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Tracy Hatch
Attorney

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Suite 700
101 N. Monroe St.
Tallahassee, FL 32301
904 425-6364
FAX: 904 425-6361

August 3, 1998

Mrs. Blanca S. Bayo, Director
Division of Records and Reporting
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, FL 32399-0850

Dear Mrs. Bayo:

Re: Docket No. 980696-TP

You will find enclosed an original and fifteen (15) copies of the Direct Testimony of Richard T. Guepe on behalf of AT&T, and an original and fifteen (15) copies of the Direct Testimony of John I. Hirshleifer and Direct Testimony of Michael J. Majoro^s Jr. on behalf of AT&T and MCI Telecommunications Corporation for filing in the above-referenced docket.

Copies of the foregoing are being served on the parties of record in accordance with the attached certificate of service.

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Yours truly,
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<i>Guepe</i>	<i>Hirshleifer</i>	<i>Majoros</i>
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**CERTIFICATE OF SERVICE
DOCKET 980696-TP**

I HEREBY CERTIFY that a true and correct copy of the foregoing was furnished via *hand delivery/**Federal Express and U.S. Mail to the following parties of record on this 3rd day of August, 1998:

William Cox
Florida Public Service
Commission
2540 Shumard Oak Boulevard
Tallahassee, FL 32399-0850

Richard Melson
Hopping Law Firm
Post Office Box 6526
Tallahassee, FL 32314

Jack Shreve
Office of Public Counsel
c/o The Florida Legislature
111 West Madison Street
Room 812
Tallahassee, FL 32399-1400

**Kimberly Caswell
GTE Service Incorporated
1 Tampa City Center
201 N. Franklin Street
Tampa, FL 33602

Carolyn Marek
VP of Regulatory Affairs
Southeast Region
Time Warner Communications
Nashville, TN 37221

Joseph A. McGlothlin
Vicki Gordon Kaufman
McWhirter, Reeves,
McGlothlin, Davidson, Rief &
Bakas, P.A.
117 S. Gadsden Street
Tallahassee, FL 32301

Floyd R. Self
Messer, Caparello & Self,
P.A.
215 S. Monroe Street
Suite 701
Tallahassee, FL 32301-1876

Brian Sulmonetti
WorldCom, Inc.
1515 S. Federal Highway
Suite 400
Boca Raton, FL 33432

*Nancy B. White
Robert G. Beatty
c/o Nancy Sims
150 S. Monroe Street
Suite 400
Tallahassee, FL 32301

Norman H. Horton, Jr.
Messer, Caparello & Self,
P.A.
215 S. Monroe Street
Suite 701
Tallahassee, FL 32301-1876

James C. Falvey
e.spire Communications,
Inc.
133 National Business
Parkway
Suite 200
Annapolis Junction, MD
20701

Laura L. Gallagher
Vice President-Regulatory
Affairs
Florida Cable
Telecommunications
Association
310 N. Monroe Street
Tallahassee, FL 32301

Harriet Eudy
ALLTELL Florida, Inc.
Post Office Box 550
Live Oak, FL 32060

J. Jeffrey Wahlen
Ausley & McMullen
Post Office Box 391
Tallahassee, FL 32302

David B. Erwin
127 Riversink Road
Crawfordville, FL 32327

Robert M. Post, Jr.
Post Office Box 277
Indiantown, FL 34956

Mark Ellmer
Post Office Box 220
502 Fifth Street
Port St. Joe, FL 32456

Tom McCabe
Post Office Box 189
Quincy, FL 32353-0189

Lynn B. Hall
Vista-United
Telecommunications
Post Office Box 10180
Lake Buena Vista, FL 32830

Lynne G. Brewer
Northeast Florida Telephone
Co.
Post Office Box 485
Macclenny, FL 32063-0485

Kelly Goodnight
Frontier Communications
180 S. Clinton Avenue
Rochester, NY 14646

Patrick Knight Wiggins
Donna L. Canzano
Wiggins & Villacorta, P.A.
Post Office Drawer 1657
Tallahassee, FL 32302

Steve Brown
Intermedia Communications
Inc.
3625 Queen Palm Drive
Tampa, FL 33619-1309

Michael A. Gross
Assistant Attorney General
Office of the Attorney
General
PL-01, the Capitol
Tallahassee, FL 32399-1050

*Charles J. Rehwinkel
Sprint-Florida, Inc.
1313 Blairstone Rd.
Tallahassee, FL 32301

Kenneth A. Hoffman
John R. Ellis
Rutledge, Ecenia, Underwood
Purnell & Hoffman
Post Office Box 551
Tallahassee, FL 32301

Paul Kouroupas
Michael McRae
Teleport Communications
Group, Inc.
2 Lafayette Centre
1133 21st Street, NW
Suite 400
Washington, DC 20036

Suzanne F. Summerlin
1311-B Paul Russell Road
Suite 201
Tallahassee, FL 32301

Peter M. Dunbar
Barbara D. Auger
Pennington, Moore,
Wilkinson, Bell & Dunbar
P.O. Box 10095
Tallahassee, FL 32302

Tracy Hellet
ATTORNEY

ORIGINAL

**BEFORE
THE FLORIDA PUBLIC SERVICE COMMISSION**

DOCKET NO. 980696-TP

**DIRECT TESTIMONY
OF
JOHN I. HIRSHLEIFER**

ON BEHALF OF

AT&T COMMUNICATIONS OF THE SOUTHERN STATES, INC.

AND

MCI TELECOMMUNICATIONS CORPORATION

AUGUST 3, 1998

DOCUMENT NUMBER-DATE

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INTRODUCTION & QUALIFICATIONS

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Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is John I. Hirshleifer and my business address is FinEcon, 10877 Wilshire Blvd., Los Angeles, California 90024.

Q. WHAT IS YOUR OCCUPATION?

A. I am Vice President and Director of Research of FinEcon, a firm which provides financial economic consulting services to corporations, law firms and government agencies.

Q. WHAT IS YOUR EDUCATIONAL AND PROFESSIONAL BACKGROUND?

A. I graduated from the University of California at Los Angeles with an B.A. degree in 1976. Subsequently, I received my M.B.A. in finance in 1980 from UCLA's Anderson Graduate School of Management. I worked at Price Waterhouse from 1980 to 1984 and I am a certified public accountant in the State of California. From 1985 through 1990 I was the due diligence officer of Transamerica Financial Resources, Inc. (TFR), the broker-dealer subsidiary of Transamerica Corporation. While at Transamerica I held the registered representative, securities principal and financial and operations principal licenses, and ultimately became TFR's treasurer

1 and chief financial officer. At FinEcon I have been responsible for numerous
2 engagements involving securities, valuation and cost of capital issues. I have
3 provided cost of capital testimony in numerous state proceedings regarding the
4 provision of network elements to competing local exchange carriers and the
5 provision of universal service. I also co-authored an article entitled "Estimating the
6 Cost of Equity", which was published in the Autumn 1997 issue of *Contemporary*
7 *Finance Digest*. My resume is attached as Attachment JH-1.

8
9 **II.**

10 **PURPOSE**

11
12 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS CASE?**

13
14 **A.** I have been asked to estimate the forward-looking economic cost of capital that
15 should be used in determining for the telephone subsidiaries of BellSouth and GTE;
16 and for Central Telephone ("Centel") and United Telephone ("United"),
17 subsidiaries of Sprint Corporation; the forward-looking cost of capital appropriate
18 for the provision of universal service in Florida. As stated below, the midpoint of
19 my cost of capital range for the provision of universal service is 8.50% for
20 BellSouth, 8.74% for GTE, and 8.55% for Centel and United.

21
22
23 **III.**

24 **SUMMARY OF TESTIMONY/RECOMMENDATIONS**

1 Q. PLEASE SUMMARIZE THE BASIC APPROACH OF YOUR TESTIMONY.

2

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

5

6 Q. SUMMARIZE THE WACC FORMULA AND EXPLAIN HOW IT IS
7 APPLIED.

8

9 A. The WACC formula is given by,

10
$$\text{WACC} = w_d * k_d + w_e * k_e \quad (1)$$

11 where,

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

13 k_d = the forward-looking cost of debt,

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

15 k_e = the forward-looking cost of equity.

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

20

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

23

24 A. I estimate the cost of capital to be in the range of 7.94 to 9.05 percent for
25 BellSouth. The average of this range is 8.50 percent. For GTE I estimate the cost

1 of capital to be in the range of 8.17 to 9.31 percent, with a midpoint of 8.74 percent.
2 For Centel and United, I estimate a range of 7.97 to 9.12 percent, with a midpoint
3 of 8.55 percent.
4

5 **Q. HOW IS THE REMAINDER OF YOUR TESTIMONY ORGANIZED?**
6

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

19 **IV.**

20 **THE RELATIONSHIP BETWEEN RISK AND THE COST OF CAPITAL**
21

22 **Q. WHAT IS THE RELATION BETWEEN THE RISK OF AN INVESTMENT**
23 **AND THE COST OF CAPITAL?**
24

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

5
6 **Q. HAVE THE COURTS RECOGNIZED THIS RELATION BETWEEN RISK
7 AND RETURN?**

8
9 A. Yes. The relation between risk and return is a centerpiece in decisions dealing with
10 the fair rate of return for regulated businesses. In *Bluefield Water Works v. Public
11 Service Commission*, 262 U.S. 679,692 (1923) the Supreme Court said:

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

17 The Court went on to say:

18 "The return should be reasonably sufficient to assure confidence in
19 the financial soundness of the utility and should be adequate, under
20 efficient economical management, to maintain and support its credit
21 and enable it to raise the money necessary for the proper discharge of
22 its public duties." *Id.* at 693.

23 In *Federal Power Commission v. Hope Natural Gas Company*, 320 U.S. 591,603
24 (1944), the Supreme Court stated:

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

6
7 **Q. WHAT RISKS ARE ASSOCIATED WITH THE PROVISION OF**
8 **UNIVERSAL SERVICE?**

9
10 A. It is my understanding that the purpose of a universal service fund will be to
11 compensate providers for costs incurred to provide services to certain types of
12 customers which are not compensated by payments from those customers. If this is
13 the case, the risk associated with the provision of universal service will be minimal.
14 A minor risk will then be the possibility that the compensation structure from the
15 fund will not in fact work properly, resulting in either undercompensation or
16 overcompensation to providers.

17
18 **Q. WHAT IS THE VIEW OF THE FEDERAL-STATE JOINT BOARD ON**
19 **UNIVERSAL SERVICE AND THE FCC ORDER ON UNIVERSAL**
20 **SERVICE?**

21 A. The Joint Board concludes that support should be set at forward-looking economic
22 cost levels (Joint Board ¶276), and that the proxy model should measure the long-
23 run cost of providing service by including a forward-looking cost of capital (Joint
24 Board ¶277(4)). The FCC Order at paragraph 26 agrees that a forward-looking
25 methodology should be used.

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Q. WHAT ARE THE FCC'S CRITERIA FOR THE COST OF CAPITAL PER ITS MAY 8, 1997 UNIVERSAL SERVICE ORDER?

A. The May 8, 1997 Universal Service Order states at ¶250.(4) that:
"The rate of return must be either the authorized federal rate of return on interstate services, currently 11.25 percent, or the state's prescribed rate of return for intrastate services. We conclude that the current federal rate of return is a reasonable rate of return by which to determine forward looking costs. We realized that, with the passage of the 1996 Act, the level of local service competition may increase, and that this competition might increase the ILECs' cost of capital. There are other factors, however, that may mitigate or offset any potential increase in the cost of capital associated with additional competition. For example, until facilities-based competition occurs, the impact of competition on the ILEC's risks associated with the supported services will be minimal because the ILEC's facilities will still be used by competitors using either resale or purchasing access to the ILEC's unbundled network elements. In addition, the cost of debt has decreased since we last set the authorized rate of return. The reduction in the cost of borrowing caused the Common Carrier Bureau to institute a preliminary inquiry as to whether the currently authorized federal rate of return is too high, given the current marketplace cost of equity and debt.

1 We will reevaluate the cost of capital as needed to ensure that it
2 accurately reflects the market situation for carriers."

3
4 **Q. TO WHAT EXTENT HAVE INTEREST RATES DECLINED SINCE THE**
5 **FCC PRESCRIBED THE 11.25% RATE?**

6
7 A. 30-year Treasury bond rates have fallen from 9.03% as of September 1990 to
8 5.62% as of June 30, 1998. This is a decline of 341 basis points since the 11.25%
9 rate was prescribed. Using this decline as a rough rule of thumb would imply a
10 current cost of capital of 7.84%, before considering the question of whether the risk
11 has increased.

12
13 **Q. WHAT DOES THE DECLINE IN INTEREST RATE IMPLY FOR THE**
14 **DETERMINATION OF THE FORWARD-LOOKING COST OF CAPITAL?**

15
16 A. The decline in interest rates implies that the 11.25% rate determined in 1990 would
17 be too high an estimate for the forward-looking cost of capital. Therefore, the
18 Florida Commission should determine the proper forward-looking cost of capital as
19 part of this proceeding, as allowed under the FCC's criteria.

20
21 **Q. ARE THE PRINCIPLES YOU HAVE CITED FROM THE SUPREME**
22 **COURT DECISIONS CONSISTENT WITH THE PROVISIONS OF THE**
23 **TELECOMMUNICATIONS ACT OF 1996 (the 1996 Act) DEALING WITH**
24 **UNBUNDLED NETWORK ELEMENTS?**

25

1 A. Yes. Section 251(c)(3) of the 1996 Act indicates that incumbent local exchange
2 carriers have the duty to provide to any requesting telecommunications carrier
3 access to unbundled network elements at rates, terms and conditions that are just,
4 reasonable and nondiscriminatory. Section 252(d) further provides that a State
5 commission shall determine just and reasonable rates for network elements based
6 on the cost (determined without reference to a rate-of-return or other rate-based
7 proceeding) of providing the interconnection or network element and may include a
8 reasonable profit. The provision for a reasonable profit as an element of total cost
9 is consistent with the opinions of the Supreme Court in both the Hope and Bluefield
10 cases. A utility's reasonable profit is essentially a true economic return
11 commensurate with the risk its business. In order to achieve this, the pricing of
12 utility services and products must be based on true economic costs.

13

14 **Q. ARE ECONOMIC COSTS FORWARD-LOOKING OR BACKWARD-**
15 **LOOKING?**

16

17 A. Economic costs are forward-looking. To better understand this, one must put
18 oneself in the shoes of a current investor. For example, if an investor today were to
19 consider an investment in BellSouth's common stock, which is fundamentally a
20 claim on the net assets BellSouth uses to conduct its varied businesses, such
21 investor would only be willing to pay the market value of those assets. An asset
22 amounts to a capacity to generate future cash flows. Therefore, an investor today
23 would not care what historical costs were spent to acquire or build BellSouth's
24 assets. The market value of any asset is a function of the time pattern of cash flows

1 expected to be derived from it and the riskiness of the business endeavor. In
2 essence then, the asset's market value represents its economic cost.

3
4 **Q. IS IT YOUR POSITION THAT THE COSTS ASSOCIATED WITH THE**
5 **PROVISION OF UNIVERSAL SERVICE ARE ANALOGOUS TO THE**
6 **COSTS OF PROVIDING UNBUNDLED NETWORK ELEMENTS?**

7
8 **A. Yes.**

9
10 **Q. DOES THE FCC PROVIDE GUIDANCE AS TO HOW TO IMPLEMENT**
11 **THE CONCEPT OF ECONOMIC COSTS FOR THE PROVISION OF**
12 **UNBUNDLED NETWORK ELEMENTS?**

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

1 The meaning of true economic costs according to TELRIC is as follows:
2 the pricing of network elements must be based on true forward-looking incremental
3 costs (including the cost of capital) which are necessary to provide the elements,
4 not on costs which have been expended in the past and may not represent the costs
5 that the utility will actually incur in the future.³ The concept of normal profit is
6 embodied in forward-looking costs because the forward-looking cost of capital, i.e.
7 the cost of obtaining debt and equity financing, is one of the forward-looking costs
8 of providing the network elements. Consistent with the correct analysis provided in
9 the August 8, 1996 FCC Order, this Commission should reject the use of either
10 embedded costs (August 8, 1996 FCC Order ¶704), which represent historical,
11 "sunk" investments, or internal "hurdle rates" used by local exchange operators to
12 evaluate projects which exceed the market cost of capital (August 8, 1996 FCC
13 Order ¶689) as being inconsistent with a forward-looking economic costing
14 methodology.

15
16 **Q. WHAT ARE THE FUNDAMENTAL DETERMINANTS OF INVESTMENT**
17 **RISK?**

18
19 **A.** There are two fundamental sources of risk: operating risk and financial risk.
20 Operating risk arises from the actual operation of the business. It is affected by
21 factors such as competition, technological change, customer acceptance of a
22 company's products, variation in the costs of producing the company's products
23 and the like.⁴ Financial risk is determined by the amount of debt in a company's
24 capital structure. Taking on more debt increases fixed financial charges, thereby

1 increasing the risk that the firm will not be able to meet its financial obligations.

2 The total risk investors face is determined by the combination of operating risk and
3 financial risk.

4
5 **Q. ARE OPERATING RISK AND FINANCIAL RISK RELATED?**

6
7 **A.** Yes. In an effort to control the total risk that investors face, companies manage
8 their capital structures in a manner that leads to a relation between operating risk
9 and financial risk. In particular, companies that face a great deal of operating risk,
10 like high technology firms, limit the debt they issue to prevent total risk from
11 becoming too large. On the other hand, firms that face little operating risk, like
12 regulated utilities, can benefit by using a good deal of low-cost debt without raising
13 total risk to an unacceptable level.

14
15 **Q. HOW DO YOU ACCOUNT FOR COMPANIES' BUSINESS AND**
16 **FINANCIAL RISK IN ESTIMATING COST OF CAPITAL?**

17
18 **A.** I apply the WACC formula to the closest comparable companies for which public
19 market data is available. The problem is that public data for key variables, such as
20 stock prices, are available only at the holding company level. Therefore, the
21 comparable companies that must be used are diversified firms. These firms operate
22 many businesses, most of which are riskier than the business in question in this
23 case. Further discussion of this risk issue is postponed until the final section of my
24 testimony. At this juncture, I proceed by using data at the holding company level.

25

1 Q. WHAT COMPARABLES DO YOU USE IN THIS TESTIMONY?

2

3 A. The comparable companies selected were derived from the list of telephone
4 operating companies in Standard and Poor's Industry Survey. These companies
5 are presented along with some descriptive information at Attachment JH-2, and
6 include the five regional Bell holding companies ("RBHCs"), and the larger
7 independent telephone companies. Among the independents, Aliant
8 Communications (formerly Lincoln Communications) was excluded because it has
9 less than 500,000 access lines in service and is an order of magnitude smaller than
10 the RBHCs. Telephone and Data Systems was excluded because a majority of its
11 operations are focused on higher-risk endeavors rather than the more traditional
12 telephone and network operations. Frontier Corp. was excluded because 73% of its
13 revenues are derived from unregulated long-distance operations and only 25% from
14 local service.

15

16 Q. WHY DID YOU NOT INCLUDE SPRINT IN THE SET OF
17 COMPARABLES?

18

19 A. Sprint, the owner of Centel and United, is a major long-distance company which
20 derives 57% of its revenues from long-distance operations and only 35% from local
21 service. My opinion is that, for estimating the cost of capital for Centel's and
22 United's provision of unbundled network elements and universal service, a more
23 appropriate sample of comparable companies is one that includes companies which
24 derive a larger proportion of their revenues from local exchange services. Standard
25 and Poor's itself categorized Sprint as a long-distance company and did not include

1 it in the group of telephone operating companies. However, in order to be
2 conservative and for a comparison, I performed a test calculation in which I
3 included Sprint in the model sample. The estimate of Centel's and United's cost of
4 capital is approximately the same in either case, as discussed in greater detail
5 below.

6
7 **Q. HOW DOES THE MAIN APPROACH THAT YOU EMPLOYED FOR THE**
8 **CALCULATION OF CENTEL'S AND UNITED'S COST OF CAPITAL**
9 **DIFFER FROM THE CALCULATION OF THE COST OF CAPITAL FOR**
10 **BELLSOUTH AND GTE?**

11
12 **A.** In my testimony which follows I set forth the theory and describe in detail the
13 calculations of the cost of debt; the DCF and CAPM methods for estimating the
14 cost of equity; and the approach for estimating the appropriate capital structure for
15 the telephone holding companies being analyzed.

16 Sprint is not included in the sample of comparable telephone holding
17 companies in my main approach. Thus, for Centel's and United's cost of capital
18 calculations my method assumes that the cost of equity for the provision of
19 universal service is approximated by the average cost of equity for the whole set of
20 the telephone holding companies. For BellSouth and GTE, I employ a weighting
21 approach for their cost of equity calculations. I utilize Sprint's actual debt costs
22 because most of its debt securities were issued by its telephone subsidiaries.

23

1 **Q. HOW MUCH WOULD YOUR ESTIMATE OF CENTEL'S AND UNITED'S**
2 **COST OF CAPITAL CHANGE IF YOU INCLUDE SPRINT IN THE SET**
3 **OF COMPANIES USED FOR THE CALCULATIONS?**

4
5 A. I performed a test where I included Sprint in the set of companies used for
6 estimation of the cost of capital and used the same cost of equity averaging
7 methodologies described below which were used for BellSouth and GTE. The cost
8 of capital of Cer.tel and United in this test model is 8.45%. This estimate is 10
9 basis points lower than my estimate of 8.55%.

10
11 **V.**

12 **THE COST OF DEBT CAPITAL**

13
14 **Q. HOW DO YOU ESTIMATE THE COST OF DEBT?**

15
16 A. Because debt payments are fixed, the cost of debt can be computed directly and
17 with a high degree of accuracy.⁵ For this reason, I am able to utilize the costs of
18 debt on the outstanding debt securities for each of the companies in this study,
19 BellSouth, GTE and Sprint. It is not necessary to use a large sample of companies
20 to estimate the cost of debt for any of the individual companies because of the small
21 measurement error.

22
23 **Q. WHAT IS THE COST OF DEBT THAT YOU USE?**

24

1 A. The best estimate of the cost of debt is the weighted average cost over all of the
2 subject company's outstanding issues, including the debt of the holding company
3 and any subsidiaries. Standard & Poor's Bond Guide ("Bond Guide") provides
4 information on the face value and current yields to maturity on individual bonds.⁵

5 The data from the Bond Guide are presented in Attachments JH-3a, JH-3b
6 and JH-3c. For each of the companies' major debt issues the Attachment shows the
7 bond rating, the face value and the yield to maturity. The yield to maturity is a
8 forward-looking cost of debt that measures the rate that the company would have to
9 pay if the bonds were issued at the measurement date, and reflects investors'
10 expectations regarding the future returns on these publicly-traded bonds.⁷ The
11 Attachments show that the weighted average cost of debt for BellSouth is 6.65
12 percent; for GTE is 6.85 percent, and for Sprint it is 6.63 percent. Consequently, I
13 use **6.65 percent** as the cost of debt of BellSouth, **6.85 percent** as the cost of debt
14 of GTE, and **6.63 percent** as the cost of debt of Centel and United in my WACC
15 analysis.⁸

16 VI.

17 THE COST OF EQUITY CAPITAL

18
19
20 Q. **WHAT MAKES THE COST OF EQUITY CAPITAL MORE DIFFICULT**
21 **TO ESTIMATE THAN THE COST OF DEBT?**

22
23 A. The cost of debt can be computed directly because both the face value of debt and
24 the contractual payments a company agrees to make are fixed. In the case of
25 equity, however, there is no face value and dividends are paid at the discretion of

1 management depending upon business conditions. In addition, the dividend stream
2 does not terminate at a known point. For these reasons, there is no simple way to
3 compute the cost of equity capital and more complex approaches must be
4 employed.

5
6 **Q. WHAT METHODS DO YOU USE TO ESTIMATE THE COST OF EQUITY**
7 **CAPITAL IN THIS CASE?**

8
9 A. I used two basic methods for estimating the cost of capital. The first is the
10 discounted cash flow, or "DCF", method that has been widely adopted by the courts
11 and regulatory agencies in rate of return hearings. Second, I use the capital asset
12 pricing model, or "CAPM". In various forms, the CAPM is the most widely
13 employed theoretical model, other than DCF, for estimating the cost of capital.
14 Methods based on the CAPM are sometimes referred to as "risk premium" methods
15 because the model provides an estimate of the risk premium associated with
16 investing in specific issues of common stock.

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

18
19 A. The DCF method is based on the realization that the price of a share of stock, P,
20 equals the present value of all future dividends expected to be received on that
21 share, discounted at the cost of common equity. Mathematically, the DCF model is
22 written,

23
$$P = \text{Div}_1 / (1+k) + \text{Div}_2 / (1+k)^2 + \text{Div}_3 / (1+k)^3 + \dots \quad (2)$$

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

3 The cost of common equity is arrived at by solving the DCF equation for the
4 cost of capital, k . There are two obstacles that make it difficult to solve the
5 equation. First, the number of terms in the equation is infinite. Second, dividends
6 must be forecast for every future year. To surmount these obstacles, simplifying
7 assumptions must be made about the behavior of future dividends.

8
9 **Q. WHAT ARE THE SIMPLIFYING ASSUMPTIONS THAT ARE
10 EMPLOYED IN THE CONTEXT OF THE DIVIDEND GROWTH MODEL?**

11
12 A. One of the simplest assumptions that can be made is that future dividends will grow
13 *forever*, at a constant rate, g , i.e. the growth rate can be maintained in perpetuity. In
14 that case the DCF equation simplifies to,

$$15 \quad P = Div_1 / (1+k) + Div_1 * (1+g) / (1+k)^2 + Div_1 * (1+g)^2 / (1+k)^3 + \dots$$

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

$$17 \quad k = Div_1 / P + g.$$

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

21
22 A. No. Once again a problem is raised by the fact that modern telephone companies
23 are composed of a variety of businesses, some of which— such as cellular— are
24 expected to grow at rates of 30 percent or more in the short run. Such high growth

1 rates are clearly not sustainable into perpetuity, so that the simple constant growth
2 model cannot be applied unless one modifies the growth rate or adopts some
3 mitigating assumption. Stewart Myers and Lynda Borucki state that:

4 "[f]orecasted growth rates are obviously not constant forever.
5 Variable-growth DCF models, which distinguish short- and
6 long-term growth rates, should give more accurate estimates of
7 the cost of equity. Use of such models guards against naïve
8 projection of short-run earnings changes into the indefinite
9 future."⁹

10 In addition, Ibbotson Associates state that:

11 "[t]he reason it is difficult to estimate the perpetual growth rate
12 of dividends, earnings, or cash flows is that these quantities do
13 not in fact grow at stable rates forever. Typically it is easier to
14 forecast a company-specific or project-specific growth rate over
15 the short run than over the long run. To produce a better
16 estimate of the equity cost of capital, one can use a two stage
17 DCF model. ... For the resulting cost of capital estimate to be
18 useful, the growth rate over the latter period should be
19 sustainable indefinitely. An example of an indefinitely
20 sustainable growth rate is the expected long-run growth rate of
21 the economy."¹⁰

22 Sharpe¹¹, Alexander and Bailey state that:

1 "Over the last 30 years, dividend discount models (DDMs) have
2 achieved broad acceptance among professional common stock
3 investors...

4 Valuing common stock with a DDM technically requires an
5 estimate of future dividends over an infinite time horizon.
6 Given that accurately forecasting dividends three years from
7 today, let alone 20 years in the future, is a difficult proposition,
8 how do investment firms actually go about implementing
9 DDMs?

10 One approach is to use constant or two-stage dividend growth
11 models, as described in the text. However, although such
12 models are relatively easy to apply, institutional investors
13 typically view the assumed dividend growth assumptions as
14 overly simplistic. Instead, these investors generally prefer three-
15 stage models, believing that they provide the best combination
16 of realism and ease of application.

17 ...[M]ost three-stage DDMs make standard assumptions that all
18 companies in the maturity stage have the same growth rates,
19 payout ratios and return on equity."¹²

20 Damodaran states that:

21 "While the Gordon growth model is a simple and powerful
22 approach to valuing equity, its use is limited to firms that are
23 growing at a *stable growth rate*...

1 The second issue relates to what growth rate is reasonable as a
2 *stable growth rate*. Again, the assumption in the model that this
3 growth rate will last forever establishes rigorous constraints on
4 *reasonableness*. A firm cannot in the long term grow at a rate
5 significantly greater than the growth rate in the economy in
6 which it operates. Thus, a firm that grows at 12% forever in an
7 economy growing at 6% will eventually become larger than the
8 economy. In practical terms, the stable growth rate cannot be
9 larger than the nominal (real) growth rate in the economy in
10 which the firm operates, if the valuation is done in nominal
11 (real) terms...

12 ...If a firm is likely to maintain a few years of above-stable
13 growth rates, an approximate value for the firm can be obtained
14 by adding a premium to the stable growth rate, to reflect the
15 above-average growth in the initial years. Even in this case, the
16 flexibility that the analyst has is limited. The sensitivity of the
17 model to growth implies that the stable growth rate cannot be
18 more than 1% or 2% above the growth rate in the economy. If
19 the deviation becomes larger, the analyst will be better served
20 by using a two-stage or a three-stage model to capture the
21 supernormal or above-average growth and restricting the use of
22 the Gordon growth model to when the firm becomes truly
23 stable."¹³

1 Copeland, Koller and Murrin echo these observations, stating that "[f]ew
2 companies can be expected to grow faster than the economy for long periods of
3 time."¹⁴

4
5 **Q. HOW DO YOU APPLY THE DCF MODEL?**

6
7 A. I use a three-stage version.¹⁵ The first stage lasts five years because that is the
8 longest horizon over which analysts forecasts of growth are available. The second
9 stage is assumed to last 15 years. During this stage the growth rate falls from the
10 high level of the first five years to the growth rate of the U.S. economy by the end
11 of year 20. From the twentieth year onward the growth rate is set equal to the
12 growth rate for the economy because rates greater than that cannot be sustained into
13 perpetuity. A perpetual growth rate that exceeded the growth rate of the economy
14 would illogically imply that eventually the whole economy would be comprised of
15 nothing but telephone companies.

16
17 **Q. WHAT DATA ARE USED TO ESTIMATE DIVIDEND GROWTH DURING**
18 **THE FIRST FIVE YEARS?**

19
20 A. To estimate growth rates during the first five years I use the Value Line dividend
21 forecasts for 1998 and individual company earnings forecast data from Institutional
22 Brokers' Estimate System ("IBES") as of January 1998. To compile the IBES data,
23 over 2000 analysts are surveyed each month regarding their estimates of five-year
24 earnings growth rates for a wide variety of major American companies. These
25 analysts represent over 100 different securities firms. The forecasts are tabulated

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

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

9
10 **Q. WHAT IS A REASONABLE ESTIMATE FOR LONG-RUN GROWTH IN**
11 **THE AGGREGATE ECONOMY?**

12
13 **A.** The long-term growth forecast was derived by averaging the long-term GNP
14 growth forecasts obtained from the Wharton Econometric Forecasting Associates
15 ("WEFA") Group and from Ibbotson Associates. The WEFA Group is an
16 econometric forecasting organization, formed in 1987 through a merger of WEFA
17 and Chase Econometrics. Ibbotson Associates is widely-known in the fields of
18 finance and valuation as one of the leading providers of securities returns data and
19 publications. As of December 1997, WEFA predicted an average nominal GNP
20 growth rate of 4.80% from 1998 through 2020. As of December 1997, Ibbotson
21 Associates forecast long-term inflation to be 3.10% annually. By adding this
22 inflation forecast to the historical long-term real GNP growth rate of 3.10%,
23 Ibbotson Associates predicted a nominal GNP growth rate of 6.20%. Given the
24 magnitude of the difference, I decided to take the average of the two forecasts,
25 5.50%, rather than choose a single GNP forecast.

1 Q. DO YOU APPLY THE DCF MODEL TO EACH INDIVIDUAL COMPANY
2 AS YOU DID IN ESTIMATING THE COST OF DEBT?

3

4 A. No. Consistent with financial practice, I use the DCF model to estimate cost of
5 equity for all of the companies selected as likely comparables, in addition to
6 estimating a DCF cost of equity for the individual companies.

7

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

11

12 A. Estimating future growth for a company always involves some uncertainty because
13 no analyst can be expected to have perfect foresight. In some cases, the growth rate
14 may be overestimated and in other cases it may be underestimated. On average,
15 over a group of similar companies, these estimation errors tend to cancel out so that
16 the average growth rate for the group is estimated more accurately than the growth
17 rate for any individual company.¹⁶ Consequently, I apply the DCF method to all
18 the telephone companies in the previously-selected sample.

19

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

21

22 A. Given the market price of a company's stock, the current dividend, and the forecast
23 growth rates during each of the three stages, equation (2) can be solved iteratively
24 for k . The iterative solution is the estimate of the cost of equity capital.¹⁷

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

2

3 A. Attachment JH-4 presents the DCF estimates of the cost of equity capital derived
4 from the three-stage model for the telephone company sample. The estimates range
5 from a low of 7.53 percent to a high of 10.23 percent.

6 The cost of equity capital for BellSouth is estimated to be 9.35 percent,
7 based on a value-weighted average of the equity cost of capital for all telephone
8 holding companies (excluding BellSouth) and the cost of capital for BellSouth
9 itself. The table below shows how this weighted average cost of equity capital was
10 computed:

11

WEIGHTED AVERAGE DCF COST OF EQUITY FOR BELLSOUTH

	Weight	Rate	Weighted Cost
Average (excluding BellSouth)	.75	9.53	7.14
BellSouth	.25	8.83	2.21
Weighted Cost of Equity			9.35

12

13 For GTE, the DCF cost of equity is estimated to be 9.50 percent. The table below
14 shows how this weighted average cost of equity capital was computed:

15

WEIGHTED AVERAGE DCF COST OF EQUITY FOR GTE

	Weight	Rate	Weighted Cost
Average (excluding GTE)	.75	9.26	6.95
GTE	.25	10.23	2.55
Weighted Cost of Equity			9.50

1 For Centel and United the DCF cost of equity is estimated to be 9.41 percent by
2 taking the weighted average of the DCF cost of equity for all the companies in the
3 sample.

4
5 **Q. WHY DO YOU USE A WEIGHTED AVERAGE TO COMPUTE**
6 **BELLSOUTH'S AND GTE'S DCF COST OF EQUITY?**

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

20
21 **Q. WHAT OTHER METHODS DID YOU USE TO ESTIMATE THE COST OF**
22 **EQUITY?**

23
24 A. I also used the capital asset pricing model ("CAPM").

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

2

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

7

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

9

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

13
$$\text{Company risk premium} = \text{Company "beta"} * \text{Market risk premium.} \quad (3)$$

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

16

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

18

19 A. The beta coefficient measures the systematic risk of investing in a company's
20 equity. The CAPM is built upon the insight that investors will be rewarded for
21 bearing only those risks, called systematic risks, that cannot be eliminated by
22 diversification. To understand the difference between systematic and non-
23 systematic risk, consider a hypothetical investment in Apple Computer. The risks
24 associated with this investment can be seen as arising from two sources. First,
25 there are risks that are unique to Apple. Will Apple design competitive products?

1 Will computer users accept Apple's new operating system? Second, there are risks
2 that affect all common stocks. Will the economy enter a recession? Will war break
3 out in the Middle East?

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

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

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

17 This concept is particularly important for the determination of cost of capital
18 because the risk that a company will lose customers to competition -- such as a
19 network leasing company or a local exchange company -- is a diversifiable risk
20 which does not increase the risk premium according to capital market theory.¹⁸

21
22 **Q. HOW DO YOU CALCULATE BETA?**

23
24 **A.** Beta is typically calculated by a procedure called regression analysis. In regression
25 analysis, the returns on the subject stock (the dependent variable), are regressed

1 against the returns of a market portfolio of stocks (frequently the S&P 500) to
2 estimate statistically the degree that the independent variable movements in the
3 market portfolio have caused the returns of the subject company. Using this
4 statistical tool, therefore, the sensitivity of a stock to movements in the market can
5 be estimated. This sensitivity is what determines beta. In this case, I used Dow
6 Jones Beta Analytics software to obtain betas computed on five years of monthly
7 return data through December 31, 1997 for BellSouth, GTE and the comparable
8 companies. Dow Jones Beta Analytics is a common source for betas used by
9 finance professionals. Returns on the S&P 500 were used as the market proxy.
10 Because beta is measured with error, the average beta over all the comparables is a
11 more accurate indicator of the true beta than any individual estimate of beta.

12 Betas can also be calculated over other time periods and using different
13 observation intervals. For examples, for newer smaller companies one year of daily
14 data are often used to measure beta. This is because the true underlying beta is
15 likely to be changing for such companies and because five years of data are often
16 not available. The drawback is that the shorter sample period and more frequent
17 observation interval increase measurement error. In this case I concluded that the
18 sample companies were sufficiently large, established and stable that it was more
19 appropriate to use five years of monthly data, which is consistent with the
20 methodology used by many institutional providers of betas, including Merrill
21 Lynch, S&P Compustat and Wilshire Associates.

22 While technological and legislative change has impacted the
23 telecommunications industry, it is equally clear from publicly available information
24 that such change has been anticipated and considered over time by industry
25 participants, financial analysts and credit-rating agencies. The telephone holding

1 companies trade very efficiently, so risks that are anticipated are impounded in the
2 telephone holding companies' stock prices rapidly and fairly.¹⁹

3 Before averaging individual betas it is necessary to take account of the fact
4 that the various comparable companies have differing amounts of debt in their
5 capital structures. The amount of a company's debt leverage affects the riskiness of
6 its stock returns and thereby its beta. To take account of this, a two-step procedure
7 is used to estimate the average beta. First, the raw betas (i.e. betas computed using
8 the Dow Jones software without accounting for capital structure differences) are
9 estimated for each of the sample companies. Second, the raw betas are "unlevered"
10 using standard financial economic formulas and based on the market value
11 debt/equity ratios of each respective company as of December 31, 1997. The
12 formula for "unlevering" a raw, or "levered" beta is,

$$13 \quad B_u = B_L / [1 + (1 - T_c) \times D/E] \quad (4)$$

14 where,

15 B_u = the "unlevered" beta,

16 B_L = the "levered" beta,

17 E = the value of the sample company's equity;

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

19 D = the value of the sample company's debt.

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

21 Once the average has been estimated, the beta for any individual company
22 is estimated by "re-levering" using a simple variant of formula (4) which solves for
23 B_L , the "levered" beta.

1

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

3

4 A. My raw (levered) estimates of beta are presented in Attachment JH-5. They vary
5 from a high of 1.11 to a low of 0.55 on a levered basis. As I discussed above,
6 however, the betas must be unlevered first to adjust for the different amount of debt
7 leverage employed by the individual companies before calculating an average.
8 Attachment JH-5 also shows the unlevered betas and their average. The average
9 unlevered beta for the entire sample is 0.64.²⁰ The average unlevered beta is re-
10 levered using the formula discussed above to take BellSouth's 1997 capital
11 structure into account, arriving at a beta of 0.72 for BellSouth. The re-levered beta
12 for GTE is 0.78.²¹

13

14 **Q. IS THERE OTHER INFORMATION THAT SUPPORTS THE BETA**
15 **ESTIMATE THAT YOU USE IN YOUR ANALYSIS?**

16

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

1 BARRA predicted betas.²² The predicted BARRA betas are 0.76 for BellSouth and
2 0.75 for GTE. These are relatively close to the relevered betas of 0.72 for
3 BellSouth and 0.78 for GTE that I have calculated. If I were to instead use the
4 BARRA predicted betas for the telephone holding companies in my sample, the
5 value-weighted unlevered beta would be .64, the same as what I calculated using
6 historical betas. Therefore, the relevered betas would be the same whether I used
7 the historical betas or the BARRA betas.

8
9 **Q. HOW DOES THE BETA RISK OF THE COMPANIES IN YOUR SAMPLE**
10 **COMPARE WITH THE BETA RISK OF COMMON STOCK**
11 **GENERALLY?**

12
13 A. By definition, the beta of all common stock generally (in other words, the beta of
14 the market) is 1.0. Therefore, it appears that the beta of telephone stocks is less
15 than that of common stocks generally. This means that investments in telephone
16 company stocks are less risky than investments in typical industrial companies.
17 Consequently, the cost of capital for telephone companies should also be less than
18 it is for the average industrial stock.

19
20 **Q. WHAT DOES YOUR BETA ANALYSIS IMPLY THE COST OF EQUITY**
21 **CAPITAL SHOULD BE IN THIS CASE?**

22
23 A. Beta alone is insufficient for estimating the cost of equity capital. To apply the
24 CAPM it is also necessary to estimate the market risk premium.

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

2

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

6

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

9

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

16

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

18

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

23

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

1

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

6

7 **Q. WHAT IS THE DCF ESTIMATE OF THE EXPECTED RETURN ON THE**
8 **MARKET?**

9

10 A. The starting point for estimating the expected return on the market is the S&P 500
11 index. The sample is then limited to those S&P 500 companies that pay a dividend
12 of at least 2 percent on the grounds that the DCF approach may be less accurate for
13 companies that pay small dividends.²³ The sample includes large companies for
14 which the data is considered to be reliable for purposes of DCF estimates. For the
15 selected companies, the three-stage DCF model is applied in the same fashion as it
16 was applied to the sample of telephone companies. Finally, the individual DCF
17 estimates for the sample companies are averaged. This average, which comes out
18 to be 9.82 percent, is used as an estimate of the expected return on the market as a
19 whole.

20

21 **Q. GIVEN THE EXPECTED RETURN ON THE MARKET HOW DO YOU**
22 **CALCULATE THE MARKET RISK PREMIUM?**

23

24 A. The market risk premium is computed by subtracting the risk-free rate from the
25 expected return. In the case of the 20-year Treasury bond this is straightforward.

1 The calculations are shown in Attachment JH-6. The Attachment shows that as of
2 December 1997, the 20-year bond yield was 6.02 percent. Subtracting 6.02 from
3 9.82 percent gives a market risk premium over long-term Treasury bonds of 3.80
4 percent.

5 In the case of one-month Treasury bills the situation is more complicated.
6 Because the goal of the analysis is to estimate the long-run cost of capital, using a
7 one-month interest rate can be misleading. A more appropriate choice is the
8 average return on one-month Treasury bills that is expected to obtain over the long-
9 term. This can be calculated using the following two-step procedure. First,
10 compute the long-run historical difference between the return on one-month
11 Treasury bills and the return on 20-year Treasury bonds. Second, subtract that
12 historical difference from the current yield on 20-year bonds. The difference gives
13 a forward-looking market estimate of the average expected yield on one-month
14 Treasury bills over the next 20 years. Attachment JH-7 shows that the average
15 expected one-month Treasury bill rate over the long run is 4.53 percent as of
16 December 31, 1997. Subtracting this rate from the expected return on the market
17 gives a market risk premium over Treasury bills of 5.29 percent as shown in
18 Attachment JH-6.

19
20 **Q. WHAT IS YOUR HISTORICAL ESTIMATE OF THE MARKET RISK**
21 **PREMIUM?**

22
23 **A.** The historical risk premium is defined as the historical difference between the
24 return on the stock market and the risk-free rate. The proper estimate of the market
25 risk premium is a question that is disputed among both academics and practitioners

1 with regard to two primary issues. First, when analyzing historical data, should an
2 arithmetic or geometric average be used to calculate the historical average risk
3 premium? Second, over what period should the average be computed to accurately
4 capture the risk premium expected in the future? Specifically, should the entire
5 sample period back to 1802 be used, should the sample period be limited to post-
6 1926 when more complete data became available, should only post-war data be
7 employed because the role of government in the economy has changed
8 fundamentally since the great depression, or should even more recent data be used?
9 With regard to the type of average, many academic authors favor the arithmetic
10 over the geometric.²⁴ Others, however, recommend using the geometric average
11 because arithmetic averages are biased by the measurement period.^{25,26} With regard
12 to the sample period for computing the average risk premium, Ibbotson argues that
13 a long data series is required so that the equity risk premium is not unduly
14 influenced by very good or very poor short-term results. The 1996 Yearbook
15 published by Ibbotson Associates suggests that the post-1926 data compiled therein
16 provides a representative period of returns that can occur under diverse economic
17 circumstances.²⁷ However, Ibbotson has recently cautioned that the long-run stock
18 market returns calculated by his firm may not prove predictive. He believes that
19 the U.S. is not as risky as it was in 1925, suggesting that lower returns will be
20 experienced in the future. Ibbotson also states that his historical averages overstate
21 the forward-looking cost of equity because of survivorship bias.²⁸ For example,
22 the U.S. stock market survived despite the Great Depression. As of 1925, however,
23 there existed a risk that the stock market would be entirely wiped out—as happened
24 in Germany, Japan, China and Russia. If these countries were included in an
25 average, historical returns would be much lower.²⁹

1 Based on an analysis of data going back to 1802, Siegel presents convincing
2 evidence that the risk premium was abnormally high after the U.S. went off the
3 gold standard resulting from unanticipated inflation which reduced the real returns
4 on bonds. He notes that the current equity premium appears to be returning to the 2
5 - 3 percent range that existed before the second world war.³⁰ Blanchard also
6 presents evidence that the risk premium has declined to 2 to 3 percent in recent
7 years and argues that either the DCF approach should be employed in place of
8 relying on an average or more recent data should be used.³¹ Similarly, Rappaport
9 opposes the use of long-term averages. He states that the relative risk of bonds has
10 increased over the past two decades, thereby lowering risk premiums to a range
11 from 3 to 5 percent.³²

12 In light of these questions, Attachments JH-6 and 8 present both DCF
13 estimates of the market risk premium and historical averages computed using both
14 arithmetic and geometric averages calculated over various periods of time.

15
16 **Q. GIVEN THE INFORMATION IN ATTACHMENTS JH-6 AND 8, WHAT IS**
17 **THE BEST MEASURE OF THE MARKET RISK PREMIUM?**

18
19 **A.** Taking account of all the information in Attachments JH-6 and 8, I conclude that
20 the reasonable estimates of the market risk premium are 7.5 percent over one-
21 month Treasury bills and 5.5 percent over 20-year Treasury bonds. These estimates
22 are conservative (i.e., on the high side) in the sense that they are above the average
23 premiums observed in a majority of the periods, including the full sample, and are
24 greater than those implied by the DCF analysis. Also, Damodaran uses a 5.5% risk
25 premium over 20-year Treasury bonds, while Copeland, Koller & Murrin

1 recommend using a 5 to 6 percent risk premium.³³ Additional information
2 indicating that my choice is conservative is provided by the statement of a
3 correspondent for Fortune magazine, who indicated that "[t]o venture into the
4 volatile stock market instead of cozying up to bonds, investors rightfully expect a
5 superior return from stocks. In fact, they expect to beat the bond return by four full
6 percentage points— something called the risk premium on stocks...".³⁴ Similarly,
7 *The Economist* stated in its October 25, 1997 issue that "recent studies [regarding
8 risk premium] suggest a current figure of one to four percentage points."³⁵
9 Moreover, in its 1990 Rate Represcription Order, the FCC agreed with the position
10 of the Consumer Coalition that the risk premiums used by the LEC's experts were
11 unrealistically high, particularly when compared to those used by financial analysts.
12 The FCC cites the Consumer Coalition expert's testimony that "...the Wall Street
13 analyst reports, relied upon by the RHCs to support their positions on other issues,
14 use much smaller risk premiums, ranging from 2.0% to 5.4%."³⁶

15
16 **Q. GIVEN YOUR ESTIMATES OF BETA AND THE MARKET RISK**
17 **PREMIUM WHAT IS THE APPROPRIATE ESTIMATE OF THE COST**
18 **OF EQUITY CAPITAL?**

19
20 **A.** To review, the CAPM says that,

21
$$\text{Cost of equity capital} = \text{Risk-free rate} + \text{Beta} * \text{Market risk premium.}$$

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

24
$$\text{BellSouth's Cost of equity capital} = 4.53\% + 0.72 * 7.5\% = 9.93\%;$$

1 GTE's Cost of equity capital = $4.53\% + 0.78 * 7.5\% = 10.38\%$.

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

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

6 BellSouth's Cost of equity capital = $6.02\% + 0.72 * 5.5\% = 9.98\%$;

7 GTE's Cost of equity capital = $6.02\% + 0.78 * 5.5\% = 10.31\%$.

8 These estimates are close to the corresponding estimates obtained using Treasury
9 bills as the measure of the risk-free rate. In light of these results, I use the average
10 of the two as the CAPM estimate of the cost of equity capital: **9.96** percent for
11 BellSouth, and **10.35** percent for GTE. Centel's and United's CAPM cost of equity
12 capital is estimated as the average for the whole sample and is **10.08** percent.

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

15

16 A. The CAPM-derived costs of equity are on average about 65 basis points higher than
17 the DCF costs of equity. Given the difficulty of estimating the cost of equity
18 capital, the differences are relatively small and hence are reassuring (see
19 Attachment JH-9).

20

21 **Q. COMBINING THE TWO METHODS, WHAT IS THE COST OF EQUITY**
22 **CAPITAL FOR THE COMPANIES?**

23

24 A. The two estimates of the cost of equity capital produced a range for BellSouth of
25 9.35 to 9.96 percent, for GTE - 9.50 to 10.35 percent. I feel the best overall

1 estimate is approximately the average of the three-stage DCF and CAPM cost of
2 equity estimates. The cost of equity capital that I use in the WACC calculations is
3 therefore 9.65 percent for BellSouth, 9.92 percent for GTE, and 9.74 percent for
4 Centel and United.

5
6 **VII.**

7 **CAPITAL STRUCTURE AND THE WACC**

8
9 **Q. WHAT IS MEANT BY THE "CAPITAL STRUCTURE" OF A BUSINESS?**

10
11 **A.** Most American businesses are financed by a combination of equity (common
12 stock) and debt (including bonds and bank loans). The capital structure refers to
13 the fraction of debt and equity used to finance a business. In terms of the WACC
14 formula presented at the outset, the capital structure is determined by the financing
15 weights, w_d and w_e .

16
17 **Q. IS THE CAPITAL STRUCTURE RELATED TO THE RISK OF A**
18 **BUSINESS?**

19
20 **A.** Yes. As discussed earlier, companies that face greater operating risk tend to take
21 on less debt. For example, most computer software and biotechnology companies
22 typically have virtually no debt in their capital structure.

23
24 **Q. HOW DO YOU ESTIMATE THE CAPITAL STRUCTURE FOR A**
25 **PARTICULAR BUSINESS?**

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A. The goal is to estimate the long-run target financing weights that a rational, informed management team would employ.³⁷ If there are companies participating in comparable business activities, the accepted solution is to use their observed capital structure as the starting point. In this case, however, the comparables are all riskier than the business activity in question (the provision of unbundled network elements and universal service) because of the necessity to use data that are only available at the holding company level.

Alan Shapiro states that:

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

The estimation of these divisional costs of capital is tricky. All the firm observes is its overall cost of capital, which is a weighted average of its divisional costs of capital."³⁸

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

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Q. WHAT ARE THE CAPITAL STRUCTURE WEIGHTS FOR YOUR SAMPLE OF COMPANIES?

A. The current capital structures for my sample of companies is shown in Attachment JH-10. Notice that the comparison depends on whether book value or market value weights are used. At this juncture, there remains a debate among academics, practitioners, and forensic experts regarding the choice between book and market weights. In traditional rate of return hearings, capital structure is typically presented in terms of book value weights.

The average book value debt weight for the sample companies is 57 percent as of December 31, 1997. BellSouth's own debt weight is 42 percent, GTE's - 69 percent. In terms of market value weight, however, the debt weight is lower. The average for the full sample is 20 percent, while BellSouth's debt weight is 17 percent and GTE's - 26 percent. However, market value debt weights of the holding companies probably understate long-run target debt weights in the capital structure of the network element leasing business as discussed in detail in Section VIII below. Consequently, in this case it is inappropriate to rely solely on current market value capital structure weights of the telephone holding companies when calculating the WACC for the network element leasing business. Therefore, I apply the WACC formula using both book and market weights to establish a range.

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

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

4
5 **Q. GIVEN YOUR PRECEDING TESTIMONY, WHAT IS THE LOWER**
6 **BOUNDARY OF THE APPROPRIATE RANGE FOR THE WEIGHTED**
7 **AVERAGE COST OF CAPITAL FOR EACH OF THE TELEPHONE**
8 **COMPANIES IN CONSIDERATION?**

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

13
14
15 **BellSouth's WACC Based On Average Book Capital Structure Weights**

	<u>Weight</u>	<u>Rate</u>	<u>Weighted cost</u>
Equity	0.43	9.65	4.15
Debt	0.57	6.65	3.79
BellSouth's WACC			7.94

16
17
18
19
20
21 **GTE's WACC Based On Average Book Capital Structure Weights**

	<u>Weight</u>	<u>Rate</u>	<u>Weighted cost</u>
Equity	0.43	9.92	4.27

1	Debt	0.57	6.85	3.90
2	GTE's WACC			8.17
3	Centel's and United's WACC Based On Average Book Capital Structure Weights			
4		<u>Weight</u>	<u>Rate</u>	<u>Weighted cost</u>
5	Equity	0.43	9.74	4.19
6	Debt	0.57	6.63	3.78
7	Centel's and United's WACC			7.97

8

9 **Q. WHAT IS THE UPPER BOUNDARY OF THE APPROPRIATE RANGE**
 10 **FOR THE WEIGHTED AVERAGE COST OF CAPITAL FOR EACH OF**
 11 **THE TELEPHONE COMPANIES FOR WHICH YOU ARE ESTIMATING**
 12 **THE COST OF CAPITAL?**

13

14 **A.** As the network element leasing business is less risky than the overall risk of a
 15 telephone holding company, estimating a cost of capital using a market value
 16 capital structure (which results in a cost of capital estimate for the telephone
 17 holding company itself) will provide an upper bound estimate of the cost of capital
 18 for the network element leasing business.

19 The table below computes the WACC from the estimates of the cost of debt,
 20 the cost of equity and the capital structure developed in my preceding testimony
 21 using market value capital structures.

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

	<u>Weight</u>	<u>Rate</u>	<u>Weighted cost</u>
3 Equity	0.80	9.65	7.72
4 Debt	0.20	6.65	1.33
5 BellSouth's WACC			9.05

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

	<u>Weight</u>	<u>Rate</u>	<u>Weighted cost</u>
9 Equity	0.80	9.92	7.94
10 Debt	0.20	6.85	1.37
11 GTE's WACC			9.31

13 **Centel's and United's WACC Based On Average Market Capital Structure Weights**

	<u>Weight</u>	<u>Rate</u>	<u>Weighted cost</u>
15 Equity	0.80	9.74	7.79
16 Debt	0.20	6.63	1.33
17 Centel's and United's WACC			9.12

19 **Q OVERALL WHAT DO YOU CONCLUDE IS A FAIR ESTIMATE OF THE**
20 **COST OF CAPITAL?**

21
22 A. I believe a fair estimate is the midpoint of my range. Averaging 7.94 and 9.05, the
23 midpoint comes to 8.50 percent for BellSouth; for GTE 8.74 percent is the
24 midpoint of the range from 8.17 to 9.31 percent; and for Centel and United 8.55

1 percent is the midpoint of the range from 7.97 to 9.12 percent (see Attachment JH-
2 11).

3
4 **Q. WHAT WOULD CENTEL'S AND UNITED'S COST OF CAPITAL**
5 **ESTIMATE BE IF YOU ALTERNATIVELY INCLUDED SPRINT IN THE**
6 **SET OF THE COMPANIES USED FOR THE CALCULATIONS?**

7
8 A. As I discussed in my testimony, if Sprint were included in the set of telephone
9 holding companies, their WACC estimate would alternatively be 8.45%.

10
11 **Q. IS THIS ESTIMATE OF THE COST OF CAPITAL FORWARD**
12 **LOOKING?**

13
14 A. Yes. The cost of debt is estimated from the yields to maturity of each company's
15 bonds obtained from the Bond Guide, which represent the forward looking returns
16 that investors would expect to earn on these bonds.³⁹ The DCF model used for
17 estimating the cost of equity employs forward-looking growth projections made by
18 analysts and forecasting organizations. The CAPM model as I have employed it
19 here uses some current U.S. Treasury bond rates as of the measurement date, which
20 impound forward-looking expectations, as one of its two return components. The
21 CAPM model by necessity uses historical information to estimate a company's
22 riskiness, through the calculation of a beta, and to estimate the market risk
23 premium, which is assumed to generally prevail into the future. Regarding these
24 issues, I have considered forward looking predicted BARRA betas and current
25 research regarding the forward-looking equity risk premium.

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VIII.

POTENTIAL UPWARD BIAS IN THE ESTIMATED COST OF CAPITAL

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

A. Yes. Modern diversified corporations, like BellSouth, GTE and other telephone operating companies operate dozens of different businesses, some of which are more risky than others. Consequently, the operating risk of the corporation is a weighted average of the risks of all the constituent businesses.

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

A. The business for which the cost of capital is being estimated in this case is essentially the business of "leasing" local exchange telephone network elements to retail providers and the provision of universal service. These businesses should have relatively low risk compared to many of the risky business endeavors being pursued by the telephone holding companies.

BellSouth's risky business undertakings include domestic cellular and personal communications service, advertising and publishing. In addition, BellSouth has invested in wireless telephone systems in Argentina, Australia, Chile, Denmark, Germany, India, Israel, New Zealand, Panama, Peru, Uruguay and Venezuela. BellSouth is also an equity investor in wireless data communications

1 networks in the United States, the United Kingdom, the Netherlands, Belgium and
2 Singapore.

3 GTE's risky businesses include retailing, cellular, long distance, airphone,
4 information processing, video games, government systems, network, leasing, cable,
5 distribution, business media and international services.⁴⁰

6 Sprint Corporation's riskier subsidiaries provide domestic and
7 international long distance services, and are engaged in the wholesale distribution
8 of telecommunications products and the publishing and marketing of white and
9 yellow page telephone directories. Sprint is a partner in several wireless personal
10 communications services partnerships and international joint ventures.

11 I understand that there is currently very little facilities-based competition,
12 and wide-spread facilities-based competition may take years to develop. The FCC
13 believes that unbundled network elements and interconnection services are
14 bottleneck, monopoly services that do not now face significant competition (August
15 8, 1996 FCC Order ¶702). In its May 8, 1997 Universal Service Order, the FCC
16 specifically stated at ¶250.(4) that "until facilities-based competition occurs, the
17 impact of competition on the ILEC's risks associated with the supported services
18 will be minimal because the ILEC's facilities will still be used by competitors using
19 either resale or purchasing access to the ILEC's unbundled network elements."
20 Further, increased demand spurred by competition may result in a more extensive
21 use of local telephone companies' networks even as competing facilities are
22 eventually constructed. There is thus little threat that local telephone companies'
23 network facilities will remain idle.

24

1 Q. HAVE ANY TELEPHONE HOLDING COMPANIES MADE COMMENTS
2 TO THE PUBLIC REGARDING BENEFITS TO BE DERIVED FROM THE
3 PROVISION OF NETWORK ELEMENTS TO COMPETITIVE LOCAL
4 EXCHANGE COMPANIES?

5
6 A. Yes. Bell Atlantic has stated in a previous posting at its internet site that the
7 business of providing network elements represents a revenue opportunity for the
8 company, in that there would now be many more users of its network without the
9 need to make additional capital expenditures. Bell Atlantic's statements to the
10 public indicate that the network element leasing business is subject to much less
11 risk than its retail local exchange business in the environment created by the
12 Telecommunications Act of 1996.

13
14 Q. WHAT RISKS ARE ASSOCIATED WITH THE BUSINESS OF "LEASING"
15 OF UNBUNDLED NETWORK ELEMENTS?

16
17 A. There is still the risk of regulation itself. The rate of return a network is allowed to
18 earn depends on the outcome of proceedings such as this and remains somewhat
19 uncertain. That risk can be substantially reduced if this Commission adopts
20 compensatory forward-looking pricing rules that tell investors that telephone
21 holding companies will have the opportunity to recover all efficiently-incurred
22 costs on a forward-looking basis. In addition, there remains some risk that
23 consumers, particularly business users, will bypass the network as other alternatives
24 become available.⁴¹ These risks, however, are substantially less than the risks faced

1 by telephone holding companies' other businesses, some of which are (or may soon
2 be) subject to competition.

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

5
6 A. Yes. Think of integrated telephone holding companies, for example BellSouth, as
7 being composed of separate business units. One business unit owns the network
8 and leases network elements to all local service providers, including both
9 competitors and the telephone companies' other business units that are involved in
10 the provision of local service. Whereas those BellSouth units involved in providing
11 local service are in businesses that (if prices are set appropriately in these
12 proceedings) will be faced with new competitors, the unit involved in leasing the
13 network which all the competitors need to use has virtual monopoly power and
14 faces much less risk. The sample of companies used in my analysis for which the
15 cost of debt and equity are estimated is composed of diversified telephone
16 companies. As stressed earlier, these companies operate a variety of businesses,
17 virtually all of which face a great deal more operating risk than leasing a local
18 exchange network or providing universal service. This has been clearly recognized
19 by financial analysts and the bond rating agencies. The company to which the
20 WACC should be applied, however, is one which is involved exclusively in leasing
21 network facilities and the provision of universal service. Under these
22 circumstances, using a higher debt weight than the current market value weights for
23 the sample companies is one way to take account of this problem. The higher debt
24 weight may be more representative of the target capital structure for the low-risk
25 network element leasing business.

1

2 **Q. HAVE YOU SEEN ANY INFORMATION TO THE PUBLIC WHICH**
3 **CONFIRMS THE REASONABLENESS OF YOUR COST OF CAPITAL**
4 **RANGE?**

5

6 A. Yes. Salomon Brothers in its January 1996 report "Regional Bell Operating
7 Companies—Opportunities Ring ... While Danger Calls" stated that "[b]ased on
8 our estimates, the RBOCs currently have an average weighted cost of capital of
9 approximately 8.6%. In order to value the RBOCs on a level playing field, we used
10 the same discount rate in each DCF. Specifically, we used a discount rate of 10%,
11 which we believe should be the minimum return an investor would expect in order
12 to entice him to invest in a security, despite the fact this is slightly above the cost of
13 capital." Also, as part of its proposed merger with NYNEX, Bell Atlantic
14 submitted to its shareholders a joint proxy statement/prospectus on September 18,
15 1996 in which Bell Atlantic's investment advisor, Merrill Lynch, performed a DCF
16 analysis of the two companies' relative market values, estimating a discount rate in
17 the range of 8 to 10 percent for the telephone company portion of its portfolio of
18 businesses.

19

20 **Q. SHOULD THE COST OF CAPITAL ESTIMATE ACCOUNT FOR**
21 **QUARTERLY COMPOUNDING?**

22

23 A. No. Telephone operating companies receive payments for the use of their network
24 elements on a monthly basis, and consequently, are able to reinvest their cash flows
25 on an approximate monthly basis. This is a more frequent basis than investors

1 receive their quarterly dividends from the telephone holding companies. Thus, the
2 effective rate that the telephone companies receive is the allowed rate— as
3 determined in this hearing— compounded monthly, regardless of the fact that a
4 telephone holding company pays dividends to investors quarterly. If the
5 Commission allows a rate which is estimated using a quarterly compounding DCF
6 model, the telephone holding companies will get an effective rate compounded both
7 quarterly (as allowed) and monthly (as actually received). To be precise, therefore,
8 if quarterly compounding is allowed, the cost of equity would also have to be
9 decomposed to account for the fact that the telephone holding companies will be
10 able to reinvest its proceeds on a monthly basis. The net effect would result in a
11 lower allowed rate than the annual DCF cost of equity proposed by me.
12 Consequently, the use of a DCF cost of equity determined using the annual formula
13 is conservatively high.

14
15 **Q. SHOULD THE COST OF CAPITAL ESTIMATE BE INCREASED FOR**
16 **EQUITY FLOTATION COSTS?**

17
18 A. No. BellSouth, GTE and Sprint are large holding companies whose stocks trade on
19 the NYSE in an efficient market. As part of the process of arriving at the day-to-
20 day prices for the companies' stock, the market is anticipating future events which
21 affect the cash flows that the companies will earn. This process clearly includes the
22 anticipation of future cash expenditures, including financing costs for both debt and
23 equity which reduce the companies' cash flows. Because the price of the
24 companies' stock has accounted for flotation costs already, an estimation of the cost
25 of equity using the DCF model accurately reflects the required return of investors.

1 Adding a flotation cost adjustment would in effect double count the cost of
2 financing.

3

4 **Q. IF YOUR THEORETICAL ARGUMENT REGARDING FLOTATION**
5 **COSTS IS CORRECT, WHY HAS THERE BEEN SO MUCH DISCUSSION**
6 **ON THIS ISSUE IN THE TRADITIONAL REGULATORY RATE**
7 **HEARING CONTEXT?**

8

9 A. The regulatory context is really a different issue. In the regulatory world, a main
10 purpose is to identify costs which can be charged back to the ratepayers by the
11 telephone operating company. Equity flotation costs have often been disallowed
12 because it would not be fair to burden current ratepayers with all of those costs if
13 the equity capital would be utilized indefinitely. One way that parties have tried to
14 "amortize" these costs so that they could be recovered by the telephone company is
15 to make the flotation cost adjustment to the allowed return, which would in effect
16 charge it back to ratepayers perpetually in very small increments. This is not the
17 issue for this proceeding. In this case, I am interested in the forward-looking cost
18 of capital which fairly compensates for the riskiness of the business. Because
19 telephone holding companies' stock trades efficiently, the market has assessed its
20 prospective cash flows, including financing costs, to arrive at its estimate of the fair
21 price. Consequently, the DCF derived cost of equity estimate is the proper measure
22 for determining forward- looking cost of capital.

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IX.

CONCLUDING SUMMARY

Q. COULD YOU SUMMARIZE THE MAIN CONCLUSIONS OF YOUR TESTIMONY.

A. Using publicly-available data and accepted finance procedures I have estimated that the weighted average cost of capital for BellSouth is in a range between 7.94 and 9.05 with a best point estimate of 8.50 percent; for GTE it is in a range between 8.17 and 9.31 with a best point estimate of 8.74 percent; and for Centel and United in a range between 7.97 and 9.12 with a best point estimate of 8.55 percent. However, I have also stressed that these are upward-biased estimates of the cost of capital of diversified telephone holding companies that should be used in this case. In this case, each of the companies in question is not a diversified holding telephone company, but a company in the more specialized (and less risky) business of providing network elements and universal service. Finally, I observed information released by independent parties unrelated to this proceeding which confirm the reasonableness of my cost of capital estimate.

Q. DOES THAT CONCLUDE YOUR TESTIMONY?

A. Yes.

¹ On Petitions for Review of an Order of the Federal Communications Commission, United States Court of Appeals for the Eight Circuit (submitted: January 17, 1997; Filed: July 18, 1997).

² Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, CC Dkt. No. 96-98, First Report & Order, FCC 96-325 (rel. August 8, 1996)

³ It should be noted that, although the principles cited in the above-mentioned Supreme Court decisions are analogous to TELRIC, in practice state utility regulation has focused on the recovery of embedded costs. The traditional embedded cost methodology is not consistent with TELRIC.

⁴ 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.

⁵ *Stocks, Bonds, Bills and Inflation, 1996 Yearbook*, Ibbotson Associates, Chicago, Illinois, pg. 146.

⁶ 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.

⁷ 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.

⁸ Sprint Corp's bonds are issued primarily by its telephone subsidiaries. Therefore, it is appropriate in my opinion to use the weighted average cost of Sprint's actual debt securities, instead of utilizing the average of the costs of debt of all telephone holding companies.

⁹ 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.

¹⁰ *Stock, Bonds, Bills and Inflation, 1996 Yearbook*, Ibbotson Associates, Chicago, pp. 158-159.

¹¹ Dr. Sharpe is a Nobel-prize winning financial economist.

¹² Sharpe, William F., Gordon J. Alexander and Jeffery V. Bailey, *Investments*, Fifth Edition, Prentice Hall, Englewood Cliffs, New Jersey, 1995, pp. 590-591.

¹³ Damodaran, Aswath, *Damodaran on Valuation: Security Analysis for Investment and Corporate Finance*, John Wiley & Sons, New York, 1994, pp. 99-101.

¹⁴ Copeland, Tom, Tim Koller, and Jack Murrin, *Valuation: Measuring and Managing the Value of Companies*, John Wiley & Sons, New York, 1994, pg. 295.

¹⁵ 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.

¹⁶ 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)

¹⁷ I utilize an annual DCF model because telephone operating companies 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 the telephone companies receive is the allowed rate -- as determined in interconnection or universal service 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.

¹⁸ Ibbotson, Roger, and Gary P. Brinson, *Global Investing: The Professional's Guide to the World Capital Markets*, McGraw-Hill, 1993, at p. 45.

¹⁹ To address the question of whether the 5-year betas are sufficiently forward-looking, I also obtained predicted betas calculated by BARRA, 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 The CAPM cost of equity for Centel and United is estimated by taking the weighted average of the CAPM cost of equity estimated for all the companies in the sample.

²² Copeland, Tom, Tim Koller, and Jack Murrin, *Valuation: Measuring and Managing the Value of Companies*, John Wiley & Sons, New York, 1994, at pg. 264.

²³ 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 average dividend yield of the market is about 2%. Therefore, I consider a 2% cut-off to be reasonable.

²⁴ Bodie, Zvi, Alex Kane, and Alan J. Marcus, *Investments*, Irwin, 1993.

²⁵ 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.

²⁶ Damodaran, Aswath, *Damodaran On Valuation: Security Analysis for Investment and Corporate Finance*, John Wiley & Sons, 1994, at p. 22.

²⁷ *Stocks, Bonds, Bills and Inflation, 1996 Yearbook*, Ibbotson Associates, Chicago, Illinois.

²⁸ 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.

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 Damodaran, *Id.*, at p. 22, and Copeland *et al.*, *Id.* at p. 260.

³⁴ Kuhn, Susan E., "Personal Fortune: Why Bonds May Beat Stocks," *Fortune*, October 28, 1996.

³⁵ "Will Investors Run for Cover/ When the Rain Comes," *The Economist*, vol. 345, October 25, 1997.

³⁶ In the Matter of Represcribing the Authorized Rate of Return for Interstate Services of Local Exchange Carriers. FCC 90-315, Adopted September 19, 1990; Released December 7, 1990. ¶'s 136 & 139, p. 7523

³⁷ Ross, Stephen A., Randolph W. Westerfield and Jeffrey Jaffe, *Corporate Finance*, Fourth Edition, Irwin, Chicago, 1996, pg. 441.

³⁸ Shapiro, Alan C., *Modern Corporate Finance*, Macmillan Publishing Company, 1990, pgs. 291-292.

³⁹ 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.

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."

⁴¹ 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.

JOHN L. HIRSHLEIFER

Vice President, Director of Research

FinEcon

Personal Information

Birth date: June 9, 1954

Marital status: Married, 2 children

Business address: FinEcon
10877 Wilshire Boulevard, Suite 710
Los Angeles, California 90024
(310) 208-2827
www.finecon.com

Home address: 3240 Barbydell Dr.
Los Angeles, California 90064
(310) 202-1403

Education and Professional Certification

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

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

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

- 1990- Present: Vice President, Director of Research, FinEcon
- 1985-1990: Director of Due Diligence, Transamerica Financial Resources, Inc., Los Angeles, CA
Elected Treasurer & Financial Principal of Transamerica Financial Resources
in 1988
Elected Second Vice President of Transamerica Financial Resources in
December 1985
- 1982-1984: Senior Tax Consultant, Price Waterhouse, Century City, CA
- 1980-1982: Tax Consultant, Price Waterhouse, Century City, CA

Professional Experience

At 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.

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 anti-trust matters.

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

At Transamerica

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

At Price Waterhouse

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 12/31/97(\$ mil)	1997 Revenues (\$ mil)	1997 Book Value of Plant (\$ mil)	Access Lines in Service (mil)
<i><u>RBHC's</u></i>				
Ameritech	44,054	16,000	13,980	19.7
Bell Atlantic	70,674	29,900	16,765	40.0
BellSouth	55,839	20,365	22,200	23.0
SBC Communications	67,140	24,800	27,400	33.0
U.S. West Comm.	21,824	10,480	14,100	15.4
<i><u>Large Independent Telephone Holding Companies</u></i>				
ALLTEL	7,610	3,230	3,320	1.6
Century Telephone Ent	3,026	750	2,000	1.2
Cincinnati Bell	4,216	1,765	1,030	0.9
GTE	50,032	23,000	23,400	27.7
SNET	3,348	2,015	1,700	2.2

Sources: Standard & Poor's Industry Survey; Value Line Inc.; Dow Jones News Retrieval;
SBC Communications 1997 10-K; GTE Annual Report.

**Summary of Cost of Debt
for BellSouth, GTE and Sprint**

as of 12/31/97

BLS	BELLSOUTH	6.65%
GTE	GTE	6.85%
FON	SPRINT	6.63%

Details are presented in Attachments 2-2 through 2-4.

BELLSOUTH Bond Yields

	S&P DEBT RATING	Debt Outstanding at Par (mil \$)	Yield to Maturity as of 12/31/97
<u>BellSouth Capital Funding (Issued under support agreement w/BellSouth)</u>			
Deb 6.04s 2026	AAA	300	5.98%
Deb 7.12s 2037	AAA	500	6.79%
<u>BellSouth Telecommunications</u>			
Deb 5 7/8s 2009	AAA	350	6.09%
Deb 7s 2025	AAA	300	6.72%
Deb 8 1/4s 2032	AAA	250	7.67%
Deb 7 7/8s 2032	AAA	300	7.47%
Deb 7 1/2s 2033	AAA	300	7.19%
Deb 6 3/4s 2033	AAA	400	6.90%
Deb 7 5/8s 2035	AAA	300	7.21%
Deb 5.85s 2045	AAA	300	6.05%
Deb 7s 2095	AAA	500	6.80%
Nts 6 1/2s 2000	AAA	275	5.98%
Nts 6 1/4s 2003	AAA	450	6.11%
Nts 6 3/8s 2004	AAA	200	6.21%
Nts 7s 2005	AAA	150	6.27%
Nts 6 1/2s 2005	AAA	300	6.12%
<u>Southern Bell Tel. & Tel (Now BellSouth Telecommunications)</u>			
Deb 4 3/8s '98	AAA	70	8.06%
Deb 4 3/4s 2000	AAA	100	6.46%
Deb 4 3/8s 2001	AAA	75	6.49%
Deb 4 3/8s 2003	AAA	70	6.37%
Deb 6s 2004	AAA	100	5.91%
Deb 7 5/8s 2013	AAA	350	7.36%
Weighted Average:			6.65%

Source: Standard & Poor's Bond Guide, January 1998.

GTE Bond Yields

	S&P DEBT RATING as of 12/31/97	Debt Outstanding at Par (mil \$)	Yield to Maturity as of 12/31/97
<u>GTE California</u>			
Deb 'A' 5 5/8s 2001	AA-	300	6.07%
Deb 'B' 6 3/4s 2004	AA-	250	6.23%
Deb 'C' 8.07s 2024	AA-	250	7.14%
Deb 'D' 7s 2008	AA-	100	6.22%
Deb 'E' 6.70s 2009	AA-	300	6.33%
<u>GTE Corp.</u>			
Deb 8.85s '98	A	700	6.39%
Deb. 9 3/8s 2000	A	500	6.23%
Deb. 9.10s 2003	A	500	6.36%
Deb. 7.51s 2009	A	500	6.59%
Deb 8 1/2s 2017	A	250	8.17%
Deb 10.30s 2017	A	200	9.66%
Deb 10 1/4s 2020	A	400	8.88%
Deb 8 3/4s 2021	A	300	6.92%
Deb 7.83s 2023	A	500	7.41%
Deb 7.90s 2027	A	500	7.36%
M-T Nts 'A' 6.39s 2000	A	100	6.28%
M-T Nts 'A' 6.56s 2002	A	105	6.43%
M-T Nts 'A' 6.60s 2005	A	75	6.60%
<u>GTE Florida</u>			
Deb 'A' 6.31s 2002	AA-	200	6.28%
Deb 'B' 7.41s 2023	AA-	200	7.11%
Deb 'C' 7 1/4s 2025	AA-	100	7.01%
Deb 'D' 6 1/4s 2005	AA-	100	6.33%
<u>General Tel Florida (Now GTE Florida)</u>			
1st O 7 1/2s 2002	A+	50.0	7.21%
1st BB 8 3/8s 2027	A+	75.0	8.00%
<u>GTE Hawaiian Tel</u>			
1st BB 6 3/4s 2005	A	125	6.39%
Deb 'A' 7s 2006	A	150	6.46%
Deb 7 3/8s 2006	A	150	6.48%
<u>GTE North Inc.</u>			
1st 8 1/2s 2031	AA-	250	7.80%
Deb 'A' 6s 2004	AA-	250	6.25%
Deb 'B' 5 1/2s '99	AA-	200	5.96%
Deb 'C' 7 5/8s 2028	AA-	200	7.07%
Deb 'D' 6.90s 2008	AA-	250	6.35%
Deb 'E' 6.40s 2005	AA-	150	6.24%

GTE Bond Yields

	S&P DEBT RATING as of 12/31/97	Debt Outstanding at Par (mil \$)	Yield to Maturity as of 12/31/97
<u>General Tel. Illinois (Now GTE North)</u>			
1st 8 1/2s 2000	AA-	26.0	8.10%
1st 8 1/4s 2003	AA-	16.7	7.85%
<u>General Tel. Michigan (Now GTE North)</u>			
1st 7 1/2s 2001	AA-	18.0	7.31%
1st 7 5/8s 2003	AA-	20.0	7.36%
1st 8 1/2s 2006	AA-	25.0	8.07%
<u>General Tel. Midwest (Now GTE North)</u>			
1st G 7 5/8s 2003	AA-	13.0	7.35%
1st I 8 1/8s 2007	AA-	20.0	7.75%
<u>General Tel. Pennsylvania (Now GTE North)</u>			
1st O 8 7/8s 2026	AA-	75.0	8.49%
<u>General Tel. Wisconsin (Now GTE North)</u>			
1st 7 1/8s 2001	AA-	15.0	6.89%
1st 7 3/4s 2003	AA-	25.0	7.43%
1st 8 3/4s 2026	AA-	45.0	8.26%
<u>GTE Northwest (was Gen'l Tel. Northwest)</u>			
1st FF 6 1/8s '99	AA-	125	6.00%
Deb A 7 3/8s 2001	A+	200	6.19%
Deb B 7 7/8s 2026	A+	175	7.17%
<u>General Tel. Northwest (Now GTE Northwest)</u>			
1st W 8 1/4s 2007	AA-	48.0	7.88%
1st BB 8 3/4s 2016	AA-	125	8.38%
<u>GTE South Inc.</u>			
Deb 7 1/4s 2002	AA-	150	6.17%
Deb 'C' 6s 2008	AA-	125	6.27%
Deb 'D' 7 1/2s 2026	AA-	250	7.09%
<u>General Tel. Kentucky (merged w/GTE South)</u>			
1st 7 3/4s 2003	AA-	10.9	7.46%
<u>General Tel. South (Now GTE South Inc., was Gen'l Tel Southeast)</u>			
1st U 7 5/8s 2002	AA-	21.0	7.33%
<u>GTE Southwest</u>			
1st 7 1/2s 2002	A+	40.0	6.93%
1st 8 1/2s 2031	A+	100.0	6.75%
Deb 'A' 5.82s '99	A+	250.0	6.03%
Deb 'B' 6.54s 2005	A+	250.0	6.34%
Deb 'C' 6s 2006	A+	150.0	6.32%
Weighted Average:			6.85%

GTE Bond Yields

S&P DEBT RATING as of 12/31/97	Debt Outstanding at Par (mil \$)	Yield to Maturity as of 12/31/97
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Source: *Standard & Poor's Bond Guide, January 1998.*

Sprint Bond Yields

	S&P DEBT RATING as of 12/31/97	Debt Outstanding at Par (mil \$)	Yield to Maturity as of 12/31/97
<u>Sprint Corp</u>			
Deb 9 1/4s 2022	A-	200	6.80%
Nts 8 1/8s 2002	A-	150	6.26%
<u>United Telecommunications (Now Sprint Corp)</u>			
Nts 9 3/4s 2000	A-	250	6.12%
Nts 9 1/2s 2003	A-	200	6.22%
<u>United Tel Co (Florida)</u>			
1st CC 9 1/4s 2019	A	135	8.68%
1st DD 7 1/4s 2004	A	50	6.35%
1st EE 6 1/4s 2003	A	70	6.22%
1st FF 6 7/8s 2013	A	60	6.51%
1st GG 7 1/8s 2023	A	75	6.70%
<u>United Tel Co (Ohio)</u>			
1st BB 6 5/8s 2002	A+	60	6.41%
1st DD 5 7/8s 2000	A+	30	6.04%
1st EE 6 1/2s 2005	A+	35	6.26%
<u>United Tel Co (Penna)</u>			
1st Y 7 3/8s 2002	NR	55	6.24%
<u>Centel Capital (Gtd by Sprint Corp)</u>			
Deb 9s 2019	A-	150	6.90%
<u>Carolina Tel & Tel,</u>			
Deb 5 3/4s 2000	A+	50	6.06%
Deb 6 1/8s 2003	A+	50	6.23%
Deb 7 1/4s 2004	A+	50	6.31%
Deb 6 3/4s 2013	A+	50	6.49%
Deb 9s 2016	A+	50	8.54%
Weighted Average:			6.63%

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

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

Company	Stock Price as of 12/31/97	1998 Dividend per Value Line	5-year I/B/E/S Forecast		COST OF EQUITY		
			Growth Rate as of 1/98	Sustainable Growth Rate	15-yr Linear Convergence (A)	Weighted Average Excluding Company (B)	Cost of Equity $\frac{1}{4} \times (A) + \frac{3}{4} \times (B)$
Ameritech	\$80.500	\$2.40	8.14%	5.50%	9.22%	9.44%	9.38%
Bell Atlantic	\$91.000	\$3.08	7.89%	5.50%	9.62%	9.35%	9.42%
BellSouth	\$56.312	\$1.50	8.11%	5.50%	8.83%	9.53%	9.35%
SBC Communications	\$73.250	\$1.87	9.64%	5.50%	9.12%	9.48%	9.39%
U.S. West	\$45.125	\$2.14	4.62%	5.50%	9.92%	9.37%	9.51%
ALLTEL	\$41.062	\$1.18	9.88%	5.50%	9.61%	9.40%	9.46%
Century Telephone Ent	\$49.812	\$0.45	14.33%	5.50%	7.53%	9.43%	8.95%
Cincinnati Bell	\$31.000	\$0.40	17.00%	5.50%	8.95%	9.41%	9.30%
GTE	\$52.250	\$1.88	8.93%	5.50%	10.23%	9.26%	9.50%
SNET	\$50.312	\$1.76	6.50%	5.50%	9.30%	9.41%	9.38%
MKT-WEIGHTED AVERAGE:					9.41%		

Estimated Betas For the Comparable Companies
(60 Monthly Observations -- Period Ending 12/31/97)

Ticker Symbol	Company	Levered Beta ¹	Unlevered Beta	Re-levering of Average Unlevered Beta Using Company's Capital Structure
AIT	Ameritech	0.78	0.71	0.71
BEL	Bell Atlantic	0.83	0.71	0.75
BLS	BellSouth	0.76	0.67	0.72
SBC	SBC Communications	0.68	0.60	0.72
USW	U.S. West	0.57	0.49	0.74
AT	ALLTEL	0.55	0.48	0.74
CTL	Century Telephone Ent	1.01	0.65	0.99
CSN	Cincinnati Bell	1.11	1.04	0.68
GTE	GTE	0.68	0.56	0.78
SNG	SNET	0.59	0.47	0.80
Assumed Tax Rate:		37.5%		
Value-Weighted Average Unlevered Beta			0.64	

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

Sources: Dow Jones Beta Analytics and Attachment JH-10.

Risk Premium Computed from DCF Expected Market Return

	Expected Long- Run Yield As Of December 1997	Expected Return on Stock Market	Implied Risk Premium
1-Month Treasury Bill	4.53%	9.82%	5.29%
20-Year Treasury Bond	6.02%	9.82%	3.80%

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

Expected Long-Run One-Month Treasury Bill Yield For December 1997

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

<u>Average Long-Term Treasury Bond Return</u>	<u>Average One-Month Treasury Bill Return</u>	<u>Historical Term Premium</u>
5.24%	- 3.75%	= 1.49%

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

<u>Long-Term Treasury Bond Yield December 1997</u>	<u>Historical Term Premium</u>	<u>Long-Run Expected Treasury Bill Yield December 1997</u>
6.02%	- 1.49%	= 4.53%

Sources: Dimensional Fund Advisors; Federal Reserve Weekly Bulletin.

Stock Market Premium Analysis

<u>Year</u>	<u>Stock Returns</u>	<u>One-month Treasury Bill Returns</u>	<u>Long-Term Treasury Bond Total Returns</u>
<u>Period</u>	Arithmetic Average	Arithmetic Average	Arithmetic Average
1802-1997	9.79% ⁽¹⁾	4.31%	5.07%
1926-1997	12.96% ⁽²⁾	3.81%	5.59%
1951-1997	14.06% ⁽²⁾	5.29%	6.37%
1971-1997	14.56% ⁽²⁾	6.88%	10.02%
<u>Period</u>		<u>Stock Premium Over Bills</u>	<u>Stock Premium Over Bond Total Returns</u>
1802-1997		5.49%	4.73%
1926-1997		9.15%	7.36%
1951-1997		8.77%	7.69%
1971-1997		7.68%	4.54%
<u>Year</u>	<u>Stock Returns</u>	<u>One-month Treasury Bill Returns</u>	<u>Long-Term Treasury Bond Total Returns</u>
<u>Period</u>	Geometric Average	Geometric Average	Geometric Average
1802-1997	8.39% ⁽¹⁾	4.21%	4.84%
1926-1997	11.00% ⁽²⁾	3.76%	5.22%
1951-1997	12.80% ⁽²⁾	5.25%	5.86%
1971-1997	13.32% ⁽²⁾	6.85%	9.39%
<u>Period</u>		<u>Stock Premium Over Bills</u>	<u>Stock Premium Over Bond Total Returns</u>
1802-1997		4.18%	3.55%
1926-1997		7.24%	5.77%
1951-1997		7.55%	6.94%
1971-1997		6.48%	3.93%

⁽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 returns are from Ibbotson Associates.

Model Estimates of Cost of Equity
For RBOC's, ALLTEL, Cincinnati Bell, GTE and SNET

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	
Ameritech	9.38%	0.71	9.86%	9.93%	9.89%	9.64%
Bell Atlantic	9.42%	0.75	10.16%	10.15%	10.15%	9.78%
BellSouth	9.35%	0.72	9.93%	9.98%	9.96%	9.65%
SBC Communications	9.39%	0.72	9.93%	9.98%	9.96%	9.67%
U.S. West	9.51%	0.74	10.08%	10.09%	10.09%	9.80%
ALLTEL	9.46%	0.74	10.08%	10.09%	10.09%	9.77%
Century Telephone Ent	8.95%	0.99	11.96%	11.47%	11.71%	10.33%
Cincinnati Bell	9.30%	0.68	9.63%	9.76%	9.70%	9.50%
GTE	9.50%	0.78	10.38%	10.31%	10.35%	9.92%
SNET	9.38%	0.80	10.53%	10.42%	10.48%	9.93%
Weighted Average	9.41%				10.08%	9.74%

Capital Structure of Telephone Holding Companies
As of Year-End 1997

Company	Short-Term Debt		Long-Term Debt		BASED ON BOOK VALUE			BASED ON MARKET VALUE		
	Debt	Debt	Debt	Debt	Total Debt	Preferred Stock	Common Equity	Total Debt	Preferred Stock	Common Equity
Ameritech	19%	29%	48%	0%	52%	0%	85%	15%	0%	85%
Bell Atlantic	20%	41%	61%	0%	39%	0%	78%	22%	0%	78%
BellSouth	14%	28%	42%	0%	58%	0%	83%	17%	0%	83%
SBC Communications	8%	50%	59%	0%	41%	0%	83%	17%	0%	83%
U.S. West	6%	51%	57%	0%	43%	0%	79%	21%	0%	79%
ALLTEL	1%	45%	47%	0.2%	53%	0.1%	80%	20%	0.1%	80%
Century Telephone Ent	1%	68%	67%	0.0%	33%	0.0%	53%	47%	0.0%	53%
Cincinnati Bell	18%	26%	44%	0%	50%	0%	90%	10%	0%	90%
GTE	13%	56%	69%	0%	31%	0%	74%	26%	0%	74%
SNET	10%	60%	69%	0%	31%	0%	71%	29%	0%	71%
Value-Weighted Average:										
			57%	0%	43%	0%	80%	20%	0%	80%

Sources: Companies' SEC Forms 10-K for 1998; market value of common equity based on closing stock price as of December 31, 1998.

Model Estimates of Cost of Capital**For BellSouth, GTE and Sprint**

Company	WEIGHTED AVERAGE COST OF CAPITAL		
	MIN	MIDPOINT	MAX
BellSouth	7.94%	8.50%	9.05%
GTE	8.17%	8.74%	9.31%
Sprint	7.97%	8.55%	9.12%