

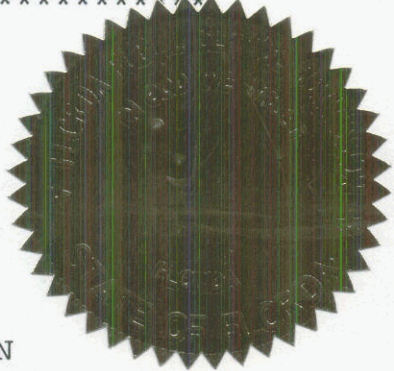
BEFORE THE  
FLORIDA PUBLIC SERVICE COMMISSION

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In the Matter of : DOCKET NO. 990649-TP  
: :  
INVESTIGATION INTO PRICING :  
OF UNBUNDLED NETWORK :  
ELEMENTS. :  
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VOLUME 4  
Pages 526 through 674



PROCEEDINGS: HEARING  
BEFORE: CHAIRMAN J. TERRY DEASON  
COMMISSIONER E. LEON JACOBS, JR.  
COMMISSIONER LILA A. JABER  
DATE: Monday, July 17, 2000  
TIME: Commenced at 9:30 a.m.  
PLACE: Betty Easley Conference Center  
Room 148  
4075 Esplanade Way  
Tallahassee, Florida  
REPORTED BY: JANE FAUROT, RPR  
FPSC Division of Records & Reporting  
Chief, Bureau of Reporting  
(850) 413-6732  
APPEARANCES: (AS HERETOFORE NOTED.)

DOCUMENT NUMBER-DATE

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## I N D E X

## WITNESSES

	NAME:	PAGE NO.
4	JOHN D. QUACKENBUSH	
5	Stipulated Prefiled Direct Testimony Inserted	530
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2 EXHIBITS

3 NUMBER: ID. ADMTD.

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7 CERTIFICATE OF REPORTER 674

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## P R O C E E D I N G S

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MS. KEATING: Next is Sprint's Witness  
Quackenbush.

CHAIRMAN DEASON: Witness Quackenbush's prefiled  
testimony shall be inserted into the record without  
objection.

MS. KEATING: And Witness Quackenbush has  
Exhibits JDQ-1 through JDQ-16.

CHAIRMAN DEASON: Those exhibits shall be  
identified as Composite Exhibit 47, and without objection  
shall be admitted.

(Exhibit Number 47 marked for identification and  
entered into the record.)



**BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION****DIRECT TESTIMONY****OF****JOHN D. QUACKENBUSH****I. QUALIFICATIONS, RESPONSIBILITIES, AND PURPOSE OF  
TESTIMONY**

Q1. Please state your name, occupation and business address.

A1. My name is John D. Quackenbush. I am currently employed as the Manager, Capital Markets in the Treasury Department of Sprint Corporation. My business address is 2330 Shawnee Mission Parkway, Westwood, Kansas 66205.

Q2. Please state your work experience, educational background, and professional qualifications.

A2. I began employment with Sprint Corporation in the Local Telecommunications Division in May 1986. In February 1995, I began my present duties in the Treasury Department. My present duties include raising capital in the public and private markets, liability management including debt refinancing analysis, debt payment and compliance, inter-company debt management, rating

1 agency relationships, and the preparation of cost of  
2 capital studies and testimony. Additionally, I  
3 currently serve as the Treasurer of Central Telephone  
4 Company, United Telephone Company of Ohio, and  
5 SprintPAC, the federal political action committee that  
6 provides Sprint employees a forum to support candidates  
7 for the U.S. Congress.

8  
9 I have previously testified concerning cost of capital  
10 on behalf of Sprint local exchange companies before the  
11 Florida Public Service Commission, the South Carolina  
12 Public Service Commission, the Kansas Corporation  
13 Commission, the Tennessee Public Service Commission,  
14 the New Jersey Board of Public Utilities, the Oregon  
15 Public Utility Commission, the Missouri Public Service  
16 Commission, and the Nevada Public Service Commission.

17  
18 I was employed by the Illinois Commerce Commission from  
19 January 1982 through May 1986. During my commission  
20 employment, I held the titles of Financial Analyst,  
21 Senior Financial Analyst, Chief Financial Analyst, and  
22 Supervisor of the Rate of Return Section. I testified  
23 before the Illinois Commerce Commission in  
24 approximately thirty proceedings on topics including  
25 cost of capital, rate of return, capital structure,

1 interim rate relief, phase-in plans, in-service  
2 criteria for electric generating units,  
3 diversification, holding company formation, mergers,  
4 and affiliated interest transactions. I also served as  
5 Governor James R. Thompson's representative on the  
6 National Governors Association Task Force on Nuclear  
7 Power Plant Financing.

8  
9 I received the designation of Chartered Financial  
10 Analyst (CFA) in September 1993. Investment  
11 professionals earn the right to use the CFA designation  
12 by passing a series of three comprehensive, rigorous  
13 examinations over a minimum of three years. The CFA  
14 examination process challenges participants to remain  
15 current with today's rapidly changing investment  
16 environment. The CFA Body of Knowledge includes  
17 ethical and professional standards, investment tools,  
18 valuation, and portfolio management.

19  
20 In December 1981, I received a Master of Business  
21 Administration degree with a concentration in Finance  
22 from Michigan State University. In May 1980, I  
23 graduated from Calvin College in Grand Rapids, Michigan  
24 with a Bachelor of Arts degree in Business Economics.

25

1 I serve on the Board of Directors of the Society of  
2 Utility & Regulatory Financial Analysts. Additionally,  
3 I am a member of the Association for Investment  
4 Management and Research, the Financial Management  
5 Association, the Eastern Finance Association, the  
6 Southern Finance Association, the Southwestern Finance  
7 Association, the Midwest Finance Association, and the  
8 Kansas City Society of Financial Analysts.

9  
10 Q3. What is the purpose of your testimony?

11 A3. I quantify the weighted average cost of capital for  
12 Sprint - Florida, Incorporated (Sprint - Florida). My  
13 analysis demonstrates the appropriateness of Company  
14 witness Dickerson's use of 13.19% as Sprint - Florida's  
15 cost of capital in determining the annual charge  
16 factor, which is used in the forward-looking cost  
17 studies for unbundled network elements in this  
18 proceeding.

19  
20 Q4. What is your recommendation concerning the cost of  
21 capital for Sprint - Florida?

22 A4. I recommend primary reliance on the weighted market  
23 value cost of capital that is consistent with Section  
24 252(d)(1) of the Telecommunications Act of 1996, which  
25 states that rates for interconnection and access to

1 unbundled elements "may include a reasonable profit."  
2 The weighted average cost of capital for Sprint -  
3 Florida is 13.19% based on the market value capital  
4 structure shown on Exhibit JDQ-14.  
5

6 **II. BASIC FINANCIAL CONCEPTS**  
7

8 Q5. What financial concepts do you rely on in developing  
9 your cost of capital recommendation?

10 A5. My recommendation is based on fundamental financial  
11 concepts that demonstrate that the appropriate cost of  
12 capital for a local exchange company is the weighted  
13 average cost rate of investor-supplied capital. If the  
14 cost of capital in a forward-looking cost study is set  
15 equal to the company's weighted average cost of  
16 capital, investors will be afforded an opportunity to  
17 earn the minimum return that they require. The  
18 weighted average cost of capital is the sum of the  
19 costs of the components of investor-supplied capital,  
20 weighted by each component's relative proportion. The  
21 investor-supplied capital structure components include  
22 debt and equity.  
23

1 Investors supply capital with the expectation of  
2 receiving a return on their investment. Investors  
3 require a return on a potential investment based on the  
4 risk of that investment in relation to the risk of  
5 other potential investments. Investors make and  
6 continue only those investments that are expected to  
7 provide returns that meet or exceed their required  
8 returns. In order to attract capital, a firm must  
9 provide investors with a return equal to or exceeding  
10 their required return. If a local exchange company  
11 makes investments that are not expected to achieve at  
12 least its cost of capital, investors will be unwilling  
13 to provide capital and will look elsewhere for  
14 alternative investments.

15  
16 Q6. Are these financial concepts consistent with the FCC  
17 interconnection order?

18 A6. Yes, the FCC interconnection order (First Report and  
19 Order in CC Docket Nos. 96-98 and 96-195 released  
20 August 8, 1996) is consistent with these financial  
21 concepts. The FCC interconnection order states:

22 The concept of normal profit is embodied in  
23 forward-looking costs because the forward-  
24 looking cost of capital, i.e. the cost of

1           obtaining debt and equity financing, is one  
2           of the forward-looking costs of providing the  
3           network elements. This forward-looking cost  
4           is equal to a normal profit. (Paragraph 700).

- 5
- 6   Q7. How do the cost rates and ratios of the capital  
7       structure components in a forward-looking cost study  
8       differ from the cost rates and ratios typically  
9       developed in the past for conventional cost of service  
10      ratemaking?
- 11   A7. Not surprisingly, forward-looking cost rates and ratios  
12      are required in developing a forward-looking cost of  
13      capital. The cost of common equity is conceptually  
14      similar because conventional ratemaking has generally  
15      focused on the forward-looking cost of common equity.  
16      The primary conceptual differences are in the cost of  
17      debt and the capital structure ratios. The forward-  
18      looking cost of debt is conceptually different from the  
19      embedded cost of debt typically developed in the past  
20      for conventional cost of service ratemaking. The  
21      forward-looking debt cost rate is the rate at which new  
22      debt can be issued under prevailing market conditions,  
23      whereas the embedded cost of debt is the rate at which  
24      existing debt was issued under past market conditions.  
25      Likewise, forward-looking capital structure ratios are

1 based on market values, not the book values used in the  
2 past for conventional cost of service ratemaking.

3  
4 Q8. What practical challenge arises in attempting to apply  
5 these financial concepts?

6 A8. The principal practical challenge lies in determining  
7 the cost of common equity. The market value capital  
8 structure component amounts and ratios are readily  
9 obtainable from the local exchange company's books and  
10 records and current market prices. The market cost of  
11 debt is readily observable from the financial  
12 marketplace. On the other hand, the cost of common  
13 equity is not easily measurable or directly observable.  
14 The determination of the cost of common equity requires  
15 the implementation of financial models and reasoned  
16 judgment to estimate investors' required return on  
17 common equity as well as an appropriate issuance cost  
18 increment.

19  
20 **III. CAPITAL STRUCTURE**

21 Q9. What capital structures do you review in determining  
22 the cost of capital for Sprint - Florida in this  
23 proceeding?

24 A9. I review both the Sprint - Florida market value capital  
25 structure shown on Exhibit JDQ-2 and the Sprint -



1 Florida book value capital structure shown on Exhibit  
2 JDQ-1. The market value capital structure is  
3 determined as of late February 2000. The book value  
4 capital structure is determined as of December 31,  
5 1999. These company-specific capital structures are  
6 determined using the most recent capital structure data  
7 available and are representative of the market and book  
8 value ratios that I expect to exist in near-term future  
9 periods when the interconnection rates of Sprint -  
10 Florida will be in effect. I place primary reliance on  
11 the market value capital structure approach, which  
12 incorporates capital structure weights based on the  
13 value of debt and equity in the financial marketplace,  
14 rather than the accounting values of debt and equity  
15 that appear on the balance sheet.

16  
17 Q10. Why do you place primary reliance on the market value  
18 capital structure in this proceeding?

19 A10. The use of market value weights in determining the cost  
20 of capital in this proceeding is justified on both  
21 conceptual and practical grounds. The market value  
22 capital structure approach is conceptually appropriate  
23 and consistent with establishing a forward-looking cost  
24 of capital. The FCC interconnection order (First

1 Report and Order in CC Docket Nos. 96-98 and 96-195  
2 released August 8, 1996) states:

3 [T]he forward-looking costs of capital (debt  
4 and equity) needed to support investments  
5 required to produce a given element shall be  
6 included in the forward-looking direct cost  
7 of that element. (Paragraph 691).

8  
9 A forward-looking cost study that uses forward-looking  
10 competitive market assumptions in the expense and  
11 investment components also requires forward-looking  
12 competitive market assumptions in the cost of capital  
13 component. The use of accounting-based book values is  
14 less consistent with the goals of a forward-looking  
15 cost study.

16  
17 Basic, intermediate, and advanced finance textbooks  
18 address the cost of capital issue by defining capital  
19 structure weights as market value weights. These same  
20 textbooks address capital structure challenges from a  
21 market value perspective. Academic theories of  
22 optimal capital structure apply to market value, rather  
23 than book value, capital structures. The fundamental  
24 financial concepts of using the cost of capital in  
25 decision making and capital budgeting to maximize

1 shareholder value and invest only in projects that  
2 provide returns equal to or in excess of the cost of  
3 capital, are predicated on using market value capital  
4 structure weights. Dr. Michael C. Ehrhardt, on page 75  
5 of The Search for Value: Measuring the Company's Cost  
6 of Capital (Boston, Massachusetts: Harvard School  
7 Business Press, 1994), states "using book values  
8 instead of market values can lead to substantial errors  
9 in estimating the weights."

10  
11 Market values are dynamically determined in the  
12 financial marketplace by investors, while book values  
13 are determined by historical accounting practices.  
14 One-time accounting events that do not change market  
15 values can significantly alter book values. Examples  
16 of one-time accounting events include restructuring  
17 charges, the adoption of SFAS 106 for Other Post-  
18 Employment Benefits, and the discontinuance of  
19 regulatory accounting under SFAS 71. Additionally, the  
20 point in time at which a company issued common stock in  
21 the past does not impact forward-looking market values,  
22 but may significantly impact backward-looking book  
23 values. Over time, market values vary from book values  
24 as stock prices change. If a new event or announcement  
25 significantly enhances or detracts from shareholder

1 value, that change is immediately translated into a  
2 market value change, while there is likely to be no  
3 immediate change in book value. Practically,  
4 differences between market and book values are typical  
5 rather than the exception.

6  
7 Competitive firms in competitive industries rely on  
8 market value weights, as finance textbooks widely  
9 demonstrate to be appropriate. Conventional cost of  
10 service ratemaking was one past forum in which book  
11 value weights were widely accepted. One goal under  
12 conventional ratemaking was to identify the book value  
13 capital on the balance sheet that supported the book  
14 value rate base. However, the goal of a forward-  
15 looking cost study is vastly different, as indicated by  
16 the FCC interconnection order. It would be  
17 inappropriate to use book value weights exclusively in  
18 this proceeding simply because they were used  
19 exclusively under conventional ratemaking.

20  
21 Q11. How did you determine the market value capital  
22 structure ratios for Sprint - Florida?

23 A11. I began with the Sprint - Florida book value capital  
24 structure shown on Exhibit JDQ-1. Secondly, I adjusted  
25 the book value of debt to market value based on market

1 prices as of late February 2000 available from  
2 Bloomberg Financial Services, as shown on Exhibit JDQ-  
3 3. Thirdly, I adjusted the book value of common equity  
4 to market value based on market-to-book ratios of a  
5 comparable group of firms, as shown on Exhibit JDQ-4.  
6 The identification of these comparable firms is  
7 detailed in the Market-Traded Group section of my  
8 testimony. Finally, I used these capital structure  
9 amounts to compute the market value capital structure  
10 ratios shown on Exhibit JDQ-2. As a check, Sprint -  
11 Florida's estimated total market value of \$6.5 billion  
12 is reasonable when viewed on a per access line basis.  
13 The estimated market value of Sprint - Florida implies  
14 a market value per access line of approximately \$2,967,  
15 within the \$1,200 to \$5,300 per access line range paid  
16 in recent market acquisitions.

17  
18 Q12. Is Sprint - Florida's common equity ratio appropriate  
19 for an incumbent local exchange company?

20 A12. Yes, it is, on both a book and market value basis. An  
21 incumbent local exchange company (ILEC) must be  
22 permitted wide latitude in managing capital structure  
23 ratios. Since there is no practical methodology  
24 available to pinpoint theoretically optimal capital  
25 structure ratios, targeted ratios can only be broadly

1 conceptualized. Appropriate ratios may shift over time  
2 as capital market conditions or business risk  
3 characteristics change. Additionally, the timing of  
4 upcoming issuances and maturities may also influence  
5 the capital structure ratios because both the size and  
6 frequency of issuances are affected by the relative  
7 cost-effectiveness of various issuance increments.  
8 Given these practical considerations, capital structure  
9 ratios cannot be deemed to be inappropriate unless the  
10 ratios greatly diverge from sound industry practice and  
11 cause a lack of financial flexibility that may lead to  
12 higher overall capital costs. The Sprint - Florida  
13 market value common equity ratio of 89.64% shown on  
14 Exhibit JDQ-2 is consistent with comparable risk  
15 companies. The market value of equity of most market-  
16 traded companies is significantly above the book value  
17 of equity, while the market value of debt more closely  
18 approximates the book value of debt. The Sprint -  
19 Florida book value common equity ratio of 60.15% shown  
20 on Exhibit JDQ-1 does not diverge from sound industry  
21 practice by any standard of comparison and maintains an  
22 adequate degree of financial flexibility.  
23  
24

1 Q13. What standards of comparison indicate that Sprint -  
2 Florida's book value common equity ratio is appropriate  
3 for an ILEC?

4 A13. ILEC common equity ratios and the U.S. District Court  
5 AT&T divestiture order indicate that the Sprint -  
6 Florida common equity ratio is appropriate for a local  
7 exchange company.

8  
9 Q14. Please discuss the industry book value common equity  
10 ratios for ILECs.

11 A14. ILEC capital structures are appropriate for industry  
12 comparisons while holding company capital structures  
13 are not. ILEC capital structures reflect the business  
14 and financial risk profile of ILECs, while holding  
15 company capital structures incorporate the business and  
16 financial risk profile of non-ILEC operations.

17  
18 Diversified holding companies typically finance  
19 competitive start-up operations with relatively large  
20 proportions of debt. Additionally, start-up operations  
21 typically experience losses that negatively impact the  
22 book value of common equity. When start-up operations  
23 subsequently begin generating positive cash flow and  
24 earnings, the debt is expected to be paid down and the  
25 book value of common equity grows. Thus, diversified

1 holding companies often exhibit relatively low book  
2 value common equity ratios during the initial start-up  
3 years.

4  
5 The composite common equity ratio for all reporting  
6 local exchange companies increased from 54.3% in 1985  
7 to 56.9% in 1998 according to data from United States  
8 Telephone Association (USTA) reports, as shown on  
9 Exhibit JDQ-5. The composite common equity ratio  
10 specifically for independent local exchange companies  
11 increased from 53.7% in 1987 to 60.9% in 1998.

12  
13 Q15. Please discuss the capital structure significance of  
14 the U.S. District Court AT&T divestiture order.

15 A15. In the August 24, 1982 Modification of Final Judgment  
16 in the United States v. American Telephone & Tel. Co.  
17 552 F. Supp. 131 (D.D.C. 1982) antitrust case, Judge  
18 Harold Greene ordered AT&T to divest the Bell regional  
19 companies with 55% equity ratios, except for Pacific  
20 Telesis with a 50% ratio. This mandate provides an  
21 indication of the book value equity ratio deemed  
22 appropriate at that time by the U.S. District Court for  
23 the Bell regional companies. Due to increasing  
24 business risk, the currently appropriate equity ratios  
25 would be higher than those appropriate at divestiture.



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Q16. What changes in business risk characteristics have occurred and are occurring in the telecommunications industry?

A16. Competition and technological change dominate the current telecommunications environment. Competitive threats are emerging and anticipated to continue to emerge. Competitive local exchange carriers (CLECs), cable television companies, Personal Communications Services (PCS) and other wireless providers, long distance carriers, and even electric utilities are actual or potential competitors of ILECs. In a January 12, 2000 research report entitled "CLECs Gain Market Share," Deutsche Bank states that competitors, including CLECs and long distance carriers, "have garnered more than 10% market share of the total local business access line market," and "65% of the increase in business access lines went to competitive providers."

Specifically, CLECs compete for ILECs' large customers that generally are high margin, as well as high revenue customers located in densely packed metropolitan areas such as metropolitan Orlando. The CLECs' trade organization, the Association for Local

1 Telecommunications Services, states that its members  
2 intend to capture 25% of local telecommunications  
3 revenue by 2003. Cable television companies are either  
4 upgrading or plan to upgrade their networks to target  
5 ILECs' small business and residential customers.  
6 Wireless providers are adding customers at a faster  
7 rate than ILECs and are expected to cannibalize minutes  
8 from ILEC wireline services. PCS providers have  
9 intensified wireless competition by increasing the  
10 number of wireless providers beyond the previously  
11 existing two analog cellular carriers in each market.  
12 Electric utilities can make use of their existing  
13 distribution facilities to compete with ILECs. Long  
14 distance companies can bypass the local loop to  
15 directly serve their customers. For example, AT&T  
16 provides Digital Link for business customers in at  
17 least 48 states. AT&T recently acquired Teleport, the  
18 largest CLEC in the United States, and TCI, the largest  
19 cable television provider. Through TCI and other cable  
20 partners including MediaOne, AT&T plans to deploy a  
21 residential telephony product that will ultimately  
22 reach approximately two-thirds of all U.S. homes, with  
23 a goal of reaching penetration of 30% within three to  
24 five years. MCI Worldcom provides CLEC services  
25 through MCImetro, Metropolitan Fiber Systems, and

1 Brooks Fiber. Fixed wireless solutions offer another  
2 alternative to the local loop.

3  
4 Sprint - Florida clearly is exposed to the competitive  
5 nature of the telecommunications industry. Sprint -  
6 Florida's competitive environment is, in part,  
7 illustrated by the existence of this proceeding. It is  
8 clear that other entities are interested in providing  
9 LEC services in competition with Sprint - Florida.  
10 There are 401 certified CLECs in the state of Florida  
11 with requests pending for an additional 26 companies.  
12 Sprint - Florida has identified approximately 32,000  
13 dial tone lines lost to CLEC competitors, not including  
14 losses to competitors that have their own networks and  
15 are now operating as CLECs. No fewer than nine  
16 competitors have installed switches and/or significant  
17 networks in or near Sprint - Florida's service  
18 territory to compete with Sprint - Florida for local  
19 service customers. In addition, there are sixteen  
20 different wireless providers operating in Sprint -  
21 Florida's service territory that represent an  
22 additional competitive threat. There are approximately  
23 1,200 payphone providers certified in Florida. It is  
24 clear that Sprint - Florida has not been exempted from  
25 the general industry trend toward greater competition.

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These technological and competitive developments provide an environment in which ILECs confront both increasing competition and the potential for new avenues for future growth. The telecommunications industry is no longer a relatively isolated monopoly business, and it is becoming increasingly less so over time. This altered environment makes less certain what once was considered a relatively secure, solid revenue stream. The resulting increased business risk has direct implications for financial risk tolerance and capital structure management.

Q17. What are the financial risk and capital structure implications of the business risk developments for ILECs?

A17. It is evident that the industry's traditional financial policies have changed in response to increased business risk. In particular, the industry's traditional reliance on a relatively high degree of financial risk cannot be and will not be continued in the face of competition. It is hardly surprising that ILECs have generally increased their equity ratios, thereby decreasing financial risk in an attempt to partially offset increased and increasing business risk.

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Q18. Please summarize your view of the appropriateness of the capital structure of Sprint - Florida.

A18. After reviewing Sprint - Florida's capital structure, the industry capital structures for ILECs, the capital structures deemed appropriate by the U.S. District Court for the Bell regional companies, the relative level of business risk in the industry, and the market-to-book ratios of comparable companies, I conclude that the capital structure of Sprint - Florida is currently appropriate.

#### IV. DEBT COST RATE

Q19. What is the forward-looking cost of debt for Sprint - Florida?

A19. The forward-looking cost of debt for Sprint - Florida is 8.08% as of late February 2000, as shown on Exhibit JDQ-6. This rate represents the rate at which Sprint - Florida could issue debt in late February 2000 and has three components: the risk-free return, a credit spread, and an issuance cost increment. The forward-looking risk-free return on twenty-year U.S. Treasury bonds implied by futures prices of 6.48% is described

1 in the Risk Premium Analysis portion of my testimony  
2 and developed on Exhibit Q-10. The current credit  
3 spread for twenty-year "A" rated telephone bonds over  
4 twenty-year U.S. Treasury bonds is estimated at 152  
5 basis points based on prevailing market data provided  
6 by Bloomberg Financial Markets. The estimated issuance  
7 cost increment for twenty-year debt is 8 basis points.  
8

9 **V. MARKET-TRADED GROUP**

10  
11 Q20. How did you estimate the cost of common equity for  
12 Sprint - Florida?

13 A20. The cost of common equity is based on investors'  
14 required return on common equity. The required return  
15 on common equity must be estimated with market-based  
16 forward-looking financial models. I used the  
17 discounted cash flow (DCF) model and the risk premium  
18 model, both of which are market-based forward-looking  
19 models, to estimate the required return on common  
20 equity. I determined the cost of common equity by  
21 adding an appropriate issuance cost increment to the  
22 required return on common equity.  
23  
24

1 Q21. How did you apply the DCF and risk premium models to  
2 Sprint - Florida?

3 A21. The implementation of market-based models requires the  
4 use of stock market prices. Sprint - Florida does not  
5 have stock traded on a stock market as a separate  
6 entity and thus, there is no way to directly observe  
7 the value that investors would place on it. As a  
8 result, it is not possible to apply market-based models  
9 directly to Sprint - Florida. Instead, I applied the  
10 market-based models to a group of market-traded  
11 companies that, on average, are comparable in risk to  
12 Sprint - Florida. Since the capital structure and debt  
13 cost rates have been determined for Sprint - Florida,  
14 consistency requires that the associated common equity  
15 cost rate also be determined for Sprint - Florida.

16  
17 Q22. How did you identify a group of market-traded companies  
18 that are comparable in risk to Sprint - Florida?

19 A22. Financial theory indicates that the cost of common  
20 equity is a function of risk. No precise formula  
21 exists to directly measure risk. However, various risk  
22 measures can be used to estimate risk levels. I  
23 identified four risk measures consisting of the common  
24 equity ratio, the cash flow-to-capital ratio, the

1 pre-tax fixed charge coverage ratio, and the  
2 revenues-to-net plant ratio. I then identified a group  
3 of twenty market-traded companies that, on average,  
4 have risk measures comparable to the risk measures of  
5 Sprint - Florida.

6  
7 Q23. How do the four risk measures indicate relative risk  
8 levels?

9 A23. The common equity ratio provides a direct indication of  
10 financial risk by measuring the degree of financial  
11 leverage. This ratio demonstrates the percentage of  
12 total capital supplied by common stockholders rather  
13 than preferred stockholders and debt holders. All else  
14 equal, the higher the common equity ratio, the lower  
15 the risk to the stockholder.

16  
17 The cash flow-to-capital ratio provides an indication  
18 of both business and financial risk by measuring the  
19 adequacy of cash flow to the providers of capital.  
20 This ratio demonstrates the quality of reported  
21 earnings levels. All else equal, the higher the cash  
22 flow-to-capital ratio, the lower the risk to the  
23 stockholder.

24



1 The pre-tax fixed charge coverage ratio provides an  
2 indication of both business and financial risk by  
3 measuring the number of times that fixed charges,  
4 including interest and preferred dividends, are earned.  
5 This ratio demonstrates the adequacy of earnings  
6 levels. All else equal, the higher the fixed charge  
7 coverage ratio, the lower the risk to the stockholder.

8  
9 The revenues-to-net plant ratio provides an indication  
10 of business risk by measuring the ability to generate  
11 revenues from fixed assets. This ratio demonstrates  
12 the net plant turnover and the degree to which  
13 resources are employed to generate revenues. All else  
14 equal, the higher the revenues-to-net plant ratio, the  
15 lower the risk to the stockholder.

16  
17 Q24. How did you identify the twenty market-traded  
18 telecommunications firms closest in risk to Sprint -  
19 Florida?

20 A24. I used cluster analysis to identify the twenty  
21 companies. Cluster analysis is a statistical approach  
22 to narrow a large universe down to a relatively small  
23 group of firms that is closest in risk to the targeted  
24 company. In this application, cluster analysis

1 measures closeness in risk of market-traded companies  
2 to Sprint - Florida.

3  
4 I began with all firms available from Standard & Poor's  
5 Research Insight. I initially screened the firms to  
6 include only market-traded, United States-based,  
7 dividend-paying companies with adequate data available  
8 to calculate the risk measures and required return on  
9 common equity estimates. Six-hundred and twenty-six  
10 market-traded companies were identified as candidates  
11 for the cluster analysis. After determining the risk  
12 measures of each company, the risk measures for all 626  
13 companies were standardized (for each risk measure, the  
14 difference between each company's risk measure and the  
15 mean risk measure of all 626 companies was divided by  
16 one standard deviation). The distance between the  
17 standardized risk measures for each company and Sprint  
18 - Florida was calculated and compared to identify the  
19 shortest distances. The resulting comparable group  
20 consists of the twenty companies with risk measures  
21 clustering around, and thus, closest to, the risk  
22 measures of Sprint - Florida.

23  
24  
25

1 Q25. Why did you not limit the universe of market-traded  
2 firms to only firms that provide telecommunications  
3 services?

4 A25. Due to industry mergers and acquisitions, the number of  
5 market-traded telecommunications firms that primarily  
6 provide ILEC services is dwindling. Due to  
7 diversification, the remaining market-traded  
8 telecommunications firms are becoming less  
9 representative of the ILEC business and are unable to  
10 serve as pure play proxies for non-market-traded ILECs.  
11 It is no longer appropriate to assume that companies  
12 that are involved in providing telecommunications  
13 services are generally facing the same types of  
14 business risk as those faced by Sprint - Florida.

15  
16 Q26. How do Sprint - Florida's risk measures compare to the  
17 risk measures of the group of twenty companies?

18 A26. The comparable group of twenty companies is shown on  
19 Exhibit JDQ-7, along with the risk measures for each  
20 company. The common equity ratios are determined as of  
21 September 30, 1999. The other three risk measures are  
22 average risk measures for 1997 and 1998. It is  
23 important to quantify the revenues, earnings, and cash  
24 flow risk measures over a time period long enough so  
25 that possible aberrations are avoided, yet short enough

1 so that the measures can still be considered current.  
2 A two-year time period adequately balances these  
3 offsetting concerns.  
4

5 Since the required returns on common equity for the  
6 group will be averaged, the appropriate comparison is  
7 between Sprint - Florida and the group average, rather  
8 than Sprint - Florida and individual companies within  
9 the group. The Sprint - Florida common equity ratio of  
10 57.4% is higher than the group average of 54.5%. The  
11 Sprint - Florida cash flow-to-capital ratio of 39.1% is  
12 higher than the group average of 35.9%. The Sprint -  
13 Florida pre-tax fixed charge coverage ratio of 8.35  
14 times is lower than the group average of 8.64 times.  
15 The Sprint - Florida revenues-to-net plant ratio of  
16 78.5% is lower than the group average of 214.7%.

17  
18 After reviewing the differences between the Sprint -  
19 Florida and group average risk measures and the  
20 relative magnitude of the differences, I conclude that  
21 the group, on average, is comparable in risk to Sprint  
22 - Florida.  
23  
24  
25

1 **VI. DISCOUNTED CASH FLOW ANALYSIS**

2  
3 Q27. Please describe the discounted cash flow (DCF) approach  
4 used in determining the required return on common  
5 equity.

6 A27. The DCF approach is based on the fundamental financial  
7 concept of the time value of money and provides a  
8 conceptually correct and straightforward approach for  
9 determining investors' required return on common  
10 equity. The DCF approach captures investors' consensus  
11 required return on common equity, because the market  
12 consensus risk analysis is embodied in the market price  
13 of the stock. The DCF model directly establishes  
14 investors' required return on common equity and is both  
15 market-based and forward-looking.

16  
17 The DCF model implies that the value of an asset is the  
18 expected cash flow generated by the asset, discounted  
19 by the investors' required return. Specifically, the  
20 market value of common stock is equal to the present  
21 value of the expected stream of future dividends.  
22 Exhibit JDQ-8 demonstrates that the quarterly required  
23 return on common equity for companies that pay  
24 dividends quarterly is determined with Equation (5) and

1 the corresponding annual required return on common  
2 equity results from Equation (8).

3  
4 The DCF model shown on Exhibit JDQ-8 is sometimes  
5 referred to as the quarterly DCF model. The use of the  
6 quarterly DCF model does not indicate that dividends  
7 are expected to increase quarterly. Rather, the use of  
8 the quarterly DCF model reflects the reality that  
9 quarterly dividend payments are expected to increase  
10 annually at a rate equal to the average compounded  
11 quarterly growth rate.

12  
13 Q28. How did you determine the current dividend yield for  
14 the companies in the comparable group?

15 A28. The current stock price represents the assessment by  
16 investors, based on all available information, of the  
17 current market value of that stock. It is important to  
18 note that an observed change in the market price does  
19 not necessarily indicate a change in the required  
20 return on common equity, since the price change may  
21 simply reflect investors' reevaluation of the growth  
22 rate or the expected dividends. When using the DCF  
23 approach to estimate the required return on common  
24 equity, it is necessary to determine the current  
25 dividend yield and the expected growth rate

1 simultaneously. Therefore, utilizing an outdated  
2 average historical stock price along with current  
3 growth expectations, or "updating" a DCF analysis  
4 merely by combining an updated stock price with past  
5 growth expectations may produce a biased estimate of  
6 the required return on common equity. Similarly,  
7 utilizing an outdated historical average stock price  
8 along with outdated historical growth expectations will  
9 produce only an outdated historical estimate of the  
10 required return on common equity.

11  
12 For each company, I utilized the most recent quarterly  
13 dividend and the average closing stock market price  
14 during February 18 through March 3, 2000. This two-  
15 week time period is current enough to avoid the use of  
16 outdated historical stock prices and corresponds to the  
17 time period of growth rate determination. The  
18 resulting current quarterly dividend yields are  
19 presented on Exhibit JDQ-9.

20  
21 Q29. Is the growth rate that is expected by investors  
22 directly observable?

23 A29. No, it is not. The DCF methodology requires a growth  
24 rate that reflects the long run dividend growth rate  
25 expectation of investors. Although the current market

1 price reflects aggregate investor expectations, no  
2 method exists to directly measure market-consensus  
3 expected long run dividend growth rates. Therefore, it  
4 is necessary to develop an expected long run dividend  
5 growth rate estimate based on sound financial theory.  
6 There are a variety of approaches to estimate the  
7 expected growth rate and the use of each approach  
8 introduces a certain amount of subjectivity.  
9

10 Q30. What approach did you use to estimate the growth rates  
11 of the companies in the comparable group?

12 A30. I used the Institutional Brokers Estimate System  
13 (I/B/E/S) consensus analysts growth rate estimates.  
14 I/B/E/S is an investment research service of I/B/E/S  
15 Inc. I/B/E/S is a frequently cited, readily  
16 accessible, timely and objective source of analysts'  
17 forecast data. On a monthly basis, I/B/E/S summarizes  
18 the consensus earnings growth expectations of financial  
19 analysts employed by the research departments of  
20 investment brokerage firms. I/B/E/S growth rates are  
21 forward-looking, expectational-based estimates of  
22 earnings growth. The five-year mean I/B/E/S earnings  
23 per share growth rate estimates for the companies in  
24 the comparable group as of February 25, 2000 are shown  
25 on Exhibit JDQ-9. These growth rates are the most



1 recent estimates available at the time of my analysis.  
2 For the comparable group, there is an average of eleven  
3 analyst estimates compiled per company to develop the  
4 consensus growth rate.

5  
6 In order to understand the value of I/B/E/S earnings  
7 growth estimates as proxies for dividend growth, it is  
8 useful to examine the relationship between dividends  
9 and earnings. The expected growth in dividends is a  
10 function of the expected growth in earnings. In the  
11 short run, dividends may grow at a rate greater or less  
12 than earnings. This short run relationship is  
13 observable when a company maintains a relatively steady  
14 dividend policy even if earnings are quite volatile.  
15 However, dividends and earnings must grow at the same  
16 rate in the long run.

17  
18 A company that increases dividends at a higher rate  
19 than earnings in the long run would ultimately pay out  
20 more in dividends than it would earn. Long run  
21 dividend growth cannot be sustained without the support  
22 of underlying earnings growth. Since the DCF model is  
23 based on long run relationships, it is the long run,  
24 rather than the short run, relationship between  
25 earnings and dividends that is important.

1 Q31. What is the average required return on common equity  
2 for the comparable group based on your DCF analysis?

3 A31. As shown on Exhibit JDQ-9, the average required return  
4 on common equity estimate for the comparable group  
5 based on DCF analysis is 13.74%.

6

7 **VI. RISK PREMIUM ANALYSIS**

8

9 Q32. Please describe the risk premium approach used in  
10 determining the required return on common equity.

11 A32. The risk premium approach is based upon the  
12 relationship between the risk and return of  
13 market-traded securities. I used a form of the risk  
14 premium approach often referred to as the Capital Asset  
15 Pricing Model (CAPM). Two financial economists who  
16 provided the foundation for and developed the CAPM  
17 shared the 1990 Nobel Memorial Prize in Economic  
18 Science. The CAPM is based on the theory that the  
19 required return for a given security is equal to the  
20 risk-free return plus a risk premium.

21

22 The risk premium approach is consistent with the  
23 observation that investors are risk averse. That is,  
24 if an investor has the opportunity of purchasing one of  
25 two securities with equal expected returns, one would

1 expect the investor to purchase the security with the  
2 least risk. Conversely, if an investor had an  
3 opportunity to purchase one of two securities with  
4 equal risk, one would expect the investor to purchase  
5 the security with the highest expected return.

6

7 Financial theory provides the CAPM relationship as:

8 
$$R_j = R_f + B_j (R_m - R_f)$$

9 Where:

10  $R_j$  = the required return on stock j;

11  $R_f$  = the risk-free return;

12  $R_m$  = the required return on the market  
13 portfolio; and

14  $B_j$  = the measure of risk for stock j.

15 In order to implement this model, it is necessary to  
16 estimate the risk-free return, the market risk premium  
17  $(R_m - R_f)$ , and the appropriate company-specific risk  
18 measure, or beta. While the risk-free return is  
19 directly observable, the implementational challenge of  
20 this approach arises in the estimation of the market  
21 risk premium and the company-specific risk measure.

22

23

24

1 Q33. What did you use as the risk-free return?

2 A33. I used the 6.48% average interest rate implied by the  
3 prices of U.S. Treasury bond futures contracts for  
4 delivery during the period March 2000 through March  
5 2001 as traded on the Chicago Board of Trade as of  
6 February 18 through March 3, 2000. These interest  
7 rates are shown on Exhibit JDQ-10. In general, the  
8 interest rates implied by the prices on U.S. Treasury  
9 bond futures contracts represent forward-looking  
10 assessments by the market as to the risk-free return  
11 during near term future periods when Sprint - Florida's  
12 new interconnection rates will be in effect. The use  
13 of forward-looking interest rates implied by the prices  
14 on futures contracts is preferable to the use of  
15 current interest rates because both capital cost  
16 estimation and the application of the new  
17 interconnection rates are prospective in nature.

18

19 Q34. Why did you use U.S. Treasury bonds in measuring the  
20 risk-free return rather than U.S. Treasury bills?

21 A34. To begin with, U.S. Treasury securities are appropriate  
22 to use in estimating the risk-free return because of  
23 minimal default risk. Default risk pertains to the  
24 possibility of principal default. U.S. Treasury  
25 securities are considered to be virtually free of

1 default risk because of the U.S. Government's fiscal  
2 and monetary authority.

3  
4 In selecting the type of U.S. Treasury security to use,  
5 it is desirable to select a security with a duration,  
6 or maturity period at issuance, similar to common  
7 equity. U.S. Treasury bills have maturity periods at  
8 issuance ranging from three months to one year. U.S.  
9 Treasury bonds are generally used for long-term  
10 financing. U.S. Treasury bonds have maturity periods  
11 at issuance in excess of fifteen years, commonly twenty  
12 or thirty years. The U.S. Treasury bond yield that I  
13 used as the risk-free rate is based on a twenty-year  
14 maturity period. Since common equity has a long-term  
15 time horizon, or in other words, an infinite maturity  
16 period, U.S. Treasury bonds are closer than U.S.  
17 Treasury bills to matching the duration of common  
18 equity.

19  
20 Q35. What did you use as the market risk premium?

21 A35. I used the 7.78% risk premium for the Standard & Poor's  
22 (S&P) Composite Index over U.S. Treasury bonds based on  
23 data from the Roger G. Ibbotson series of risk premium  
24 studies. Specifically, I used the 2000 Stocks, Bonds,  
25 Bills and Inflation Classic Edition Yearbook (Chicago,

1 Illinois: Ibbotson Associates, Inc., 2000). This risk  
2 premium of common stock returns over U.S. Treasury bond  
3 returns is based on market results for 1926 through  
4 1999. Admittedly, different market risk premiums can  
5 be calculated by subjectively varying the time period  
6 over which the return comparison is made. The realized  
7 market risk premium can vary from year-to-year and  
8 decade-to-decade. I used the entire period for which  
9 data is available, thus avoiding the introduction of  
10 additional subjectivity and capturing a wide variety of  
11 economic circumstances. The 7.78% market risk premium  
12 and the 6.48% risk-free return imply a current required  
13 return on the market portfolio of 14.26%.

14  
15 A DCF analysis applied to all 403 dividend-paying  
16 stocks in the S&P Composite Index confirms the  
17 reasonableness of this estimate of the current required  
18 return on the market portfolio. I applied the DCF  
19 model shown on Exhibit JDQ-8 to the current quarterly  
20 dividends and stock prices as of February 18 through  
21 March 3, 2000 and the I/B/E/S growth rates as of  
22 February 25, 2000 for the 403 firms. The resulting DCF  
23 average for the S&P Composite Index is 15.41%.

1 Q36. Is the 7.78% market risk premium based on arithmetic  
2 mean returns or geometric mean returns?

3 A36. The 7.78% market risk premium is based on arithmetic  
4 mean returns. The arithmetic mean is a simple average  
5 while the geometric mean is a compounded average. In  
6 determining the required return on common equity, the  
7 risk premium based on arithmetic mean returns is the  
8 appropriate risk premium to use because the arithmetic  
9 mean, or simple average, returns provide a more direct  
10 indication of expected year-by-year returns. The  
11 geometric mean, or compounded average, returns provide  
12 a more direct indication of changes in investor wealth  
13 over more than one annual period, and thus should be  
14 achieved in the long run. However, the geometric mean  
15 returns will understate the expected year-by-year  
16 returns. The expected year-by-year returns must be  
17 earned in each year in order for an investor to earn  
18 the geometric mean return in the long run. If the  
19 geometric mean return is mistakenly used to estimate  
20 the required return on common equity, the required  
21 return on common equity estimate will be biased  
22 downward and the geometric mean return cannot be  
23 achieved in the long run.

24

25

1 Q37. What measure of risk did you use to determine the  
2 comparable group risk premium?

3 A37. The implementation of the CAPM approach requires an  
4 objective measure of risk. I used beta as the  
5 appropriate measure of risk. Beta is widely recognized  
6 by the financial community as an objective measure of  
7 risk in a portfolio context. A beta of 1.0 indicates a  
8 risk level equal to the market average risk level. A  
9 beta greater than 1.0 indicates a risk level greater  
10 than the market average risk level. Similarly, a beta  
11 less than 1.0 indicates a risk level lower than the  
12 market average risk level.

13  
14 Q38. What beta estimates did you use for the comparable  
15 group?

16 A38. I used Value Line beta estimates published in The Value  
17 Line Investment Survey Summary and Index of March 3,  
18 2000. The Value Line betas are computed with sixty  
19 months of weekly returns, and with the New York Stock  
20 Exchange Composite Index as the market index. Value  
21 Line's current estimated betas for the companies in the  
22 comparable group are shown on Exhibit JDQ-11. The  
23 average comparable group beta is 0.93.

24  
25



1 Q39. What is the average required return on common equity of  
2 the comparable group based on your risk premium  
3 analysis?

4 A39. As shown on Exhibit JDQ-10, the required return on  
5 common equity for the comparable group is 13.72% based  
6 on risk premium analysis.

7

8 **VIII. REQUIRED RETURN ON COMMON EQUITY**

9

10 Q40. What is the required return on common equity for Sprint  
11 - Florida based on the market-based analyses?

12 A40. A required return on common equity analysis requires  
13 both the application of financial models and the use of  
14 informed judgment. A return on common equity  
15 recommendation based solely on judgment would be  
16 inappropriate, as would be sole reliance on the  
17 mechanistic and arbitrary application of financial  
18 models. My comparable group DCF analysis indicates a  
19 required return on common equity of 13.74%, while my  
20 comparable group risk premium analysis indicates a  
21 required return on common equity of 13.72%.

22

23 In my judgment, the range of 13.72% to 13.74%  
24 represents my best estimate of an appropriate range for

1 the required return on common equity for Sprint -  
2 Florida.

3

4 Q41. Does the required return on common equity range of  
5 13.72% to 13.74% represent the cost of common equity  
6 range for Sprint - Florida?

7 A41. No, it does not. To determine the cost of common  
8 equity, it is necessary to add an increment for  
9 issuance costs to the required return on common equity.

10

11 **IX. ISSUANCE COST INCREMENT**

12

13 Q42. Why is an increment for issuance costs necessary?

14 A42. When a company raises common equity capital, it  
15 experiences costs of issuance including an underwriting  
16 fee as well as legal, accounting, printing, and other  
17 out-of-pocket costs. Although Sprint - Florida does  
18 not issue common stock directly to the public, Sprint -  
19 Florida's ultimate parent company, Sprint Corporation,  
20 does make public issuances of common stock. Exhibit  
21 JDQ-12 shows the Sprint Corporation common equity  
22 issues and associated costs for 1967 through the  
23 present. The average issuance cost as a percent of net  
24 proceeds is 4.9%. Because Sprint Corporation raises  
25 equity capital for the benefit of its subsidiary

1 entities, investors expect each subsidiary entity,  
2 including Sprint - Florida, to invest in projects that  
3 provide a return that covers the associated issuance  
4 costs.

5  
6 Without explicit recognition of issuance costs, neither  
7 existing nor potential investors would have an  
8 opportunity to recover all costs of common equity and  
9 Sprint - Florida might be unable to attract capital at  
10 a reasonable cost. Since a cost of capital increment  
11 is an ongoing requirement, the actual timing of  
12 issuances has no bearing on the need for a cost of  
13 capital increment and it is required even if there are  
14 no recent issuances or plans for future issuances.

15  
16 Q43. How did you quantify the rate of return increment for  
17 issuance costs?

18 A43. An issuance cost increment can be quantified within the  
19 framework of the DCF model. Issuance costs are  
20 deducted from the market price at the time of issuance  
21 to determine the net proceeds available. The current  
22 issuance cost increment can be quantified by applying  
23 the issuance cost ratio, 4.9% for Sprint Corporation as  
24 shown on Exhibit JDQ-12, to the current market price  
25 within the framework of the DCF model. In other words,

1 the stock price component should be reduced by 4.9% to  
2 determine the net proceeds per share under current  
3 market conditions. By holding all other DCF variables  
4 constant, the DCF result with this adjustment will be  
5 higher than the DCF result without adjustment. The  
6 difference between the two DCF results represents the  
7 appropriate issuance cost increment. For Sprint  
8 Corporation and its subsidiary entities, the  
9 appropriate issuance cost increment is currently five  
10 basis points. This increment is based on the 4.9%  
11 issuance cost ratio, the DCF model shown on Exhibit  
12 JDQ-8, the current Sprint FON Group quarterly dividend  
13 of \$0.125, the current Sprint FON Group stock price as  
14 of February 18 through March 3, 2000 of \$61.31, and the  
15 I/B/E/S growth rate as of February 25, 2000, of 12.37%.

16  
17 Q44. After incorporating the five basis point issuance cost  
18 increment, what is your estimate of the cost of common  
19 equity range for Sprint - Florida?

20 A44. My estimate of the cost of common equity range for  
21 Sprint - Florida is 13.77% to 13.79%, five basis points  
22 greater than the required return on common equity  
23 range. My best point estimate of the cost of common  
24 equity is the 13.78% midpoint of the range.

1 **X. RECOMMENDED COST OF CAPITAL**

2 Q45. In summary, what is your recommendation concerning the  
3 cost of capital for Sprint - Florida in this  
4 proceeding?

5 A45. I recommend primary reliance on the weighted market  
6 value cost of capital. The weighted average cost of  
7 capital for Sprint - Florida is 13.19% based on the  
8 market value capital structure shown on Exhibit JDQ-14.  
9 The weighted average cost of capital for Sprint -  
10 Florida is 11.51% based the book value capital  
11 structure shown on Exhibit JDQ-13. Therefore, I  
12 recommend the forward-looking cost of capital of 13.19%  
13 for use in developing the annual charge factor in this  
14 proceeding.

15

16 Q46. Does this conclude your testimony?

17 A46. Yes, it does.

1                   **BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION**2                                   **REBUTTAL TESTIMONY**3   **OF**4   **JOHN D. QUACKENBUSH**5  
6           **Q.    Please state your name.**7           **A.    My name is John D. Quackenbush.**8  
9           **Q.    Are you the same John D. Quackenbush who filed**  
10           **direct testimony in this proceeding on May 1,**  
11           **2000?**12  
13           **A.    Yes, I am.**14  
15           **Q.    What is the purpose of your rebuttal testimony?**16  
17           **A.    I am responding to the direct testimony of three**  
18           **witnesses that addressed the cost of capital**  
19           **issue. Specifically, I will discuss the testimony**  
20           **of witness John I. Hirshleifer of AT&T**  
21           **Communications of the Southern States and MCI**  
22           **WorldCom; and to a lesser extent, witnesses**  
23           **William J. Barta of the Florida Cable**

1 Telecommunications Association and Carol Bentley  
2 of Supra Telecommunications & Information Systems.

3

4 **Q. What are your primary observations about Mr.**  
5 **Hirshleifer's testimony?**

6

7 **A.** Mr. Hirshleifer's cost of capital recommendations  
8 should be given little weight by the Commission  
9 because: 1) his "comparable" companies are based  
10 on an arbitrary selection of holding companies  
11 rather than on ILEC risk considerations; 2) his  
12 recommended capital structures understate the  
13 appropriate equity ratio because they are in part  
14 based on book value capital structures; 3) his  
15 cost of debt calculation is outdated; 4) his  
16 idiosyncratic DCF model is subjective and not  
17 reflective of investor expectations for  
18 telecommunications firms; 5) his CAPM betas and  
19 market risk premium are understated; 6) his  
20 observation of investment banking references to  
21 cost of capital are misleading; and 7) he fails to  
22 acknowledge that issuance costs are a necessary  
23 and legitimate cost of obtaining equity.

24

1 Q. Because all aspects of Mr. Hirshleifer's analysis  
2 are impacted by his selection of "comparable"  
3 companies, please begin by commenting on his  
4 "comparable" company selection process.

5  
6 A. It is clear from page 6 of Mr. Hirshleifer's  
7 direct testimony that he expended minimal effort  
8 and did not rely on ILEC risk considerations to  
9 determine his "comparable" companies. Mr.  
10 Hirshleifer arbitrarily limited his selected  
11 companies to the four remaining Bell holding  
12 companies and several larger independent telephone  
13 holding companies. He later admits on page 32  
14 that the risks of these holding companies are not  
15 comparable to the risks that he is trying to  
16 isolate. Because Mr. Hirshleifer made no effort  
17 to identity comparability based on risk, his group  
18 of "comparable" companies will be comparable in  
19 risk only by accident.

20  
21 In contrast, I, as well as Dr. Billingsley,  
22 identified comparable firms with a rigorous  
23 cluster analysis approach based on accepted risk  
24 measures. Mr. Hirshleifer's flawed group of  
25 "comparable" companies underlies, and thus taints,



1 all aspects of his analysis, including his capital  
2 structure, cost of debt, DCF, and CAPM analyses.

3

4 **Q. Please comment on Mr. Hirshleifer's capital**  
5 **structure recommendation.**

6

7 A. Mr. Hirshleifer appropriately acknowledges that  
8 market value capital structures are appropriate to  
9 use in a cost of capital analysis. However, he  
10 recommends a hybrid capital structure with only  
11 50% weight placed on the market value capital  
12 structure ratios, with the other 50% weight placed  
13 on the book value capital structure ratios. I  
14 explained on pages 9 through 12 of my direct  
15 testimony the reasons that market value capital  
16 structures are appropriate for forward-looking  
17 cost studies for unbundled network elements. Mr.  
18 Hirshleifer indicates that he deviates from using  
19 market value capital structures in order to adjust  
20 for the difference in risk between his  
21 "comparable" holding companies and the network  
22 elements leasing business. To be clear, his  
23 intended adjustment should be viewed as having two  
24 components: 1) an adjustment between his  
25 "comparable" holding companies and ILECs; and then

1           2) an adjustment between ILECs and the network  
2           elements leasing business.       Any potential  
3           difference in risk between Mr. Hirshleifer's  
4           "comparable" companies and ILECs is a problem that  
5           Mr. Hirshleifer has created for himself by his  
6           flawed decision to focus his initial analysis on  
7           holding companies rather than firms that are  
8           comparable in risk to ILECs.   Moreover, it is  
9           unnecessary to adjust for risk between ILECs and  
10          the network elements leasing business.

11

12       **Q.   Why is it unnecessary to adjust for risk between**  
13       **ILECs and the network elements leasing business?**

14

15       **A.   Mr. Hirshleifer errs first by attempting to**  
16       differentiate unbundled network element risk from  
17       ILEC risk and secondly by postulating that  
18       unbundled network elements are low risk relative  
19       to local service.   In general, the practice of  
20       segmenting risk to determine different cost of  
21       capital rates has intuitive appeal when a company  
22       has multiple distinct projects or divisions that  
23       it can invest in, for example, a computer division  
24       and a grocery store division.   The company can use  
25       different cost of capital rates to decide to what

1 extent it wants to make additional investments in  
2 either business. However, the provision of  
3 unbundled network elements is not a separate and  
4 distinct line of business. The risk of providing  
5 unbundled network elements is inherent in being an  
6 ILEC. It makes little sense to attempt to  
7 bifurcate ILEC risks into piece parts that are  
8 operationally inseparable. An ILEC cannot decide  
9 to invest exclusively in or withdraw from  
10 providing unbundled network elements while still  
11 providing local, toll and access services.

12

13 Moreover, if unbundled network element risks were  
14 separable, Mr. Hirshleifer postulates the risk  
15 going in the wrong direction relative to overall  
16 ILEC risks. The provision of unbundled network  
17 elements would intuitively be among the most risky  
18 ILEC services. Investors recognize that a CLEC  
19 intends to re-sell ILEC services up to the point  
20 in time that the CLEC accumulates enough customers  
21 to justify installing its own facilities. From an  
22 investor standpoint, the ILEC is required to  
23 invest in plant to accommodate CLEC customers that  
24 will ultimately be switched over to CLEC  
25 facilities, thus stranding the ILEC investment.

1 This expected chain of events introduces  
2 additional risk to an ILEC and increases the  
3 probability of ILEC investors not receiving an  
4 adequate return on invested capital.

5

6 **Q. What is your conclusion concerning Mr.**  
7 **Hirshleifer's proposed hybrid capital structure?**

8

9 **A.** I recommend that the Commission adopt a market  
10 value capital structure rather than Mr.  
11 Hirshleifer's proposed hybrid capital structure.

12

13 **Q. Please describe your objections to the outdated**  
14 **cost of debt employed by Mr. Hirshleifer.**

15

16 **A.** Mr. Hirshleifer used September 30, 1999 yields to  
17 maturity on seasoned debt issues to determine the  
18 cost of debt information in his testimony that was  
19 filed on June 8, 2000. On page 37, he attempts to  
20 justify his choice of outdated data by stating  
21 that 30-year Treasury bond rates have fallen  
22 minimally (by 15 basis points) since September 30,  
23 1999. He fails to mention that Treasury rates for  
24 other maturities, and therefore the yields to

1 maturity on his selected group of seasoned debt  
2 issues, have generally increased during this time  
3 period. For example, one-year, five-year, and  
4 ten-year Treasury rates increased by 135, 62, and  
5 31 basis points, respectively, from September 30,  
6 1999 to June 23, 2000.

7  
8 More importantly, corporate debt spreads have  
9 significantly widened over the same time period.  
10 Exhibits JDQ-15 and JDQ-16 compare Mr.  
11 Hirshleifer's cost of debt calculations from  
12 Exhibits JH-3a and JH-3b to an update based on his  
13 methodology and his selected seasoned debt issues  
14 as of June 23, 2000. As shown on Exhibits JDQ-15  
15 and JDQ-16, Mr. Hirshleifer's own cost of debt  
16 methodology shows a 56 and 72 basis point increase  
17 for BellSouth and GTE, respectively, rather than  
18 the 15 basis point decrease that Mr. Hirshleifer  
19 communicated in his testimony.

20  
21 **Q. Please comment on Mr. Hirshleifer's DCF analysis.**

22  
23 **A. Mr. Hirshleifer creates a three-stage DCF model**  
24 **that does not reflect investor expectations,**  
25 **particularly for the telecommunications companies**

1 to which he chooses to apply it. Mr. Hirshleifer  
2 assumes that the growth rate will immediately  
3 decline after five years. The rigid five-year time  
4 period that Mr. Hirshleifer imposes on his model  
5 is unsupported and not reflective of investor  
6 expectations. The telecommunications industry is  
7 dynamic and replete with continuous technological  
8 innovation. Investors do not expect  
9 telecommunications growth to taper off after five  
10 years as Mr. Hirshleifer postulates. As a result,  
11 Mr. Hirshleifer's idiosyncratic three-stage model  
12 is of little use to the Commission in this  
13 proceeding.

14  
15 **Q. Please comment on Mr. Hirshleifer's CAPM analysis.**

16  
17 **A.** Mr. Hirshleifer understates his CAPM cost of  
18 equity estimate by understating both his beta and  
19 market risk premium estimates. Mr. Hirshleifer  
20 calculates his own betas in a way that is not  
21 reflective of investor expectations. Value Line  
22 betas more closely approximate the betas that  
23 investors would use in a CAPM analysis. Mr.  
24 Hirshleifer's own betas are raw historical betas  
25 that are strictly based on a mechanical

1 calculation. In contrast, Value Line betas  
2 undergo an adjustment procedure that makes them  
3 more forward-looking than raw historical betas.  
4 Value Line's forward-looking adjustment process  
5 regresses raw betas toward the mean market beta of  
6 1.0. The tendency of betas to regress toward the  
7 mean is documented in "Betas and Their Regression  
8 Tendencies" by Marshall Blume in The Journal of  
9 Finance, June 1975.

10  
11 Additionally, Mr. Hirshleifer understates the  
12 market risk premium by: 1) basing his estimate on  
13 the same flawed three-stage DCF model that he used  
14 in his DCF approach; 2) introducing low quality  
15 risk premium data prior to 1926 that was rejected  
16 for inclusion in the Ibbotson study; and 3)  
17 emphasizing the use of geometric mean returns  
18 rather than arithmetic mean returns. Geometric  
19 mean returns should not be used in capital cost  
20 estimation for the reasons that I detailed on page  
21 39 of my direct testimony and as warned against in  
22 the Ibbotson study itself.

23

24

1 Q. Please explain why Mr. Hirshleifer's observations  
2 of occasional investment banking references to  
3 cost of capital are misleading.

4  
5 A. To begin with, investment banking cost of capital  
6 estimates are almost always provided on an after-  
7 tax basis and are not directly comparable to the  
8 pre-tax cost of capital that is at issue in this  
9 proceeding. Secondly, investment banks devote few  
10 resources to calculating cost of capital  
11 estimates. Investment banks are in the business  
12 of recommending stocks based on relative  
13 valuations. Therefore, investment banks are more  
14 concerned with relative differences in risk across  
15 companies and industries rather than absolute cost  
16 of capital levels for a particular company or  
17 industry.

18  
19 Q. Finally, did Mr. Hirshleifer incorporate an  
20 issuance cost increment in his cost of capital  
21 estimate?

22  
23 A. No, he did not. Mr. Hirshleifer states that  
24 equity issuance costs should be considered only in  
25 a traditional regulatory rate hearing context and



1 not in this proceeding. I disagree because the  
2 cost of equity, whether or not for use in a  
3 traditional regulatory setting, consists of two  
4 components: the required return to equity  
5 investors and the costs associated with accessing  
6 equity investors. Issuance costs are a necessary  
7 and legitimate cost of obtaining equity financing.  
8 Mr. Hirshleifer further understates the cost of  
9 equity by pretending that only the required return  
10 component should be considered.

11

12 **Q. In summary, what is your conclusion concerning Mr.**  
13 **Hirshleifer's cost of capital analysis?**

14

15 **A. Mr. Hirshleifer's approaches significantly**  
16 **understate the cost of capital for the ILECs in**  
17 **this proceeding and offer little useful**  
18 **information to the Commission.**

19

20 **Q. Please comment on the cost of capital discussion**  
21 **offered by witnesses Barta and Bentley.**

22

23 **A. Witnesses William Barta and Carol Bentley, on**  
24 **behalf of the Florida Cable Telecommunications**  
25 **Association and Supra Telecommunications &**

1 Information Systems, both discussed cost of  
2 capital in their testimony. However, witnesses  
3 Barta and Bentley provided no useful cost of  
4 capital analysis. Witness Barta acknowledges that  
5 "the appropriate cost of capital should recognize  
6 current capital market conditions," but offers no  
7 analysis of current capital market conditions.  
8 Witness Bentley asserts a rate of return range  
9 based on a belief that ILEC investments are  
10 "essentially risk-free." However, she offers  
11 absolutely no supporting evidence.

12  
13 Additionally, witness Barta commented about  
14 "widely divergent capital structures" proposed by  
15 BST, GTE, and Sprint. Actually, the capital  
16 structures recommended by the three ILECs are  
17 quite similar. Apparently, witness Barta is not  
18 aware that BST witness Billingsley recommended an  
19 equity ratio of 90.17%, similar to my recommended  
20 equity ratio of 89.64%.

21

22 **Q. Does this conclude your rebuttal testimony?**

23 **A. Yes, it does.**

1 MS. KEATING: Next is Sprint's Witness Holmes.

2 CHAIRMAN DEASON: Witness Holmes' prefiled  
3 testimony shall be inserted into the record without  
4 objection.

5 MS. KEATING: And --

6 MR. FONS: He is not on your prehearing list for  
7 some reason.

8 CHAIRMAN DEASON: The exhibits?

9 MR. FONS: Holmes' exhibits aren't on your list  
10 for some reason.

11 MS. KEATING: I don't believe he was listed in  
12 the prehearing statement as having any exhibits.

13 CHAIRMAN DEASON: Does Witness Holmes have  
14 exhibits?

15 MR. FONS: No, not for the Phase 1.

16 CHAIRMAN DEASON: Okay.

17

18

19

20

21

22

23

24

25

1                   **BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION**  
2                   **DIRECT TESTIMONY**  
3                   **OF**  
4                   **JOHN A. HOLMES**

5  
6   **Q.    Please state your name and business address.**

7  
8   **A.    My name is John A. Holmes. My business address is 901**  
9           **East 104th Street, Kansas City, Missouri, 64131.**

10  
11 **Q.    Please describe your educational background and relevant**  
12 **work experience.**

13  
14 **A.    I received Bachelor of Science degrees in Education and**  
15 **Engineering Technology from Kansas State University in**  
16 **1977 and 1982, respectively. I have 15 years of**  
17 **Wireline Telecom Operations, Costing, Planning,**  
18 **Engineering, and Design experience in rural, urban, and**  
19 **suburban environments, plus two years of Wireless**  
20 **Telecom Engineering experience. I was employed by**  
21 **Sprint/United Telephone-Midwest in (1982), as a Test and**  
22 **Assignment Center (TAC) Specialist (1983-1984), TAC**  
23 **Supervisor (1984-1986), Network Maintenance Supervisor**  
24 **(1986-1987), Network Cost Administrator (1987-1989),**

1 Network Planning Engineer (1989-1990), and Network  
2 Planning Manager (1990-1995).

3

4 In late 1995, I accepted a position as Network Design  
5 Manager for Sprint PCS (Personal Communications  
6 Services) before accepting a promotion into my current  
7 position in January 1998.

8

9 In my current position, I am responsible for the  
10 development and analysis of cost studies for Universal  
11 Service Funding, Unbundled Network Elements, and other  
12 product offerings. I have been charged with developing  
13 and implementing cost study methods related to Total  
14 Service Long Run Incremental Cost ("TSLRIC") and Total  
15 Element Long Run Incremental Cost ("TELRIC")  
16 methodologies. In addition, I am responsible for filing  
17 written comments, serving on industry work groups, and  
18 participating in technical conferences related to  
19 TSLRIC/TELRIC costing methodology and the filing of  
20 studies within the 18 states that comprise Sprint's  
21 Local Telephone Division.

22

23 Q. On whose behalf are you testifying?

24

1 A. I am testifying on behalf of Sprint-Florida, Inc.  
2 (Sprint).

3

4 Q. What is the purpose of your testimony in this  
5 proceeding?

6

7 A. The purpose of my testimony is to support Sprint's  
8 recurring cost studies associated with all unbundled  
9 network elements in the following categories:

10 I. Circuit Switching

11 II. Signaling Networks and Call-related  
12 databases

13 III. Operator / Directory Assistance

14

15 Q. What specific issues are you addressing?

16

17 A. I will address the following Issues as numbered in the  
18 list established in the second revised order on  
19 procedure:

20 5. For which signaling networks and call related  
21 databases should rates be set?

22 7. What are the appropriate assumptions and  
23 inputs for the following items to be used in  
24 the forward-looking recurring UNE cost  
25 studies?

1

2

(o). switching networks and associated

3

variables

4

(p). traffic data

5

(q). signaling system costs

6

7

9 (a) What are the appropriate recurring rates and

8

non-recurring charges for each of the following UNES?

9

10

(13). circuit switching (where required);

11

(18). signaling networks and call-related

12

databases;

13

(19). Operator Services/Directory Assistance

14

(OS/DA)

15

For purposes of clarity, I will address each of the

16

issues in order of the four principal areas identified

17

earlier. Unless otherwise identified, all non-

18

recurring charges for the above will be addressed by

19

Sprint's witness, Steve McMahon.

20

21

Q. In addition to your testimony, which portions of

22

Sprint's cost study filings are you supporting?

23

1 A. Exhibit KWD-2 in the testimony of Sprint witness Kent  
2 Dickerson identifies the portions of Sprint's cost  
3 study filings that I support.  
4

5 I. Circuit Switching  
6

7 Q. What assumptions and inputs did Sprint use in its  
8 recurring cost studies for forward-looking switching  
9 network costs (issues 7(o) and 7(p))?  
10

11 A. Sprint used the FCC's original recommendations in the  
12 First Report and Order to develop recurring switching  
13 costs. The FCC Order states,

14  
15 We conclude that a combination of a flat-rated  
16 charge for line ports, which are dedicated to a  
17 single new entrant, and either a flat-rate or per-  
18 minute usage charge for the switching matrix and for  
19 trunk ports, which constitute shared facilities,  
20 best reflects the way costs for unbundled switching  
21 are incurred and is therefore reasonable.

22 (Paragraph 810).  
23

24 Consistent with the FCC's recommendation, Sprint has  
25 developed prices for local switching via three



1 separate components: usage sensitive switching, a  
2 flat-rated port, and flat-rated features.

3

4 A detailed description of the assumptions used by  
5 Sprint in developing switching costs can be found in  
6 Volume I of Sprint's filing. In general, the approach  
7 for switching cost development is to distinguish  
8 between the fixed and variable switch cost components  
9 on a switch-by-switch basis. The total variable  
10 component is divided by the switch minutes of use  
11 (MOU), and the fixed component by the lines in the  
12 switch.

13

14 **Q. Please describe the models used by Sprint for**  
15 **development of circuit switching costs.**

16

17 **A.** The costing methodology for circuit switching is  
18 developed using an Excel-based Switching Cost Model  
19 (SCM) described in Volume I of Sprint's filing. Total  
20 investment is derived from the Telcordia SCIS  
21 (Switching Cost Information System) model, and  
22 combined with actual usage information and company-  
23 specific vendor switch discounts to derive TELRIC  
24 investment results for each host office complex. The

1 SCIS model is a widely used and accepted standard  
2 industry model for determining switching investment.  
3 Since SCIS only considers vendor-specific hardware  
4 investments in each central office, one-time software  
5 and power investment required to provide basic  
6 switching functionality must also be determined  
7 separately and included with the SCIS results in the  
8 SCM investment inputs.

9

10 **Q. What calculations are performed in the Switching Cost**  
11 **Model?**

12

13 A. The SCM TELRIC methodology for local switching  
14 consists of six basic steps. The calculations for one  
15 particular switch, WNP/Altamonte Springs, Florida,  
16 can be found in Volume I, under the Circuit Switching  
17 tab. This process is repeated for each switch  
18 studied.

19

20 The first step is to determine the total forward-  
21 looking switching investment using the SCIS model.  
22 Individual Host switches in Florida were modeled,  
23 which are predominantly Nortel DMS-100 technology.  
24 Although a few earlier vintage processors may be  
25 currently in use, they represent obsolete technology

1 and do not represent forward-looking technology as  
2 required by TELRIC standards. The DMS-100/200 switch  
3 represents the predominant technology deployed by  
4 Sprint in Florida.

5  
6 This investment is segregated into six investment  
7 categories. These are,

- 8
- 9 1. Processor - the minimum investment required to  
10 provide switching, regardless of usage. It is  
11 composed primarily of the central processor and  
12 memory.
  - 13
  - 14 2. Fixed Line - the investment required to terminate  
15 the local loop in the central office. It is  
16 composed primarily of a line card, the main  
17 distribution frame, and protector.
  - 18
  - 19

1           3. Line Usage - the investment associated with usage  
2           sensitive line-side switching. It consists  
3           primarily of line concentration equipment,  
4           digital links, controllers, and a portion of the  
5           network modules.

6           4. Trunk Usage - the investment with usage sensitive  
7           trunk-side switching. It is composed primarily  
8           of digital trunk controllers, DS1 links, and a  
9           portion of the network modules.

10          5. Umbilical Usage - the usage sensitive investment  
11          in host-remote links.

12          6. SS7 Link - investment associated with the SSP  
13          (Service Signaling Point) located in the central  
14          office.

15  
16          This investment information is summarized in Volume I,  
17          tab Circuit Switching, on Page 2 of 23, titled "Common  
18          Switching Calculations." Switch specific demand data  
19          for MOU and call set-ups derived from traffic studies  
20          are included as shown on the "Common Switching  
21          Calculations" page.

22

1           The second step is to determine the number of  
2           processor milliseconds required to process each type  
3           of call. This information, shown in Volume I, tab  
4           Circuit Switching, on Page 3 of 23, is vendor  
5           proprietary.

6  
7           The third step is to derive monthly expense per  
8           investment category by multiplying the investment by  
9           the appropriate forward-looking annual charge factor.  
10          This is shown in Volume I, tab Circuit Switching, on  
11          Page 4 of 23.

12  
13          The fourth step is to calculate the cost per call set-  
14          up per call type. Determining the total processor  
15          cost per call type, and dividing by the appropriate  
16          MOU based on actual recent switch-specific demand does  
17          this. The resulting calculations, costs per Centum  
18          Call Second (CCS) for both the line and trunk side of  
19          the switch, are shown Volume I, tab Circuit  
20          Switching, on Page 5 of 23.

21  
22          The fifth step is to calculate the cost per MOU per  
23          call type. Determining the total CCS investment by  
24          call type, and dividing by the appropriate MOU does  
25          this. This calculation is shown on Volume I, tab

1 Circuit Switching, Page 6 of 23. The TELRIC results  
2 (excluding the common cost factor) for each central  
3 office in Florida are summarized in the "Switching  
4 Cost Summary" worksheet, found in Volume I. At this  
5 point common costs are not included.

6

7 **Q. How and why does SCM segregate costs?**

8

9 **A.** The SCM TELRIC switching results are segregated into  
10 two distinct cost zones:

11 1. Host offices

12 2. Remote offices outside of the host office's  
13 exchange.

14

15 Switching costs are provided on a per exchange basis.  
16 Each exchange reflects the cost characteristics of the  
17 switch providing service to that exchange. Host  
18 switches generally require less investment per line  
19 than remotes due to economies of scale. In addition,  
20 there are additional costs associated with remote  
21 switches, including processor, power, and umbilical  
22 investment. Thus, these two cost zones reflect the  
23 cost differences between exchanges served by a host  
24 and exchanges served solely by a remote. Remote  
25 switches within the host office's exchange are not

1 included since Sprint's loop cost model assumes use of  
2 Digital Loop Carrier Systems (DLCs) within each  
3 exchange. Thus, the lines normally served by (higher  
4 cost) in-exchange remote switches are added to the  
5 host switch and included with the total host  
6 investment for TELRIC cost development purposes.

7

8 **Q. How are Call Termination costs calculated?**

9

10 **A.** The Call Termination Prices worksheet, in Volume I,  
11 tab Circuit Switching, page 12 of 23, shows the  
12 calculations for the Winter Park exchange. Call  
13 Termination costs include the processor set-up cost  
14 plus CCS costs associated with the line, trunk, and  
15 host-remote umbilical investment. In this case, since  
16 Winter Park is not a remote switch, no umbilical costs  
17 are included. The TELRIC results for each central  
18 office are summarized in the Call Termination Summary  
19 worksheet. Sprint calculated a single weighted  
20 average per MOU cost of end office call termination  
21 for its entire service area as shown at the top of the  
22 worksheet. Common costs are included in this result.

23

24 **Q.** Previously, you mentioned that Sprint has developed  
25 usage sensitive, flat-rated port, and flat-rated

1           **feature costs for switching. Does Sprint support**  
2           **usage sensitive rates for local switching?**

3

4    A.    Sprint supports a usage charge per originating and  
5           terminating MOU. Previously, I have discussed how  
6           these costs are developed by exchange. The testimony  
7           of Sprint's witness, Mr. Jim Sichter, addresses  
8           deaveraging and pricing of all exchange-specific  
9           usage-sensitive switching costs as applicable.

10

11   Q.    **Please describe the costing methodology for switching**  
12           **ports.**

13

14   A.    The total line termination investment for each office  
15           is multiplied by the annual charge factor, divided by  
16           twelve, and divided by the number of lines per office.  
17           The calculations for the Altamonte Springs office can  
18           be found in Volume I, on the page titled "Cost per  
19           MOU". This process is repeated for each switch  
20           studied. BRI-ISDN port costs were also calculated  
21           using SCIS and use a similar set of calculations.

22

23   Q.    **Please describe the costing methodology for features.**

24



- 1 A. The TELRIC methodology is described in the "Centrex  
2 Features", "CLASS Features", "Custom Calling  
3 Features", and "ISDN Features" pages included in  
4 Volume I, tab Circuit Switching. In addition, the  
5 TELRIC methodology consists of five steps. First, the  
6 SCIS model is used to determine the cost of the most  
7 prevalent features. In total, nineteen Centrex  
8 features, nine CLASS features, eleven Custom Calling  
9 features, and eight BRI-ISDN features were studied.  
10 Actual usage and demand information for Florida was  
11 used in the SCIS model.  
12  
13 Second, since the SCIS model only considers hardware  
14 costs, software costs are added.  
15  
16 Third, the annual charge factor is applied to derive  
17 an annual cost.  
18  
19 Fourth, the annual cost is divided by twelve to derive  
20 a monthly cost.  
21  
22 Fifth, and finally, the common cost factor is applied.  
23  
24 Q. How does Sprint propose to price switching features  
25 purchased with an unbundled port?

1

2 A. Sprint has developed feature packages that may be  
3 purchased with a switching port. Individual feature  
4 packages may be selected to provision on individual  
5 access lines. This will prevent CLECs from being  
6 forced to purchase feature capability for their  
7 customers who do not desire features, while allowing  
8 Sprint to recover its feature-specific costs on a per  
9 port basis.

10

11 **Q. Should carriers be permitted to purchase unbundled**  
12 **features without purchasing the switching port?**

13

14 A. No. As supported by the FCC, feature capability is an  
15 integral part of the switch. Sprint's approach is to  
16 allow the CLEC to customize the switching ports it  
17 purchases from Sprint. The CLEC cannot purchase  
18 feature capability without first purchasing the  
19 switching port.

20

21 **Q. Has Sprint calculated a cost for a Private Branch**  
22 **Exchange (PBX) UNE?**

23

24 A. Yes. The TELRIC methodology used by Sprint and  
25 resulting cost study to obtain a cost per Digital PBX

1 trunk port are shown in Volume III. The same basic  
2 steps used to develop feature costs are used, with the  
3 exception that SCIS is used to both develop the DID  
4 port and multi-line hunt feature cost. The DID trunk  
5 allows calls to be terminated to a specific station.  
6 Multiline Hunt allows for dialtone for outgoing calls.  
7 These are added together with engineering labor and  
8 power allocations added to the basic hardware cost for  
9 each switch. The testimony of Sprint's witness, Mr.  
10 Jim Sichter, addresses deaveraging and pricing of the  
11 Digital PBX Trunk port.

12

13 **Q. Please describe the costing methodology for local**  
14 **tandem switching.**

15

16 **A.** The methodology is the same as for local switching.  
17 It is assumed that the cost of local tandem switching  
18 is equal to local trunk to trunk switching. An  
19 example for the Winter Park office is shown in the  
20 "Tandem Switching Prices" page included in Volume I,  
21 tab Circuit Switching.

22

23 **Q. How is local tandem switching rate developed and when**  
24 **does it apply?**

25

1 A. The SCM shows a single weighted average rate for  
2 Sprint's entire service area. However, for pricing  
3 purposes, specific offices that provide a local tandem  
4 switching function have been identified. These local  
5 tandem switches and resulting pricing are addressed in  
6 the testimony of Sprint's witness, Mr. Jim Sichtler.  
7 Tandem switching charges apply if local traffic goes  
8 through both a tandem switch and an end-office switch  
9 to reach a customer; both rates would apply (as well  
10 as common transport) and are simply added together.

11

12 **Q. Please describe the costing methodology for UNE-P**  
13 **lines.**

14

15 A. As described in Volume I of Sprint's filing, under the  
16 UNE-P tab, the elements of the UNE-P consist of a two-  
17 wire loop and switching. The cost benefits that  
18 result are related to using a GR-303 switch interface.  
19 The GR-303 interface is a digital interface that  
20 interfaces directly from the Integrated Digital Loop  
21 Carrier (IDLC) system to the switch at a digital DS1  
22 level. In contrast, in order to provide unbundled  
23 stand-alone switch ports, an analog interface is  
24 required at the switch for each line. The interface  
25 point between unbundled loops and ports is thus an

1 analog line card on the switch. This analog  
2 conversion must appear either at the switch or at the  
3 Remote Terminal (RT), since ordinary telephone sets  
4 require an analog electrical signal at the customer  
5 end of a basic access loop.

6  
7 When using GR-303 technology, the analog signal at the  
8 RT is converted into a DS1 digital format before it is  
9 delivered to the switching matrix of a digital circuit  
10 switch. This allows multiple lines to be combined  
11 onto a single efficient fiber optic transport system  
12 back to the central office, thus negating the need for  
13 an analog line card at the switch. At the office, the  
14 line signals, in a GR-303 DS1 format, can be delivered  
15 directly to GR-303 capable interface equipment at the  
16 switch in lieu of analog line ports. Each GR-303 DS1  
17 must be cabled using four wires from the IDLC Central  
18 Office Terminal (COT) DS1 interface to the digital  
19 switch DS1 interface. This "integrated" configuration  
20 is the most efficient method for terminating lines on  
21 a digital switch. It is also critical to note that  
22 all lines on a particular GR-303 DS1 must connect one  
23 switch and one RT. With this understanding, one can  
24 see that economies of scale can be achieved when one  
25 carrier is providing a combined loop and switch line

1 termination in a combined fashion such as the UNE-P  
2 configuration.

3  
4 Attachment JAH-1 shows both the UNE, or unbundled  
5 switch port, and the UNE-P, or integrated  
6 configuration using GR-303 technology. The top  
7 scenario shows the GR-303 direct switch integration.  
8 The GR-303 configuration consists the direct DS1  
9 termination to the switch. In the example shown,  
10 assuming a DMS-100 switch, the GR-303 circuit  
11 terminates to an Enhanced Subscriber Module  
12 AccessNode. In this scenario, the entire switch  
13 investment consists of traffic sensitive (TS)  
14 investment. For a single analog line, both non-  
15 traffic sensitive (NTS), or port investment; and  
16 traffic sensitive (TS), or line concentration module  
17 and line group controller investment, are required as  
18 shown.

19  
20 The first step is to recognize the efficiencies gained  
21 by elimination of the NTS, or line port investment.  
22 This results in a reduction in the cost per line as  
23 shown in the UNE-P study results contained in Volume  
24 I.

25

1           The second step is to recognize the slightly higher  
2           level of TS investment required for GR-303 technology.  
3           This was accomplished by completing a study of TS  
4           investment for both the analog and GR-303 scenarios as  
5           shown in the Volume I analysis under the "UNE-P Cost  
6           Study - Methods" tab. As shown in the analysis, a  
7           slightly higher level of TS investment is required  
8           using GR-303 technology. This is expressed by a per-  
9           line offset that is applied only to the traffic  
10          sensitive per-line switch investment. It is important  
11          to note that additional cost efficiencies are also  
12          achieved in the DLC equipment, or loop investment, as  
13          well. Elimination of the analog interface in the  
14          switch results in a similar reduction in the DLC  
15          Central Office Terminal (COT) investment as described  
16          in the testimony of Sprint's witness, Mr. Kent  
17          Dickerson.

18

19   **Q.   What is the UNE-P rate and when does it apply?**

20

21          The UNE-P rate is shown in the attachments to the  
22          direct testimony of Sprint's witness, Mr. Jim Sichtler.  
23          The rate consists of the per office UNE-P switch port  
24          and UNE-P loop cost. The study results contained in  
25          Volume I, tab UNE-P, include an average UNE-P switch

1 port rate. The complete UNE-P price includes both  
2 loop and port costs for each exchange. Application of  
3 these costs and pricing are addressed in the testimony  
4 of Sprint's witness, Mr. Jim Sichter. The UNE-P rate  
5 would apply whenever a combined switched line and port  
6 are concurrently purchased.

7

8 **Q. Does Sprint propose non-recurring rates for customized**  
9 **routing requests?**

10

11 **A.** No. Requests for customized routing are received from  
12 CLECs via a Bona-Fide Request (BFR). Since these  
13 requests are almost always specific to a particular  
14 office, group of offices, and routing configuration of  
15 interest to the requesting CLEC, specific specialized  
16 translations are required. Customized routing  
17 consists of either configuring an existing trunk group  
18 or setting up a new one to route traffic to the CLEC;  
19 or another provider of interoffice facilities,  
20 operator services, and/or directory assistance.  
21 Customized routing is generally technically feasible,  
22 but varies from switch to switch based on capacity  
23 constraints.

24



1 Q. Please describe the specific Non-recurring charges  
2 that apply to customized routing.

3

4 A. Five separate non-recurring charges have been  
5 identified. Only those charges applicable to a  
6 specific customized routing request would apply.

7 They are:

- 8 • Switch Analysis Charge
- 9 • Host Switch Translations
- 10 • Remote Switch Translations
- 11 • Host TOPS translations
- 12 • Remote TOPS translations

13 Detailed explanations of the labor activities  
14 associated with each charge can be found in the Volume  
15 III work papers. Time estimates and Florida-specific  
16 loaded labor rates have been used to derive the  
17 applicable charges shown in the cost study.

18

19 **II. SIGNALING NETWORKS AND CALL-RELATED DATABASES**

20

21 Q. For which signaling networks and call related  
22 databases should rates be set (Issue 5)?

23

24 A. Sprint proposes UNE rates for the following call-  
25 related database items:

- 1           •     911/E911
- 2           •     STP Ports and STP Switching (SS7 Interconnection)
- 3           •     Database Query Services

4

5   **Q.   Please describe the general TELRIC methodology used**  
6   **for each of these services.**

7

8   **A.   The following TELRIC methodology is used for all**  
9   **services except 911:**

- 10           1. Determine direct expense associated with the  
11           service.
- 12           2. Determine the direct investment associated with  
13           the service.
- 14           3. Multiply the investment by the annual charge  
15           factor to determine the annual return.
- 16           4. Add the annual return, direct expenses, and other  
17           direct operating expenses.
- 18           5. Add common cost.
- 19           6. Divide total economic cost by the appropriate  
20           number of units to determine the total economic  
21           cost per unit.

22

23   **Q.   What are the forward-looking economic costs of**  
24   **911/E911?**

25

1 A. Since this is a newly defined federal UNE, well-  
2 defined and consistent definitions of content,  
3 responsibilities, and accountabilities for the service  
4 do not exist. Until this can be achieved, a rigorous  
5 cost study cannot be completed.

6  
7 **Q. What prices for 911/E911 does Sprint propose in the**  
8 **absence of a cost study?**

9  
10 A. Sprint proposes a proxy for interim rates until  
11 consistent and clear definitions are available for  
12 911/E911 UNEs. A rate of \$0.04 per existing 911  
13 subscriber record, and \$0.06 to process updates to the  
14 Automatic Line Information (ALI) databases is  
15 proposed, consistent with the FCC's Third Report and  
16 Order in CC Docket No. 96-115, released September 9,  
17 1999. The FCC Order establishes presumptively  
18 reasonable rates for directory listings. Selective  
19 call routing and 911 database downloads and uploads  
20 share many of the same characteristics of directory  
21 listings furnished to external parties. Paragraph 104  
22 of the above mentioned order states "Having  
23 presumptively reasonable rates of \$0.04 and \$0.06 per  
24 listing should reduce the regulatory costs to carriers  
25 and publishers (CLECs in this instance). Carriers

1 will not have to provide detailed cost studies, except  
2 in compliant proceedings..." Accordingly, Sprint  
3 proposes to comply with the interim rates proposed by  
4 the FCC. Sprint reserves the right to revisit these  
5 rates when additional information and clarity  
6 concerning the appropriate TELRIC methodology for  
7 E911/911 pricing becomes available.

8  
9 **Q. Please define Signaling System Seven (SS7)**  
10 **interconnection.**

11  
12 **A.** SS7 interconnection consists of Signal Transfer Point  
13 (STP) ports, interconnecting facilities, and STP  
14 switching usage. The costs for these unbundled  
15 network elements are included in Volume I under the  
16 Signaling and Database tab in the SS7 Cost Model  
17 section. The common channel signaling interconnection  
18 service provides a signaling path for SS7 between a  
19 customer designated point of signaling premises and a  
20 Sprint STP. This two-way signaling path provides  
21 interconnection to the out-of-band signaling network  
22 in order to transmit and receive information related  
23 to call completion.

24

1 The STP port provides the customer access to the  
2 Sprint STP, which acts as a packet switch to route  
3 out-of-band signaling. It is in some respects similar  
4 to the concept of access to a local switch through a  
5 port. An STP port requires use of a link port card  
6 and processor costs.

7  
8 The STP transport link represents the facilities to  
9 connect from the carrier customer's designated  
10 premises to the Sprint STP. The link may be  
11 provisioned at a DS0 (56 Kbps) or as an optional DS1  
12 (1.544 Mbps), at the option of the requesting carrier.  
13 The interconnecting links are provisioned in mated  
14 pairs connecting to diversely located STPs consistent  
15 with industry technical standards for out of band  
16 signaling network diversity requirements.

17  
18 STP switching usage consists of the cost of routing  
19 ISDN User Part (ISUP) messages through an STP. The  
20 cost of SS7 switching is determined by the number of  
21 individual interoffice trunks using an STP port. The  
22 rate is applied on the basis of equivalent 56 Kbps  
23 trunks per month. The optional DS1 rate is simply 24  
24 times the 56 Kbps rate. STPs are deployed in mated  
25 pairs for network reliability, and interconnecting

1 carriers must provision links to each STP in a mated  
2 pair.

3

4 **Q. How are the forward-looking economic costs of**  
5 **Signaling System Seven (SS7) interconnection developed**  
6 **(Issue 7(q))?**

7

8 A. The TELRIC methodology and costing assumptions  
9 associated with STP Ports and Switching are detailed  
10 in Volume I, under the "Signaling Database" tab. Care  
11 has been taken to exclude port costs from the STP  
12 switching usage investment. Florida-specific annual  
13 charge factors, equipment fill factors, and demand are  
14 used in the calculations. The applicable transport  
15 link and multiplexing charges are calculated in the  
16 Transport and Multiplexing Cost Models. Costing  
17 methodology associated with Transport and Multiplexing  
18 are addressed in the testimony of Sprint's witness,  
19 Mr. Talmage Cox.

20

21 **Q. Please define the database query services Sprint**  
22 **proposes.**

23

24 A. Sprint LTD's intelligent network database services  
25 consist of the following:

- 1       •     Local Number Portability (LNP)
- 2       •     Line Information Database (LIDB)
- 3       •     Calling Name (CNAM)
- 4       •     Toll Free Code (TFC) 800/888/877

5

6   **Q.   How are the forward-looking economic costs of database**  
7       **query services developed?**

8

9   **A.**   Again, detailed descriptions and cost studies for  
10       these services can be found in Volume I under the  
11       Signaling and Database tab in the SS7 Cost Model  
12       section, and in the Sprint Cost Input Documentation  
13       section of Volume II.

14

15       In general, LIDB, CNAM, and TFC services are provided  
16       via a diverse pair of Service Control Points (SCPs)  
17       located in Johnson City and Bristol, Tennessee.  Since  
18       these three services use the same SCPs, a common per  
19       octet rate is developed based on the common  
20       investment.  Next, annual expenses incurred specific  
21       to the type of service are identified and a per octet  
22       expense cost calculated.

23

1 Finally, the per-octet costs of query transport and  
2 switching from the local STPs in Florida to the  
3 National STPs are added.

4  
5 The sum of these three elements is then multiplied by  
6 the average number of octets per query type to arrive  
7 at a total cost per query.

8  
9 The LNP database is housed in a separate pair of SCPs  
10 with Advanced Intelligent Network Capabilities  
11 required for this service. Accordingly, a unique per  
12 octet cost is developed for this service. The  
13 remaining calculations are similar to the other  
14 database query services. All services utilize the  
15 same national STP platform. Care has been exercised  
16 to ensure no duplication of investment occurs within  
17 the cost studies.

18  
19 **III. OPERATOR / DIRECTORY ASSISTANCE / CALL RELATED DATA**

20 **BASE SERVICES**

21

22 **Q. Please define the Operator/Directory Assistance**  
23 **services Sprint provides.**

24

25 **A. Sprint provides the following services:**



- 1           •     Directory Assistance (DA) Operator Service  
2           •     Toll and Local Assistance Service  
3           •     National Directory Assistance (NDA)

4  
5   **Q.   Please summarize the results of Sprint's cost studies**  
6           **for these services.**

7  
8   **A.   Sprint has developed service descriptions and TELRIC**  
9           **studies for these services as described in Volume I**  
10          **under the "OS/DA" tab.**

11  
12   **Q.   How were appropriate recurring rates for Operator**  
13          **Services / Directory Assistance (OS/DA) developed?**  
14          **(Issue 9(19))?**

15  
16   **A.   DA, Toll and Local Assistance, and NDA operator work**  
17          **expenses were determined using a combination of**  
18          **projected and average work volumes and associated**  
19          **labor costs for each service.**

20  
21          Database seizure costs were calculated for DA  
22          investment and listing costs.

23

1 Transport and Tandem Switching costs per minute were  
2 calculated and applied to each service based on the  
3 estimated seconds required to handle each call type.

4

5 NDA service costs also include access to the Listing  
6 Services Solutions, Inc. database located in Research  
7 Triangle Park, North Carolina. Transport costs to  
8 access this database were developed and included.

9

10 The appropriate switch hardware and software  
11 investment requirements to complete the call volumes  
12 for each operator call category were determined.  
13 Costs were recovered over the economic life of the  
14 associated equipment.

15

16 TELRIC costs were developed as follows:

- 17 1. Annual call volumes for each service were  
18 identified.
- 19 2. Direct Annual Charge Factors (ACFs) were applied  
20 to the Capital Investments and divided by the  
21 annual call volumes.
- 22 3. Expenses specific to each call type were  
23 identified and divided by annual call volumes.

1           4.    Each service specific expense/call and capital  
2                    cost/call was summed and the Other Direct Expense  
3                    ACF applied to the result

4           5.    The Common Cost Factor was applied to the above  
5                    to obtain per unit TELRIC rates by call type.

6

7    **Q.    Does this conclude your direct testimony?**

8

9    **A.    Yes, it does.**

10

1 MS. KEATING: Okay. Next is AT&T and MCI  
2 WorldCom's Witness Hirshleifer.

3 CHAIRMAN DEASON: Witness Hirshleifer's prefiled  
4 testimony shall be inserted without objection.

5 MS. KEATING: And Witness Hirshleifer has  
6 Exhibits JH-1 through JH-11.

7 CHAIRMAN DEASON: Those exhibits shall be  
8 identified as Composite Exhibit 48, and without objection  
9 shall be admitted.

10 (Exhibit Number 48 marked for identification and  
11 entered into the record.)

12

13

14

15

16

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18

19

20

21

22

23

24

25



1 of Transamerica Financial Resources, Inc. (TFR), the broker-dealer  
2 subsidiary of Transamerica Corporation. While at Transamerica I held the  
3 registered representative, securities principal and financial and operations  
4 principal licenses, and ultimately became TFR's treasurer and chief financial  
5 officer. From 1991 through 1999 I was Vice President and Director of  
6 Research of FinEcon, a firm which provided financial economic consulting  
7 services to corporations, law firms and government agencies. At FinEcon I  
8 was responsible for numerous engagements involving securities, valuation  
9 and cost of capital issues. In 1999, FinEcon merged with CRA. As a  
10 Principal with CRA, my duties are substantially similar to those I held at  
11 FinEcon. In the past several years, I have provided cost of capital testimony  
12 in numerous state proceedings regarding the provision of unbundled  
13 network elements ("UNEs") to competing local exchange carriers and the  
14 provision of universal service, and have testified in the FCC's current  
15 proceeding regarding the represetion of rates for the provision of  
16 interstate access services.<sup>1</sup> I also co-authored an article entitled "Estimating  
17 the Cost of Equity", which was published in the Autumn 1997 issue of  
18 *Contemporary Finance Digest*. My resume is attached as Exhibit JH-1.

## 20 II. PURPOSE

### 21 22 Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

23 A. I have been asked by AT&T and MCI WorldCom to estimate the forward-  
24 looking economic cost of capital that should be used in determining  
25 BellSouth's and GTE's forward-looking economic costs to provide UNEs.

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

3

4 **III. SUMMARY OF TESTIMONY/RECOMMENDATIONS**

5

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

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

11

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

14 The WACC formula is given by,

15 
$$\text{WACC} = w_d * k_d + w_e * k_e \quad (1)$$

16 where,

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

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

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

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

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

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

3 **A.** I estimate the cost of capital to be in the range of 8.12 to 8.96 percent for  
4 BellSouth's provision of UNEs. The midpoint average of this range is 8.54  
5 percent. The range for GTE's provision of UNEs is 8.24 to 9.09 percent  
6 with a midpoint average of 8.66 percent.

7

8 **Q. HOW IS THE REMAINDER OF YOUR TESTIMONY**  
9 **ORGANIZED?**

10 **A.** The remainder of my testimony is divided into six sections. Section IV  
11 discusses the fundamental relationship between risk and the cost of capital.  
12 Section V addresses the cost of debt that should be employed. Section VI  
13 discusses several approaches to estimating the cost of equity capital.  
14 Section VII addresses the question of determining the appropriate capital  
15 structure to use when calculating the WACC, and presents my estimates of  
16 the WACC. Section VIII discusses why the cost of capital I have calculated  
17 for BellSouth and GTE, based on the public data available for companies at  
18 the holding company level, is likely to overstate the relevant cost of capital  
19 for the leasing of UNEs. Finally, Section IX presents a summary of my  
20 conclusions.

21



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

2

3       **Q.   WHAT IS THE RELATION BETWEEN THE RISK OF AN**  
4       **INVESTMENT AND THE COST OF CAPITAL?**

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

10

11       **Q.   WHAT ARE THE FUNDAMENTAL DETERMINANTS OF**  
12       **INVESTMENT RISK?**

13       A.   There are two fundamental sources of risk: operating risk and financial risk.  
14       Operating risk arises from the actual operation of the business. It is affected  
15       by factors such as competition, technological change, customer acceptance  
16       of a company's products, variation in the costs of producing the company's  
17       products and the like.<sup>2</sup> Financial risk is determined by the amount of debt in  
18       a company's capital structure. Taking on more debt increases fixed  
19       financial charges, thereby increasing the risk that the firm will not be able to  
20       meet its financial obligations. The total risk investors face is determined by  
21       the combination of operating risk and financial risk.

22

23       **Q.   ARE OPERATING RISK AND FINANCIAL RISK RELATED?**

24       A.   Yes. In an effort to control the total risk that investors face, companies  
25       manage their capital structures in a manner that leads to a relation between

1 operating risk and financial risk. In particular, companies that face a great  
2 deal of operating risk, like high technology firms, limit the debt they issue  
3 to prevent total risk from becoming too large. On the other hand, firms that  
4 face little operating risk, like regulated utilities, can benefit by using a good  
5 deal of low-cost debt without raising total risk to an unacceptable level.

6

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

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

17

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

19 A. The comparable companies selected were derived from the list of telephone  
20 operating companies in Standard and Poor's Industry Survey. These  
21 companies are presented along with some descriptive information at Exhibit  
22 JH-2, and include the four regional Bell holding companies ("RBHCs"), and  
23 the larger independent telephone companies. Among the independents,  
24 Aliant Communications (formerly Lincoln Communications) was excluded  
25 because it has less than 500,000 access lines in service and is an order of

1 magnitude smaller than the RBHCs. Telephone and Data Systems was  
2 excluded because only 27% of its revenues derive from traditional telephone  
3 and network operations, while 64% of revenues come from its high-risk  
4 cellular operations. Frontier Corp. was excluded because 72% of its  
5 revenues are derived from unregulated long-distance and integrated service  
6 operations and only 27% from local service. Cincinnati Bell (now  
7 BroadWing Inc.) was excluded because it has ceased paying dividends (to  
8 focus on investing in higher-growth businesses) and because I/B/E/S did not  
9 have an analyst growth estimate.

## 11 V. THE COST OF DEBT CAPITAL

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

14 A. Because debt payments are fixed, the cost of debt can be computed directly  
15 and with a high degree of accuracy.<sup>3</sup> For this reason, I am able to utilize the  
16 costs of debt on the outstanding debt securities for BellSouth and GTE. It is  
17 not necessary to use a large sample of companies to estimate the cost of  
18 debt for the individual company because of the small measurement error.

### 20 Q. WHAT IS THE COST OF DEBT THAT YOU USE?

21 A. The best estimate of the cost of debt is the weighted average cost over all of  
22 the subject company's outstanding issues, including the debt of the holding  
23 company and any subsidiaries. Standard & Poor's Bond Guide ("Bond  
24 Guide") provides information on the face value and current yields to  
25 maturity on individual bonds.<sup>4</sup>

1           The data from the Bond Guide are presented in Exhibits JH-3a and  
2 JH3-b. For both of the companies' major debt issues the exhibits show the  
3 bond rating, the face value and the yield to maturity. The yield to maturity  
4 is a forward-looking cost of debt that measures the rate that the company  
5 would have to pay if the bonds were issued at the measurement date, and  
6 reflects investors' expectations regarding the future returns on these  
7 publicly-traded bonds.<sup>5</sup> The exhibits show that the weighted average cost of  
8 debt is 7.16 percent for BellSouth and 7.25 for GTE. Consequently, I use  
9 **7.16 percent** as the cost of debt of BellSouth and **7.25 percent** as the cost  
10 of debt of GTE in my WACC analysis.

11

12

## VI. THE COST OF EQUITY CAPITAL

13

14 **Q. WHAT MAKES THE COST OF EQUITY CAPITAL MORE**  
15 **DIFFICULT TO ESTIMATE THAN THE COST OF DEBT?**

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

23

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

1 A. I used two basic methods for estimating the cost of capital. The first is the  
2 discounted cash flow (“DCF”) method. Second, I use the capital asset  
3 pricing model, or “CAPM”. In various forms, the CAPM is the most widely  
4 employed theoretical model, other than DCF, for estimating the cost of  
5 capital. Methods based on the CAPM are sometimes referred to as “risk  
6 premium” methods because the model provides an estimate of the risk  
7 premium associated with investing in specific issues of common stock.

8  
9 **Q. PLEASE EXPLAIN THE BASIC DCF METHOD.**

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

$$14 \quad P = \text{Div}_1 / (1+k) + \text{Div}_2 / (1+k)^2 + \text{Div}_3 / (1+k)^3 + \dots, \quad (2)$$

15 where  $\text{Div}_1$  is the expected dividend in year 1,  $\text{Div}_2$  is the expected  
16 dividend in year 2, etc.

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

1 **Q. WHAT ARE THE SIMPLIFYING ASSUMPTIONS THAT ARE**  
 2 **EMPLOYED IN THE CONTEXT OF THE DIVIDEND GROWTH**  
 3 **MODEL?**

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

$$7 \quad P = \text{Div}_1 / (1+k) + \text{Div}_1 * (1+g) / (1+k)^2 + \text{Div}_1 * (1+g)^2 / (1+k)^3 +$$

8 ... ,

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

$$10 \quad k = \text{Div}_1 / P + g .$$

11

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

15 A. No. Once again a problem is raised by the fact that modern telephone  
 16 companies are composed of a variety of businesses, some of which— such  
 17 as wireless telephony and high-speed internet access— are expected to grow  
 18 at rates of 25 percent or more in the short run. Such high growth rates are  
 19 clearly not sustainable into perpetuity, so that the simple constant growth  
 20 model cannot be applied unless one modifies the growth rate or adopts some  
 21 mitigating assumption. Stewart Myers and Lynda Borucki state that:

22 [f]orecasted growth rates are obviously not constant  
 23 forever. Variable-growth DCF models, which distinguish  
 24 short- and long-term growth rates, should give more

1 accurate estimates of the cost of equity. Use of such  
2 models guards against naïve projection of short-run  
3 earnings changes into the indefinite future.<sup>6</sup>

4 In addition, Ibbotson Associates state that:

5 The reason it is difficult to estimate the perpetual growth  
6 rate of dividends, earnings, or cash flows is that these  
7 quantities do not in fact grow at stable rates forever.  
8 Typically it is easier to forecast a company-specific or  
9 project-specific growth rate over the short run than over the  
10 long run. To produce a better estimate of the equity cost of  
11 capital, one can use a two stage DCF model... For the  
12 resulting cost of capital estimate to be useful, the growth  
13 rate over the latter period should be sustainable indefinitely.  
14 An example of an indefinitely sustainable growth rate is the  
15 expected long-run growth rate of the economy.<sup>7</sup>

16 Sharpe,<sup>8</sup> Alexander and Bailey state that:

17 Over the last 30 years, dividend discount models (DDMs)  
18 have achieved broad acceptance among professional  
19 common stock investors...

20 Valuing common stock with a DDM technically requires an  
21 estimate of future dividends over an infinite time horizon.  
22 Given that accurately forecasting dividends three years  
23 from today, let alone 20 years in the future, is a difficult

1           proposition, how do investment firms actually go about  
2           implementing DDMs?

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

11          ...[M]ost three-stage DDMs make standard assumptions  
12          that all companies in the maturity stage have the same  
13          growth rates, payout ratios and return on equity.<sup>9</sup>

14          Damodaran states that:

15                 While the Gordon growth model is a simple and powerful  
16                 approach to valuing equity, its use is limited to firms that  
17                 are growing at a *stable growth rate*...

18                 The second issue relates to what growth rate is reasonable  
19                 as a *stable growth rate*. Again, the assumption in the model  
20                 that this growth rate will last forever establishes rigorous  
21                 constraints on *reasonableness*. A firm cannot in the long  
22                 term grow at a rate significantly greater than the growth  
23                 rate in the economy in which it operates. Thus, a firm that



1 grows at 12% forever in an economy growing at 6% will  
2 eventually become larger than the economy. In practical  
3 terms, the stable growth rate cannot be larger than the  
4 nominal (real) growth rate in the economy in which the  
5 firm operates, if the valuation is done in nominal (real)  
6 terms...

7 ...If a firm is likely to maintain a few years of above-stable  
8 growth rates, an approximate value for the firm can be  
9 obtained by adding a premium to the stable growth rate, to  
10 reflect the above-average growth in the initial years. Even  
11 in this case, the flexibility that the analyst has is limited.  
12 The sensitivity of the model to growth implies that the  
13 stable growth rate cannot be more than 1% or 2% above the  
14 growth rate in the economy. If the deviation becomes  
15 larger, the analyst will be better served by using a two-stage  
16 or a three-stage model to capture the supernormal or above-  
17 average growth and restricting the use of the Gordon  
18 growth model to when the firm becomes truly stable.<sup>10</sup>

19 Copeland, Koller and Murrin echo these observations, stating that “[f]ew  
20 companies can be expected to grow faster than the economy for long  
21 periods of time.”<sup>11</sup>

22

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

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

11

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

14 A. To estimate growth rates during the first five years I use the Value Line  
15 dividend forecasts for the year 2000, and individual company earnings  
16 forecast data from Institutional Brokers' Estimate System ("I/B/E/S") as of  
17 September 1999 for the subsequent four years. To compile the I/B/E/S data,  
18 more than 7,000 financial analysts representing over 800 research  
19 organizations provide I/B/E/S with research on 18,000 stocks in 56  
20 countries. In the U.S. alone, I/B/E/S receives estimates for 6000 companies  
21 from over 240 research firms.<sup>13</sup>

22 By relying on the I/B/E/S data, which is for earnings, I am implicitly  
23 assuming that dividends and earnings will grow at approximately the same  
24 rate over the five-year horizon. There are no growth forecasts beyond a  
25 five-year horizon. That is why an assumption must be made about how the

1 growth rate behaves after that. As stated above, I assume that it converges  
2 to the long-run aggregate growth rate of the U.S. economy over the  
3 succeeding 15 years.

4

5 **Q. WHAT IS A REASONABLE ESTIMATE FOR LONG-RUN**  
6 **GROWTH IN THE AGGREGATE ECONOMY?**

7 A. The long-term growth forecast was derived by averaging the long-term GNP  
8 growth forecasts obtained from the Wharton Econometric Forecasting  
9 Associates ("WEFA") Group and from Ibbotson Associates. The WEFA  
10 Group is an econometric forecasting organization, formed in 1987 through a  
11 merger of WEFA and Chase Econometrics. Ibbotson Associates is widely  
12 known in the fields of finance and valuation as one of the leading providers  
13 of securities returns data and publications. As of September 1999, WEFA  
14 predicted an average nominal GNP growth rate of 4.40% from 1999 through  
15 2025. As of September 1999, Ibbotson Associates forecast long-term  
16 inflation to be 2.60% annually. By adding this inflation forecast to the  
17 historical long-term real GNP growth rate of 3.28%, Ibbotson Associates  
18 predicted a nominal GNP growth rate of 5.88%. I take the average of the  
19 two forecasts, 5.14%, rather than choose a single GNP forecast.

20

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

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

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

4 A. Estimating future growth for a company always involves some uncertainty  
5 because no analyst can be expected to have perfect foresight. In some cases,  
6 the growth rate may be overestimated and in other cases it may be  
7 underestimated. On average, over a group of similar companies, these  
8 estimation errors tend to cancel out so that the average growth rate for the  
9 group is estimated more accurately than the growth rate for any individual  
10 company.<sup>14</sup> Consequently, I apply the DCF method to all the telephone  
11 companies in the previously selected sample.

12

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

14 A. Given the market price of a company's stock, the current dividend, and the  
15 forecast growth rates during each of the three stages, equation (2) can be  
16 solved iteratively for  $k$ . The iterative solution is the estimate of the cost of  
17 equity capital.<sup>15</sup>

18

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

21 A. Exhibit JH-4 presents the DCF estimates of the cost of equity capital  
22 derived from the three-stage model for the telephone company sample. The  
23 estimates range from a low of 7.86 percent to a high of 9.44 percent.<sup>16</sup>

24 The DCF cost of equity capital for BellSouth is estimated to be 8.62  
25 percent, based on a value-weighted average of the equity cost of capital for

1 all telephone holding companies (excluding BellSouth) and the cost of  
 2 capital for BellSouth itself. Using the same method for GTE yields a cost  
 3 of equity of 8.72%. The tables below show how these weighted average  
 4 costs of equity capital were computed:  
 5

**WEIGHTED AVERAGE DCF COST OF EQUITY FOR BELL SOUTH**

	<b>Weight</b>	<b>Rate</b>	<b>Weighted Cost</b>
Average (excluding BellSouth)	.75	8.87	6.65
BellSouth	.25	7.86	1.97
<b>Weighted Cost of Equity</b>			<b>8.62</b>

6

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

	<b>Weight</b>	<b>Rate</b>	<b>Weighted Cost</b>
Average (excluding GTE)	.75	8.66	6.49
GTE	.25	8.91	2.23
<b>Weighted Cost of Equity</b>			<b>8.72</b>

7

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

10 **A.** There is a trade-off between two considerations. First, because the DCF  
 11 approach, like any approach, estimates the cost of equity capital with error,  
 12 it is wise to use an average. This is because in the averaging process errors  
 13 tend to cancel with overestimates offsetting underestimates. However, the  
 14 DCF method does not have a mechanism to adjust for differences in risk  
 15 caused by differing capital structures employed by the firms in the sample.

1 For example, of all the individual companies in the sample, BellSouth  
2 provides the best estimate of BellSouth's own cost of capital. In light of  
3 these two considerations, I feel a weighted average which assigns a  $\frac{3}{4}$   
4 weight to the average excluding BellSouth and a  $\frac{1}{4}$  weight to BellSouth is  
5 the best estimate. Using this procedure, BellSouth is given a significantly  
6 larger weight than any of the other companies in the sample, but a smaller  
7 weight than the aggregate of all the comparables.

8

9 **Q. WHAT OTHER METHODS DID YOU USE TO ESTIMATE THE**  
10 **COST OF EQUITY?**

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

12

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

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

18

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

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

24 
$$\text{Company risk premium} = \text{Company "beta"} * \text{Market risk premium.}$$

25 (3)

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

3

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

5 A. The beta coefficient measures the systematic risk of investing in a  
6 company's equity. The CAPM is built upon the insight that investors will  
7 be rewarded for bearing only those risks, called systematic risks, that cannot  
8 be eliminated by diversification. To understand the difference between  
9 systematic and non-systematic risk, consider a hypothetical investment in  
10 Apple Computer. The risks associated with this investment can be seen as  
11 arising from two sources. First, there are risks that are unique to Apple.  
12 Will Apple design competitive products? Will computer users accept  
13 Apple's new operating system? Second, there are risks that affect all  
14 common stocks. Will the economy enter a recession? Will war break out in  
15 the Middle East?

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

22 On the other hand, market-wide risks cannot be eliminated by  
23 diversification. If the economy enters a recession and stock prices fall  
24 across the board, investors holding hundreds of securities fare no better than

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

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

6 This concept is particularly important for the determination of cost of  
7 capital because the risk that a company will lose customers to competition --  
8 such as a network leasing company losing business to competing facilities  
9 providers -- is a diversifiable risk which does not increase the risk premium  
10 according to capital market theory.<sup>17</sup>

11

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

13 A. Beta is typically calculated by a procedure called regression analysis. In  
14 regression analysis, the returns on the subject stock (the dependent  
15 variable), are regressed against the returns of a market portfolio of stocks  
16 (frequently the S&P 500) to estimate statistically the degree that the  
17 independent variable movements in the market portfolio have caused the  
18 returns of the subject company. Using this statistical tool, therefore, the  
19 sensitivity of a stock to movements in the market can be estimated. This  
20 sensitivity is what determines beta. In this case, I calculated the betas based  
21 on five years of monthly return data through September 30, 1999 for  
22 BellSouth, GTE and the comparable companies. Returns on the S&P 500  
23 were used as the market proxy. Because beta is measured with error, the  
24 average beta over all the comparables is a more accurate indicator of the  
25 true beta than any individual estimate of beta.



1           Betas can also be calculated over other time periods and using  
2 different observation intervals. For examples, for newer smaller companies  
3 one year of daily data are often used to measure beta. This is because the  
4 true underlying beta is likely to be changing for such companies and  
5 because five years of data are often not available. The drawback is that the  
6 shorter sample period and more frequent observation interval increase  
7 measurement error. In this case I concluded that the sample companies  
8 were sufficiently large, established and stable that it was more appropriate  
9 to use five years of monthly data, which is consistent with the methodology  
10 used by many institutional providers of betas, including Merrill Lynch, S&P  
11 Compustat and Wilshire Associates.<sup>18</sup>

12           While technological and legislative change has impacted the  
13 telecommunications industry, it is equally clear from publicly available  
14 information that such change has been anticipated and considered over time  
15 by industry participants, financial analysts and credit-rating agencies. The  
16 telephone holding companies trade very efficiently, so risks that are  
17 anticipated are impounded in the telephone holding companies' stock prices  
18 rapidly and fairly.<sup>19</sup>

19           Before averaging individual betas it is necessary to take account of  
20 the fact that the various comparable companies have differing amounts of  
21 debt in their capital structures. The amount of a company's debt leverage  
22 affects the riskiness of its stock returns and thereby its beta. To take  
23 account of this, a two-step procedure is used to estimate the average beta.  
24 First, the raw betas (i.e. betas computed by regressing each company's  
25 return against the return of the S&P 500) are estimated for each of the

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

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

6 where,

7  $B_u$  = the “unlevered” beta,

8  $B_L$  = the “levered” beta,

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

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

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

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

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

17

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

19 A. My raw (levered) estimates of beta are presented in Exhibit JH-5. They  
 20 vary from a high of 0.82 to a low of 0.35 on a levered basis. As I discussed  
 21 above, however, the betas must be unlevered first to adjust for the different  
 22 amount of debt leverage employed by the individual companies before  
 23 calculating an average. Exhibit JH-5 also shows the unlevered betas and  
 24 their average. The average unlevered beta for the entire sample is 0.59.<sup>20</sup>  
 25 The average unlevered beta is re-levered using the formula discussed above

1 to take BellSouth's September 30, 1999 capital structure into account,  
2 arriving at a beta of 0.66 for BellSouth. Re-levering using GTE's  
3 September 30, 1999 capital structure arrives at a beta of 0.69 for GTE.

4

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

7 A. Yes. In addition to the betas I calculated by regressing each company's  
8 return against the S&P 500, I obtained predicted betas from BARRA.  
9 BARRA (formerly Rosenberg Associates) is an internationally known  
10 financial consulting firm providing risk measurement services to investment  
11 managers, corporations, consultants, securities dealers and traders, and  
12 master custodians. The predicted betas are developed using sophisticated  
13 financial modeling techniques which account for factors which impact the  
14 future risk of a company. Unlike conventional regression betas, therefore,  
15 the BARRA betas do not rely solely on historical stock returns and  
16 explicitly consider forward-looking projections. Copeland, Koller and  
17 Murrin recommend the use of BARRA predicted betas.<sup>21</sup> The predicted  
18 BARRA beta before any unlevering and averaging adjustment is 0.69 for  
19 BellSouth and 0.68 for GTE as of September 30, 1999. These are close to  
20 the relevered betas of 0.66 for BellSouth and 0.69 for GTE that I have  
21 calculated. If I were to instead use the BARRA predicted betas for the  
22 telephone holding companies in my sample, the value-weighted unlevered  
23 beta would be 0.64, again, close to the 0.59 I have calculated using  
24 historical betas. Using these BARRA predicted betas would have the affect

1 of raising my recommended weighted average cost of capital for BellSouth  
2 to 8.67% and for GTE to 8.79%, increases of 13 basis points.

3

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

7 A. By definition, the beta of all common stock generally (in other words, the  
8 beta of the market) is 1.0. Therefore, it appears that the beta of telephone  
9 stocks used in the sample is less than that of common stocks generally. This  
10 means that investments in the sample telephone company stocks are less  
11 risky than investments in typical industrial companies. Consequently, the  
12 cost of capital for telephone companies should also be less than it is for the  
13 average industrial stock.

14

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

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

19

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

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

24

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

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

9  
10 **Q. HOW IS THE MARKET RISK PREMIUM ESTIMATED?**

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

16  
17 **Q. HOW CAN THE DCF MODEL BE USED TO ESTIMATE THE**  
18 **MARKET RISK PREMIUM?**

19 A. Two steps are required to estimate the market risk premium using the DCF  
20 model. The first step is to compute the DCF expected return (another word  
21 for the cost of equity) for the market as a whole. Subtracting the risk-free  
22 rate from the expected return gives the market risk premium.

23  
24 **Q. WHAT IS THE DCF ESTIMATE OF THE EXPECTED RETURN ON**  
25 **THE MARKET?**

1 A. The starting point for estimating the expected return on the market is the  
2 S&P 500 index. The sample is then limited to those S&P 500 companies  
3 that pay a dividend of at least 1.5% on the grounds that the DCF approach  
4 may be less accurate for companies that pay small dividends.<sup>22</sup> The  
5 exclusion of companies paying dividends under 1.5% is conservative,  
6 having the effect of increasing the estimated return on the market by about  
7 150 basis points. The sample includes large companies for which the data is  
8 considered to be reliable for purposes of DCF estimates. For the selected  
9 companies, the three-stage DCF model is applied in the same fashion as it  
10 was applied to the sample of telephone companies. Finally, the individual  
11 DCF estimates for the sample companies are averaged on a market-value  
12 basis. This average, which comes out to be 9.55%, is used as an estimate of  
13 the expected return on the market as a whole.

14  
15 **Q. GIVEN THE EXPECTED RETURN ON THE MARKET HOW DO**  
16 **YOU CALCULATE THE MARKET RISK PREMIUM?**

17 A. The market risk premium is computed by subtracting the risk-free rate from  
18 the expected return. In the case of the 20-year Treasury bond this is  
19 straightforward. The calculations are shown in Exhibit JH-6. The exhibit  
20 shows that as of September 1999, the 20-year bond yield was 6.47 percent.  
21 Subtracting 6.47 from 9.55 percent gives a market risk premium over long-  
22 term Treasury bonds of 3.08 percent.

23 In the case of one-month Treasury bills the situation is more  
24 complicated. Because the goal of the analysis is to estimate the long-run  
25 cost of capital, using a one-month interest rate can be misleading. A more

1 appropriate choice is the average return on one-month Treasury bills that is  
2 expected to obtain over the long-term. This can be calculated using the  
3 following two-step procedure. First, compute the long-run historical  
4 difference between the return on one-month Treasury bills and the return on  
5 20-year Treasury bonds. Second, subtract that historical difference from the  
6 current yield on 20-year bonds. The difference gives a forward-looking  
7 market estimate of the average expected yield on one-month Treasury bills  
8 over the next 20 years. Exhibit JH-7 shows that the average expected one-  
9 month Treasury bill rate over the long run is 4.90 percent as of September  
10 30, 1999. Subtracting this rate from the expected return on the market gives  
11 a market risk premium over Treasury bills of 4.65 percent as shown in  
12 Exhibit JH-6.

13

14 **Q. WHAT IS YOUR HISTORICAL ESTIMATE OF THE MARKET**  
15 **RISK PREMIUM?**

16 A. The historical risk premium is defined as the historical difference between  
17 the return on the stock market and the risk-free rate. The proper estimate of  
18 the market risk premium is a question that is disputed among both  
19 academics and practitioners with regard to two primary issues. First, when  
20 analyzing historical data, should an arithmetic or geometric average be used  
21 to calculate the historical average risk premium? Second, over what period  
22 should the average be computed to accurately capture the risk premium  
23 expected in the future? Specifically, should the entire sample period back to  
24 1802 be used, should the sample period be limited to post-1926 when more  
25 complete data became available, should only post-war data be employed

1           because the role of government in the economy has changed fundamentally  
2           since the great depression, or should even more recent data be used? With  
3           regard to the type of average, many academic authors favor the arithmetic  
4           over the geometric.<sup>23</sup> Others, however, recommend using the geometric  
5           average because arithmetic averages are biased by the measurement period,  
6           and because empirical studies of stock market returns show negative serial  
7           correlation of returns over time.<sup>24,25</sup> With regard to the sample period for  
8           computing the average risk premium, Ibbotson argues that a long data series  
9           is required so that the equity risk premium is not unduly influenced by very  
10          good or very poor short-term results. The 1998 Yearbook published by  
11          Ibbotson Associates suggests that the post-1926 data compiled therein  
12          provides a representative period of returns that can occur under diverse  
13          economic circumstances.<sup>26</sup> However, Ibbotson has cautioned that the long-  
14          run stock market returns calculated by his firm may not prove predictive.  
15          He believes that the U.S. is not as risky as it was in 1925, suggesting that  
16          lower returns will be experienced in the future.<sup>27</sup> Ibbotson also states that  
17          his historical averages overstate the forward-looking cost of equity because  
18          of survivorship bias.<sup>28</sup> For example, the U.S. stock market survived despite  
19          the Great Depression. As of 1925, however, there existed a risk that the  
20          stock market would be entirely wiped out—as happened in Germany, Japan,  
21          China and Russia. If these countries were included in an average, historical  
22          returns would be much lower.<sup>29</sup>

23                   Based on an analysis of data going back to 1802, Siegel presents  
24                   convincing evidence that the risk premium was abnormally high after the  
25                   U.S. went off the gold standard resulting from unanticipated inflation which



1 reduced the real returns on bonds. He notes that the current equity premium  
2 appears to be returning to the 2 - 3 percent range that existed before the  
3 second world war.<sup>30</sup> Blanchard also presents evidence that the risk premium  
4 has declined to 2 to 3 percent in recent years and argues that either the DCF  
5 approach should be employed in place of relying on an average or more  
6 recent data should be used.<sup>31</sup> Similarly, Rappaport opposes the use of long-  
7 term averages. He states that the relative risk of bonds has increased over  
8 the past two decades, thereby lowering risk premiums to a range from 3 to 5  
9 percent.<sup>32</sup> More recently, the Wall Street Journal noted that traditional  
10 measures of value are failing to explain current stock prices in part because,  
11 "the so-called risk premium has declined, as investors become more  
12 comfortable holding stocks."<sup>33</sup>

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

17

18 **Q. GIVEN THE INFORMATION IN EXHIBITS JH-6 AND JH-8, WHAT**  
19 **IS THE BEST MEASURE OF THE MARKET RISK PREMIUM?**

20 A. Taking account of all the information in Exhibits JH-6 and JH-8, I conclude  
21 that the reasonable estimates of the market risk premium are 7.5 percent  
22 over one-month Treasury bills and 5.5 percent over 20-year Treasury bonds.  
23 These estimates are conservative (i.e., on the high side) in the sense that they  
24 are above the average premiums observed in half of the periods, including  
25 the full sample, and are greater than those implied by the DCF analysis.

1           From a Wall Street perspective, Merrill Lynch estimated the market  
 2 risk premium over the 20-year Treasury yield to be 3.82% as of April-end  
 3 2000. This is 168 basis points lower than the 5.50% market risk premium  
 4 over long-term Treasuries which I used in my study. In addition, J.P.  
 5 Morgan used an equity risk premium of 5.00% over the long bond rate for  
 6 its CAPM calculation in its October 15, 1998 Telecommunications Review.

7  
 8 **Q. GIVEN YOUR ESTIMATES OF BETA AND THE MARKET RISK**  
 9 **PREMIUM WHAT IS THE APPROPRIATE ESTIMATE OF THE**  
 10 **COST OF EQUITY CAPITAL?**

11 A. To review, the CAPM says that,

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

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

15           BellSouth's cost of equity capital = 4.90% + 0.66 \* 7.5% = 9.85%;

16           GTE's cost of equity capital = 4.90% + 0.69 \* 7.5% = 10.08%;

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

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

22           BellSouth's cost of equity capital = 6.47% + 0.66 \* 5.5% = 10.10%;

23           GTE's cost of equity capital = 6.47% + 0.69 \* 5.5% = 10.27%;

1 In light of these results, I use the average of the two as the CAPM estimate  
2 of the cost of equity capital: **9.98 percent** for BellSouth and **10.17 percent**  
3 for GTE.

4

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

7 A. The CAPM-derived costs of equity are on average about 130 basis points  
8 higher than the DCF costs of equity. Given the difficulty of estimating the  
9 cost of equity capital, I take an average of the two methods (see Exhibit JH-  
10 9).

11

12 **Q. COMBINING THE TWO METHODS, WHAT IS THE COST OF**  
13 **EQUITY CAPITAL FOR BELLSOUTH AND GTE?**

14 A. The two estimates of the cost of equity capital produced a range for  
15 BellSouth of 8.62 to 9.98 percent and a range for GTE of 8.72 to 10.17. I  
16 feel the best overall estimate is approximately the average of the three-stage  
17 DCF and CAPM cost of equity estimates. The cost of equity capital that I  
18 use in the WACC calculations is therefore **9.30 percent** for BellSouth and  
19 **9.45 percent** for GTE.

20

21

## VII. CAPITAL STRUCTURE AND THE WACC

22

23 **Q. WHAT IS MEANT BY THE "CAPITAL STRUCTURE" OF A**  
24 **BUSINESS?**

1 A. Most American businesses are financed by a combination of equity  
2 (common stock) and debt (including bonds and bank loans). The capital  
3 structure refers to the fraction of debt and equity used to finance a business.  
4 In terms of the WACC formula presented at the outset, the capital structure  
5 is determined by the financing weights,  $w_e$  and  $w_d$ .

6  
7 **Q. IS THE CAPITAL STRUCTURE RELATED TO THE RISK OF A**  
8 **BUSINESS?**

9 A. Yes. As discussed earlier, companies that face greater operating risk tend to  
10 take on less debt.

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

14 A. The goal is to estimate the long-run target financing weights that a rational,  
15 informed management team would employ.<sup>34</sup> If there are companies  
16 participating in comparable business activities, the accepted solution is to  
17 use their observed capital structure as the starting point. In this case,  
18 however, the comparables are all riskier than the business activity in  
19 question (the provision of unbundled network elements) because of the  
20 necessity to use data that are only available at the holding company level.

21 Alan Shapiro states that:

22 "[i]n multiproduct firms, the requirement that  
23 projects be of homogeneous risk is more likely to be  
24 met for divisions than for the company as a whole.  
25 This suggests that the use of a divisional cost of

1 capital may be valid in some cases in which the use  
2 of a companywide cost of capital would be  
3 inappropriate. Conglomerate firms that compete in  
4 a variety of different product markets ... often  
5 estimate separate divisional costs of capital that  
6 reflect both the differential risks and the differential  
7 debt capacity of each division.

8  
9 The estimation of these divisional costs of capital is  
10 tricky. All the firm observes is its overall cost of  
11 capital, which is a weighted average of its divisional  
12 costs of capital."<sup>35</sup>

13 I performed my analysis using the holding company information because of  
14 the data limitation.

15

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

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

1           The average book value debt weight for the sample companies is 55  
2 percent as of September 30, 1999.<sup>36</sup> BellSouth's own debt weight is 54  
3 percent while GTE's is 66 percent. In terms of market value weight,  
4 however, the debt weight is lower. The average for the full sample is 16  
5 percent, while BellSouth's debt weight is 16 percent and GTE's is 22  
6 percent. However, market value debt weights of the holding companies  
7 probably understate long-run target debt weights in the capital structure of  
8 the network element leasing business as discussed in detail in Section VIII  
9 below. Consequently, in this case it is inappropriate to rely solely on current  
10 market value capital structure weights of the telephone holding companies  
11 when calculating the WACC for the network element leasing business.  
12 Therefore, I apply the WACC formula using both book and market weights  
13 to establish a range.

14

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

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

20

1 **Q. GIVEN YOUR PRECEDING TESTIMONY, WHAT IS THE LOWER**  
 2 **BOUNDARY OF THE APPROPRIATE RANGE FOR THE**  
 3 **WEIGHTED AVERAGE COST OF CAPITAL FOR BELLSOUTH**  
 4 **AND GTE?**

5 A. The table below computes the WACC from the estimates of the cost of debt,  
 6 the cost of equity and the capital structure developed in my preceding  
 7 testimony using book value capital structures.

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

	<u>Weight</u>	<u>Rate</u>	<u>Weighted cost</u>
9 Equity	0.45	9.30	4.18
10 Debt	0.55	7.16	3.94
11 <b>BellSouth's WACC</b>			<b>8.12</b>

12  
 13  
 14 **GTE's WACC Based On Average Book Capital Structure Weights**

	<u>Weight</u>	<u>Rate</u>	<u>Weighted cost</u>
15 Equity	0.45	9.45	4.25
16 Debt	0.55	7.25	3.99
17 <b>GTS's WACC</b>			<b>8.24</b>

18  
 19 **Q. WHAT IS THE UPPER BOUNDARY OF THE APPROPRIATE**  
 20 **RANGE FOR THE WEIGHTED AVERAGE COST OF CAPITAL**  
 21 **FOR EACH OF THE TELEPHONE COMPANIES FOR**  
 22 **BELLSOUTH AND GTE?**

23 A. As the network element leasing business is less risky than the overall risk of  
 24 a telephone holding company, estimating a cost of capital using a market

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

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

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

	<u>Weight</u>	<u>Rate</u>	<u>Weighted cost</u>
8 Equity	0.84	9.30	7.81
9 Debt	0.16	7.16	1.15
10			
11 <b>BellSouth's WACC</b>			<b>8.96</b>

12

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

	<u>Weight</u>	<u>Rate</u>	<u>Weighted cost</u>
14 Equity	0.84	9.45	7.93
15 Debt	0.16	7.25	1.16
16			
17 <b>GTE's WACC</b>			<b>9.09</b>

18

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

21 **A.** I believe a fair estimate is the midpoint of my range. Averaging 8.12 and  
 22 8.96, the midpoint comes to 8.54 percent for BellSouth's provision of  
 23 UNEs. For GTE, averaging 8.24 and 9.09, the midpoint comes to 8.66  
 24 percent. These numbers are presented in Exhibit JH-11.



1 **Q WHAT IS THE CAPITAL STRUCTURE IMPLIED BY THIS**  
2 **MIDPOINT COST OF CAPITAL ESTIMATE?**

3 A. The capital structure implied by the 8.54 percent cost of capital for  
4 BellSouth is **35.5% Debt** and **64.5% Equity**. The same capital structure is  
5 implied by GTE's WACC of 8.66 percent.

6

7 **Q YOUR WACC ESTIMATE IS CALCULATED USING DATA AS OF**  
8 **SEPTEMBER 30, 1999. TO WHAT EXTENT HAVE INTEREST**  
9 **RATES DECLINED SINCE THEN?**

10 A. 30-year Treasury bond rates have fallen from 6.06% as of September 30,  
11 1999 to 5.91% as of June 6, 2000, a drop of 15 basis points. Using this  
12 decline as a rough rule of thumb would imply current costs of capital of  
13 8.39% for BellSouth and 8.51% for GTE, before considering the question of  
14 whether the risk has increased or declined.

15

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

18 A. Yes. The cost of debt is estimated from the yields to maturity of each  
19 company's bonds obtained from the Bond Guide, which represent the  
20 forward looking returns that investors would expect to earn on these  
21 bonds.<sup>37</sup> The DCF model used for estimating the cost of equity employs  
22 forward-looking growth projections made by analysts and forecasting  
23 organizations. The CAPM model as I have employed it here uses current  
24 U.S. Treasury bond rates as of the measurement date, which impound  
25 forward-looking expectations, as one of its two return components. The

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

7  
8 **VIII. POTENTIAL UPWARD BIAS IN THE ESTIMATED COST OF CAPITAL**

9  
10 **Q. IS THERE ANY REASON TO BELIEVE THAT THE COST OF**  
11 **CAPITAL RANGE YOU HAVE CALCULATED IS ON THE HIGH**  
12 **SIDE?**

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

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

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

1           BellSouth's risky business undertakings include domestic cellular and  
2           personal communications service, e-commerce web design and hosting,  
3           advertising and publishing. In addition, BellSouth has invested in wireless  
4           telephone systems in Argentina, Brazil, Chile, Denmark, Ecuador,  
5           Germany, Guatemala, India, Israel, Nicaragua, Panama, Peru, Uruguay and  
6           Venezuela. BellSouth is also an equity investor in wireless data  
7           communications networks in the United States, the United Kingdom, the  
8           Netherlands, Belgium and Singapore.

9           GTE's risky businesses include retailing, cellular, long distance,  
10          airphone, managed network security, virtual private networks, Web-server  
11          and application hosting, information processing, network, leasing, cable and  
12          international services. GTE has wireless subsidiaries in Argentina, Canada,  
13          and the Dominican Republic and affiliates in Canada, Puerto Rico,  
14          Venezuela and Taiwan.

15  
16   **Q.   HAVE ANY TELEPHONE HOLDING COMPANIES MADE**  
17   **COMMENTS TO THE PUBLIC REGARDING BENEFITS TO BE**  
18   **DERIVED FROM THE PROVISION OF NETWORK ELEMENTS**  
19   **TO COMPETITIVE LOCAL EXCHANGE COMPANIES?**

20   **A.   Yes. Bell Atlantic states in its mid-year 1999 Investor's Reference Guide**  
21   **that the business of providing network elements "provides a unique**  
22   **opportunity to add new revenues onto our platform without significant**  
23   **incremental capital investment . . ." Bell Atlantic also notes that "our**  
24   **networks must be able to handle increased traffic volumes from competitors**  
25   **utilizing our infrastructure as we move into a wholesale environment."<sup>38</sup>**

1 **Q. WHAT RISKS ARE ASSOCIATED WITH THE BUSINESS OF**  
2 **“LEASING” OF UNBUNDLED NETWORK ELEMENTS?**

3 A. There is still the risk of regulation itself. The rate of return a network is  
4 allowed to earn depends on the outcome of proceedings such as this and  
5 remains somewhat uncertain. That risk can be substantially reduced if this  
6 Commission adopts compensatory forward-looking pricing rules that tell  
7 investors that telephone holding companies will have the opportunity to  
8 recover all efficiently-incurred costs on a forward-looking basis. In  
9 addition, there remains some risk that consumers, particularly business  
10 users, will bypass the network as other alternatives become available.<sup>39</sup>  
11 These risks, however, are substantially less than the risks faced by telephone  
12 holding companies' other businesses, some of which are (or may soon be)  
13 subject to competition.

14  
15 **Q. IS THERE A SIMPLE WAY TO DISTINGUISH THE BUSINESS OF**  
16 **LEASING THE NETWORK FROM PROVIDING LOCAL**  
17 **SERVICE?**

18 A. Yes. Think of integrated telephone holding companies, for example  
19 BellSouth, as being composed of separate business units. One business unit  
20 owns the network and leases network elements to all local service providers,  
21 including both competitors and the telephone companies' other business  
22 units that are involved in the provision of local service. Whereas those  
23 BellSouth units involved in providing local service are in businesses that (if  
24 prices are set appropriately in these proceedings) will be faced with new  
25 competitors, the unit involved in leasing the network which all the

1 competitors need to use has virtual monopoly power and faces much less  
2 risk. The sample of companies used in my analysis for which the cost of  
3 debt and equity are estimated is composed of diversified telephone  
4 companies. As stressed earlier, these companies operate a variety of  
5 businesses, virtually all of which face a great deal more operating risk than  
6 leasing a local exchange network. This has been clearly recognized by  
7 financial analysts and the bond rating agencies.<sup>40</sup> The company to which  
8 the WACC should be applied, however, is one which is involved  
9 exclusively in leasing network facilities. Under these circumstances, using  
10 a higher debt weight than the current market value weights for the sample  
11 companies is one way to take account of this problem. The higher debt  
12 weight may be more representative of the target capital structure for the  
13 low-risk network element leasing business.

14

15 **Q. HAVE YOU SEEN ANY INFORMATION TO THE PUBLIC WHICH**  
16 **CONFIRMS THE REASONABLENESS OF YOUR COST OF**  
17 **CAPITAL RANGE?**

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

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

7  
8 **Q. ARE THERE MORE RECENT PUBLICLY-AVAILABLE COST OF**  
9 **CAPITAL ESTIMATES WHICH CONFIRM THE**  
10 **REASONABLENESS OF YOUR COST OF CAPITAL RANGE?**

11 A. Yes. In the GTE/Bell Atlantic merger proxy statement dated April 13,  
12 1999, Salomon Smith Barney performed a five-year DCF analysis of Bell  
13 Atlantic as part of its fairness opinion and assumed discount rates ranging  
14 from 9.0% to 11.0%. It is important to note that these rates are for the  
15 entire Bell Atlantic holding company and include businesses that are far  
16 riskier than leasing unbundled network elements. This is demonstrated by  
17 the Ameritech/SBC merger proxy statement dated October 15, 1998, in  
18 which Salomon Smith Barney performed a DCF valuation analysis of the  
19 two companies as part of its fairness opinion. The opinion broke down each  
20 company into its component business segments and applied a separate  
21 discount rate to each segment. For the telco business segments, excluding  
22 long distance, Salomon Smith Barney used a discount rate reflecting a  
23 WACC of 8.75% to 9.75%. Salomon Smith Barney uses higher ranges of  
24 10.50% to 11.50% for long distance business segments, 10.00% to 11.00%  
25 for cellular business segments, and 12.50% to 13.50% for PCS business

1 segments. This is consistent with my testimony that local telephone  
2 company operations are less risky than other telecommunications segments  
3 and that telephone holding companies are engaged in many of these riskier  
4 business activities. Goldman Sachs also performed a DCF analysis for its  
5 fairness opinion for the Ameritech/SBC merger. Goldman Sachs indicated  
6 that it used various discount rates ranging from 8.5% to 11.5%. Although  
7 the firm did not provide a detailed breakdown of how it applied the rates, it  
8 is reasonable to assume that it was also attempting to gauge the effect of the  
9 rates by business segment.

10 In an earlier fairness opinion for the SBC/Southern New England  
11 Telephone merger proxy statement dated February 9, 1998, Salomon Smith  
12 Barney again performed such a business segment breakdown in its DCF  
13 analysis. In valuing the telco business, Salomon Smith Barney applied a  
14 WACC of 9.0% to 10.0%. Salomon Smith Barney applied higher ranges  
15 of 11.0% to 12.0% to the long-distance and cellular business.

16 In its Industry Analysis report on Telecommunication Services dated  
17 August 28, 1998, JP Morgan estimated the WACC for the U.S. telecom  
18 sector for 1998 at 7.8%. This report also shows that JP Morgan estimated  
19 that the WACC for the telecom sector for the period 1995-2002 would stay  
20 within the range of 7.6 to 7.8%.

21  
22 **Q. IN ITS 1990 REPRESRIPTION ORDER, THE FCC SET THE**  
23 **RATE OF RETURN FOR INTERSTATE SERVICES OF LOCAL**  
24 **EXCHANGE CARRIERS AT 11.25%. WHAT DO INTEREST RATE**

1           **MOVEMENTS SINCE THEN SUGGEST ABOUT THE**  
2           **APPROPRIATE CURRENT RATE?**

3    A.   30-year Treasury bond rates have fallen from 9.03% as of September 1990  
4           to 6.17% as of May 23, 2000. This is a decline of 286 basis points since the  
5           11.25% rate was prescribed. Using this decline as a rough rule of thumb  
6           would imply a current cost of capital of 8.39%, before considering the  
7           question of whether the risk has increased or declined. This number is less  
8           than my WACC estimates of 8.54% for BellSouth and 8.66% for GTE and  
9           is further evidence that my estimate is reasonable.

10  
11   **Q.   SHOULD THE COST OF CAPITAL ESTIMATE ACCOUNT FOR**  
12           **QUARTERLY COMPOUNDING?**

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



1 companies will be able to reinvest proceeds on a monthly basis. The net  
2 effect would result in a lower allowed rate than the annual DCF cost of  
3 equity proposed by me. Consequently, the use of a DCF cost of equity  
4 determined using the annual formula is conservatively high.

5

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

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

19

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

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

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

13

14

#### IX. REEXAMINING THE COST OF CAPITAL

15

16 **Q. IS THERE ANY BASIS FOR INCREASING THE 9.9% COST OF**  
17 **CAPITAL SET BY THE COMMISSION IN THE MOST RECENT**  
18 **UNE COST PROCEEDING AS SUGGESTED BY BELL SOUTH AND**  
19 **GTE?**

20 **A.** No. There have been no new significant developments in the market for the  
21 provision of UNEs that would suggest that the cost of capital has increased.  
22 In fact, in the most recent universal service proceeding, the Commission  
23 itself ruled that the cost of capital for BellSouth and GTE was only 9.5%.

24

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**X. CONCLUDING SUMMARY**

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**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's provision of UNEs is in a range between 8.12 and 8.96 percent with a best point estimate of 8.54 percent. Alternately, if BARRA predicted betas are used, I estimate a range of 8.21 to 9.12 percent with a best point estimate of 8.67 percent. I have estimated that the weighted average cost of capital for GTE's provision of UNEs is in a range between 8.24 and 9.09 percent with a best point estimate of 8.66 percent. Using BARRA predicted betas, I estimate a range of 8.32 to 9.26 percent with a best point estimate of 8.79 percent. I have also stressed, however, that the higher side of the range represents upward-biased estimates of the cost of capital because they incorporate the risks of multi-business telephone holding companies. In this proceeding, BA-NY's business at issue is not a diversified telephone holding company, but a company in the more specialized (and less risky) business of providing UNEs. Finally, I observed public information made available by independent parties unrelated to this proceeding that confirm the reasonableness of my cost of capital estimate.

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

A. Yes.

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

<sup>2</sup> 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.

<sup>3</sup> *Stocks, Bonds, Bills and Inflation, 1998 Yearbook*, Ibbotson Associates, Chicago, Illinois, pg. 150.

<sup>4</sup> 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.

<sup>5</sup> 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.

<sup>6</sup> 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.

<sup>7</sup> *Stock, Bonds, Bills and Inflation, 1998 Yearbook*, Ibbotson Associates, Chicago, pp. 161-162.

<sup>8</sup> Dr. Sharpe is a Nobel-prize winning financial economist.

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

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

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

<sup>12</sup> 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.

<sup>13</sup> I/B/E/S website, [www.ibes.com](http://www.ibes.com).

<sup>14</sup> 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*, (3<sup>rd</sup> 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)

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

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

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

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

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

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

<sup>20</sup> 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.

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

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

<sup>23</sup> Bodie, Zvi, Alex Kane, and Alan J. Marcus, *Investments*, Irwin, 1993, pp. 800-801.

<sup>24</sup> 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.

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

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<sup>26</sup> *Stocks, Bonds, Bills and Inflation, 1998 Yearbook*, Ibbotson Associates, Chicago, Illinois, pp. 156-157.

<sup>27</sup> 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.

<sup>28</sup> *Ibid.*

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

<sup>30</sup> 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.

<sup>31</sup> Blanchard, Oliver, "Movements in the Equity Premium", *Brookings Papers on Economic Activity*, 75 (2) 1993.

<sup>32</sup> Rappaport, Alfred, *Creating Shareholder Value*, The Free Press, New York, 1998.

<sup>33</sup> Clements, Jonathan, "Value Judgment: Getting a Handle on Stocks' Worth," *Wall Street Journal*, January 11, 2000.

<sup>34</sup> Ross, Stephen A., Randolph W. Westerfield and Jeffrey Jaffe, *Corporate Finance*, Fourth Edition, Irwin, Chicago, 1996, pg. 441.

<sup>35</sup> Shapiro, Alan C., *Modern Corporate Finance*, Macmillan Publishing Company, 1990, pgs. 291-292.

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

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<sup>37</sup> 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.

<sup>38</sup> Bell Atlantic Investment Reference Guide, Mid-Year 1999, p. 22 (underlining added).

<sup>39</sup> 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.

<sup>40</sup> 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."

(Transcript continues in sequence in Volume 5.)



1 STATE OF FLORIDA)

2 : CERTIFICATE OF REPORTER

3 COUNTY OF LEON )

4 I, JANE FAUROT, RPR, Chief, FPSC Bureau of Reporting  
5 Official Commission Reporter, do hereby certify that the  
6 Hearing in Docket No. 990649-TP was heard by the Florida  
7 Public Service Commission at the time and place herein  
8 stated.

9 It is further certified that I stenographically  
10 reported the said proceedings; that the same has been  
11 transcribed under my direct supervision; and that this  
12 transcript, consisting of 149 pages, Volume 4 constitutes  
13 a true transcription of my notes of said proceedings and  
14 the insertion of the prescribed prefiled testimony of the  
15 witness(s).

16 I FURTHER CERTIFY that I am not a relative, employee,  
17 attorney or counsel of any of the parties, nor am I a  
18 relative or employee of any of the parties' attorneys or  
19 counsel connected with the action, nor am I financially  
20 interested in the action.

21 DATED THIS 25TH DAY OF JULY, 2000.

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23 \_\_\_\_\_  
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