| 2 | | of a companywide cost of capital would be |
| 3 | | inappropriate. Conglomerate firms that compete in |
| 4 | | a variety of different product markets ... often |
| 5 | | estimate separate divisional costs of capital that |
| 6 | | reflect both the differential risks and the differential |
| 7 | | debt capacity of each division. |
| 8 | | |
| 9 | | The estimation of these divisional costs of capital is |
| 10 | | tricky. All the firm observes is its overall cost of |
| 11 | | capital, which is a weighted average of its divisional |
| 12 | | costs of capital."[35] |
| 13 | | I performed my analysis using the holding company information because of |
| 14 | | the data limitation. |
| 15 | | |
| 16 | Q. | **WHAT ARE THE CAPITAL STRUCTURE WEIGHTS FOR YOUR** |
| 17 | | **SAMPLE OF COMPANIES?** |
| 18 | A. | The current capital structures for my sample of companies is shown in |
| 19 | | Exhibit JH-10. Notice that the comparison depends on whether book value |
| 20 | | or market value weights are used. At this juncture, there remains a debate |
| 21 | | among academics, practitioners, and forensic experts regarding the choice |
| 22 | | between book and market weights. In traditional rate of return hearings, |
| 23 | | capital structure is typically presented in terms of book value weights. |

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1    The average book value debt weight for the sample companies is 55

2    percent as of September 30, 1999.[36] BellSouth's own debt weight is 54

3    percent while GTE's is 66 percent. In terms of market value weight,

4    however, the debt weight is lower. The average for the full sample is 16

5    percent, while BellSouth's debt weight is 16 percent and GTE's is 22

6    percent. However, market value debt weights of the holding companies

7    probably understate long-run target debt weights in the capital structure of

8    the network element leasing business as discussed in detail in Section VIII

9    below. Consequently, in this case it is inappropriate to rely solely on current

10   market value capital structure weights of the telephone holding companies

11   when calculating the WACC for the network element leasing business.

12   Therefore, I apply the WACC formula using both book and market weights

13   to establish a range.

14

15   Q.   WHAT CAPITAL STRUCTURES WEIGHTS DO YOU USE IN

16        YOUR SAMPLE?

17   A.   Given the dispersion in capital structure weights, I use the average weights

18        in my WACC calculations. Both book and market averages are employed

19        to establish a range.

20

34

1  Q.  **GIVEN YOUR PRECEDING TESTIMONY, WHAT IS THE LOWER**

2     **BOUNDARY OF THE APPROPRIATE RANGE FOR THE**

3     **WEIGHTED AVERAGE COST OF CAPITAL FOR BELLSOUTH**

4     **AND GTE?**

5  A.  The table below computes the WACC from the estimates of the cost of debt,

6     the cost of equity and the capital structure developed in my preceding

7     testimony using book value capital structures.

8     **BellSouth's WACC Based On Average Book Capital Structure Weights**

9     |         | Weight | Rate | Weighted cost |
       |---------|--------|------|---------------|
10    | Equity  | 0.45   | 9.30 | 4.18          |
11    | Debt    | 0.55   | 7.16 | 3.94          |
12    | **BellSouth's WACC** |  |  | **8.12**      |

13

14    **GTE's WACC Based On Average Book Capital Structure Weights**

15    |         | Weight | Rate | Weighted cost |
       |---------|--------|------|---------------|
16    | Equity  | 0.45   | 9.45 | 4.25          |
17    | Debt    | 0.55   | 7.25 | 3.99          |
18    | **GTS's WACC** |  |  | **8.24**          |

19 Q.  **WHAT IS THE UPPER BOUNDARY OF THE APPROPRIATE**

20    **RANGE FOR THE WEIGHTED AVERAGE COST OF CAPITAL**

21    **FOR EACH OF THE TELEPHONE COMPANIES FOR**

22    **BELLSOUTH AND GTE?**

23 A.  As the network element leasing business is less risky than the overall risk of

24    a telephone holding company, estimating a cost of capital using a market

35

| | | | | |
|---|---|---|---|---|
| 1 | | value capital structure (which results in a cost of capital estimate for the | | |
| 2 | | telephone holding company itself) will provide an upper bound estimate of | | |
| 3 | | the cost of capital for the network element leasing business. | | |

4       The table below computes the WACC from the estimates of the cost

5       of debt, the cost of equity and the capital structure developed in my

6       preceding testimony using market value capital structures.

7 **BellSouth's WACC Based On Average Market Capital Structure Weights**

| 8 | | Weight | Rate | Weighted cost |
|---|---|---|---|---|
| 9 | Equity | 0.84 | 9.30 | 7.81 |
| 10 | Debt | 0.16 | 7.16 | 1.15 |
| 11 | **BellSouth's WACC** | | | **8.96** |

12

13 **GTE's WACC Based On Average Market Capital Structure Weights**

| 14 | | Weight | Rate | Weighted cost |
|---|---|---|---|---|
| 15 | Equity | 0.84 | 9.45 | 7.93 |
| 16 | Debt | 0.16 | 7.25 | 1.16 |
| 17 | **GTE's WACC** | | | **9.09** |

18

19 **Q OVERALL WHAT DO YOU CONCLUDE IS A FAIR ESTIMATE OF**

20 **THE COST OF CAPITAL?**

21 A. I believe a fair estimate is the midpoint of my range. Averaging 8.12 and

22 8.96, the midpoint comes to **8.54** percent for BellSouth's provision of

23 UNEs. For GTE, averaging 8.24 and 9.09, the midpoint comes to **8.66**

24 percent. These numbers are presented in Exhibit JH-11.

1  Q   **WHAT IS THE CAPITAL STRUCTURE IMPLIED BY THIS**

2      **MIDPOINT COST OF CAPITAL ESTIMATE?**

3  A.  The capital structure implied by the 8.54 percent cost of capital for

4      BellSouth is **35.5% Debt** and **64.5% Equity**. The same capital structure is

5      implied by GTE's WACC of 8.66 percent.

6

7  Q   **YOUR WACC ESTIMATE IS CALCULATED USING DATA AS OF**

8      **SEPTEMBER 30, 1999. TO WHAT EXTENT HAVE INTEREST**

9      **RATES DECLINED SINCE THEN?**

10 A.  30-year Treasury bond rates have fallen from 6.06% as of September 30,

11     1999 to 5.91% as of June 6, 2000, a drop of 15 basis points. Using this

12     decline as a rough rule of thumb would imply current costs of capital of

13     8.39% for BellSouth and 8.51% for GTE, before considering the question of

14     whether the risk has increased or declined.

15

16 Q.  **IS THIS ESTIMATE OF THE COST OF CAPITAL FORWARD**

17     **LOOKING?**

18 A.  Yes. The cost of debt is estimated from the yields to maturity of each

19     company's bonds obtained from the Bond Guide, which represent the

20     forward looking returns that investors would expect to earn on these

21     bonds.[37] The DCF model used for estimating the cost of equity employs

22     forward-looking growth projections made by analysts and forecasting

23     organizations. The CAPM model as I have employed it here uses current

24     U.S. Treasury bond rates as of the measurement date, which impound

25     forward-looking expectations, as one of its two return components. The

37

| 1 | | CAPM model by necessity uses historical information to estimate a |
| 2 | | company's riskiness, through the calculation of a beta, and to estimate the |
| 3 | | market risk premium, which is assumed to generally prevail into the future. |
| 4 | | Regarding these issues, I have considered forward looking predicted |
| 5 | | BARRA betas and both current research and Wall Street estimates regarding |
| 6 | | the forward-looking equity risk premium. |
| 7 | | |

## VIII. POTENTIAL UPWARD BIAS IN THE ESTIMATED COST OF CAPITAL

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

13 A. Yes. Modern diversified corporations, like BellSouth and other telephone
14 operating companies operate dozens of different businesses, some of which
15 are more risky than others. Consequently, the operating risk of the
16 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**
20 **IS BEING ESTIMATED IN THIS CASE?**

21 A. The business for which the cost of capital is being estimated in this case is
22 essentially the business of "leasing" local exchange telephone network
23 elements to retail providers. This business should have relatively low risk
24 compared to many of the risky business endeavors being pursued by the
25 telephone holding companies.

38

1    BellSouth's risky business undertakings include domestic cellular and

2    personal communications service, e-commerce web design and hosting,

3    advertising and publishing. In addition, BellSouth has invested in wireless

4    telephone systems in Argentina, Brazil, Chile, Denmark, Ecuador,

5    Germany, Guatemala, India, Israel, Nicaragua, Panama, Peru, Uruguay and

6    Venezuela. BellSouth is also an equity investor in wireless data

7    communications networks in the United States, the United Kingdom, the

8    Netherlands, Belgium and Singapore.

9    GTE's risky businesses include retailing, cellular, long distance,

10   airphone, managed network security, virtual private networks, Web-server

11   and application hosting, information processing, network, leasing, cable and

12   international services. GTE has wireless subsidiaries in Argentina, Canada,

13   and the Dominican Republic and affiliates in Canada, Puerto Rico,

14   Venezuela and Taiwan.

15

16  Q.   **HAVE ANY TELEPHONE HOLDING COMPANIES MADE**

17       **COMMENTS TO THE PUBLIC REGARDING BENEFITS TO BE**

18       **DERIVED FROM THE PROVISION OF NETWORK ELEMENTS**

19       **TO COMPETITIVE LOCAL EXCHANGE COMPANIES?**

20  A.   Yes. Bell Atlantic states in its mid-year 1999 Investor's Reference Guide

21       that the business of providing network elements "provides a unique

22       opportunity to add new revenues onto our platform without significant

23       incremental capital investment . . ." Bell Atlantic also notes that "our

24       networks must be able to handle increased traffic volumes from competitors

25       utilizing our infrastructure as we move into a wholesale environment."[38]

1   Q.   **WHAT RISKS ARE ASSOCIATED WITH THE BUSINESS OF**

2       **"LEASING" OF UNBUNDLED NETWORK ELEMENTS?**

3   A.   There is still the risk of regulation itself. The rate of return a network is

4       allowed to earn depends on the outcome of proceedings such as this and

5       remains somewhat uncertain. That risk can be substantially reduced if this

6       Commission adopts compensatory forward-looking pricing rules that tell

7       investors that telephone holding companies will have the opportunity to

8       recover all efficiently-incurred costs on a forward-looking basis. In

9       addition, there remains some risk that consumers, particularly business

10      users, will bypass the network as other alternatives become available.[39]

11      These risks, however, are substantially less than the risks faced by telephone

12      holding companies' other businesses, some of which are (or may soon be)

13      subject to competition.

14

15   Q.   **IS THERE A SIMPLE WAY TO DISTINGUISH THE BUSINESS OF**

16       **LEASING THE NETWORK FROM PROVIDING LOCAL**

17       **SERVICE?**

18   A.   Yes. Think of integrated telephone holding companies, for example

19      BellSouth, as being composed of separate business units. One business unit

20      owns the network and leases network elements to all local service providers,

21      including both competitors and the telephone companies' other business

22      units that are involved in the provision of local service. Whereas those

23      BellSouth units involved in providing local service are in businesses that (if

24      prices are set appropriately in these proceedings) will be faced with new

25      competitors, the unit involved in leasing the network which all the

40

1    competitors need to use has virtual monopoly power and faces much less

2    risk. The sample of companies used in my analysis for which the cost of

3    debt and equity are estimated is composed of diversified telephone

4    companies.  As stressed earlier, these companies operate a variety of

5    businesses, virtually all of which face a great deal more operating risk than

6    leasing a local exchange network.  This has been clearly recognized by

7    financial analysts and the bond rating agencies.[40]  The company to which

8    the WACC should be applied, however, is one which is involved

9    exclusively in leasing network facilities.  Under these circumstances, using

10   a higher debt weight than the current market value weights for the sample

11   companies is one way to take account of this problem.  The higher debt

12   weight may be more representative of the target capital structure for the

13   low-risk network element leasing business.

14

15   Q.   **HAVE YOU SEEN ANY INFORMATION TO THE PUBLIC WHICH**

16        **CONFIRMS THE REASONABLENESS OF YOUR COST OF**

17        **CAPITAL RANGE?**

18   A.   Yes.  Salomon Brothers in its January 1996 report "Regional Bell Operating

19        Companies—Opportunities Ring ... While Danger Calls" stated that

20        "[b]ased on our estimates, the RBOCs currently have an average weighted

21        cost of capital of approximately **8.6%**.  In order to value the RBOCs on a

22        level playing field, we used the same discount rate in each DCF.

23        Specifically, we used a discount rate of 10%, which we believe should be

24        the minimum return an investor would expect in order to entice him to

25        invest in a security, despite the fact this is slightly above the cost of capital."

41

| 1 | | Also, as part of its proposed merger with NYNEX, Bell Atlantic submitted |
|---|---|---|
| 2 | | to its shareholders a joint proxy statement/prospectus on September 18, |
| 3 | | 1996 in which Bell Atlantic's investment advisor, Merrill Lynch, performed |
| 4 | | a DCF analysis of the two companies' relative market values, estimating a |
| 5 | | discount rate in the range of **8% to 10%** for the telephone company portion |
| 6 | | of its portfolio of businesses. |
| 7 | | |
| 8 | Q. | **ARE THERE MORE RECENT PUBLICLY-AVAILABLE COST OF** |
| 9 | | **CAPITAL ESTIMATES WHICH CONFIRM THE** |
| 10 | | **REASONABLENESS OF YOUR COST OF CAPITAL RANGE?** |
| 11 | A. | Yes. In the GTE/Bell Atlantic merger proxy statement dated April 13, |
| 12 | | 1999, Salomon Smith Barney performed a five-year DCF analysis of Bell |
| 13 | | Atlantic as part of its fairness opinion and assumed discount rates ranging |
| 14 | | from **9.0% to 11.0%**. It is important to note that these rates are for the |
| 15 | | entire Bell Atlantic holding company and include businesses that are far |
| 16 | | riskier than leasing unbundled network elements. This is demonstrated by |
| 17 | | the Ameritech/SBC merger proxy statement dated October 15, 1998, in |
| 18 | | which Salomon Smith Barney performed a DCF valuation analysis of the |
| 19 | | two companies as part of its fairness opinion. The opinion broke down each |
| 20 | | company into its component business segments and applied a separate |
| 21 | | discount rate to each segment. For the telco business segments, excluding |
| 22 | | long distance, Salomon Smith Barney used a discount rate reflecting a |
| 23 | | WACC of **8.75% to 9.75%**. Salomon Smith Barney uses higher ranges of |
| 24 | | 10.50% to 11.50% for long distance business segments, 10.00% to 11.00% |
| 25 | | for cellular business segments, and 12.50% to 13.50% for PCS business |

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| 1 | segments. This is consistent with my testimony that local telephone |
| 2 | company operations are less risky than other telecommunications segments |
| 3 | and that telephone holding companies are engaged in many of these riskier |
| 4 | business activities. Goldman Sachs also performed a DCF analysis for its |
| 5 | fairness opinion for the Ameritech/SBC merger. Goldman Sachs indicated |
| 6 | that it used various discount rates ranging from **8.5% to 11.5%**. Although |
| 7 | the firm did not provide a detailed breakdown of how it applied the rates, it |
| 8 | is reasonable to assume that it was also attempting to gauge the effect of the |
| 9 | rates by business segment. |
| 10 | In an earlier fairness opinion for the SBC/Southern New England |
| 11 | Telephone merger proxy statement dated February 9, 1998, Salomon Smith |
| 12 | Barney again performed such a business segment breakdown in its DCF |
| 13 | analysis. In valuing the telco business, Salomon Smith Barney applied a |
| 14 | WACC of **9.0% to 10.0%**. Salomon Smith Barney applied higher ranges |
| 15 | of 11.0% to 12.0% to the long-distance and cellular business. |
| 16 | In its Industry Analysis report on Telecommunication Services dated |
| 17 | August 28, 1998, JP Morgan estimated the WACC for the U.S. telecom |
| 18 | sector for 1998 at **7.8%**. This report also shows that JP Morgan estimated |
| 19 | that the WACC for the telecom sector for the period 1995-2002 would stay |
| 20 | within the range of **7.6 to 7.8%**. |
| 21 | |
| 22 | Q. **IN ITS 1990 REPRESCRIPTION ORDER, THE FCC SET THE** |
| 23 | **RATE OF RETURN FOR INTERSTATE SERVICES OF LOCAL** |
| 24 | **EXCHANGE CARRIERS AT 11.25%. WHAT DO INTEREST RATE** |

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1    MOVEMENTS SINCE THEN SUGGEST ABOUT THE

2    APPROPRIATE CURRENT RATE?

3    A.    30-year Treasury bond rates have fallen from 9.03% as of September 1990

4          to 6.17% as of May 23, 2000.  This is a decline of 286 basis points since the

5          11.25% rate was prescribed.  Using this decline as a rough rule of thumb

6          would imply a current cost of capital of 8.39%, before considering the

7          question of whether the risk has increased or declined.  This number is less

8          than my WACC estimates of 8.54% for BellSouth and 8.66% for GTE and

9          is further evidence that my estimate is reasonable.

10

11   Q.    SHOULD THE COST OF CAPITAL ESTIMATE ACCOUNT FOR

12         QUARTERLY COMPOUNDING?

13   A.    No. Telephone operating companies receive payments for the use of their

14         network elements on a monthly basis, and consequently, are able to reinvest

15         their cash flows on an approximate monthly basis.  This is a more frequent

16         basis than investors receive their quarterly dividends from the telephone

17         holding companies.  Thus, the effective rate that the telephone companies

18         receive is the allowed rate— as determined in this hearing— compounded

19         monthly, regardless of the fact that a telephone holding company pays

20         dividends to investors quarterly.  If the Commission allows a rate which is

21         estimated using a quarterly compounding DCF model, the telephone

22         holding companies will get an effective rate compounded both quarterly (as

23         allowed) and monthly (as actually received).   To be precise, therefore, if

24         quarterly compounding is allowed, the cost of equity would also have to be

25         "decompounded" to account for the fact that the telephone holding

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1    companies will be able to reinvest proceeds on a monthly basis. The net

2    effect would result in a lower allowed rate than the annual DCF cost of

3    equity proposed by me. Consequently, the use of a DCF cost of equity

4    determined using the annual formula is conservatively high.

5

6    Q.  **SHOULD THE COST OF CAPITAL ESTIMATE BE INCREASED**

7        **FOR EQUITY FLOTATION COSTS?**

8    A.  No. BellSouth, GTE and the other telephone companies in the sample are

9        large holding companies whose stocks trade on the NYSE in an efficient

10       market. As part of the process of arriving at the day-to-day prices for the

11       companies' stock, the market is anticipating future events which affect the

12       cash flows that the companies will earn. This process clearly includes the

13       anticipation of future cash expenditures, including financing costs for both

14       debt and equity which reduce the companies' cash flows. Because the price

15       of the companies' stock has accounted for flotation costs already, an

16       estimation of the cost of equity using the DCF model accurately reflects the

17       required return of investors. Adding a flotation cost adjustment would in

18       effect double count the cost of financing.

19

20   Q.  **IF YOUR THEORETICAL ARGUMENT REGARDING**

21       **FLOTATION COSTS IS CORRECT, WHY HAS THERE BEEN SO**

22       **MUCH DISCUSSION ON THIS ISSUE IN THE TRADITIONAL**

23       **REGULATORY RATE HEARING CONTEXT?**

24   A.  The regulatory context is really a different issue. In the regulatory world, a

25       main purpose is to identify costs which can be charged back to the

45

1    ratepayers by the telephone operating company. Equity flotation costs have

2    often been disallowed because it would not be fair to burden current

3    ratepayers with all of those costs if the equity capital would be utilized

4    indefinitely. One way that parties have tried to "amortize" these costs so

5    that they could be recovered by the telephone company is to make the

6    flotation cost adjustment to the allowed return, which would in effect charge

7    it back to ratepayers perpetually in very small increments. This is not the

8    issue for this proceeding. In this case, I am interested in the forward-

9    looking cost of capital which fairly compensates for the riskiness of the

10   business. Because telephone holding companies' stock trades efficiently,

11   the market has assessed its prospective cash flows, including financing

12   costs, to arrive at its estimate of the fair price.

13

14                    IX.  REEXAMINING THE COST OF CAPITAL

15

16   Q.  IS THERE ANY BASIS FOR INCREASING THE 9.9% COST OF

17       CAPITAL SET BY THE COMMISSION IN THE MOST RECENT

18       UNE COST PROCEEDING AS SUGGESTED BY BELLSOUTH AND

19       GTE?

20   A.  No. There have been no new significant developments in the market for the

21       provision of UNEs that would suggest that the cost of capital has increased.

22       In fact, in the most recent universal service proceeding, the Commission

23       itself ruled that the cost of capital for BellSouth and GTE was only 9.5%.

24

25

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| 1 | | **X. CONCLUDING SUMMARY** |
| 2 | | |

3 **Q.   COULD YOU SUMMARIZE THE MAIN CONCLUSIONS OF YOUR**

4 **TESTIMONY.**

5 A.   Using publicly-available data and accepted finance procedures I have

6 estimated that the weighted average cost of capital for BellSouth's provision

7 of UNEs is in a range between 8.12 and 8.96 percent with a best point

8 estimate of **8.54** percent.  Alternately, if BARRA predicted betas are used, I

9 estimate a range of 8.21 to 9.12 percent with a best point estimate of **8.67**

10 percent.  I have estimated that the weighted average cost of capital for

11 GTE's provision of UNEs is in a range between 8.24 and 9.09 percent with

12 a best point estimate of **8.66** percent.  Using BARRA predicted betas, I

13 estimate a range of 8.32 to 9.26 percent with a best point estimate of **8.79**

14 percent.  I have also stressed, however, that the higher side of the range

15 represents upward-biased estimates of the cost of capital because they

16 incorporate the risks of multi-business telephone holding companies.  In this

17 proceeding, BA-NY's business at issue is not a diversified telephone

18 holding company, but a company in the more specialized (and less risky)

19 business of providing UNEs.  Finally, I observed public information made

20 available by independent parties unrelated to this proceeding that confirm

21 the reasonableness of my cost of capital estimate.

22

23 **Q.   DOES THAT CONCLUDE YOUR PRESENT TESTIMONY?**

24 A.   Yes.

25

[1] *In the Matter of Prescribing the Authorized Unitary Rate of Return for Interstate Services of Local Exchange Carriers*, CC Docket No. 98-166.

[2] As I discuss later in my testimony, however, operating risks which an investor can diversify away are not compensated with a risk premium according to capital market theory. Competition risks, for example, are diversifiable. In this segment of my testimony I explain all types of operating risks that a company faces, including both diversifiable and nondiversifiable risk.

[3] *Stocks, Bonds, Bills and Inflation, 1998 Yearbook*, Ibbotson Associates, Chicago, Illinois, pg. 150.

[4] The Bond Guide does not always cover all outstanding issues if there are many. It appears that the smaller and shorter-term obligations may be excluded. Because interest rates on longer-term obligations are generally higher, excluding the smaller and shorter term obligations would have the effect of overstating the cost of debt slightly.

[5] Theoretically, the yield-to-maturity on debt overstates the forward-looking cost of debt because of default risk. The problem raised by risky debt is that only the promised yield is observable, but it is the expected return that is required to estimate the cost of debt. Although the expected return and the default premium sum to the promised yield, neither the expected return nor the default premium can be observed directly. Because of this default risk, the debt cost of capital is actually the yield-to-maturity minus the expected default loss. The default risk of telephone holding company bonds is considered to be minimal and hence is ignored for purposes of this analysis.

[6] Stewart C. Myers and Lynda S. Borucki, "Discounted Cash Flow Estimates of the Cost of Equity Capital—A Case Study", *Financial Markets, Institutions & Instruments*, vol. 3, no. 3, New York University Salomon Center, 1994.

[7] *Stock, Bonds, Bills and Inflation, 1998 Yearbook*, Ibbotson Associates, Chicago, pp. 161-162.

[8] Dr. Sharpe is a Nobel-prize winning financial economist.

[9] Sharpe, William F., Gordon J. Alexander and Jeffery V. Bailey, *Investments*, Fifth Edition, Prentice Hall, Englewood Cliffs, New Jersey, 1995, pp. 590-591.

[10] Damodaran, Aswath, *Damodaran on Valuation: Security Analysis for Investment and Corporate Finance*, John Wiley & Sons, New York, 1994, pp. 99-101.

[11] Copeland, Tom, Tim Koller, and Jack Murrin, *Valuation: Measuring and Managing the Value of Companies*, John Wiley & Sons, New York, 1994, pg. 295.

[12] There are numerous formulations of the DCF model of varying complexity. Damodaran, for example, describes several different DCF models in his book. It should be noted that what he calls the "three-stage model" is different from the model I employ and is not comparable. Damodaran's "H Model" is more comparable to the model that I use.

[13] I/B/E/S website, www.ibes.com.

[14] I refer to estimation error and the desirability of using averages in several discussions in my testimony. The following excerpt from *A Guide to Econometrics*, (3rd Edition, The MIT Press, Cambridge, MA, 1992) by Peter Kennedy summarizes the purpose for using larger samples:

"The sampling distribution of most estimators changes as the sample size changes. The sample mean statistic, for example, has a sampling distribution that is centered over the population mean but whose variance becomes smaller as the sample size becomes larger. In many cases it happens that a biased estimator becomes less and less biased as the sample size becomes larger and larger— as the sample size becomes larger its sampling distribution changes, such that the mean of its sampling distribution shifts closer to the true value of the parameter being estimated." (pg. 18)

[15] I utilize an annual DCF model because BellSouth and GTE receive payments for the use of their network elements on a monthly basis, and consequently, are able to reinvest their cash flows on an approximate monthly basis. Thus, the effective rate that BellSouth and GTE receive is the allowed rate -- as determined in UNE cost proceedings-- compounded monthly, regardless of the fact that telephone companies only pay dividends quarterly. Consequently, the use of a DCF cost of equity determined using the annual formula is conservatively high.

[16] Because Century Telephone has a very small dividend yield of 0.54%, applying the DCF model yields a cost of equity estimate that is not meaningful. As I note later in my testimony, the DCF

approach may be less accurate for companies that pay small dividends. Consequently, I exclude Century Telephone from the DCF cost of equity calculation. However, I still include Century Telephone's CAPM cost of equity estimate. Because Century Telephone has a small market value of equity, its exclusion from the DCF calculation has a minimal (although slightly conservative) effect on the DCF cost of equity estimates for BellSouth and GTE.

[17] Ibbotson, Roger, and Gary P. Brinson, *Global Investing: The Professional's Guide to the World Capital Markets*, McGraw-Hill, 1993, at p. 45.

[18] Pratt, Shannon P., Robert F. Reilly and Robert P. Schweihs, *Valuing a Business: The Analysis and Appraisal of Closely Held Companies*, Third Edition, Irwin, 1996, p. 177.

[19] To address the question of whether the 5-year betas are sufficiently forward-looking, I also obtained predicted betas calculated by BARRA, an internationally known financial consulting firm, which are discussed later.

[20] Note that the judgmental weighting which I utilized in estimating the average DCF cost of equity is not necessary because betas can be unlevered to adjust for the capital structure leverage of the companies in the sample.

[21] Copeland, Tom, Tim Koller, and Jack Murrin, *Valuation: Measuring and Managing the Value of Companies*, John Wiley & Sons, New York, 1994, at pg. 264.

[22] With the recent increase in the equity values of S&P 500 companies, the dividend yield calculations produce lower results than in previous years, even though no reduction in dividends occurred. The market-value-weighted average dividend yield of the market is about 1.5%. Therefore, I consider a 1.5% cut-off to be reasonable.

[23] Bodie, Zvi, Alex Kane, and Alan J. Marcus, *Investments*, Irwin, 1993, pp. 800-801.

[24] Copeland, Tom, Tim Koller and Jack Murrin, *Valuation: Measuring and Managing the Value of Companies*, Wiley and McKinsey & Company, New York, NY, 1995, at p. 260.

[25] Damodaran, Aswath, *Damodaran On Valuation: Security Analysis for Investment and Corporate Finance*, John Wiley & Sons, 1994, at p. 22.

[26] *Stocks, Bonds, Bills and Inflation, 1998 Yearbook,* Ibbotson Associates, Chicago, Illinois, pp. 156-157.

[27] Clements, Jonathan, "Getting Going, Keeping Perspective: Lower Expectations May Bring Happier Long-Term Results", *The Wall Street Journal,* November 26, 1996. See also, Ibbotson, Roger G., and Gary P. Brinson, *GLOBAL INVESTING: The Professional's Guide to the World Capital Markets,* McGraw Hill, Inc., New York, 1993, pg. 171.

[28] *Ibid.*

[29] Brown, Stephen J., William N. Goetzmann and Stephen A. Ross, "Survival", *The Journal of Finance,* Vol. L, No. 3, July 1995.

[30] Siegel, Jeremy, *Stocks for the Long Run,* Irwin, New York, 1994. See also, Siegel, Jeremy J., "Risk and return: start with the building blocks", *The Financial Times,* May 12, 1997.

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

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

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

[34] Ross, Stephen A., Randolph W. Westerfield and Jeffrey Jaffe, *Corporate Finance,* Fourth Edition, Irwin, Chicago, 1996, pg. 441.

[35] Shapiro, Alan C., *Modern Corporate Finance,* Macmillan Publishing Company, 1990, pgs. 291-292.

[36] U S West's capital structure was excluded from the average capital structure calculation because of a special accounting treatment connected with its split with the MediaOne Group which gives it a book equity percentage of 1%. Excluding U S West's capital structure is conservative since it has the effect of lowering the value-weighted percentage of book debt and increasing the lower bound of the WACC. Because US West has a higher than average market percentage of debt, excluding it also has the conservative effect of lowering the value-weighted percentage of market debt and increasing the upper bound of the WACC.

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[37] Copeland, Tom, Tim Koller and Jack Murrin, *Valuation: Measuring and Managing the Value of Companies*, Wiley and McKinsey & Company, New York, NY, 1995, at p. 251.

[38] Bell Atlantic Investment Reference Guide, Mid-Year 1999, p. 22 (underlining added).

[39] As previously discussed in my testimony, however, under capital market theory competitive risks are not relevant for computing the cost of capital because they can be diversified away.

[40] The credit-rating agencies have noted the increasing risk-profile of the telephone holding companies in comparison to core telephone operations. For example, Standard & Poor's states in its Global Sector Review (November 1996, p. 288) that "[p]artially offsetting the solid position of its local exchange companies is the higher-risk profile of GTE's diversified activities, including its wireless and international ventures."

# JOHN I. HIRSHLEIFER – Principal

## EDUCATION AND PROFESSIONAL CERTIFICATION

M.B.A.        Concentration in Finance, University of California, Los Angeles, 1980

B.A.          Political Science, University of California, Los Angeles, *magna cum laude*, 1976

Certified Public Accountant, California

## LICENSES HELD

Registered securities representative (Series 7 license)

General securities principal (Series 24 license)

Financial operations principal (Series 27 license)

Licensed real estate broker in the State of California

## PROFESSIONAL MEMBERSHIPS

American Institute of Certified Public Accountants

California Society of Certified Public Accountants

## PUBLICATIONS

"Estimating the Cost of Equity Capital." With Bradford Cornell and Elizabeth P. James. *Contemporary Finance Digest*, FMA International/CIBC Wood Gundy, Autumn 1997, Vol. 1, No. 1, p. 5.

## PROFESSIONAL POSITIONS

1999–present  *Principal*, Charles River Associates Incorporated.

1990–1999     *Vice President, Director of Research*, FinEcon. Testified before state public utility commissions regarding the cost of capital applicable to the provision of telephone network elements and universal service by local exchange companies. Testified at deposition and trial regarding economic and financial issues related to business damages, valuation, cost of capital, and securities matters.

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Managed consulting and valuation engagements dealing with a broad variety of issues including damages estimation in business disputes; the development of cost of capital estimation methodologies; valuation of intangible assets; estimation of minority and liquidity discounts; insider trading; fraud-on-the-market damages and class certification issues; the impact of information disclosures on stock price movements; the economic substance of stock and futures trading strategies; analyses of complex derivative securities; analyses of mergers, acquisitions, and restructurings; analyses of high-yield bonds; the risk characteristics of fixed income portfolios; analysis of viability of asbestos liability compensation funds; and antitrust matters.

Representative industry experience includes securities and mutual funds, telecommunications, healthcare, computer peripherals, entertainment, banking, food service, real estate, oil and gas, biotechnology, consumer electronics, and insurance.

1985–1990  *Director of Due Diligence*, Transamerica Financial Resources, Inc., Los Angeles, CA. As financial principal, oversaw all financial regulatory filings and coordinated financial aspects of periodic NASD and SEC audits. Supervised all securities due diligence and proprietary partnership origination activities of Transamerica broker-dealer affiliate. Coordinated and analyzed the work of due diligence staff, outside securities and tax attorneys, accountants, private detectives, and other third-party experts in the course of due diligence investigation of securities considered for sale by the broker-dealer.

Reviewed investment opportunities for proprietary syndication or direct brokerage, including potential real estate, cable television, equipment leasing, and film financing investments; inspected property sites; prepared financial analyses and projections; negotiated terms of acquisitions, partnership participations, and loans; wrote, reviewed, and edited offering documents and contracts.

Consulted for other Transamerica companies regarding acquisitions, including venture capital opportunities, and qualifications and performance records of asset managers. Established Registered Investment Adviser affiliate company. Supervised administration of previously syndicated proprietary partnerships including oversight of property management performance; investor reporting; partnership legal, treasury, accounting, tax, and financial reporting functions.

Coordinated litigation matters for proprietary limited partnerships; directed litigation strategies in conjunction with cost-benefit analyses of alternative actions; testified at deposition and trial. Licensed real estate affiliate to promote Asian investment in Transamerica-brokered real estate and securities; made

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presentations to top management of major Japanese and Taiwanese corporations regarding real estate investment in the United States.

Elected Treasurer & Financial Principal of Transamerica Financial Resources in 1988.

Elected Second Vice President of Transamerica Financial Resources in December 1985.

1980–1984   *Senior Tax Consultant*, Price Waterhouse, Century City, CA. Responsible for corporate, partnership, trust, and individual client matters including tax research and planning, review and supervision of tax compliance and projections, and preparation of financial cash flow analyses. Supervised and performed audits of corporate and partnership clients. Prepared projections for privately syndicated limited partnerships. Supervised writing of tax opinion letters and co-authored comments to the U.S. Treasury Department regarding proposed income tax regulations.

# Telephone Holding Companies

| Company | Market Value of Equity at 9/30/99 ($ mil) | 1998 Revenues ($ mil) | 1998 Book Value of Plant ($ mil) | Access Lines in Service (mil) |
|---|---|---|---|---|
| _RBHC's_ | | | | |
| Bell Atlantic | 104,518 | 31,566 | 36,816 | 41.6 |
| BellSouth | 84,842 | 23,123 | 23,940 | 24.0 |
| SBC Communications | 175,298 | 45,939 [1] | 44,225 [1] | 58.8 [1] |
| U.S. West | 28,796 | 12,378 | 14,908 | 16.0 |
| _Large Independent Telephone Holding Companies_ | | | | |
| ALLTEL | 21,480 | 5,194 | 4,828 | 1.9 |
| Century Telephone Ent | 5,668 | 1,577 | 2,352 | 1.3 |
| GTE | 75,406 | 25,473 | 24,866 | 30.0 |

[1] Includes Ameritech.

_Sources: Standard & Poor's Industry Survey; S&P Stock Guide; Value Line Inc.; 10-Ks._

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# BELLSOUTH Bond Yields

| | S&P DEBT RATING | Debt Outstanding at Par (mil $) | Yield to Maturity as of 9/30/99 |
|---|---|---|---|
| **_BellSouth Capital Funding (Issued under support agreement w/BellSouth)_** | | | |
| Deb 6.04s 2026 | AAA | 300 | 6.10% |
| Deb 7.12s 2097 | AAA | 500 | 7.63% |
| **_BellSouth Telecommunications_** | | | |
| Deb 5 7/8s 2009 | AAA | 350 | 6.83% |
| Deb 7s 2025 | AAA | 300 | 7.41% |
| Deb 6 3/8s 2028 | AAA | 500 | 7.46% |
| Deb 8 1/4s 2032 | AAA | 250 | 7.97% |
| Deb 7 7/8s 2032 | AAA | 300 | 7.79% |
| Deb 7 1/2s 2033 | AAA | 300 | 7.70% |
| Deb 6 3/4s 2033 | AAA | 400 | 7.66% |
| Deb 7 5/8s 2035 | AAA | 300 | 7.76% |
| Deb 5.85s 2045 | AAA | 300 | 6.04% |
| Deb 7s 2095 | AAA | 500 | 7.67% |
| Nts 6 1/2s 2000 | AAA | 275 | 7.19% |
| Nts 6 1/4s 2003 | AAA | 450 | 6.36% |
| Nts 6 3/8s 2004 | AAA | 200 | 6.34% |
| Nts 7s 2005 | AAA | 150 | 6.86% |
| Nts 6 1/2s 2005 | AAA | 300 | 6.55% |
| **_Southern Bell Tel. & Tel ( Now BellSouth Telecommunications)_** | | | |
| Deb 4 3/4s 2000 | AAA | 100 | 7.03% |
| Deb 4 3/8s 2001 | AAA | 75 | 6.77% |
| Deb 4 3/8s 2003 | AAA | 70 | 6.66% |
| Deb 6s 2004 | AAA | 100 | 6.75% |
| **Weighted Average:** | | | 7.16% |

*Source: Standard & Poor's Bond Guide, October 1999.*

## GTE Bond Yields

| | S&P DEBT RATING | Debt Outstanding at Par (mil $) | Yield to Maturity as of 9/30/99 |
|---|---|---|---|
| **_GTE California_** | | | |
| Deb 'A' 5 5/8s 2001 | AA- | 300 | 6.21% |
| Deb 'B' 6 3/4s 2004 | AA- | 250 | 6.62% |
| Deb 'C' 8.07s 2024 | AA- | 250 | 8.14% |
| Deb 'D' 7s 2008 | AA- | 100 | 6.96% |
| Deb 'E' 6.70s 2009 | AA- | 300 | 7.05% |
| Deb 'F' 6 3/4s 2027 | AA- | 200 | 7.50% |
| Deb 'G' 5 1/2s 2009 | AA- | 225 | 6.98% |
| **_GTE Corp._** | | | |
| Deb 9 3/8s 2000 | A | 500 | 6.32% |
| Deb 9.10s 2003 | A | 500 | 6.72% |
| Deb 6.36s 2006 | A | 450 | 6.91% |
| Deb 6.46s 2008 | A | 250 | 7.05% |
| Deb 7.51s 2009 | A | 500 | 7.09% |
| Deb 6.84s 2018 | A | 600 | 7.47% |
| Deb 10 1/4s 2020 | A | 400 | 9.38% |
| Deb 8 3/4s 2021 | A | 300 | 7.63% |
| Deb 7.83s 2023 | A | 500 | 7.95% |
| Deb 7.90s 2027 | A | 500 | 7.94% |
| Deb 6.94s 2028 | A | 800 | 7.52% |
| M-T Nts 'A' 6.39s 2000 | A | 100 | 5.97% |
| M-T Nts 'A' 6.56s 2002 | A | 105 | 6.36% |
| M-T Nts 'A' 6.60s 2005 | A | 75 | 6.86% |
| **_GTE Florida_** | | | |
| Deb 'A' 6.31s 2002 | A+ | 200 | 6.57% |
| Deb 'B' 7.41s 2023 | A+ | 200 | 7.79% |
| Deb 'C' 7 1/4s 2025 | A+ | 100 | 7.76% |
| Deb 'D' 6 1/4s 2005 | A+ | 100 | 6.93% |
| Deb 'E' 6.86s 2028 | A+ | 300 | 7.50% |
| **_GTE Hawaiian Tel_** | | | |
| 1st BB 6 3/4s 2005 | A | 125 | 7.00% |
| Deb 'A' 7s 2006 | A | 150 | 7.25% |
| Deb 7 3/8s 2006 | A | 150 | 7.30% |
| **_GTE North Inc._** | | | |
| 1st 8 1/2s 2031 | AA- | 250 | 8.32% |
| Deb 'A' 6s 2004 | AA- | 250 | 6.64% |
| Deb 'C' 7 5/8s 2026 | AA- | 200 | 8.04% |
| Deb 'D' 6.90s 2008 | AA- | 250 | 7.03% |
| Deb 'E' 6.40s 2005 | AA- | 150 | 6.76% |

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## GTE Bond Yields

|  | S&P DEBT RATING | Debt Outstanding at Par (mil $) | Yield to Maturity as of 9/30/99 |
|---|---|---|---|
| Deb 'F' 6 3/8s 2010 | AA- | 200 | 6.96% |
| Deb 'G' 6.73s 2028 | AA- | 200 | 7.49% |
| Deb 'H' 5.65s 2008 | AA- | 250 | 6.92% |
| *GTE Northwest  (was Gen'l Tel. Northwest)* |  |  |  |
| Deb 'A'  7 3/8s 2001 | AA- | 200 | 6.44% |
| Deb 'B'  7 7/8s 2026 | AA- | 175 | 8.02% |
| Deb 'C' 6.30s 2010 | AA- | 175 | 7.09% |
| Deb 'D' 5.55s 2008 | AA- | 200 | 7.06% |
| *GTE South Inc.* |  |  |  |
| Deb 7 1/4s 2002 | AA- | 150 | 6.70% |
| Deb 'C' 6s 2008 | AA- | 125 | 7.02% |
| Deb 'D' 7 1/2s 2026 | AA- | 250 | 8.04% |
| Deb 'E' 6 1/8s 2007 | AA- | 225 | 7.06% |
| *GTE Southwest* |  |  |  |
| 1st 8 1/2s 2031 | AA- | 100 | 7.63% |
| Deb 'A' 5.82s '99 | AA- | 250 | 5.71% |
| Deb 'B' 6.54s 2005 | AA- | 250 | 6.89% |
| Deb 'C' 6s 2006 | AA- | 150 | 7.04% |
| Deb 6.23s 2007 | AA- | 150 | 7.15% |
|  |  | **Weighted Average:** | 7.25% |

*Source:  Standard & Poor's Bond Guide, October 1999.*

004036

## 3-Stage DCF Model Estimates of Cost of Equity

## For Telephone Holding Companies

| Company | Stock Price as of 9/30/99 | 2000 Dividend per Value Line | 5-year I/B/E/S Forecast Growth Rate as of 9/99 | Sustainable Growth Rate | COST OF EQUITY | | |
|---|---|---|---|---|---|---|---|
| | | | | | 15-yr Linear Convergence (A) | Weighted Average Excluding Company (B) | Cost of Equity 1/4 x (A) + 3/4 x (B) |
| Bell Atlantic | $67.313 | $1.66 | 10.25% | 5.14% | 8.93% | 8.63% | 8.71% |
| BellSouth | $45.000 | $0.78 | 10.24% | 5.14% | 7.86% | 8.87% | 8.62% |
| SBC Communications | $51.063 | $1.02 | 11.96% | 5.14% | 8.71% | 8.69% | 8.69% |
| U.S. West | $57.063 | $2.14 | 6.84% | 5.14% | 9.44% | 8.65% | 8.85% |
| ALLTEL | $70.375 | $1.32 | 13.82% | 5.14% | 9.02% | 8.68% | 8.77% |
| GTE | $76.875 | $1.92 | 10.04% | 5.14% | 8.91% | 8.66% | 8.72% |

*Sources:  Standard and Poors; Value Line, Inc.; I/B/E/S; WEFA; Ibbotson Associates.*

# Estimated Betas For the Comparable Companies
## (60 Monthly Observations -- Period Ending 9/30/99)

| Ticker Symbol | Company | Levered Beta [1] | Unlevered Beta | Re-levering of Average Unlevered Beta Using Company's Capital Structure |
|---|---|---|---|---|
| BEL | Bell Atlantic | 0.68 | 0.61 | 0.66 |
| BLS | BellSouth | 0.45 | 0.40 | 0.66 |
| SBC | SBC Communications | 0.82 | 0.75 | 0.64 |
| USW | U.S. West | 0.52 | 0.40 | 0.76 |
| AT | ALLTEL | 0.35 | 0.32 | 0.66 |
| CTL | CenturyTel | 0.82 | 0.66 | 0.73 |
| GTE | GTE | 0.67 | 0.57 | 0.69 |
| | Assumed Tax Rate: | 37.5% | | |
| **Value-Weighted Average Unlevered Beta** | | | **0.59** | |

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

Sources: finance.yahoo.com and Attachment JH-10.

# Risk Premium Computed from DCF Expected Market Return

|  | Expected Long-Run Yield As Of September 1999 | Expected Return on Stock Market | Implied Risk Premium |
|---|---|---|---|
| 1-Month Treasury Bill | 4.90% | 9.55% | 4.65% |
| 20-Year Treasury Bond | 6.47% | 9.55% | 3.08% |

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

# Expected Long-Run One-Month Treasury Bill Yield For September 1999

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

| Average Long-Term Treasury Bond Return | | Average One-Month Treasury Bill Return | | Historical Term Premium |
|---|---|---|---|---|
| 5.34% | - | 3.77% | = | 1.57% |

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

| Long-Term Treasury Bond Yield September 1999 | | Historical Term Premium | | Long-Run Expected Treasury Bill Yield September 1999 |
|---|---|---|---|---|
| 6.47% | - | 1.57% | = | 4.90% |

*Sources: Dimensional Fund Advisors; Ibbotson Associates; Federal Reserve Weekly Bulletin.*

## Stock Market Premium Analysis

| Year<br>Period | Stock<br>Returns<br>Arithmetic<br>Average | One-month Treasury<br>Bill Returns<br>Arithmetic<br>Average | Long-Term Treasury<br>Bond Total Returns<br>Arithmetic<br>Average |
|---|---|---|---|
| 1802-1998 | 9.89% [1][3][4] | 4.31% | 5.11% |
| 1926-1998 | 13.17% [2][3][4] | 3.82% | 5.70% |
| 1951-1998 | 14.36% [2][3][4] | 5.28% | 6.51% |
| 1971-1998 | 15.06% [2][3][4] | 6.81% | 10.13% |

| Period | | Stock Premium Over<br>Bills | Stock Premium Over<br>Bond Total Returns |
|---|---|---|---|
| 1802-1998 | | 5.58% | 4.78% |
| 1926-1998 | | 9.35% | 7.48% |
| 1951-1998 | | 9.08% | 7.85% |
| 1971-1998 | | 8.25% | 4.93% |

| Year<br>Period | Stock<br>Returns<br>Geometric<br>Average | One-month Treasury<br>Bill Returns<br>Geometric<br>Average | Long-Term Treasury<br>Bond Total Returns<br>Geometric<br>Average |
|---|---|---|---|
| 1802-1998 | 8.49% [1][3][4] | 4.21% | 4.88% |
| 1926-1998 | 11.22% [2][3][4] | 3.77% | 5.33% |
| 1951-1998 | 13.11% [2][3][4] | 5.24% | 6.00% |
| 1971-1998 | 13.83% [2][3][4] | 6.77% | 9.52% |

| Period | | Stock Premium Over<br>Bills | Stock Premium Over<br>Bond Total Returns |
|---|---|---|---|
| 1802-1998 | | 4.28% | 3.60% |
| 1926-1998 | | 7.45% | 5.89% |
| 1951-1998 | | 7.87% | 7.11% |
| 1971-1998 | | 7.06% | 4.31% |

[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.

[4] 1997-1998 returns are from Ibbotson Associates.

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## Model Estimates of Cost of Equity

## For RBOC's, ALLTEL, CenturyTel, and GTE

| Company | DCF Weighted Cost of Equity | Beta | CAPM Cost of Equity | | | COST OF EQUITY (AVERAGE of DCF and CAPM Average) |
|---|---|---|---|---|---|---|
| | | | 1-month Treasury Bills | 20-yr Treasury Bonds | Average | |
| Bell Atlantic | 8.71% | 0.66 | 9.85% | 10.10% | 9.98% | 9.34% |
| BellSouth | 8.62% | 0.66 | 9.85% | 10.10% | 9.98% | 9.30% |
| SBC Communications | 8.69% | 0.64 | 9.70% | 9.99% | 9.85% | 9.27% |
| U.S. West | 8.85% | 0.76 | 10.60% | 10.65% | 10.63% | 9.74% |
| ALLTEL | 8.77% | 0.66 | 9.85% | 10.10% | 9.98% | 9.37% |
| CenturyTel | NM | 0.73 | 10.38% | 10.49% | 10.43% | 10.43% |
| GTE | 8.72% | 0.69 | 10.08% | 10.27% | 10.17% | 9.45% |

NM - Not Meaningful.

004042

# Capital Structure of Telephone Holding Companies[1]
## As of 9/30/99

| 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 |
| Bell Atlantic | 9% | 48% | 57% | 0% | 43% | 17% | 0% | 83% |
| BellSouth | 25% | 30% | 54% | 0% | 46% | 16% | 0% | 84% |
| SBC Communications [2] | 13% | 35% | 49% | 0% | 51% | 12% | 0% | 88% |
| ALLTEL | 1% | 48% | 49% | 0% | 51% | 15% | 0% | 85% |
| CenturyTel | 1% | 54% | 55% | 0.2% | 45% | 27% | 0.1% | 73% |
| GTE | 22% | 44% | 66% | 0% | 34% | 22% | 0% | 78% |
| Value-Weighted Average: | | | 55% | 0% | 45% | 16% | 0% | 84% |

[1] US West excluded - see testimony, Section VII.

[2] Includes Ameritech.

Sources:  Companies' SEC Forms 10-Q  for 3Q 1999; market value of common equity based on closing stock price as of September 30, 1999.

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## Model Estimates of Cost of Capital

## For BellSouth and GTE

| Company | WEIGHTED AVERAGE COST OF CAPITAL | | |
|---|---|---|---|
| | MIN | MIDPOINT | MAX |
| BellSouth | 8.12% | 8.54% | 8.96% |
| GTE | 8.24% | 8.66% | 9.09% |