

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In Re: Investigation into Pricing
Unbundled Network Elements

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Docket 990649B-TP

DIRECT TESTIMONY OF

JAMES H. VANDER WEIDE

on behalf of

VERIZON FLORIDA INC.

SUBJECT: COST OF CAPITAL

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DIRECT TESTIMONY OF JAMES H. VANDER WEIDE

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is James H. Vander Weide. I am Research Professor of Finance and Economics at the Fuqua School of Business of Duke University. I am also President of Financial Strategy Associates, a firm that provides strategic and financial consulting services to clients in the electric, gas, insurance, telecommunications, and water industries. My business address is 3606 Stoneybrook Drive, Durham, North Carolina.

Q. WOULD YOU PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND PRIOR ACADEMIC EXPERIENCE?

A. I graduated from Cornell University in 1966 with a Bachelor's Degree in Economics. I then attended Northwestern University where I earned a Ph.D. in Finance. In January 1972, I joined the faculty of the School of Business at Duke University and was named Assistant Professor, Associate Professor, and then Professor.

Since joining the faculty I have taught courses in corporate finance, investment management, and management of financial institutions. I have taught a graduate seminar on the theory of public utility pricing and lectured in executive development seminars on the cost of capital, financial analysis, capital budgeting, mergers and acquisitions, cash management, short-run financial planning, and competitive strategy. I have also served as Program Director of several executive education

1 programs at the Fuqua School of Business, including the Duke Advanced
2 Management Program, the Duke Executive Program in
3 Telecommunications, Competitive Strategies in Telecommunications, and
4 the Duke Program for Manager Development for managers from the
5 former Soviet Union.

6
7 I have conducted seminars and training sessions on financial analysis,
8 financial strategy, cost of capital, cash management, depreciation
9 policies, and short-run financial planning for a wide variety of U.S. and
10 international companies, including ABB, Accenture, Allstate, Ameritech,
11 AT&T, Bell Atlantic, BellSouth, Contel, Fisons, Glaxo Wellcome, GTE,
12 Lafarge, MidAmerican Energy, New Century Energies, Norfolk Southern,
13 Pacific Bell Telephone, Progress Energy, The Rank Group, Siemens,
14 Southern New England Telephone, TRW, and Wolseley PLC.

15
16 In addition to my teaching and executive education activities, I have
17 written research papers on such topics as portfolio management, the cost
18 of capital, capital budgeting, the effect of regulation on the performance
19 of public utilities, and cash management. My articles have been
20 published in *American Economic Review*, *Financial Management*,
21 *International Journal of Industrial Organization*, *Journal of Financial and*
22 *Quantitative Analysis*, *Journal of Bank Research*, *Journal of Accounting*
23 *Research*, *Journal of Cash Management*, *Management Science*, *The*
24 *Journal of Portfolio Management*, *Atlantic Economic Journal*, *Journal of*
25 *Economics and Business*, and *Computers and Operations Research*. I

1 have written a book titled *Managing Corporate Liquidity: an Introduction*
2 *to Working Capital Management*, and a chapter for *The Handbook of*
3 *Modern Finance*, "Financial Management in the Short Run."

4

5 **Q. HAVE YOU PREVIOUSLY TESTIFIED ON FINANCIAL OR ECONOMIC**
6 **ISSUES?**

7 A. Yes. As an expert on financial and economic theory, I have testified on
8 the cost of capital, competition, risk, incentive regulation, forward-looking
9 economic cost, economic pricing guidelines, depreciation, accounting,
10 valuation, and other financial and economic issues in more than 300
11 cases before the U.S. Congress, the Canadian Radio-Television and
12 Telecommunications Commission, the Federal Communications
13 Commission, the National Telecommunications and Information
14 Administration, the Federal Energy Regulatory Commission, the public
15 service commissions of 39 states, and the insurance commissions of five
16 states. With respect to implementation of the Telecommunications Act of
17 1996, I have testified in 26 states and in Washington, D.C. on issues
18 relating to the pricing of unbundled network elements and universal
19 service cost studies. I have also consulted with Bell Canada, Deutsche
20 Telekom, and Telefónica on similar issues.

21

22 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS**
23 **PROCEEDING?**

24 A. Verizon Florida Inc. (Verizon Florida) asked me to make an independent
25 appraisal of the appropriate weighted average cost of capital to be used

1 in Verizon Florida's studies of the forward-looking economic cost of
2 providing interconnection and unbundled network elements (UNEs). I
3 conclude that 12.95 percent is a conservative estimate of the appropriate
4 weighted average cost of capital for use in Verizon Florida's forward-
5 looking economic cost studies.
6

7 II. FUNDAMENTAL ECONOMIC PRINCIPLES

8 A. THE FCC'S FORWARD-LOOKING ECONOMIC COST STANDARD

9
10 **Q. HAS THE FCC DETERMINED WHAT ECONOMIC PRINCIPLES**
11 **SHOULD BE USED IN SETTING RATES FOR UNBUNDLED**
12 **NETWORK ELEMENTS?**

13 **A.** Yes. The FCC determined the basic economic principles for setting rates
14 for unbundled network elements in its First Report and Order, *In the*
15 *Matter of Implementation of the Local Competition Provisions in the*
16 *Telecommunications Act of 1996 (Local Competition Order)*. In that
17 order, the FCC decided that three fundamental economic principles
18 should be used to set rates for unbundled network elements. First, the
19 FCC decided that rates for unbundled network elements should be based
20 on forward-looking economic costs, not embedded or accounting costs.
21 Second, the FCC decided that rates for unbundled network elements
22 should approximate the rates the incumbent LEC would be able to charge
23 in a competitive market for unbundled network elements. Third, the FCC
24 decided that rates for unbundled network elements should provide correct
25 economic signals for the investment decisions of both competitive and

1 incumbent local exchange carriers.

2

3 **Q. DO THE FCC'S RULES ADDRESS THE COST OF CAPITAL THAT**
4 **SHOULD BE USED IN A FORWARD-LOOKING COST STUDY?**

5 A. Yes. Rule 51.505(b)(2) provides that a "forward-looking cost of capital
6 shall be used in calculating the total element long-run incremental cost of
7 an element." Forward-looking costs are the costs "that a carrier would
8 incur in the future," and do not include embedded or historical costs.
9 (*Local Competition Order* at ¶¶ 683, 704.)

10

11 **Q. DOES YOUR INDEPENDENT ANALYSIS REFLECT THE FCC'S**
12 **FORWARD-LOOKING COST PRINCIPLE?**

13 A. Yes. I calculated the forward-looking cost of capital using a forward-
14 looking cost of debt, forward-looking cost of equity, and forward-looking
15 capital structure. In doing so, I did not consider Verizon Florida's
16 embedded, historical or accounting costs, nor did I consider Verizon
17 Florida's embedded or "book" capital structure. The cost of capital I
18 compute is appropriate for use in determining the forward-looking cost of
19 providing UNEs through the application of correct economic principles.

20

21 **Q. DOES YOUR ESTIMATED COST OF CAPITAL ASSUME THAT A**
22 **CARRIER INSTANTANEOUSLY CONSTRUCTS A NEW NETWORK?**

23 A. No. My 12.95 percent weighted cost of capital is forward-looking, but
24 does not reflect the forward-looking assumptions some parties use when
25 calculating other costs, such as the incremental cost of investments.

1 Specifically, their total element long run incremental cost (TELRIC)
2 studies assume that a carrier instantaneously constructs an all-new
3 ubiquitous, efficient network based on the incumbent's existing wire
4 center locations. In my opinion, the cost of capital for such a carrier
5 would be significantly higher than the 12.95 percent cost of capital
6 produced by my study. In contrast, my cost of capital reflects the
7 forward-looking cost of established companies that operate in the real
8 world.

9
10 **Q. DO THE FCC'S RULES PRESCRIBE THE ECONOMIC PURPOSE OF**
11 **FORWARD-LOOKING COST STUDIES?**

12 A. Yes. The FCC has held that forward-looking economic costs should
13 simulate the results of a competitive market for unbundled network
14 elements. For example, at ¶ 679 of the *Local Competition Order*, the
15 FCC states,

16 "Adopting a pricing methodology based on forward-looking,
17 economic costs best replicates, to the extent possible, the
18 conditions of a competitive market . . . **Because a pricing**
19 **methodology based on forward-looking costs**
20 **simulates the conditions in a competitive marketplace,**
21 it allows the requesting carrier to produce efficiently and to
22 compete effectively, which should drive retail prices to their
23 competitive levels." (Emphasis added.)

24 And at ¶ 738, the FCC states,

25 "In this proceeding, we are establishing pricing rules that

1 should produce rates for monopoly elements and services
2 that approximate what the incumbent LEC would be
3 able to charge if there were a competitive market for
4 such offerings." (Emphasis added.)

5

6 **Q. HAS THE FCC RECENTLY REITERATED ITS DECISION THAT**
7 **FORWARD-LOOKING ECONOMIC COSTS SHOULD "SIMULATE[S]**
8 **THE CONDITIONS IN A COMPETITIVE MARKETPLACE"?**

9 A. Yes. In its recent ruling on Verizon Massachusetts' Section 271 Petition,
10 the FCC reiterated that it has:

11 "determined that new entrants "should make their
12 decisions whether to purchase unbundled
13 elements...based on the relative economic costs of
14 these options," and that such competitors would not be
15 able to make such decisions "efficiently" unless the
16 BOC was offering UNEs based on forward-looking
17 economic costs. The FCC equated "efficient entry" with
18 the availability of UNEs at forward-looking economic
19 costs, which "replicates...the conditions of a competitive
20 market." "Efficient entry" simply means that competitors
21 seeking entry will face the same sorts of costs they
22 would face in a fully competitive market, that is,
23 TELRIC-based UNE rates. (*Memorandum, Opinion,*
24 *and Order in CC Docket No. 01-9, FCC 01-130,*
25 *adopted April 16, 2001 (Mass. 271 Order), 42.)"*

1 (Emphasis added.)

2

3 **Q. DO VERIZON FLORIDA'S COMPETITIVE LOCAL EXCHANGE (CLEC)**
4 **CUSTOMERS SUPPORT THE OPINION THAT THE USE OF THE**
5 **FORWARD-LOOKING ECONOMIC COST STANDARD REPLICATES**
6 **CONDITIONS IN A COMPETITIVE MARKET FOR UNES?**

7 A. Yes. The CLECs have repeatedly stated that forward-looking costs must
8 replicate the conditions of a competitive market. (Note that throughout
9 my testimony I use the term "CLEC" to refer to Competitive Local
10 Exchange Companies or Alternative Local Exchange Companies.)
11 AT&T, for example, has repeatedly supported this concept in its
12 testimony on UNEs throughout the country.

13

14 **Q. DO YOU AGREE THAT THE FORWARD-LOOKING ECONOMIC**
15 **COSTS IN UNE COST MODELS SHOULD APPROXIMATE THE**
16 **COSTS THE INCUMBENT LEC WOULD INCUR IN A COMPETITIVE**
17 **TELECOMMUNICATIONS MARKET?**

18 A. Yes. However, I believe the costs Verizon Florida would incur in a
19 competitive market should be estimated on the basis of realistic
20 assumptions about the dynamic economic environment in which Verizon
21 Florida operates. In contrast, the CLECs have generally based their cost
22 estimates on the hypothetical assumption that the telecommunications
23 network is instantaneously re-constructed using the most efficient
24 technology for meeting the current demand for telecommunications
25 service. Because it ignores the technological and demand uncertainties

1 of the real world, the CLECs' hypothetical construct is unrelated to the
2 way telecommunications networks are operated and constructed in
3 reality.

4

5 **Q. DOES THE FORWARD-LOOKING ECONOMIC COST STANDARD**
6 **CREATE ANY CHALLENGES FOR PARTIES SEEKING TO ESTIMATE**
7 **UNE COSTS?**

8 A. Yes. Because forward-looking economic costs are, by their nature, not
9 observable, parties have been forced to estimate forward-looking
10 economic costs from engineering cost models that may, or may not,
11 reflect the incumbent LEC's future operating conditions.

12

13 **Q. DOES ECONOMIC THEORY OFFER ANY SUGGESTIONS FOR THE**
14 **CONSTRUCTION OF SUCH AN ENGINEERING COST MODEL?**

15 A. Yes. Economic theory offers at least two suggestions for the construction
16 of such a cost model. First, such a model should seek to approximate
17 the costs the incumbent LEC would expect to incur to construct and
18 operate a telecommunications network for the purpose of offering UNEs.
19 Specifically, a cost model should be based on realistic assumptions that
20 mirror the dynamic economic environment the incumbent LEC faces in
21 making future investment and operating decisions.

22

23 Second, the model should be based on a consistent assumption
24 regarding the level of competition in the UNE market. It is not appropriate
25 for CLECs to invoke the competitive market assumption in estimating the

1 expense and amount of investment components of their cost models, for
2 example, at the same time they assume that the market for UNEs is
3 monopolistic when estimating the cost of capital component.

4

5 **Q. DO THE FCC'S RULES ADDRESS THE APPROPRIATE ROLE FOR**
6 **UNE RATES IN SENDING CORRECT ECONOMIC SIGNALS TO**
7 **PARTICIPANTS IN A COMPETITIVE TELECOMMUNICATIONS**
8 **MARKET?**

9 A. Yes. The FCC's rules clearly establish that UNE rates should send
10 correct economic signals for the investment and operating decisions of
11 new entrants and incumbent LECs alike. For example, in ¶ 620 of the
12 *Local Competition Order*, the FCC states:

13 "In dynamic competitive markets, firms take action based
14 . . . on the relationship between market-determined prices
15 and forward-looking economic costs. If market prices
16 exceed forward-looking economic costs, new competitors
17 will enter the market. If their forward-looking economic
18 costs exceed market prices, new competitors will not enter
19 the market and existing competitors may decide to leave
20 . . . New entrants should make their decisions whether to
21 purchase unbundled elements or to build their own facilities
22 based on the relative economic costs of these options."

23

24 **Q. DOES YOUR COST OF CAPITAL RECOMMENDATION IN THIS**
25 **PROCEEDING PROVIDE CORRECT ECONOMIC SIGNALS FOR THE**

1 **INVESTMENT DECISIONS OF NEW ENTRANTS AND THE**
2 **INCUMBENT LECs?**

3 A. Yes. My 12.95 percent weighted average cost of capital recommendation
4 in this proceeding reflects the forward-looking risk and required return on
5 the incumbent LEC's investment in the network facilities required to
6 provide unbundled network elements in a competitive market. If UNE
7 rates were based on a lower cost of capital, new entrants would find it
8 advantageous to purchase unbundled network elements rather than to
9 build their own facilities, even if they could provide telecommunications
10 service more efficiently than the incumbent LEC. In addition, if rates
11 were based on a lower cost of capital, the incumbent LEC would have no
12 incentive to continue to invest in its network.

13
14 **Q. IS YOUR COST OF CAPITAL RECOMMENDATION IN THIS**
15 **PROCEEDING APPROPRIATE FOR A UNE COST MODEL THAT**
16 **ASSUMES INCUMBENTS WILL MAKE MASSIVE SUNK**
17 **INVESTMENTS TO INSTANTANEOUSLY REPLACE THEIR**
18 **NETWORKS, COMPETITORS HAVE THE OPTION TO IMMEDIATELY**
19 **DISCONTINUE THEIR USE OF THE INCUMBENTS' NETWORKS**
20 **WHEN THEIR OWN FACILITIES ARE BUILT, AND UNE PRICES WILL**
21 **BE RE-SET EVERY FEW YEARS UNDER THESE SAME**
22 **ASSUMPTIONS?**

23 A. No. The appropriate cost of capital would be substantially higher for a
24 model that assumes: (1) incumbent LECs instantaneously replace their
25 networks through massive sunk investments in network facilities;

1 (2) competitors have the option to abandon their use of the incumbents'
2 networks immediately after they build their own facilities; (3) UNE pricing
3 proceedings occur every few years; and (4) at each UNE pricing
4 proceeding, prices are based on a hypothetical cost model where the
5 network is assumed to be replaced yet again, creating the added risk that
6 what are today forward-looking investments will become stranded. As Dr.
7 Jerry A. Hausman explained in his Reply Affidavit in CC Docket No. 96-
8 98, the cost of capital required in such an extreme application of forward-
9 looking principles may well be several times higher.

10

11

B. THE COST OF CAPITAL

12

13 **Q. DOES THE COST OF CAPITAL PLAY ANY ROLE IN THE FCC'S**
14 **GUIDELINES FOR FORWARD-LOOKING COST STUDIES?**

15 **A.** Yes. As noted above, the FCC requires that unbundled network element
16 cost studies be based on the forward-looking economic cost of providing
17 interconnection and unbundled network elements. The forward-looking
18 economic cost of providing interconnection and unbundled network
19 elements includes both capital costs and expenses. The capital costs, in
20 turn, include three elements: (1) the LECs' incremental investment in the
21 telecommunications facilities required to provide interconnection or
22 unbundled network elements; (2) the economic depreciation on these
23 facilities; and (3) the required rate of return, or cost of capital, associated
24 with these facilities.

25

1 **Q. HOW DO ECONOMISTS DEFINE THE REQUIRED RATE OF RETURN,**
2 **OR COST OF CAPITAL, ASSOCIATED WITH PARTICULAR**
3 **INVESTMENT DECISIONS, SUCH AS THE DECISION TO INVEST IN**
4 **THE BUILDING OF TELECOMMUNICATIONS NETWORK**
5 **FACILITIES?**

6 A. Economists define the required rate of return on a particular investment
7 as the return that investors forego by making that investment instead of
8 an alternative investment of equal risk.

9

10 **Q. HOW DOES THE COST OF CAPITAL AFFECT A FIRM'S**
11 **INVESTMENT DECISIONS?**

12 A. The goal of a firm is to maximize the value of the firm. This goal can be
13 accomplished by accepting all investments in plant and equipment with
14 an expected rate of return greater than or equal to the cost of capital.
15 Thus, a firm should continue to invest in plant and equipment only so long
16 as the return on its investment is greater than or equal to its cost of
17 capital.

18

19 **Q. HOW DOES THE COST OF CAPITAL AFFECT INVESTORS'**
20 **WILLINGNESS TO INVEST IN A COMPANY?**

21 A. The cost of capital measures the return investors can expect on
22 investments of comparable risk. Rational investors will not invest in a
23 particular investment opportunity if the expected return on that
24 opportunity is less than the cost of capital. Thus, the expected rate of
25 return on an investment in a company must exceed the cost of capital

1 before investors will be willing to invest in that company.

2

3 **Q. DO ALL INVESTORS HAVE THE SAME POSITION IN THE FIRM?**

4 A. No. Debt investors have a fixed claim on a firm's assets and income that
5 must be paid prior to any payment to the firm's equity investors. Since
6 the firm's equity investors have a residual claim on the firm's assets and
7 income, equity investments are riskier than debt investments. Thus, the
8 cost of equity exceeds the cost of debt.

9

10 **Q. WHAT IS THE OVERALL OR WEIGHTED AVERAGE COST OF**
11 **CAPITAL?**

12 A. The overall or weighted average cost of capital is a weighted average of
13 the cost of debt and cost of equity, where the weights are the
14 percentages of debt and equity in a firm's capital structure.

15

16 **Q. CAN YOU ILLUSTRATE THE CALCULATION OF THE OVERALL OR**
17 **WEIGHTED AVERAGE COST OF CAPITAL?**

18 A. Yes. Assume that the cost of debt is 9 percent, the cost of equity is
19 15 percent, and the percentages of debt and equity in the firm's capital
20 structure are 25 percent and 75 percent, respectively. Then the weighted
21 average cost of capital is expressed by 0.25 times 9 percent plus 0.75
22 times 15 percent, or 13.5 percent.

23

24 **Q. HOW DO ECONOMISTS DEFINE THE COST OF DEBT COMPONENT**
25 **OF THE WEIGHTED AVERAGE COST OF CAPITAL?**

1 A. Economists define the cost of debt as the market interest rate that a firm
2 would have to pay on newly-issued debt obligations. In efficient markets,
3 the market interest rate is also the best estimate of future interest rates.
4 The correct economic definition of the cost of debt is thus forward-looking
5 and market-oriented.

6

7 **Q. HOW DO ECONOMISTS DEFINE THE COST OF EQUITY**
8 **COMPONENT OF THE WEIGHTED AVERAGE COST OF CAPITAL?**

9 A. Economists define the cost of equity as the return investors expect to
10 receive on alternative equity investments of comparable risk. Since the
11 return on an equity investment of comparable risk is not fixed by contract,
12 the cost of equity is more difficult to measure than the cost of debt. There
13 is agreement, however, as I have already noted, that the cost of equity is
14 greater than the cost of debt. There is also agreement among
15 economists that the cost of equity, like the cost of debt, is both forward-
16 looking and market-based.

17

18 **Q. WHAT APPROACHES DO ECONOMISTS EMPLOY TO OBTAIN**
19 **NUMERICAL ESTIMATES OF THE COST OF EQUITY?**

20 A. Economists generally use market models such as the Discounted Cash
21 Flow (DCF) Model to estimate a firm's cost of equity. The DCF Model is
22 based on the assumption that the market price of a firm's stock is equal
23 to the present value of the stream of cash flows that investors expect to
24 receive from owning the stock. The cost of equity in the DCF Model is
25 that discount rate which equates the firm's stock price to the present

1 value of the future stream of cash flows investors expect from owning the
2 stock.

3

4 **Q. HOW DO ECONOMISTS MEASURE THE PERCENTAGES OF DEBT**
5 **AND EQUITY IN A FIRM'S CAPITAL STRUCTURE?**

6 A. Economists measure the percentages of debt and equity in a firm's
7 capital structure by first calculating the market value of the firm's debt and
8 the market value of its equity. Economists then calculate the percentage
9 of debt by the ratio of the market value of debt to the combined market
10 value of debt and equity, and the percentage of equity by the ratio of the
11 market value of equity to the combined market values of debt and equity.
12 For example, if a firm's debt has a market value of \$25 million and its
13 equity has a market value of \$75 million, then its total market
14 capitalization is \$100 million, and its capital structure contains 25 percent
15 debt and 75 percent equity.

16

17 **Q. WHY DO ECONOMISTS MEASURE A FIRM'S CAPITAL STRUCTURE**
18 **IN TERMS OF THE MARKET VALUES OF ITS DEBT AND EQUITY?**

19 A. Economists measure a firm's capital structure in terms of the market
20 values of its debt and equity because that is the best measure of the
21 amounts of debt and equity that investors have invested in the company
22 on a going-forward basis. Furthermore, economists generally assume
23 that the goal of management is to maximize the value of the firm, where
24 the value of the firm is the sum of the market value of the firm's debt and
25 equity. Only by measuring a firm's capital structure in terms of market

1 values can its managers choose a financing strategy that maximizes the
2 value of the firm.

3

4 **Q. IS THE ECONOMIC DEFINITION OF THE COST OF CAPITAL, WHICH**
5 **FOCUSES ON THE MARKET VALUES OF DEBT AND EQUITY,**
6 **WIDELY ACCEPTED IN OTHER CONTEXTS BY CAPITAL MARKET**
7 **PARTICIPANTS?**

8 A. Yes. Homeowners measure the value of their homes in terms of market
9 values, not historical cost or book values. Investors measure the return
10 and risk on their portfolios in terms of market values, not book values.
11 Companies use a market value definition of the cost of capital to make
12 entry, investment, and innovation decisions.

13

14 **Q. HOW DO INVESTORS MEASURE THE RATE OF RETURN ON THEIR**
15 **INVESTMENT PORTFOLIOS?**

16 A. Investors, like economists, measure the rate of return on their investment
17 portfolios in terms of the market values of the debt and equity in their
18 portfolios. Suppose an investor has a portfolio that has a market value of
19 \$100,000 at the beginning of 2000. Further suppose that the value of the
20 portfolio at the end of 2000 is \$112,000, and that the investor earns
21 interest and dividends of \$3,000 during the course of 2000. Then the
22 investor's rate of return in 2000 is 15 percent $[(112 - 100)/100 + 3/100 =$
23 $15 \text{ percent}]$. In making this calculation, I assumed that dividends and
24 interest were not reinvested in the portfolio during the year.

25

1 Q. SUPPOSE THE INVESTOR IN YOUR PREVIOUS EXAMPLE
2 PURCHASED HIS PORTFOLIO IN 1980 AT A COST OF \$20,000.
3 DOES THE HISTORICAL COST OF INVESTMENT IN 1980 HAVE ANY
4 EFFECT ON EITHER THE INVESTOR'S EARNED OR REQUIRED
5 RATE OF RETURN IN 2000?

6 A. No. The fact that the investor purchased the portfolio in 1980 for \$20,000
7 has no bearing on either the investor's earned or required rate of return in
8 2000. Thus, the historical or embedded cost of the investment is
9 irrelevant to the calculation of the rate of return. Investors calculate their
10 rate of return based on market values, not book values.

11

12 Q. YOUR EXAMPLE CLEARLY DEMONSTRATES THAT THE
13 INVESTOR'S EARNED RATE OF RETURN IN 2000 DEPENDS ON THE
14 \$100,000 MARKET VALUE OF THE PORTFOLIO AT THE BEGINNING
15 OF 2000, NOT ON THE \$20,000 HISTORICAL COST, OR BOOK
16 VALUE, OF THE PORTFOLIO IN 1980. DO INVESTORS MEASURE
17 THE *REQUIRED* RATE OF RETURN FOR 2001 IN TERMS OF THE
18 MARKET VALUE OR THE BOOK VALUE OF THEIR PORTFOLIO AT
19 THE BEGINNING OF 2001?

20 A. Investors measure their required rate of return for 2001 in terms of
21 market values, not book values. Suppose that the investor's required
22 rate of return for 2001 is 15 percent. Since the value of the portfolio at
23 the beginning of 2001 is \$112,000, the investor will require a dollar return
24 of \$16,800 in 2001 (15 percent x \$112,000 = \$16,800) including
25 dividends, interest, and capital gains. If the investor expects a return less

1 than \$16,800, he should sell this portfolio and invest his capital in another
2 portfolio that has an expected rate of return of at least 15 percent.

3

4 **Q. IF A GROUP OF INVESTORS WERE TO CONSTRUCT A PORTFOLIO**
5 **THAT CONSISTED OF ALL OF A FIRM'S DEBT AND EQUITY, HOW**
6 **WOULD THEY MEASURE THE REQUIRED RETURN ON THEIR**
7 **INVESTMENT?**

8 A. These investors would measure their required return by calculating a
9 weighted average of their required returns on the debt and equity portions
10 of the portfolio, where the weights are measured in terms of market
11 values, not book values. For example, if a firm's debt has a market value
12 of \$25 million, its equity has a market value of \$75 million, the market
13 interest rate on corporate debt of similar risk is 9 percent, and the market
14 required return on equity of similar risk is 15 percent, then the required
15 rate of return on a \$100 million portfolio containing all of the firm's debt
16 and equity securities would be 13.5 percent ($.25 \times 9 \text{ percent} + .75 \times$
17 $15 \text{ percent} = 13.5 \text{ percent}$).

18

19 Thus, the investors' required rate of return from an investment in the
20 company is the same as the company's weighted average cost of capital,
21 where both the required rate of return and the weighted average cost of
22 capital are measured in terms of market value weights.

23

24 **Q. IS THE ECONOMIC DEFINITION OF THE AVERAGE COST OF**
25 **CAPITAL CONSISTENT WITH THE WAY COMPETITIVE FIRMS**

1 **DETERMINE THE REQUIRED RATE OF RETURN ON INVESTMENT**
2 **DECISIONS?**

3 A. Yes. Managers also use a market value definition of the weighted
4 average cost of capital in making investment decisions. From the
5 manager's perspective, the firm's cost of capital is equal to the return
6 investors can earn on the market value of other investments of the same
7 risk. Rational managers, like rational investors, will not commit resources
8 to investments in new markets or technologies unless the expected return
9 on the market value of these investments in new markets or technologies
10 is greater than or equal to the firm's cost of capital, measured on a
11 market value basis, for projects with the same degree of risk.

12

13 **Q. DOES THE ECONOMIC LOGIC BEHIND THE DEFINITION OF THE**
14 **COST OF CAPITAL HAVE ANY IMPLICATIONS FOR COMPETITIVE**
15 **ENTRY IN THE LOCAL EXCHANGE MARKET IN FLORIDA?**

16 A. Yes. If the Florida Public Service Commission wants to encourage
17 efficient facilities-based competitive entry in the market for local
18 exchange services, the cost of capital input in Verizon Florida's forward-
19 looking cost studies must be at least as large as the return those potential
20 facilities-based competitors can earn on other investments of the same
21 risk. If potential competitors can lease local exchange facilities from
22 Verizon Florida at rates that include a ten percent rate of return on
23 investment, for example, they will have no incentive to invest in their own
24 facilities if they can earn returns greater than ten percent on other
25 investments of comparable risk. In short, it would make more sense for

1 those competitors to lease the undervalued unbundled network elements
2 from Verizon Florida than to build their own facilities. To provide correct
3 incentives for entry into local exchange markets, the Florida Commission
4 should measure Verizon Florida's cost of capital in the same way that
5 potential competitors measure their own costs of capital.

6

7 **Q. DOES THE ECONOMIC DEFINITION OF THE COST OF CAPITAL**
8 **HAVE ANY IMPLICATIONS FOR THE POLICY GOAL OF**
9 **ENCOURAGING INVESTMENT AND INNOVATION IN**
10 **TELECOMMUNICATIONS SERVICES?**

11 A. Yes. The Florida Commission should likewise use a market definition of
12 the cost of capital if it wishes to promote efficient investment and
13 innovation in telecommunications services. In competitive markets, the
14 incumbent and its competitors can only be encouraged to invest in new
15 technologies, products, and services if the rate of return they can earn on
16 the market value of their investments exceeds the rate of return they
17 could earn on the market value of other investments of the same risk.

18

19 **Q. WHY DO INVESTORS MEASURE THE RETURN ON THEIR**
20 **INVESTMENT PORTFOLIOS USING MARKET VALUE WEIGHTS**
21 **RATHER THAN BOOK VALUE WEIGHTS?**

22 A. Investors measure the return on their investment portfolios using market
23 value weights because market value weights are the best measure of the
24 amounts the investors currently have invested in each security in the
25 portfolio. From the investor's point of view, the historical cost or book

1 value of his investment is entirely irrelevant to the current risk and return
2 on his portfolio because if he were to sell his investment, he would
3 receive only its market value and not the historical cost. Thus, the return
4 can only be measured in terms of market values.

5

6 **Q. IS THE ECONOMIC DEFINITION OF THE AVERAGE COST OF**
7 **CAPITAL CONSISTENT WITH REGULATORS' TRADITIONAL**
8 **DEFINITION OF THE AVERAGE COST OF CAPITAL?**

9 A. No. As noted above, the economic definition of the average cost of
10 capital is based on the market costs of debt and equity, the market value
11 percentages of debt and equity in a company's capital structure, and the
12 future expected risk of investing in the company. Regulators, in contrast,
13 have traditionally defined the average cost of capital using the embedded
14 cost of debt, the book values of debt and equity in a company's capital
15 structure, and the risk of investing in a franchised provider of
16 telecommunications services.

17

18 **Q. WHAT IS THE DIFFERENCE BETWEEN THE MARKET COST OF**
19 **DEBT AND A COMPANY'S EMBEDDED COST OF DEBT?**

20 A. The market cost of debt is the rate of interest a company would have to
21 pay if it issued debt under today's market conditions. The embedded
22 cost of debt is the company's total interest expense divided by the total
23 book value of its debt. Thus, the embedded cost of debt is an average of
24 the interest rates the company has paid in the past to issue debt
25 securities. This calculation of the embedded cost of debt, however,

1 provides no basis for measuring the market cost of debt.

2

3 **Q. WHAT IS THE DIFFERENCE BETWEEN THE MARKET VALUE AND**
4 **THE BOOK VALUE OF A COMPANY'S DEBT?**

5 A. The market value of a company's debt represents the current price in the
6 capital markets of the company's debt obligations. The book value of a
7 company's debt is the historical face value of its debt adjusted for the
8 accounting amortization of premiums and discounts. The market value of
9 a company's debt is approximately equal to the book value of its debt
10 when market interest rates are approximately equal to the average
11 interest rate of the company's previous debt issuances.

12

13 **Q. WHAT IS THE DIFFERENCE BETWEEN THE MARKET VALUE AND**
14 **THE BOOK VALUE OF A COMPANY'S EQUITY?**

15 A. The market value of a company's equity is simply the market price of the
16 company's stock times the number of shares outstanding. The book
17 value of equity is more complex: it represents the sum of paid-in capital
18 and retained earnings, where paid-in capital represents the amount of
19 capital a firm has historically obtained from stock issuances, and retained
20 earnings represent the cumulative earnings over the life of the company
21 that have not been paid out as dividends. In addition, the book value of a
22 company's equity is adjusted periodically for accounting events such as
23 changes in accounting rules and regulations, write-offs, and extraordinary
24 events.

25

1 Q. DOES THE BOOK VALUE OF A COMPANY'S EQUITY REFLECT THE
2 HISTORICAL COST OF ITS ASSETS?

3 A. Yes. The book value of a company's equity is defined as the book value
4 of a company's assets minus the book value of the company's debt:

5 *Book Value of Equity = Book Value of Assets - Book Value of Debt.*

6 Since the book value of a company's assets, in turn, is equal to the
7 historical cost of a company's assets minus accumulated depreciation,
8 the book value of a company's equity can also be stated as the historical
9 cost of a company's assets, minus the accumulated book depreciation on
10 these assets, minus the book value of a company's debt:

11 *Book Value of Equity = Historical Cost of Assets – Accumulated*
12 *Book Depreciation – Book Value of Debt*

13 Thus, the book value of a company's equity reflects the historical cost
14 of the company's assets.

15

16 Q. WHY HAVE STATE AND FEDERAL REGULATORS DEFINED THE
17 AVERAGE COST OF CAPITAL IN TERMS OF EMBEDDED COSTS
18 AND BOOK VALUES RATHER THAN FORWARD-LOOKING COSTS
19 AND MARKET VALUES?

20 A. State and federal regulators traditionally have defined a company's
21 average cost of capital in terms of embedded costs and book values
22 because these concepts were consistent with the regulators' accounting
23 model of the firm. Economists, in contrast, generally employ an
24 economic model of the firm in which forward-looking costs and market
25 values are the relevant standards.

1

2 **Q. IS THE TRADITIONAL STATE AND FEDERAL REGULATORY**
3 **DEFINITION OF THE AVERAGE COST OF CAPITAL CONSISTENT**
4 **WITH THE ECONOMIC PRINCIPLES UNDERLYING A FORWARD-**
5 **LOOKING COST STUDY?**

6 A. No. As I have already noted, the economic principles underlying a
7 forward-looking economic cost study require that the average cost of
8 capital be calculated using a market interest rate, a market value capital
9 structure, and a cost of equity that measures the return investors require
10 in competitive markets on other investments of the same risk. In
11 contrast, the regulatory definition of the weighted average cost of capital
12 is based on an embedded interest rate, a book value capital structure,
13 and a cost of equity that measures the return investors require in markets
14 that are at least partially protected from competition. The regulatory
15 definition of the weighted average cost of capital is inconsistent with the
16 economic principle that economic costs are forward looking and market
17 based, not backward looking and accounting based.

18

19 **Q. IN SUM, THEN, WHAT IS THE PROPER DEFINITION OF THE**
20 **AVERAGE COST OF CAPITAL FOR USE IN VERIZON FLORIDA'S**
21 **FORWARD-LOOKING COST STUDIES?**

22 A. The Act removes all barriers to entry in the local exchange market and
23 opens the market to full competition. In a competitive market for local
24 exchange service, forward-looking economic cost is the appropriate cost
25 benchmark for forward-looking cost studies. Furthermore, the FCC has

1 determined that forward-looking economic costs should approximate the
2 costs the incumbent LEC would incur in a competitive market for UNEs.
3 Thus, for use in Verizon Florida's forward-looking economic cost studies,
4 the average cost of capital should be defined in terms of market interest
5 rates, the market values of debt and equity in a company's capital
6 structure, and investors' expectations regarding the future risk of
7 investing in the company in a competitive environment. This is the only
8 definition of the average cost of capital that is consistent with the
9 underlying assumptions of Verizon Florida's forward-looking cost studies.

10 III. Risk

11

12 **Q. DOES THE REQUIRED RATE OF RETURN ON AN INVESTMENT**
13 **VARY WITH THE RISK OF THAT INVESTMENT?**

14 **A.** Yes. Since investors are averse to risk, they require a higher rate of
15 return on investments with greater risk.

16

17 **A. RISK IMPLIED BY THE FCC'S COST STANDARDS**

18

19 **Q. HOW DO THE FCC'S FORWARD-LOOKING ECONOMIC COST**
20 **STANDARDS AFFECT THE APPROPRIATE VIEW OF INVESTMENT**
21 **RISK IN THE CONTEXT OF UNE MODELS?**

22 **A.** The FCC has specifically stated that rates for UNEs should "approximate
23 what the incumbent LEC would be able to charge if there were a
24 competitive market for such offerings." CLECs have argued in other UNE
25 proceedings that the expense and investment components of the

1 forward-looking economic cost of providing UNEs will be lower in a fully
2 competitive market environment than in a less competitive market
3 environment. However, they fail to acknowledge that the competitive
4 market environment also has implications for investment risk, and thus
5 the depreciation and cost of capital components of their cost studies.
6 Firms in a fully competitive environment would certainly use shorter
7 depreciation lives than firms in a less competitive environment, and they
8 would certainly face higher costs of capital as well.

9

10 **Q. WHAT WOULD BE THE EFFECT OF USING THE COMPETITIVE**
11 **MARKET ASSUMPTION TO ESTIMATE THE EXPENSE AND**
12 **INVESTMENT COMPONENTS, BUT A MONOPOLY MARKET**
13 **ASSUMPTION TO ESTIMATE THE COST OF CAPITAL?**

14 **A.** If the Florida Commission assumes the market is fully competitive when
15 determining the expense and investment components in UNE cost
16 models, but not when determining the cost of capital, the resulting
17 forward-looking economic cost studies ***will not replicate*** the results of a
18 competitive market. Indeed, since the resulting forward-looking economic
19 costs would then be less than the costs competitors would face in
20 building their own networks, there would be no incentive for facilities-
21 based competition. Similarly, there would be no incentive for incumbent
22 LECs to continue to invest in and upgrade their networks. Thus,
23 customers would be deprived of the advanced technologies that the
24 authors of the Telecommunications Act envisioned.

25

1 Q. YOU MENTIONED EARLIER THAT PARTIES IN UNE PROCEEDINGS
2 FREQUENTLY USE COST MODELS TO ESTIMATE THE FORWARD-
3 LOOKING ECONOMIC COST OF PROVIDING UNES. CAN YOU
4 ILLUSTRATE HOW THE INVESTMENT ASSUMPTIONS IN SUCH
5 MODELS AFFECT INVESTMENT RISK AND THE COST OF CAPITAL?

6 A. Yes. Consider four possible cost model scenarios, each with different
7 assumptions regarding the required investment in network facilities to
8 provide UNEs. The first scenario is one in which operating expenses and
9 amounts of investment will be measured on the basis of historical costs.

10

11 The second scenario is one in which operating expenses and amounts of
12 investment will be based on the forward-looking economic costs of the
13 incumbent LEC, recognizing the existence of the incumbent LEC's
14 current network, the optimal time path of replacing the current network
15 with the optimal mix of new technologies, and the inherent uncertainties
16 of demand and technology forecasts.

17

18 The third scenario assumes a hypothetical world where operating
19 expenses and amounts of investment will be measured on the basis of
20 the forward-looking economic costs of building the local exchange
21 network all at once, using the most efficient technology for meeting the
22 foreseeable demand for telecommunications services. This scenario
23 ignores the economic consequences of both demand and technology
24 uncertainty, as well as the huge costs of transitioning from the incumbent
25 LEC's current network to an entirely rebuilt new local exchange network.

1 This is the scenario that most closely reflects Verizon Florida's cost
2 model in this proceeding. As Mr. Tucek explains in his direct testimony,
3 the costs produced by this model are, at best, a lower bound for the
4 forward-looking economic costs Verizon Florida expects to incur in
5 providing UNEs.

6
7 The fourth scenario is the same as scenario three, except that Verizon
8 Florida is also assumed to be able to achieve extraordinary cost savings
9 by: (1) purchasing all switches at large new-switch discounts; (2) sharing
10 outside plant facilities with electric and cable companies, even though
11 these companies are not planning to rebuild their networks from scratch;
12 and (3) achieving unrealistic expense reductions that are inconsistent
13 with experience in Florida.

14
15 These four scenarios involve increasing levels of risky investments in new
16 technology and increasingly optimistic assumptions about the costs of
17 operating and transitioning to the new technology. In fact, the fourth
18 scenario assumes investment and expense levels that are significantly
19 less than those that any efficient local exchange carrier could be
20 expected to achieve. The increasing level of investment risk must be
21 recognized when estimating the cost of capital input in the corresponding
22 UNE cost model.

23

24 **Q. WHY DO YOU CONSIDER SCENARIO THREE TO INVOLVE**
25 **CONSIDERABLY MORE INVESTMENT RISK THAN SCENARIO TWO?**

1 A. Scenario three involves more investment risk than scenario two because
2 it assumes that the network is built all at once, whereas scenario two
3 recognizes the reality that networks are built gradually over time.
4 Scenario three ignores most of the economic effects of demand and
5 technology uncertainty, as well as the very realistic transition costs of
6 moving from the installed network to the technology embodied in the
7 reconstructed network. A firm building an entirely new local exchange
8 network all at once is placing a very large bet on the accuracy of its
9 demand and technology forecasts. In reality, a firm building a network all
10 at once would face greater risks that (1) actual demand could be
11 significantly different from forecasted demand; (2) the optimal mix of
12 technology could change as new technology becomes available; (3) the
13 cost of installing and operating the modeled technology may be greater
14 than expected; and (4) the modeled technology may not provide the
15 quality and number of services that had been predicted. Furthermore,
16 the investment required to build an entirely new local exchange network
17 all at once would be enormous, and the investment would be sunk once
18 the network was installed. The risks of making such a large investment in
19 fixed network technology is even greater given that customers have the
20 option to abandon their use of UNEs and build their own network facilities
21 at any time. Indeed, the Act is intended to encourage that behavior.

22

23 **Q. CAN YOU PROVIDE ANY REAL WORLD EXAMPLES OF THE RISKS**
24 **OF MAKING A HUGE SUNK INVESTMENT IN AN ENTIRELY NEW**
25 **TELECOMMUNICATIONS NETWORK WHEN DEMAND IS**

1 **UNCERTAIN AND TECHNOLOGICAL CHANGE IS RAPID?**

2 A. Yes. Over the last several years, companies such as Teligent,
3 Allegiance, Covad, Rythms, Level 3, Qwest, Global Crossing,
4 Metromedia Fiber Network, Williams Communications, McLeodUSA and
5 others have invested billions of dollars in constructing entirely new
6 telecommunications networks both here and abroad. These companies
7 have found that telecommunications demand was not as large as they
8 originally forecast, and advances in technology may soon make some
9 parts of their networks obsolete. As a result, these companies have lost
10 anywhere from 60 percent to 90 percent of their market value as
11 investors have come to realize that these networks were built on overly
12 optimistic demand and cost forecasts. The companies and their investors
13 are now aware of the enormous risk of making high-cost, sunk
14 investments in new telecommunications technology.

15
16 **Q. WHY DO YOU CONSIDER SCENARIO FOUR TO INVOLVE MORE**
17 **RISK THAN SCENARIO THREE?**

18 A. Scenario four involves more investment risk than scenario three because,
19 in addition to assuming that Verizon Florida builds an entirely new local
20 exchange network from scratch, using the most efficient technology for
21 satisfying the foreseeable demand for telecommunications service, it also
22 assumes that Verizon Florida will be able to achieve unrealistic levels of
23 cost savings through new switch discounts, sharing facilities with other
24 companies, and extraordinary reductions in operating expenses. Under
25 these assumptions, there is a high risk that Verizon Florida would not be

1 able to earn an economic rate of return on its investment.

2

3 **Q. WHY IS IT IMPORTANT TO CONSIDER THE RISK IMPLICATIONS OF**
4 **THE FORWARD-LOOKING ECONOMIC COST STANDARDS WHEN**
5 **INVESTORS IN THE CAPITAL MARKETS DETERMINE THE COST OF**
6 **CAPITAL?**

7 A. There are at least two reasons for considering the risk implications of the
8 FCC's cost standards. First, there are no publicly-traded companies
9 whose sole business is constructing and operating telecommunications
10 networks for the purpose of offering UNEs. Thus, one must necessarily
11 use cost of capital proxies whose stock is publicly traded, and whose risk
12 approximates the risk of investing in the facilities to provide UNEs. One
13 must thoroughly understand the risks of investing in UNE facilities in
14 order to properly evaluate the results of applying cost of capital
15 methodologies to these proxy companies.

16

17 Second, the cost of capital obviously depends on the risk of the economic
18 environment assumed in the UNE cost study. If one develops a UNE
19 cost model based on a more risky economic environment, then the
20 analyst must include this higher risk in the estimate of the cost of capital
21 input for this cost model to be consistent. If the analyst does not include
22 the higher risk in estimating the cost of capital input, the results of the
23 economic cost study will be economically meaningless.

24

25 **Q. WHAT DO YOU MEAN WHEN YOU SAY THAT THE RESULTS OF AN**

1 **ECONOMIC COST STUDY WILL BE ECONOMICALLY MEANINGLESS**
2 **IF THE ANALYST DOES NOT CONSIDER THE RISK OF THE**
3 **ECONOMIC SCENARIO WHEN ESTIMATING THE COST OF**
4 **CAPITAL?**

5 A. *I mean that the resulting UNE rates will not provide correct economic*
6 *signals to either new entrants or incumbent LECs. If a CLEC develops a*
7 *cost study based on scenario four, for example, but fails to include the*
8 *higher risk of scenario four in the cost of capital input, then the resulting*
9 *UNE rates would be significantly less than the cost a new entrant would*
10 *face in building its own network, even if it is more efficient in building the*
11 *new network than the incumbent LEC. Thus, there would be no*
12 *economic incentive for efficient entry.*

13
14 With respect to the incumbent, a failure to include the higher level of risk
15 of scenario four in the cost of capital input implies that UNE rates would
16 be significantly less than the forward-looking economic cost of providing
17 UNEs. Thus, the LEC would have no incentive to continue to introduce
18 new technology in the local exchange, and the goal of the
19 Telecommunications Act to bring advanced technology to customers
20 would be thwarted.

21

22 **Q. WHICH SCENARIO DID YOU ASSUME WHEN CONDUCTING YOUR**
23 **COST OF CAPITAL STUDIES?**

24 A. I have estimated the cost of capital under scenario two. Because the
25 cost of capital would be higher in the more risky scenarios three or four,

1 using my cost of capital estimate will understate UNE costs. All other
2 aspects of Verizon Florida's cost model are based on the more risky
3 scenario three.

4

5 **B. RISK IMPLIED BY ACTUAL COMPETITIVE MARKET CONDITIONS**

6

7 **Q. IN ADDITION TO MODEL ASSUMPTIONS, WHAT ARE THE MAJOR**
8 **FACTORS THAT AFFECT THE RISK OF INVESTING IN THE**
9 **FACILITIES REQUIRED TO PROVIDE LOCAL EXCHANGE SERVICE**
10 **IN FLORIDA?**

11 A. The risk of investing in the facilities required to provide local exchange
12 service in Florida depends on operating leverage, the level of
13 competition, rapidly changing technology, and the regulatory
14 environment.

15

16 **Q. WHAT IS OPERATING LEVERAGE?**

17 A. Operating leverage refers to the relationship between the company's
18 revenues, on the one hand, and the company's fixed and variable costs
19 on the other. The provision of facilities-based telecommunications
20 services is a business that requires a large commitment to fixed costs in
21 relation to variable costs, a situation called high operating leverage. The
22 relatively high degree of fixed costs in the provision of facilities-based
23 telecommunications service exists because of the average LEC's large
24 investment in fixed assets such as central office, transport, and loop
25 facilities. High operating leverage causes Verizon Florida's net income to

1 be highly sensitive to fluctuations in revenues. There is a positive
2 correlation between operating leverage and risk: as operating leverage
3 rises, so does the risk of operation.

4

5 **Q. IS THE CURRENT LEVEL OF LOCAL EXCHANGE COMPETITION**
6 **RELEVANT?**

7 A. No. The FCC's rules require that forward-looking UNE cost studies
8 *assume* a fully competitive market. However, if the Florida Commission
9 analyzes the level of competition in Florida, it should look at the forward-
10 looking level of competition over the life of the investment, not the current
11 level of competition.

12

13 **Q. ARE INVESTORS PRIMARILY CONCERNED WITH CURRENT OR**
14 **EXPECTED FUTURE COMPETITION WHEN THEY ASSESS THE**
15 **INVESTMENT RISK OF VERIZON FLORIDA?**

16 A. Investors are primarily interested in expected future competition when
17 they assess the current investment risk of Verizon Florida because
18 expected future competition is a primary determinant of volatility in the
19 expected returns on their investment.

20

21 **Q. CAN VERIZON FLORIDA'S INVESTMENT RISK BE MEASURED BY**
22 **VERIZON FLORIDA'S CURRENT SHARE OF THE LOCAL EXCHANGE**
23 **MARKET?**

24 A. No. Remarkable as the growth of CLEC revenues and market share may
25 be, current market share statistics are nonetheless a poor indicator of

1 competitive risks in the local exchange market. An incumbent's current
2 market share reflects its historical position as the franchised provider of
3 local exchange services in its service territory. The position of the
4 incumbent as the franchised provider has been eliminated. Investors'
5 perception of risk depends on expected future competition, not current
6 competition as reflected in market share.

7

8 **Q. YOU NOTED PREVIOUSLY THAT THE COST OF CAPITAL TO BE**
9 **USED IN VERIZON FLORIDA'S COST STUDIES MUST BE BASED ON**
10 **THE PRINCIPLE OF FORWARD-LOOKING ECONOMIC COST. IS THE**
11 **FORWARD-LOOKING ECONOMIC COST PRINCIPLE CONSISTENT**
12 **WITH THE USE OF VERIZON FLORIDA'S CURRENT MARKET SHARE**
13 **AS AN INDICATOR OF INVESTMENT RISK?**

14 **A.** No. First, the forward-looking economic cost principle is economically
15 relevant only in a competitive market for telecommunications services.
16 Thus, the forward-looking economic cost principle, at its heart, is based
17 on the assumption that the market for local exchange services is fully
18 competitive.

19

20 Second, the forward-looking economic cost principle requires a
21 consideration of the level of competition and investment risk over the
22 entire future life of Verizon Florida's investment in network facilities.
23 Given the rapid changes in the telecommunications industry and the
24 certainty that competition will increase, Verizon Florida's current market
25 share is a poor indicator of future competition and risk.

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Q. ARE YOU AWARE OF THE STATE OF COMPETITION IN FLORIDA?

A. Yes. Local exchange competition is extensive in Florida. Some 463 CLECs are certificated to offer local exchange service, and CLECs have access to all of Verizon Florida's lines. CLECs own and operate at least 36 switches in Verizon's service area. Facilities-based competitors to Verizon include, among others, 2nd Century, AT&T, Intermedia, ITC Deltacom, KMC, MCI WorldCom, Sprint, Teligent, and Time Warner.

In addition, as shown in the Commission's annual reports on telecommunications competition in Florida, CLECs continue to increase their share of both business and residential access line markets (see Table 1). According to the Commission's draft report released in October 2001, CLEC market share as of June 30, 2001, was 15.6 percent of the business access line market and 4.4 percent of the residential access line market.

TABLE 1
CLEC Access Lines Served At June 30, 2001
As Reported by the Florida Public Service Commission

	1996	1997	1998	1999	2000	2001
Number of CLECs	39	86	191	265	362	463
CLECs Providing Local Service	6	22	51	80	91	107

1	CLEC Access Lines (Thousands of						
2	Lines):						
3	Business	0.6	42	141	439	493	580
4	Residential	0	14	50	97	218	367
5	Total Lines	0.6	56	191	536	711	947
6							
7	Annual Growth – Business Lines		6900%	236%	211%	12%	18%
8	Annual Growth – Residential Lines			257%	94%	125%	68%
9	Annual Growth – Total Lines		9233%	241%	181%	33%	33%
10							
11	CLEC Market Share						
12	Business Lines		1.4%	4.3%	12.2%	14.2%	15.6%
13	Residential Lines		0.2%	0.7%	1.3%	2.7%	4.4%
14	Total Lines		0.5%	1.8%	5.0%	6.1%	7.9%
15							

16

17 The Commission's 2000 competition report identifies numerous

18 communities where CLECs have captured up to 25 percent of the

19 business access line market, including Tampa, Ft. Lauderdale,

20 Jacksonville, Destin, Winter Garden, Orlando, and Pensacola. The 2001

21 draft report does not show comparable data, apparently because some

22 CLECs have not reported data to the Florida Commission on an

23 exchange basis. However, data compiled by Verizon which is not

24 reflected in the Commission's report shows that, as of June 30, 2001,

25 CLECs have 290 NXXs covering all of Verizon Florida's exchanges and

1 interconnection trunks serving all of Verizon Florida's central offices; and
2 CLECs have purchased resale service in every Verizon Florida central
3 office.

4

5 **Q. IS THERE ANY INDICATION THAT DATA IN REPORTS SUCH AS**
6 **THOSE PREPARED BY THE FLORIDA COMMISSION AND THE FCC**
7 **MAY CONSERVATIVELY ESTIMATE CLECS' MARKET SHARE**
8 **PENETRATION?**

9 A. Yes. First, CLECs are not compelled to respond to inquiries regarding
10 their activities; and, since they are active participants in adversarial
11 proceedings such as this one, they have an incentive not to disclose
12 information about the lines they serve. (For example, the Florida
13 competition report notes that there are instances where incumbents
14 report having resold lines in an exchange, but no CLEC acknowledges
15 providing service.) In addition, many larger businesses, educational
16 institutions, and governmental organizations have private networks that
17 provide telecommunications services that bypass the facilities of
18 incumbents; and these activities are not taken into account in the
19 competition reports prepared by the Florida Commission and the FCC.
20 Furthermore, the data in reports prepared by the Florida Commission and
21 the FCC relate only to CLEC activity, not to competitive services offered
22 using competing infrastructures such as cable, Internet, and wireless
23 networks. For example, a recent FCC broadband survey report indicates
24 that subscribership to high-speed Internet access services increased by
25 63 percent during the second half of 2000 and that the incumbent LECs

1 have less than a 30 percent share of the broadband access line market.
2 ["Understanding the Local Exchange and Broadband Markets in Florida,"
3 Division of Policy Analysis and Intergovernmental Liaison, October 2001,
4 pp. 20 – 21, reporting to an August 9, 2001, FCC report on broadband
5 demand at year-end 2000.]

6

7 **Q. HOW DOES RAPIDLY CHANGING TECHNOLOGY AFFECT THE RISK**
8 **OF INVESTING IN INCUMBENT LOCAL EXCHANGE COMPANIES**
9 **SUCH AS VERIZON FLORIDA?**

10 A. Rapidly changing technology increases Verizon Florida's risk in two ways.
11 First, it threatens Verizon Florida's ability to recover the investment cost
12 of its new telecommunications plant. Second, it reduces the cost of entry
13 for competitors. Rapid advances in fiber optics, wireless, and multimedia
14 transmission technologies, for example, have shortened the economic
15 lives of the incumbent LECs' current investments in copper-based
16 facilities and allowed cable TV, interexchange, and wireless companies to
17 compete efficiently to offer local exchange service. Advances in these
18 technologies further threaten the incumbent LECs' heavy investment in
19 landline telecommunications service.

20

21 **Q. IS VERIZON FLORIDA ABLE TO COMPETE ON EQUAL TERMS WITH**
22 **COMPETITORS IN THE LOCAL EXCHANGE?**

23 A. No. Verizon Florida faces a number of disadvantages in its efforts to
24 compete in a fully competitive local exchange market. First, as the
25 incumbent LEC, Verizon Florida has the unique obligation to provide

1 telecommunications services to *all* customers, even those whose rates
2 fail to cover the cost of providing service. Telecommunications prices
3 have historically been set to provide subsidies to high-cost customers in
4 low-density geographic areas. Such subsidies are inconsistent with the
5 competitive framework of the Act. Although the Act provides for the FCC
6 and states to implement mechanisms that eliminate the implicit subsidies
7 that have previously financed the provision of basic local
8 telecommunications service, those implicit subsidies have not yet been
9 eliminated. In truly competitive markets, there are no sources to
10 subsidize prices that are lower than cost. Investors are concerned that
11 the universal service support mechanisms that will be put in place may
12 not be sufficient to balance the incumbent LEC's obligation to continue to
13 provide service in high-cost areas. Competitors, in stark contrast, are
14 free to serve only the most profitable markets.

15
16 Second, Verizon Florida has the unique obligation to make significant
17 investments in the technology and software needed to provide unbundled
18 network elements to competitors. Verizon Florida's competitors,
19 however, have announced their intention to develop their own facilities for
20 providing local exchange service. Thus, Verizon Florida faces the
21 considerable risk that its investments in the technology and software
22 needed to provide unbundled network elements to competitors will not be
23 recovered, and is therefore at a cost disadvantage relative to its
24 competitors.

25

1 Third, Verizon Florida has the unique obligation to share the benefits of
2 network investments with competitors. When Verizon Florida invests to
3 upgrade the technology in its network, Verizon Florida must share the
4 benefits of this investment with competitors through resale and through
5 leasing of unbundled network elements. However, when Verizon
6 Florida's competitors invest to upgrade the technology in their networks,
7 Verizon Florida receives no benefit from the CLECs' investments
8 because Verizon Florida's competitors are not required to unbundle their
9 networks. For example, if AT&T is able to provide a complete package of
10 video, Internet, and voice services from its investments in TCI and
11 MediaOne, AT&T will have a significant competitive advantage compared
12 to Verizon Florida, who is unable to offer such bundled services.
13 However, when Verizon Florida enhances the local portion of its service
14 offerings through upgrades of its network, it is required to share these
15 benefits with all competitors, including AT&T.

16

17 **Q. HOW DOES REGULATION AFFECT THE RISK OF VERIZON**
18 **FLORIDA?**

19 **A.** Since regulation constrains Verizon Florida's activities more than those of
20 its competitors, it impairs Verizon Florida's ability to compete on the same
21 terms as its competitors, thereby increasing the risk of investing in
22 Verizon Florida and thus increasing Verizon Florida's cost of capital.

23

24 **Q. IS THE RISK OF PROVIDING UNBUNDLED NETWORK ELEMENTS**
25 **GREATER THAN THE RISK OF PROVIDING LOCAL EXCHANGE**

1 **SERVICE IN THE CURRENT REGULATORY ENVIRONMENT?**

2 A. Yes. In their eagerness to promote competition for local exchange
3 service at the residential level, regulators have generally set rates for
4 unbundled network elements based on forward-looking economic cost
5 studies that include: (1) aggressive assumptions about the expenses and
6 amount of investment required to build a new telecommunications
7 network using the most efficient technology currently available; and
8 (2) conservative estimates of the appropriate rate of depreciation and
9 cost of capital for that forward-looking network. As a result of these
10 contradictory approaches to estimating these four components of the
11 forward-looking economic cost of providing unbundled network elements
12 (that is, expenses, investment, cost of capital, and depreciation), local
13 exchange carriers such as Verizon Florida have been required to lease
14 unbundled network elements at rates that are below the cost of providing
15 these elements in a competitive environment. Thus, the risk of providing
16 unbundled network elements has exceeded the risk of providing local
17 exchange service.

18
19 Furthermore, the provision of unbundled network elements presents its
20 own unique risk. Verizon Florida is required to provide unbundled
21 network elements primarily to facilitate its competitors' entry into the
22 market. Those competitors will use unbundled network elements for
23 short periods until it becomes economical for them to build their own
24 networks, and abandon their use of Verizon Florida's network. Verizon
25 Florida is essentially facilitating the movement of business off its network,

1 which presents a significant additional risk. In addition, Verizon Florida
2 receives only a single revenue stream from the provision of unbundled
3 network elements. By contrast, in the provision of local exchange
4 service, Verizon Florida can compete to provide multiple services over
5 the same line, and hence receive multiple revenue streams. Thus, the
6 risk of providing unbundled network elements clearly exceeds the risk of
7 providing local exchange service.

8

9 **Q. HAVE YOU CONSIDERED THE POTENTIAL IMPACT OF LONG-TERM**
10 **COMMITMENTS TO TAKE AND PAY FOR UNBUNDLED NETWORK**
11 **ELEMENTS ON THE RISK OF INVESTING IN THE FACILITIES**
12 **REQUIRED TO PROVIDE UNBUNDLED NETWORK ELEMENTS?**

13 **A. Yes. As noted above, Verizon's competitors may choose at any time to**
14 **discontinue purchasing UNEs from Verizon. Long-term commitments to**
15 **take and pay for unbundled network elements, in theory, could reduce the**
16 **risk of Verizon Florida's forward-looking investment in facilities to provide**
17 **unbundled network elements. However, the key rates to be established in**
18 **this proceeding are quoted at a price per month, or per minute of use. A**
19 **competing carrier may choose not to use Verizon Florida's facilities, or it**
20 **may choose to use these facilities for one month at a time. Thus, while**
21 **Verizon Florida is required to provide other carriers with unbundled**
22 **network elements, competitors are under no obligation to use Verizon**
23 **Florida's elements for any specific period of time. In short, there are no**
24 **long-term commitments to take and pay for unbundled network elements**
25 **that might reduce the risk of Verizon Florida's investment in the facilities**

1 and software to provide interconnection and unbundled network
2 elements.

3

4 **Q. HOW DOES THE FORWARD-LOOKING RISK OF INVESTING IN THE**
5 **FACILITIES REQUIRED TO PROVIDE UNBUNDLED NETWORK**
6 **ELEMENTS COMPARE TO THE FORWARD-LOOKING RISK OF**
7 **INVESTING IN THE STANDARD & POOR'S INDUSTRIALS (S&P**
8 **INDUSTRIALS)?**

9 A. The forward-looking risk of investing in the facilities required to provide
10 unbundled network elements in Florida is at least as great as the forward-
11 looking risk of investing in the S&P Industrials.

12

13 **Q. WHY DO YOU BELIEVE THAT THE RISK OF INVESTING IN THE**
14 **FACILITIES REQUIRED TO PROVIDE UNBUNDLED NETWORK**
15 **ELEMENTS IN FLORIDA IS AT LEAST AS GREAT AS THE**
16 **FORWARD-LOOKING RISK OF INVESTING IN THE S&P**
17 **INDUSTRIALS?**

18 A. As I noted above, the risk of investing in the facilities to provide
19 unbundled network elements depends on operating leverage, the degree
20 of competition, rapidly changing technology, and the regulatory
21 environment. The degree of operating leverage required to provide
22 facilities-based telecommunications services far exceeds the average
23 degree of operating leverage required to provide the goods and services
24 offered by companies in the S&P Industrials. Telecommunications is also
25 a high technology business that is particularly sensitive to the risks of

1 rapidly changing technology. Furthermore, the regulatory environment
2 has placed restrictions on incumbents in their ability to compete on equal
3 terms with their competitors. These three factors—high operating
4 leverage, rapidly changing technology, and the regulatory environment—
5 tend to make the risk of investing in the facilities required to provide
6 unbundled network elements greater than the risk of investing in the S&P
7 Industrials.

8
9 The only factor that might reduce the risk of investing in the facilities
10 required to provide unbundled network elements is the level of
11 competition. However, the FCC's cost study principles require that cost
12 studies "replicate . . . the conditions of a competitive market" for
13 unbundled network elements. In addition, the level of competition for
14 unbundled network elements is increasing rapidly. Taken as a whole, my
15 analysis of the factors affecting the risk of investing in the facilities
16 required to provide unbundled network elements causes me to believe
17 that this risk is at least as great as the risk of investing in the S&P
18 Industrials.

19

20 **IV. Estimate of the Weighted Average Cost of Capital for**
21 **Use in Verizon Florida's Forward-Looking Cost**
22 **Studies**

23

24 **Q. HOW DID YOU CALCULATE THE WEIGHTED AVERAGE COST OF**
25 **CAPITAL THAT YOU RECOMMEND FOR USE IN VERIZON**

1 **FLORIDA'S FORWARD-LOOKING COST STUDIES?**

2 A. I calculated the weighted average cost of capital to be used in Verizon
3 Florida's forward-looking cost studies by analyzing the market-based
4 percentages of debt and equity in the capital structures of competitive
5 firms, the market cost of debt, and the market-required rate of return on
6 an equity investment in competitive firms of comparable risk.

7

8 **A. TARGET CAPITAL STRUCTURE**

9

10 **Q. HOW DID YOU DETERMINE AN APPROPRIATE TARGET CAPITAL**
11 **STRUCTURE FOR USE IN VERIZON FLORIDA'S FORWARD-**
12 **LOOKING COST STUDIES?**

13 A. To determine an appropriate target capital structure for use in Verizon
14 Florida's forward-looking cost studies, I examined capital structure data
15 for both my proxy group of S&P Industrials and a group of
16 telecommunications companies with incumbent local exchange
17 subsidiaries. I examined the most current available data for these
18 companies, and I also reviewed data for the past five years. In all
19 periods, the average market value capital structure for these companies
20 contains no more than 25 percent debt, and no less than 75 percent
21 equity.

22

23 **Q. WHAT ARE THE AVERAGE MARKET VALUE CAPITAL**
24 **STRUCTURES OF THE S&P INDUSTRIALS AND THE**
25 **TELECOMMUNICATIONS COMPANIES WITH INCUMBENT LOCAL**

1 **EXCHANGE OPERATIONS?**

2 A. Table 2 below shows the average year-end market value capital
3 structures of the S&P Industrials and the telecommunications companies
4 for the five-year period 1996 through 2000. These data show that both
5 groups, on average, have at least 75 percent equity (and generally have
6 more than 75 percent equity) in their capital structures.

7

8

Table 2

9

Capital Structure of the S&P Industrials

10

and Telecommunications Companies at Year End

11

(\$ in Millions)

12

S&P Industrials

Telecom Companies

13

Market Total Percent

Market Total Percent

14

Value Debt Equity

Value Debt Equity

15

1996 1,700,587 285,381 85.6% 107,320 28,004 79.3%

16

1997 2,289,166 323,858 87.6% 204,385 50,221 80.3%

17

1998 2,863,543 353,205 89.0% 308,876 53,124 85.3%

18

1999 3,052,212 405,374 88.3% 381,874 68,495 84.8%

19

2000 3,041,722 469,285 86.6% 398,381 111,479 78.1%

20

Total 12,947,231 1,837,104 87.6% 1,400,837 311,324 81.8%

21

22

Q. BASED ON YOUR REVIEW OF THESE DATA, WHAT IS YOUR

23

RECOMMENDED TARGET MARKET VALUE CAPITAL STRUCTURE

24

FOR USE IN VERIZON FLORIDA'S FORWARD-LOOKING COST

25

STUDIES?

1 A. Based on my examination of these data, I recommend that a target
2 market value capital structure containing 25 percent debt and 75 percent
3 equity be used to calculate Verizon Florida's weighted average cost of
4 capital.

5

6

B. COST OF DEBT

7

8 **Q. HOW DID YOU MEASURE THE MARKET COST OF DEBT**
9 **INVESTMENTS?**

10 A. I used the 7.55 percent average yield to maturity on Moody's A-rated
11 industrial bonds for March 2001, as reported by Moody's Investors
12 Service. This estimate is conservative because it does not include the
13 flotation costs that must be paid to issue the debt securities required to
14 finance the building of local exchange facilities on a forward-looking
15 basis.

16

17

C. COST OF EQUITY

18

19 **Q. HOW DID YOU MEASURE THE MARKET COST OF AN EQUITY**
20 **INVESTMENT IN VERIZON FLORIDA?**

21 A. I applied the Discounted Cash Flow (DCF) Model to the S&P Industrials.

22

23 **Q. WHY DID YOU APPLY THE DCF MODEL TO THE S&P**
24 **INDUSTRIALS?**

25 A. A proper definition of the cost of capital for use in Verizon Florida's

1 forward-looking cost studies is based on the assumption that the market
2 for local exchange services is competitive. As previously noted, the FCC
3 stated in the *Local Competition Order* that it sought to establish UNE
4 pricing rules that simulate conditions in a competitive marketplace.
5 However, at the present time, there are no publicly-traded companies that
6 have built telecommunications networks solely for the purpose of
7 providing unbundled network elements in a competitive market. Since
8 the S&P Industrials are a well-known sample of publicly traded
9 competitive companies whose risk, on average, approximates the risk the
10 incumbent LECs actually face in providing telecommunications services
11 in a competitive market, I believe the S&P Industrial group is a
12 conservative proxy for the risks of investing in the facilities required to
13 provide local exchange services on a forward-looking basis.

14

15 **Q. DOES THE S&P INDUSTRIAL GROUP FACE THE SAME RISK AS A**
16 **COMPANY BUILDING A NEW TELECOMMUNICATIONS NETWORK?**

17 **A.** No. The S&P Industrial group certainly faces less risk than a company
18 building an entirely new telecommunications network for providing UNEs,
19 using the most efficient technology to satisfy the foreseeable demand for
20 telecommunications service. A better proxy group for this latter company
21 would include such companies as Teligent, Allegiance, Covad, Rhythms,
22 Metromedia Fiber Network, Level 3, Qwest, Global Crossing, The
23 Williams Companies, and McLeodUSA. My recommended cost of capital
24 would be many times higher if I looked at companies that were building
25 entirely new networks to provide UNEs.

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Q. WHAT DCF RESULT DID YOU OBTAIN FROM YOUR APPLICATION OF THE DCF MODEL TO THE S&P INDUSTRIALS?

A. As shown in Exhibit JWV-1, I obtained a market-weighted average DCF cost of equity of 14.75 percent for the S&P Industrials.

Q. IN ADDITION TO YOUR DCF RESULTS FOR THE S&P INDUSTRIALS, HAVE YOU ALSO CALCULATED DCF RESULTS FOR A GROUP OF TELECOMMUNICATIONS COMPANIES THAT PROVIDE LOCAL EXCHANGE SERVICE?

A. Yes, I have. As shown in Exhibit JWV-2, the average cost of equity for my group of telecommunications companies that provide local exchange service is 15.52 percent.

D. WEIGHTED AVERAGE COST OF CAPITAL

Q. WHAT IS YOUR ESTIMATE OF VERIZON FLORIDA'S OVERALL WEIGHTED AVERAGE COST OF CAPITAL?

A. I estimate Verizon Florida's overall weighted average cost of capital to be 12.95 percent. This estimate is based on a 7.55 percent market cost of debt, a target market value capital structure containing 25 percent debt and 75 percent equity, and a cost of equity of 14.75 percent (see Table 3).

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Table 3

Weighted Average Cost of Capital Using 25/75 Capital Structure

<u>Source of Capital</u>	<u>Cost Rate</u>	<u>Percent</u>	<u>Weighted Cost</u>
Debt	7.55%	25.00%	1.89%
Equity	14.75%	75.00%	11.06%
WAAC			12.95%

Q. ON THE BASIS OF YOUR COST OF CAPITAL STUDIES, WHAT IS YOUR CONCLUSION REGARDING THE REASONABLENESS OF THE 12.95 PERCENT WEIGHTED AVERAGE COST OF CAPITAL VERIZON FLORIDA USED IN ITS FORWARD-LOOKING COST STUDIES?

A. I conclude that 12.95 percent is a conservative estimate of the weighted average cost of capital that should be used in Verizon Florida's forward-looking studies of the cost of providing unbundled network elements and interconnection.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, it does.

Company	Average Price	Annual Dividend	I/B/E/S Mean Growth	Cost Of Equity
Albertsons Inc	29.63	0.760	11.4%	14.44%
Abbott Laboratories	46.12	0.760	12.4%	14.36%
Archer-Daniels-Midland Co	14.03	0.200	11.8%	13.49%
Automatic Data Processing	54.14	0.410	15.1%	16.02%
Aetna Inc	35.56	0.800	12.7%	15.39%
American Home Products Corp	57.40	0.920	13.5%	15.43%
American Greetings	12.53	0.400	9.5%	13.23%
Air Products & Chemicals Inc	39.93	0.760	11.1%	13.34%
Allegheny Technologies Inc	17.80	0.800	10.6%	15.93%
Avon Products	40.70	0.740	12.4%	14.57%
Avery Dennison Corp	52.78	1.200	12.8%	15.52%
Baxter International Inc	90.11	1.164	13.5%	15.05%
Brunswick Corp	21.06	0.500	12.8%	15.65%
Bard (C.R.) Inc	43.53	0.840	12.2%	14.50%
Black & Decker Corp	40.14	0.480	14.5%	15.95%
Becton Dickinson & Co	33.73	0.380	12.2%	13.54%
BellSouth Corp	39.48	0.760	11.9%	14.18%
Biomet Inc	39.38	0.107	15.0%	15.33%
Bemis Co	33.67	0.960	11.4%	14.78%
Bristol Myers Squibb	57.65	0.980	12.5%	14.53%
Computer Associates Intl Inc	27.64	0.080	15.7%	16.05%
Conagra Foods Inc	18.75	0.900	9.8%	15.46%
Caterpillar Inc	44.08	1.360	9.8%	13.41%
Cooper Industries Inc	39.23	1.400	10.3%	14.50%
Carnival Corp	28.50	0.420	14.0%	15.78%
Cigna Corp	107.60	1.240	13.2%	14.58%
Colgate-Palmolive Co	54.40	0.630	12.5%	13.88%
Clorox Co/De	33.05	0.840	11.9%	14.92%
Cooper Tire & Rubber	12.80	0.420	10.3%	14.16%
CenturyTel Inc	27.68	0.190	13.6%	14.42%
Centex Corp	40.48	0.160	13.0%	13.47%
Disney (Walt) Company	28.53	0.210	14.6%	15.49%
Dow Jones & Co Inc	56.20	1.000	11.1%	13.20%
Deluxe Corp	23.24	1.480	6.7%	14.04%
Donnelley (R R) & Sons Co	27.52	0.920	11.6%	15.58%
Darden Restaurants Inc	22.83	0.080	14.9%	15.32%
Engelhard Corp	25.18	0.400	12.6%	14.50%
Ecolab Inc	40.98	0.520	14.0%	15.53%
Eastman Kodak Co	42.72	1.760	8.5%	13.28%
Emerson Electric Co	64.48	1.530	12.6%	15.44%
EOG Resources Inc	45.00	0.140	14.4%	14.78%
Eaton Corp	69.89	1.760	10.5%	13.46%
First Data Corp	58.90	0.080	14.5%	14.66%
Fortune Brands Inc	32.63	0.960	11.6%	15.10%
Sprint FON Group	21.77	0.500	12.3%	15.04%
Gillette Co	31.71	0.650	11.6%	14.03%
Gannett Co	60.68	0.880	12.0%	13.72%
General Mills Inc	43.55	1.100	10.7%	13.67%
Genuine Parts Co	25.84	1.140	8.2%	13.31%
Goodrich (B F) Co	38.40	1.100	12.1%	15.52%
Goodyear Tire & Rubber Co	25.10	1.200	9.6%	15.22%

Company	Average Annual Price	Annual Dividend	I/B/E/S Mean Growth	Cost Of Equity
Grainger (W W) Inc	33.51	0.680	12.3%	14.72%
Harcourt General Inc	55.85	0.840	14.3%	16.12%
HCA-Healthcare Co	37.15	0.080	14.9%	15.16%
Hilton Hotels Corp	10.90	0.080	12.5%	13.37%
Heinz (H J) Co	40.29	1.570	9.2%	13.75%
Honeywell International Inc	40.99	0.750	13.9%	16.11%
Hewlett-Packard Co	30.30	0.320	14.3%	15.58%
Intl Business Machines Corp	98.03	0.520	13.2%	13.83%
ITT Industries Inc	39.61	0.600	13.9%	15.73%
Illinois Tool Works	61.15	0.800	12.9%	14.46%
Johnson Controls Inc	64.59	1.240	13.6%	15.91%
Johnson & Johnson	90.18	1.280	12.9%	14.60%
Nordstrom Inc	17.03	0.360	13.0%	15.54%
Kimberly-Clark Corp	68.11	1.080	11.3%	13.17%
Kerr-McGee Corp	66.75	1.800	11.8%	15.01%
Coca-Cola Co	48.83	0.680	13.0%	14.67%
Leggett & Platt Inc	19.65	0.440	12.7%	15.38%
Liz Claiborne Inc	46.86	0.450	12.3%	13.44%
Lilly (Eli) & Co	75.20	1.120	13.2%	14.99%
Lockheed Martin Corp	35.55	0.440	11.9%	13.37%
May Department Stores Co	37.83	0.930	10.6%	13.49%
McGraw-Hill Companies	57.65	0.940	13.1%	15.05%
Minnesota Mining & Mfg Co	109.13	2.320	11.4%	13.91%
Molex Inc	37.25	0.100	14.9%	15.23%
Merck & Co	73.52	1.360	11.9%	14.10%
USX-Marathon Group	27.92	0.920	10.1%	13.97%
Maytag Corp	34.00	0.720	13.3%	15.85%
Nucor Corp	43.58	0.600	14.3%	15.97%
New York Times Co	42.20	0.460	12.5%	13.80%
Pitney Bowes Inc	34.70	1.160	11.9%	15.89%
Pepsico Inc	43.68	0.560	13.3%	14.84%
Procter & Gamble Co	65.33	1.400	11.4%	13.93%
Parker-Hannifin Corp	41.81	0.720	11.6%	13.64%
Rohm & Haas Co	34.24	0.800	11.6%	14.37%
Rockwell Intl Corp	42.38	1.020	11.0%	13.84%
Raytheon Co -CI B	29.02	0.800	10.8%	14.05%
Sears Roebuck & Co	36.88	0.920	10.3%	13.22%
SBC Communications Inc	43.88	1.015	13.3%	16.08%
Schering-Plough	36.98	0.560	13.7%	15.52%
Sherwin-Williams Co	25.49	0.540	11.0%	13.50%
Snap-On Inc	29.28	0.960	10.1%	13.95%
Supervalu Inc	13.38	0.550	11.0%	15.88%
Stanley Works	34.62	0.920	11.7%	14.86%
Target Corp	36.08	0.220	15.1%	15.84%
Tosco Corp	42.02	0.320	12.7%	13.61%
Tribune Co	39.17	0.440	13.1%	14.44%
TRW Inc	36.90	1.400	9.6%	14.04%
Tupperware Corp	23.95	0.880	11.8%	16.19%
Texaco Inc	66.94	1.800	10.7%	13.87%
Textron Inc	55.62	1.300	13.1%	15.91%
United Technologies Corp	73.70	0.900	13.8%	15.27%

Company	Average Annual Price	Annual Dividend	I/B/E/S Mean Growth	Cost Of Equity
VF Corp	34.96	0.920	11.2%	14.31%
Verizon Communications	47.15	1.540	11.6%	15.49%
Wendy's International Inc	22.78	0.240	14.1%	15.37%
Whirlpool Corp	52.44	1.360	11.4%	14.47%
Waste Management Inc	25.70	0.010	14.2%	14.25%
Wal-Mart Stores	48.55	0.240	14.5%	15.10%
USX-U S Steel Group	15.68	1.000	8.1%	15.54%
Market Weighted Average				14.75%

Source: Standard & Poor's Compustat Database. Price is average of March 2001 high and low prices. Quarterly dividend obtained from the annual dividend rate as reported by Compustat, divided by 4. I/B/E/S growth rate is the mean estimate of the long-term growth rate as reported by Compustat.

Notes: In applying the DCF Model to the S&P Industrials, I included in the DCF analysis only those companies in the S&P Industrial group which have a reported stock price, pay a dividend, have a positive growth rate, have at least three analysts' long-term growth estimates, and have at least one common share outstanding. To be conservative, I also eliminated those 25 percent of companies with the highest and lowest DCF results, those companies with cost of equity results equal to or below the March 2001 average yield on Moody's A-rated industrial bonds or equal to or above 20 percent. The weighted average DCF result for all four quartiles of the S&P Industrials was 15.01 percent, while the weighted average DCF result for 2nd and 3rd quartiles shown here on Schedule JWV-1 is 14.75 percent. Elimination of the 1st and 4th quartiles of the S&P Industrials had a negligible effect on the market value capital structure.

Notation:

- d_0 = Quarterly Dividend (indicated annual dividend divided by 4).
- P_0 = Average of the monthly high and low stock prices March 2001.
- FC = Flotation costs expressed as a percent of gross proceeds (5 percent).
- g = I/B/E/S mean forecast of future earnings growth.
- k = Cost of equity using the quarterly version of the DCF Model as shown by the formula below:

$$k = \left[\frac{d_0(1+g)^{\frac{1}{4}}}{P_0} + (1+g)^{1/4} \right]^4 - 1$$

Company	Average Price	Annual Dividend	I/B/E/S Mean Growth	Cost of Equity
ALLTEL	52.69	1.320	13.8%	16.83%
BellSouth	39.48	0.760	11.9%	14.18%
SBC Communications	43.88	1.015	13.3%	16.08%
Verizon Communications	47.15	1.540	11.6%	15.49%
Market Weighted Average				15.52%

Source: Standard & Poor's Compustat Database. Price is average of March 2001 high and low prices. Quarterly dividend obtained from the annual dividend rate as reported by Compustat, divided by 4. I/B/E/S growth rate is the mean estimate of the long-term growth rate as reported by Compustat.

Notation:

- d_0 = Quarterly Dividend (indicated annual dividend divided by 4).
- P_0 = Average of the monthly high and low stock prices March 2001.
- FC = Flotation costs expressed as a percent of gross proceeds (5 percent).
- g = I/B/E/S mean forecast of future earnings growth.
- k = Cost of equity using the quarterly version of the DCF Model as shown by the formula below:

$$k = \left[\frac{d_0(1+g)^{1/4}}{P_0} + (1+g)^{1/4} \right]^4 - 1$$