COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF TELECOMMUNICATIONS AND ENERGY

Investigation by the Department of Telecommunications and Energy on its own Motion into the Appropriate Pricing, based upon Total Element Long-Run Incremental Costs, for Unbundled Network Elements and Combinations of Unbundled Network Elements, and the Appropriate Avoided Cost Discount for Verizon New England, Inc. d/b/a Verizon Massachusetts' Resale Services in the Commonwealth of Massachusetts

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DIRECT TESTIMONY OF JOHN I. HIRSHLEIFER
ON BEHALF OF AT&T

May 8, 2001

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I.

INTRODUCTION & QUALIFICATIONS

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is John I. Hirshleifer and my business address is Charles River Associates, Inc., 10877 Wilshire Blvd., Suite 710, Los Angeles, California 90024. I am a Vice President at Charles River Associates, Inc. ("CRA"), an international financial and economic consulting firm.

Q. WHAT IS YOUR EDUCATIONAL AND PROFESSIONAL BACKGROUND?

A. I graduated from the University of California at Los Angeles with a B.A. degree in 1976. Subsequently, I received my M.B.A. in finance in 1980 from UCLA's Anderson Graduate School of Management.

I worked at Price Waterhouse from 1980 to 1984 and I am a certified public accountant in the State of California. From 1985 through 1990 I was the due diligence officer of Transamerica Financial Resources, Inc. (TFR), the broker-dealer subsidiary of Transamerica Corporation. While at Transamerica I held the registered representative, securities principal and financial and operations principal licenses, and ultimately became TFR's treasurer and chief financial officer. From 1991 through 1999 I was Vice President and Director of Research of FinEcon, a firm which provided financial economic consulting services to corporations, law firms and government agencies. At FinEcon I was responsible for numerous engagements involving securities, valuation and cost of

capital issues. In 1999, FinEcon merged with CRA. As a Vice President with CRA, my duties are substantially similar to those I held at FinEcon.

In the past several years, I have provided cost of capital testimony in numerous state proceedings regarding the provision of unbundled network elements ("UNEs") to competing local exchange carriers and the provision of universal service, and have testified in the FCC's current proceeding regarding the represcription of rates for the provision of interstate access services.[1] I have filed an affidavit regarding Verizon New England Inc.'s ("VZ-NE") application to the FCC dated November 2, 2000 to provide in-region interLATA services in Massachusetts. I also co-authored an article entitled "Estimating the Cost of Equity", which was published in the Autumn 1997 issue of *Contemporary Finance Digest*. My resume is attached as Attachment JH-1.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. I have been asked by AT&T to estimate the forward-looking economic cost of capital that should be used in determining VZ-NE's forward-looking economic costs to provide UNEs in Massachusetts.

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II.

SUMMARY OF TESTIMONY/RECOMMENDATIONS

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Q. PLEASE SUMMARIZE THE BASIC APPROACH OF YOUR TESTIMONY.

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

Q. WHAT DO YOU MEAN BY THE WACC FORMULA?

The WACC formula is given by the following equation [equation (1)]:

$$WACC = w_d * k_d + w_e * k_e \quad (1)$$

where,

w_d = the fraction of debt in the capital structure,

k_d = the forward-looking cost of debt,

w_e = the fraction of equity in the capital structure,

k_e = the forward-looking cost of equity.

Thus, in order to estimate a forward-looking weighted average cost of capital I estimate the forward-looking cost of both debt (bonds) and equity (common stock) using methodologies that are well accepted by both financial economists and regulators. In addition, I estimate the appropriate capital structure mix of debt and equity capital. With these inputs, the WACC can be calculated from equation (1).

COULD YOU BRIEFLY SUMMARIZE YOUR COST OF CAPITAL METHODOLOGY AND RESULTS?

1. I have estimated the WACC for the business of providing unbundled network elements (UNE's) by VZ-NE in Massachusetts.

2. As there are no public companies solely involved in the provision of UNE's, my analysis starts with a proxy group of telephone holding companies, which own local exchange companies and also the underlying network elements.

3. However, as noted by analysts, the credit rating agencies and the FCC, telephone holding companies also own many businesses that are much riskier than the leasing of UNEs, such as wireless and international ventures. The risk of such other ventures is not relevant to the cost of capital for the wholesale leasing of UNEs by VZ-NE. Thus, by starting with this proxy group, the WACC estimated for the telephone holding companies will be higher than what applies to the network element leasing business alone.

4. Using a market value capital structure of the telephone holding companies for weighting the costs of debt and equity yields a WACC estimate for Verizon Communications Inc. (Verizon), the holding company which owns many riskier businesses in addition to the UNE business. This consequently provides an upper bound estimate in my WACC range.

5. To estimate the WACC applicable to UNE's alone, I also calculate the WACC using book value capital structure weights, and then take the midpoint as the best estimate.

6. The WACC range and midpoint estimate that I arrive at as of June 30, 2000 are:

1) WACC range: 9.17% to 9.91%

2) midpoint estimate: 9.54%

7. Based on a:

1) Cost of debt of: 7.86%

2) Cost of equity of: 10.42%

8. The cost of debt is estimated by calculating the weighted average market yield to maturity at June 30, 2000 on all of the long-term debt of Verizon and its subsidiaries.

9. The cost of equity is estimated by averaging the results of the three-stage DCF model and the CAPM model.

10. The capital structure implied by using the midpoint WACC estimate is:

1) Equity: 65.5%

2) Debt: 34.5%

11. As a reality check, I looked at discount rates used by investment banks in the proxy statements of telecommunications companies, and at cost of capital estimates used in numerous analysts reports which largely support the reasonableness of my WACC estimate.

Q. HOW IS THE REMAINDER OF YOUR TESTIMONY ORGANIZED?

A. The remainder of my testimony is divided into six sections. Section III discusses the fundamental relationship between risk and the cost of capital. Section IV addresses the cost of debt that should be employed. Section V discusses several approaches to estimating the cost of equity capital. Section VI addresses the question of determining the appropriate capital structure to use when calculating the WACC, and presents my estimates of the WACC. Section VII discusses why the cost of capital I have calculated for VZ-NE, based on the public data available for companies at the holding company level, is likely to overstate the relevant cost of capital for the leasing of UNEs. Finally, Section VIII presents a summary of my conclusions.

III.

THE RELATIONSHIP BETWEEN RISK AND THE COST OF CAPITAL

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

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

Q. WHAT ARE THE FUNDAMENTAL DETERMINANTS OF INVESTMENT RISK?

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

Q. ARE OPERATING RISK AND FINANCIAL RISK RELATED?

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

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

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

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

Q. WHAT COMPARABLES DO YOU USE IN THIS TESTIMONY?

A. The comparable companies selected were derived from the list of telephone operating companies in Standard and Poor's Industry Survey. These companies are presented along with some descriptive information at Attachment JH-2, and include three regional Bell holding companies ("RBHCs"), and two larger independent telephone holding companies.

The only RBHC omitted from the sample was US West, which merged with QWEST on June 30, 2000. As a result of this merger, no stand-alone capital structure information was available for US West as of this date. Exclusion of US West from the sample is, in fact, conservative. If US West were included in the sample for the purposes of calculation of Verizon's cost of equity, the cost of equity and the weighted average cost of capital would have been a few basis points lower.

Telephone and Data Systems was excluded because only 27% of its revenues derive from traditional telephone and network operations, it had only 646,000 access lines in mostly rural areas, and 64% of revenues come from its high-risk cellular operations.(3) Cincinnati Bell (now BroadWing Inc.) was excluded because it has ceased paying dividends (to focus on investing in higher-growth businesses) and because I/B/E/S did not have an analyst growth estimate.

IV.

THE COST OF DEBT CAPITAL

Q. HOW DO YOU ESTIMATE THE FORWARD-LOOKING COST OF DEBT FOR VZ-NE IN MASSACHUSETTS?

A. Because debt payments are fixed, the cost of debt can be computed directly and with a high degree of accuracy.(4) For this reason, I am able to utilize the costs of debt on the outstanding debt securities for Bell Atlantic and GTE, which I combine to estimate the cost of debt for Verizon. It is not necessary to use a sample of companies to estimate the cost of debt for the individual company because of the small measurement error.

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

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

The data from the Bond Guide are presented in Attachment JH-3a. For both of the companies' major debt issues the Attachment shows the bond rating, the face value and the market yield to maturity. The yield to maturity is a forward-looking cost of debt that measures the rate that the company would have to pay if the bonds were issued at the measurement date, and reflects investors' expectations regarding the future returns on these publicly-traded bonds.(6)

The June 30, 2000 cost of debt for Verizon is estimated as a weighted average yield to maturity of the bonds of Bell Atlantic and GTE listed in the Standard & Poor's Bond Guide. The resulting estimate is 7.86%. (See Attachments 3-a, 3-b and 3-c.) Consequently, I use **7.86 percent** as the cost of debt of Verizon in my WACC analysis.

DO THESE DEBT COST ESTIMATES INCLUDE THE COST OF SHORT TERM DEBT?

A. No. Because of data limitations, I have not tried to incorporate the impact of short-term debt in my study as of June 30, 2000, such as the effect of the cost of commercial paper issued by the operating telephone companies. Including the cost of short-term debt would reduce the overall cost of debt, and thus would reduce the weighted average cost of capital.

V.

THE COST OF EQUITY CAPITAL

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

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

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

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

Q. PLEASE EXPLAIN THE BASIC DISCOUNTED CASH FLOW METHOD.

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

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

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

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

Q. WHAT ARE THE SIMPLIFYING ASSUMPTIONS THAT ARE EMPLOYED IN THE CONTEXT OF THE DCF MODEL?

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

$$P = Div_1 / (1+k) + Div_1 * (1+g) / (1+k)^2 + Div_1 * (1+g)^2 / (1+k)^3 + \ldots ,$$

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

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

Q. SHOULD THE DEPARTMENT USE THE CONSTANT GROWTH DCF EQUATION GIVEN ABOVE IN ESTIMATING THE COST OF CAPITAL FOR YOUR SAMPLE OF TELEPHONE COMPANIES?

A. No. Once again a problem is raised by the fact that modern telephone holding companies are composed of a variety of businesses, some of which-- such as wireless telephony and high-speed internet access-- are expected to grow at rates of 25 percent or more in the short run.

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

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

Ibbotson Associates state that:

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

Sharpe,(9) Alexander and Bailey state that:

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

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

One approach is to use constant or two-stage dividend growth, models, as described in the text. However, although such models are relatively easy to apply, institutional investors typically view the assumed dividend growth assumptions as overly simplistic. Instead,

these investors generally prefer three-stage models, believing that they provide the best combination of realism and ease of application.

…[M]ost three-stage DDMs make standard assumptions that all companies in the maturity stage have the same growth rates, payout ratios and return on equity."(10)

Damodaran states that:

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

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

…If a firm is likely to maintain a few years of above-stable growth rates, an approximate value for the firm can be obtained by adding a premium to the stable growth rate, to reflect the above-average growth in the initial years. Even in this case, the flexibility that the analyst has is limited. The sensitivity of the model to growth implies that the stable growth rate cannot be more than 1% or 2% above the growth rate in the economy. If the deviation becomes larger, the analyst will be better served by using a two-stage or a three-stage model to capture the supernormal or above-average growth and restricting the use of the Gordon growth model to when the firm becomes truly stable."(11)

Copeland, Koller and Murrin echo these observations, stating that "[f]ew companies can be expected to grow faster than the economy for long periods of time."(12)

Q. HOW DO YOU APPLY THE DCF MODEL?

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

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

A. To estimate growth rates during the first five years I use the Value Line dividend forecasts for the year 2001, which incorporate Value Line's projection of dividend growth for the full year, and individual company earnings forecast data from Institutional Brokers' Estimate System ("I/B/E/S") as of June 2000 for the subsequent four years. To compile the I/B/E/S data, more than 7,000 financial analysts representing over 800 research organizations provide I/B/E/S with research on 18,000 stocks in 56 countries. In the U.S. alone, I/B/E/S receives estimates for 6,000 companies from over 240 research firms.(14)

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

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

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

A. The long-term growth forecast was derived by averaging the long-term GNP growth forecasts obtained from the Wharton Econometric Forecasting Associates ("WEFA") Group and from Ibbotson Associates. The WEFA Group is an econometric forecasting organization, formed in 1987 through a merger of WEFA and Chase Econometrics. Ibbotson Associates is widely known in the fields of finance and valuation as one of the leading providers of securities returns data and publications. As of June 2000, WEFA predicted an average nominal GNP growth rate of 4.97% from 2000 through 2025. As of June 2000, Ibbotson Associates forecast long-term inflation to be 4.10% annually. By adding this inflation forecast to the historical average long-term real GNP growth rate of 3.50%, Ibbotson Associates predicted a nominal GNP growth rate of 7.60%. I take the average of the two forecasts, 6.29%, rather than choose a single GNP forecast.

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

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

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

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

Q. YOUR SAMPLE IS COMPRISED OF FIVE COMPANIES. DO YOU BELIEVE THAT THIS PARTICULAR SAMPLE IS SUFFICIENTLY LARGE FOR THE PURPOSE OF YOUR STUDY?

A. Yes. Larger sample sizes of similar companies are desirable in order to reduce measurement error. However, the companies should share important similarities to the subject business, which in this case is the ownership of subsidiaries that own significant network elements being utilized to provide local exchange service. My sample is composed of primarily giant telecommunications holding companies which own much of the network elements in use in the United States. Three of the companies have assets in excess of $24 billion dollars and are some of the largest companies in the world. Many of these companies have been formed by the mergers of several formerly-independent regional telephone holding companies with substantial local telephone holdings, such as Bell Atlantic, GTE, NYNEX, SNET, Pacific Bell and Ameritech. In prior studies, I included such companies in the sample when they were independent entities.

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

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

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

A. Attachment JH-4 presents the DCF estimates of the cost of equity capital derived from the three-stage model for the telephone company sample. The estimates range from a low of 9.13 percent to a high of 11.07 percent.(17)

Using the DCF approach, the cost of equity capital for Verizon is estimated to be 10.24 percent, based on a value-weighted average of the equity cost of capital for all telephone holding companies (excluding Verizon) and the cost of capital for Verizon itself. The table below shows how this weighted average cost of equity capital was computed:

WEIGHTED AVERAGE DCF COST OF EQUITY FOR VERIZON

	Weight	Rate	Weighted Cost
Average (excluding Verizon)	.75	9.96%	7.47
Verizon	.25	11.07%	2.77
Weighted Cost of Equity			**10.24%**

Q. WHY DO YOU USE A WEIGHTED AVERAGE TO COMPUTE VERIZON'S DCF COST OF EQUITY?

A. There is a trade-off between two considerations. First, because the DCF approach, like any approach, estimates the cost of equity capital with error, it is wise to use an average. This is because in the averaging process errors tend to cancel with overestimates offsetting underestimates. However, the DCF method does not have a mechanism to adjust for differences in risk caused by differing capital structures employed by the firms in the sample. Therefore, of all the individual companies in the sample, Verizon provides the best estimate of Verizon's own cost of capital. In light of these two considerations, I feel a weighted average which assigns a ¾ weight to the average excluding Verizon and a ¼ weight to Verizon is the best estimate. Using this procedure, Verizon is given a significantly larger weight than any of the other companies in the sample, but a smaller weight than the aggregate of all the comparables.

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

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

Q. WHAT ARE CAPITAL ASSET PRICING MODELS?

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

Q. HOW DOES THE CAPITAL ASSET PRICING MODEL WORK?

A. The Capital Asset Pricing Model, or "CAPM", is designed to give the risk premium, that is the premium over the rate on Treasury securities, required to induce investors to hold specific issues of common stock. The standard CAPM is given by equation (3):

Company risk premium = Company "beta" * Market risk premium. (3)

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

Q. WHAT IS A COMPANY'S BETA?

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

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

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

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

This concept is particularly important for the determination of cost of capital because the risk that a company will lose customers to competition -- such as a network leasing company losing business to competing facilities providers -- is a diversifiable risk which does not increase the risk premium according to capital market theory.[18]

Q. WHAT IS A TYPICAL METHOD USED TO CALCULATE BETA?

A. Beta is typically calculated by a procedure called regression analysis. In regression analysis, the returns on the subject stock (the dependent variable), are regressed against the returns of a market portfolio of stocks (frequently the S&P 500) to estimate statistically the degree that the independent variable movements in the market portfolio have caused the returns of the subject company. Using this statistical tool, therefore, the sensitivity of a stock to movements in the market can be estimated. This sensitivity is what determines beta.

Q. WHAT SOURCE FOR BETA HAVE YOU USED FOR YOUR ANALYSIS?

A. In prior testimonies, using data before June 30, 2000, I calculated betas based on five years of monthly return data for Bell Atlantic and the comparable companies. However, given Bell Atlantic's merger with GTE which became effective June 30, 2000, I use BARRA predicted betas because a 5-year historical beta cannot be calculated for the newly-formed Verizon.

BARRA (formerly Rosenberg Associates) is an internationally known financial consulting firm providing risk measurement services to investment managers, corporations, consultants, securities dealers and traders, and master custodians. The predicted betas are developed using sophisticated financial modeling techniques which account for factors which impact the future risk of a company. Unlike conventional regression betas, therefore, the BARRA betas do not rely solely on historical stock returns and explicitly consider forward-looking projections. According to BARRA studies, BARRA predicted betas have more than 16 times the predictive power of historical betas.[19] Copeland, Koller and Murrin have recommended the use of BARRA predicted betas.[20]

Because beta is measured with error, the average beta over all the comparables is probably a more accurate indicator of the true beta than any individual estimate of beta. For this reason I averaged historical unlevered betas in studies which used data prior to Bell Atlantic and GTE's merger, and I continue that practice using BARRA betas in this study.

Before averaging individual betas it is necessary to take account of the fact that the various comparable companies have differing amounts of debt in their capital structures. The amount of a company's debt leverage affects the riskiness of its stock returns and thereby its beta. The raw betas (i.e. predicted betas obtained from BARRA) are "unlevered" using standard financial economic formulas and based on the market value debt/equity ratios of each respective company as of June 30, 2000. The formula for "unlevering" a raw, or "levered" beta is,

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

where,

B_u = the "unlevered" beta,

B_L = the "levered" beta,

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

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

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

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

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

Q. WHAT IS YOUR ESTIMATE OF BETA?

A. The BARRA predicted (levered) estimates of beta are presented in Attachment JH-5. They vary from a high of 0.84 to a low of 0.65 on a levered basis. As I discussed above, however, the betas must be unlevered first to adjust for the different amount of debt leverage employed by the individual companies before calculating an average. Attachment JH-5 also shows the unlevered betas and their average. The average unlevered beta for the entire sample is 0.63.[21] The average unlevered beta is re-levered using the formula discussed above to take Verizon's June 30, 2000 capital structure into account, arriving at a beta of **0.77** for Verizon.

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

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

Q. WHAT IS THE MARKET RISK PREMIUM?

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

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

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

Q. HOW IS THE MARKET RISK PREMIUM ESTIMATED?

A. The market risk premium can be estimated two ways. First, the DCF approach can be applied to the market as a whole to arrive at a forward-looking estimate of the market risk premium. Second, the premium can be estimated by examining historical data on the difference between the return on a broad portfolio of common stocks and associated Treasury securities.

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

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

Q. IN THE PAST, HOW HAVE YOU CALCULATED A DCF ESTIMATE OF THE EXPECTED RETURN ON THE MARKET?

A. The starting point that I utilized for estimating the expected return on the market was the S&P 500 index as a proxy for the market. I limited the sample to those S&P 500 companies that paid a dividend of at least 1.5% on the grounds that the DCF approach may be less accurate for companies that pay small dividends.[22] This sample included large companies for which the data is considered to be reliable for purposes of DCF estimates. For the selected companies, the three-stage DCF model was applied in the same fashion as it was applied to the sample of telephone companies. Finally, the individual DCF estimates for the sample companies were averaged on a market-value basis.

Q. HAVE YOU PERFORMED THIS RETURN ON THE MARKET CALCULATION FOR DATA THROUGH JUNE 30, 2000?

A. No. In prior testimonies, I would compare my DCF results to Merrill Lynch's expected return on the market estimate as a test of reasonableness. For example, as of September 30, 1999, I estimated the DCF return on the market to be 9.55%, while as of December 1999 Merrill Lynch's expected return on the market estimate was 9.80%. Given the relative cost and degree of difficulty of obtaining data for, and updating the calculation of, the DCF return on the market frequently, and given that Merrill Lynch's calculation techniques appear to result in slightly higher estimates, I have elected to use Merrill Lynch's estimate as a reasonable substitute for use in this study. As of June 30, 2000, Merrill Lynch's expected return on the market estimate was 10.20%.

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

A. The market risk premium is computed by subtracting the risk-free rate from the expected return. In the case of the 20-year Treasury bond this is straightforward. The calculations are shown in Attachment JH-6. The Attachment shows that as of June 30, 2000, the 20-year bond yield was 6.26 percent. Subtracting 6.26 percent from 10.20 percent gives a market risk premium over long-term Treasury bonds of 3.94 percent.

In the case of one-month Treasury bills the situation is more complicated. Because the goal of the analysis is to estimate the long-run cost of capital, using a one-month interest rate can be misleading. A more appropriate choice is the average return on one-month Treasury bills that is expected to obtain over the long-term. This can be estimated using the following two-step procedure. First, compute the long-run historical difference between the return on one-month Treasury bills and the return on 20-year Treasury bonds. Second, subtract that historical difference from the current yield on 20-year bonds. The difference gives a forward-looking market estimate of the average expected yield on one-month Treasury bills over the next 20 years. Attachment JH-7 shows that the average expected one-month Treasury bill rate over the long run is 4.93 percent as of June 30, 2000. Subtracting this rate from the expected return on the market gives a market risk premium over Treasury bills of 5.27 percent as shown in Attachment JH-6.

Q. WHAT ISSUES ARE INVOLVED WITH RESPECT TO HISTORICAL ESTIMATES OF THE MARKET RISK PREMIUM?

A. The historical risk premium is defined as the historical difference between the return on the stock market and the risk-free rate. The proper estimate of the historical market risk premium is a question that is disputed among both academics and practitioners with regard to two primary issues. First, when analyzing historical data, should an arithmetic or geometric average be used to calculate the historical average risk premium? Second, over what period should the average be computed to accurately capture the risk premium expected in the future? Specifically, should the entire sample period back to 1802 be used, should the sample period be limited to post-1926 when more complete data became available, should only post-war data be employed because the role of government in the economy has changed fundamentally since the great depression, or should even more recent data be used? With regard to the type of average, many academic authors favor the arithmetic over the geometric.[23] Others, however, recommend using the geometric average because arithmetic averages are biased by the measurement period, and because empirical studies of stock market returns show negative serial correlation of returns over time. Damodaran states that "[i]n the context of valuation, where cash flows over a long time horizon are discounted back to the present, the geometric mean provides a better estimate of the risk premium."[24] With regard to the sample period for computing the average risk premium, Ibbotson Associates argues that a long data series is required so that the equity risk premium is not unduly influenced by very good or very poor short-term results. The 2000 Yearbook published by Ibbotson Associates suggests that the post-1926 data compiled therein provides a representative period of returns that can occur under diverse economic circumstances.[25]

Q. HAS THE USEFULNESS OF HISTORICAL RISK PREMIA BEEN QUESTIONED BY ACADEMICS?

A. Yes, for many reasons. For example, Roger Ibbotson himself has cautioned that the long-run stock market returns calculated by his firm may not prove predictive. He has stated that the U.S. is not as risky as it was in 1925, suggesting that lower returns will be experienced in the future.[26] Roger Ibbotson also states that historical averages overstate the forward-looking cost of equity because of survivorship bias.[27] For example, the U.S. stock market survived despite the Great Depression. As of 1925, however, there existed a risk that the stock market would be entirely wiped out--as happened in Germany, Japan, China and Russia. If these countries were included in an average, historical returns would be much lower.[28]

Based on an analysis of data going back to 1802, Siegel presents convincing evidence that the risk premium was abnormally high after the U.S. went off the gold standard resulting from unanticipated inflation which reduced the real returns on bonds. He notes that the current equity premium appears to be returning to the 2 - 3 percent range that existed before the second world war.[29] Blanchard also

presents evidence that the risk premium has declined to 2 to 3 percent in recent years and argues that either the DCF approach should be employed in place of relying on an average or more recent data should be used.[30]

Similarly, Rappaport opposes the use of long-term averages. He states that the relative risk of bonds has increased over the past two decades, thereby lowering risk premiums to a range from 3 to 5 percent.[31] More recently, the Wall Street Journal noted that traditional measures of value are failing to explain current stock prices in part because, "the so-called risk premium has declined, as investors become more comfortable holding stocks."[32] Glassman and Hassett, American Enterprise Institute scholars, argue that over the long-run stock actually have been no riskier than bonds, and consequently, long-term investors should demand no extra premium for holding stock.[33]

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

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

A. Taking account of all the information in Attachments JH-6 and 8, and the extensive research and views of academics and practitioners, I conclude that the reasonable estimates of the market risk premium are 7.5 percent over one-month Treasury bills and 5.5 percent over 20-year Treasury bonds. These estimates are conservative (i.e., on the high side) in the sense that they are above the average premiums observed in half of the periods, including the full sample, and are greater than those implied by the DCF analysis. This is also conservative given the substantial number of views of both academics and practitioners that the risk premium is now quite low.

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

A. To review, the CAPM says that,

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

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

Verizon's Cost of equity capital = 4.93% + 0.77 * 7.5% = 10.71%.

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

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

Verizon 's Cost of equity capital = 6.26% + 0.77 * 5.5% = 10.50%.

In light of these results, I use the average of the two as the CAPM estimate of the cost of equity capital: 10.60 percent for Verizon.

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

A. The CAPM-derived costs of equity differ by less than 40 basis points from the DCF costs of equity. Given the difficulty of estimating the cost of equity capital, I take an average of the two methods (see Attachment JH-9).

Q. COMBINING THE TWO METHODS, WHAT IS THE COST OF EQUITY CAPITAL FOR VERIZON?

A. The two estimates of the cost of equity capital produced a range for Verizon of 10.24 to 10.60 percent. I feel the best overall estimate is approximately the average of the three-stage DCF and CAPM cost of equity estimates.

In sum, I recommend that the Department use a cost of equity capital of **10.42 percent** in estimating the weighted average cost of capital (or "WACC").

VI.

CAPITAL STRUCTURE AND THE WACC

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

A. Most American businesses are financed by a combination of equity (common stock) and debt (including bonds and bank loans). The capital structure refers to the fraction of debt and equity used to finance a business. In terms of the WACC formula presented at the outset, the capital structure is determined by the financing weights, w_e and w_d. As discussed earlier, companies that face greater operating risk tend to take on less debt.

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

A. The goal is to estimate the long-run target financing weights that a rational, informed management team would employ.[34] If there are companies participating in comparable business activities, the accepted solution is to use their observed capital structure as the starting point because it is difficult to estimate a company's true target capital structure. In this case, however, the comparables are all riskier than the business activity in question (the wholesale provisioning of unbundled network elements) because of the necessity to use data that are only available at the holding company level.

Alan Shapiro states that:

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

The estimation of these divisional costs of capital is tricky. All the firm observes is its overall cost of capital, which is a weighted average of its divisional costs of capital."[35]

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

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

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

The average book value debt weight for the sample companies is 49 percent as of June 30, 2000. Verizon's own debt weight is 49 percent. In terms of market value weight, however, the debt weight is lower. The average for the full sample is 20 percent, while Verizon's debt weight is 26 percent. However, market value debt weights of the holding companies probably understate the long-run target debt weights in the capital structure of the network element leasing business, for the reasons discussed in detail in Section VII below. Consequently, in this case it is inappropriate to rely solely on current market value capital structure weights of the telephone holding companies when calculating the WACC for the network element leasing business. Therefore, I apply the WACC formula using both book and market weights to establish a range.

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

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

Q. GIVEN YOUR PRECEDING TESTIMONY,

WHAT IS THE UPPER BOUNDARY OF THE APPROPRIATE RANGE FOR THE WEIGHTED AVERAGE COST OF CAPITAL FOR EACH OF THE TELEPHONE COMPANIES FOR VERIZON?

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

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

Verizon's WACC Based On Average Market Capital Structure Weights

	Weight	**Rate**	**Weighted Cost**[36]
Equity	0.80	10.42 %	8.34
Debt	0.20	7.86 %	1.57
Verizon's WACC			**9.91 percent**

Q. WHAT IS THE LOWER BOUNDARY OF THE APPROPRIATE RANGE FOR THE WEIGHTED AVERAGE COST OF CAPITAL FOR VERIZON?

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

Verizon's WACC Based On Average Book Capital Structure Weights

	Weight	Rate	Weighted Cost[37]
Equity	0.51	10.42 %	5.32
Debt	0.49	7.86 %	3.85
Verizon's WACC			**9.17 percent**

Q OVERALL WHAT DO YOU CONCLUDE IS A FAIR ESTIMATE OF THE WEIGHTED AVERAGE COST OF CAPITAL AS OF JUNE 30, 2000?

A. I believe a fair estimate is the midpoint of my range. Averaging 9.17 and 9.91, the midpoint comes to **9.54 percent** for VZ-NE's provision of UNEs.

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

A. The capital structure implied by the 9.54 percent cost of capital is **34.5% debt** and **65.5% equity**.

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

A. Yes. The cost of debt is estimated from the yields to maturity of each company's bonds obtained from the Bond Guide, which represent the forward looking returns that investors would expect to earn on these bonds.[38] The DCF model used for estimating the cost of equity employs forward-looking growth projections made by analysts and forecasting organizations. The CAPM model as I have employed it here uses current U.S. Treasury bond rates as of the measurement date, which impound forward-looking expectations, as one of its two return components. The CAPM model by necessity uses some historical information to estimate a company's riskiness, through the calculation of a beta, and can use either historical or forward-looking information to estimate the market risk premium, which is assumed to generally prevail into the future. Regarding these issues, I have considered forward looking predicted BARRA betas and both current research and Wall Street estimates regarding the forward-looking equity risk premium.

VII.

POTENTIAL UPWARD BIAS IN THE ESTIMATED COST OF CAPITAL

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

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

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

A. The business for which the cost of capital is being estimated in this case is the wholesale business of leasing local exchange unbundled network elements to retail providers. This business should have relatively low risk compared to many of the risky business endeavors being pursued by Verizon and other telephone holding companies.

Verizon's risky business undertakings include domestic wireless communications service, electronic commerce services, undersea fiber-optic cable, and publishing. In addition, Verizon has invested in international wireless telephone systems in Mexico, Italy, Greece, Czech Republic, Slovakia, Indonesia and international telecommunications in New Zealand, Great Britain, Thailand and the Philippines. The cost of capital relevant to this proceeding has nothing to do with the cost of financing risky ventures such as these.

Q. HAS VERIZON MADE COMMENTS TO THE PUBLIC REGARDING BENEFITS TO BE DERIVED FROM THE PROVISION OF NETWORK ELEMENTS TO COMPETITIVE LOCAL EXCHANGE COMPANIES?

A. Yes. Bell Atlantic stated in its mid-year 1999 Investor's Reference Guide that the business of providing network elements "provides a unique opportunity to add new revenues onto our platform without significant incremental capital investment … ."[39]

Q. WHAT RISKS ARE ASSOCIATED WITH THE BUSINESS OF LEASING UNBUNDLED NETWORK ELEMENTS?

A. There is still the risk of regulation itself. The rate of return a network is allowed to earn depends on the outcome of proceedings such as this and remains somewhat uncertain. That risk can be substantially reduced if the Department adopts compensatory forward-looking pricing rules that tell investors that telephone holding companies will have the opportunity to recover all efficiently-incurred costs on a forward-looking basis. In addition, there remains some risk that consumers, particularly business users, will bypass the network as other alternatives become available.[40] These risks, however, are substantially less than the risks faced by telephone holding companies' other businesses, some of which are (or may soon be) subject to competition.

Q. DO LOWER RISK BUSINESSES HAVE MORE DEBT IN THEIR OPTIMAL CAPITAL STRUCTURES?

A. Yes. Businesses that have lower risk are capable of supporting higher level of debts. The riskiness of a business is determined by the volatility of its cash flows. From the perspective of both equity and debt holders, volatile and uncertain cash flows increase the risk that the business will be able to make interest and principal payments in accordance with the terms of the debt. Consequently, riskier businesses typically carry lower amounts of debt to ensure that their debt obligations are met even under unfavorable conditions.

Less risky businesses, i.e., businesses whose cash flows are not so volatile, can increase the amount of debt in their capital structure because they are more certain to be able to meet their debt service obligations.[41]

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

A. Yes. Think of integrated telephone holding companies, for example Verizon, as being composed of separate business units. One business unit owns the network and leases network elements to all local service providers, including both competitors and the telephone companies' other business units that are involved in the provision of local service. Whereas those Verizon units involved in providing local service are in businesses that (if prices are set appropriately in these proceedings) will be faced with new competitors, the unit involved in leasing the network which all the competitors need to use has virtual monopoly power and faces much less risk. For example, in its May 15, 2000 "Telecom -Wireline" report Morgan Stanley Dean Witter highlighted that in the first quarter of 2000 it "saw some renewed strength in local and access revenues. Sales of value added services and strong wholesale business more than offset local competition. [emphasis added]

The sample of companies used in my analysis for which the cost of debt and equity are estimated is composed of telephone holding companies. As stressed earlier, these companies operate a variety of businesses, virtually all of which face a great deal more operating risk than leasing UNE's. The greater risk of telephone holding companies has been clearly recognized by financial analysts and the bond rating agencies.(42) The company to which the WACC should be applied, however, is one which is involved exclusively in leasing network facilities. Under these circumstances, using a higher debt weight than the current market value weights for the sample companies is one way to take account of this problem. The higher debt weight may be more representative of the target capital structure for the low-risk network element leasing business.

HAVE YOU SEEN ANY INFORMATION PROVIDED TO THE PUBLIC WHICH CONFIRMS THE REASONABLENESS OF YOUR COST OF CAPITAL RANGE?

Yes. Salomon Brothers in its January 1996 report "Regional Bell Operating Companies--Opportunities Ring … While Danger Calls" stated that,

"[b]ased on our estimates, the RBOCs currently have an average weighted cost of capital of approximately 8.6%. In order to value the RBOCs on a level playing field, we used the same discount rate in each DCF. Specifically, we used a discount rate of 10%, which we believe should be the minimum return an investor would expect in order to entice him to invest in a security, despite the fact this is slightly above the cost of capital."

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

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

A. Yes. Some appear in a prospectus related to the formation of Verizon itself.

In the Bell Atlantic-GTE merger prospectus filed with the SEC on April 14, 1999, Bell Atlantic's financial advisors, Merrill Lynch and Bear Stearns, used a range of discount rates from **8.5% to 10.5%** to determine the exchange ratios of Bell Atlantic and GTE shares. Notably, Bell Atlantic's advisors performed an illustrative valuation of the expected combination benefits where they discounted expected incremental free cash flows using a discount rate of **9.5%**, the midpoint of the discount rate range from 7.5% to 11.5%. In the same Bell Atlantic-GTE merger proxy statement, GTE's financial advisor Salomon Smith Barney performed a five-year DCF analysis of Bell Atlantic and GTE as part of its fairness opinion and assumed discount rates ranging from 9.0% to 11.0%. It is important to note that these rates are for the entire Bell Atlantic holding company and include businesses that are far riskier than leasing unbundled network elements.

Second, in a fairness opinion for the SBC/Southern New England Telephone merger proxy statement dated February 9, 1998, Salomon Smith Barney performed a business segment breakdown in its DCF analysis. In valuing the telco business, Salomon Smith Barney applied a WACC of **9.0% to 10.0%**. Salomon Smith Barney applied higher ranges of 11.0% to 12.0% to the long-distance and cellular businesses.

Third, in the Ameritech/SBC merger proxy statement dated October 15, 1998, Salomon Smith Barney performed a DCF valuation analysis of the two companies as part of its fairness opinion. The opinion broke down each company into its component business segments and applied a separate discount rate to each segment. For the telco business segments, excluding long distance, Salomon Smith Barney used a discount rate reflecting a WACC of **8.75% to 9.75%**. Salomon Smith Barney used higher ranges of 10.50% to

11.50% for long distance business segments, 10.00% to 11.00% for cellular business segments, and 12.50% to 13.50% for PCS business segments. This is consistent with my testimony and the observations of the ratings agencies and the FCC that local telephone company operations are less risky than other telecommunications segments and that telephone holding companies are engaged in many of these riskier business activities.

Fourth, Goldman Sachs also performed a DCF analysis for its fairness opinion for the Ameritech/SBC merger. Goldman Sachs indicated that it used various discount rates ranging from **8.5% to 11.5%**. Although the firm did not provide a detailed breakdown of how it applied the rates, it is reasonable to assume that it was also attempting to gauge the effect of the rates by business segment.

Fifth, in Alltell Corp.'s Form S-4 which was filed with the SEC on March 24, 1999, Merrill Lynch performed a DCF analysis of Aliant and Alltell on a stand-alone basis. Merrill Lynch acted as the financial advisor to Aliant in connection with the merger with Alltell. In its DCF analysis, Merrill Lynch used discount rates ranging from 10% to 12% for both Aliant and Alltell. These rate apply to all business segments of Aliant and Alltell which include substantial endeavors in businesses far riskier than either the local exchange or network element leasing businesses.

Sixth, in Worldcom Inc.'s Amendment No. 3 To Form S-4 which was filed with the SEC on February 17, 2000, Salomon Smith Barney, acting as MCI WorldCom's financial advisor, estimated the Sprint FON group segment DCF using a discount rate reflecting a weighted average cost of capital for each of the company's business segments. The weighted average cost of capital for Sprint FON's local segment was in the range of **8.75% to 9.75%**, and the long distance segment was in the range of 9.25% to 10.25%. It also performed a DCF analysis of Sprint PCS Group and MCI WorldCom, reflecting a weighted average cost of capital ranging from 10.5% to 11.5% for Sprint PCS Group and 11.5% to 12.5% for MCI WorldCom. Warburg Dillon Read, acting as Sprint's financial advisor in the merger, performed a DCF analysis on Sprint FON group's local and long-distance telephone division. Warburg Dillon Read assumed that the discount rates for Sprint's local telephone division ranged from **10% to 11%** while the long distance telephone division ranged from 10.5% to 11.5%.

Seventh, analyst reports also indicate that the costs of capital for various telecommunications businesses are quite low. In its Industry Analysis report on Telecommunication Services dated August 28, 1998, JP Morgan estimated the WACC for the U.S. telecom sector for 1998 at **7.8%**. This report also shows that JP Morgan estimated that the WACC for the telecom sector for the period 1995-2002 would stay within the range of **7.6 to 7.8**%. In March 2000 Morgan Stanley Dean Witter used an estimated cost of capital of 10% in its DCF valuation of ALLTEL.[43] In April 2000, BHF-Bank used an 8.2% cost of equity and 7.7% WACC for valuing Deutsche Telekom.[44]

Q. IN ITS 1990 REPRESCRIPTION ORDER, THE FCC SET THE RATE OF RETURN FOR INTERSTATE SERVICES OF LOCAL EXCHANGE CARRIERS AT 11.25%. WHAT DO INTEREST RATE MOVEMENTS IN THE SUBSEQUENT TEN YEARS SUGGEST ABOUT THE APPROPRIATE CURRENT RATE?

A. 30-year Treasury bond rates have fallen from 9.03% as of September 1990 to 5.78% as of April 25, 2001. This is a decline of 325 basis points since the 11.25% rate was prescribed. Similarly, 10-year Treasury bond rates have fallen to 5.28% as of April 25, 2001. This decline in capital market interest rates, used as a rough rule of thumb, suggests that the cost of capital has fallen dramatically.

Q. IS THE FCC ITSELF CURRENTLY CONDUCTING A RATE REPRESCRIPTION PROCEEDING BECAUSE OF THIS DECLINE?

A. Yes. The FCC has noted for many years that capital market conditions indicate that the cost of capital is probably well below the 11.25 percent rate set in 1990. In its 1998 Notice Initiating a Prescription Proceeding and Notice of Proposed Rulemaking,[45] the FCC specifically stated that:

The sustained low yields of the U.S. treasury securities strongly suggest that the current prescribed rate of return is much higher that the rate required to attract capital and earn a reasonable profit. (¶ 5)

… It is important that our prescribed rate of return correspond to current market conditions. The recent yields on 10-year U.S. treasury securities have remained more than 150 basis points below the reference point, suggesting that the prescribed rate does not coincide with current market conditions. Therefore, we conclude that we should begin a rate-of-return prescription proceeding. (¶ 7)

Q. DOES THE JULY 18, 2000 DECISION OF THE U.S. COURT OF APPEALS FOR THE EIGHTH CIRCUIT AFFECT THE ESTIMATION OF THE COST OF CAPITAL FOR UNE'S?

A. No. Even if the decision withstands further review, it should have no effect on determining the forward-looking economic cost of capital. The court objected to UNE costs based on "…some state of the art presently available technology ideally configured but neither deployed by the ILEC nor to be used by the competitor... ." Notably, the Eighth Circuit Court also rejected the use of historical "sunk" costs and reaffirmed the principle of forward-looking costs:

We reiterate that a forward-looking cost calculation methodology that is based on the incremental costs that an ILEC actually incurs or will incur in providing the interconnection to its network or the unbundled access to its specific network elements requested by a competitor will produce rates that comply with the statutory requirement of Sec. 252(d)(1) that an ILEC recover its "cost" of providing the shared items.(46)

My cost of capital methodology is based on forward-looking market expectations regarding the performance and risk of the telephone holding companies in my sample, not on explicit assumptions regarding the network architectures or types of technologies that are to be priced in UNE cost proceedings.

ARE YOU AWARE THAT THE DEPARTMENT DECIDED ON A COST OF CAPITAL OF 12.16 PERCENT FOR SETTING NYNEX'S MASSACHUSETTS UNE RATES IN THE 1996 <u>CONSOLIDATED ARBITRATIONS</u> DOCKET?

A. Yes. Based on my experience, this cost of capital decision is an extreme outlier. In Verizon's service area alone, the vast majority of state commissions found that the forward looking cost of capital of the local Verizon operating company was between 10 and 11 percent, based on similar 1996 or earlier data.(47)

Massachusetts	*12.16%*
Pennsylvania	11.9%
West Virginia	11.25%
Maine	10.61%
New Hampshire	10.61%
New Jersey	10.4%
Delaware	10.28 %
New York	10.2%
Virginia	10.12%
Maryland	10.1%
Vermont	10.0%

The Virginia decision was affirmed in federal district court. Moreover, the 11.9 percent value adopted by the Pennsylvania PUC was challenged in federal district court by AT&T and MCI as excessive and contrary to TELRIC principles, and the court remanded this aspect of the Pennsylvania Commission's decisions for reconsideration in light of the August 8, 1996 Order.(48)

As I also note above, analysts and investment bankers in analyst reports and in proxy statements filed under federal and state securities disclosure laws, have utilized costs of capital and discounts rates far below 12.16 percent.

DO YOU DISAGREE WITH THE DEPARTMENT'S REASONING FOR ITS PRIOR NYNEX COST OF CAPITAL DECISION?

Respectfully, I do. The decision appears to rest on two hypothetical presumptions: the first that the Local Competition Order allows for a hypothetical assumption that the wholesale market for UNE's will become competitive; and the second that the Department was required to qualitatively assess the impact of risks that NYNEX might face on its cost of capital, independent of the market's forward-looking assessment of such risks. In its 1996 order, the Department indicated that:

We are conducting a forward-looking cost study and in so doing are attempting to estimate an appropriate cost of capital in the marketplace that will develop upon the signing of the interconnection agreements…The competition experienced by NYNEX to date is simply not a relevant indicator of the broadly expanded competitive marketplace envisioned by the Act.(49)

WHY IS IT INCORRECT TO MAKE A HYPOTHETICAL ASSUMPTION OF A COMPETITIVE MARKET FOR THE WHOLESALE LEASING OF UNEs?

A. While the Department's Phase 4 Order in the Consolidated Arbitrations Docket acknowledged the existence of Par. 702 of the First Local Competition Order, the Department chose not to follow it for the determination of the cost of capital for UNE's. Paragraph 702 states:

Based on the current record, we conclude that the currently authorized rate of return at the federal or state level is a reasonable starting point for TELRIC calculations, and *incumbent LECs bear the burden of demonstrating with specificity that the business risks that they face in providing unbundled network elements and interconnection services would justify a different risk-adjusted cost of capital or depreciation rate. These elements generally are bottleneck, monopoly services that do not now face significant competition.* We recognize that incumbent LECs are likely to face increased risks given the overall increases in competition in this industry, which generally *might* warrant an increased cost of capital, *but note that, earlier this year, we instituted a preliminary inquiry as to whether the currently authorized federal 11.25 percent rate of return is too high given the current marketplace cost of equity and debt.* On the basis of the current record, we decline to engage in a time-consuming examination to determine a new rate of return, which may well require a detailed proceeding. *States may adjust the cost of capital if a party demonstrates to a state commission that either a higher or lower level of cost of capital is warranted*, without that commission conducting a 'rate-of-return or other rate based proceeding.' *We note that the risk-adjusted cost of capital need not be uniform for all elements. We intend to re-examine the issue of the appropriate risk-adjusted cost of capital on an ongoing basis*, particularly in light of the state commissions' experiences in addressing this issue in specific situations. [emphasis added] [footnotes omitted]

None of the highlighted passages above would be necessary if the FCC had intended for state commissions to merely presume as a hypothetical the existence of intense competition.

DOES THE FCC'S USF ORDER MIRROR THE VIEWS STATED IN PARAGRAPH 702 OF THE LOCAL COMPETITION ORDER REGARDING COMPETITION?

A. Yes. In the May 8, 1997 Universal Service Order, the FCC states at ¶250.(4) that:

We realized that, with the passage of the 1996 Act, the level of local service competition may increase, and that this competition might increase the ILECs' cost of capital. There are other factors, however, that may mitigate or offset any potential increase in the cost of capital associated with additional competition. *For example, until facilities-based competition occurs, the impact of competition on the ILEC's risks associated with the supported services will be minimal because the ILEC's facilities will still be used by competitors using either resale or purchasing access to the ILEC's unbundled network elements.* In addition, the cost of debt has decreased since we last set the authorized rate of return. [emphasis added]

DID THE FCC EXPLICITLY REJECT THE PROPOSITION OF INSTANT COMPETITION?

A. Yes. Paragraph 688 of Local Competition Order states that "USTA's argument unrealistically assumes that competitive entry would be instantaneous. The more reasonable assumption of entry occurring over time will reduce the costs associated with sunk investment."

Q. HAS ANY COURT AGREED WITH YOU ABOUT THE RISK ASSUMPTIONS IMPLIED BY THE TELRIC STANDARD?

A. Yes. In the 1997 UNE proceeding before the Delaware PSC, Dr. Vander Weide argued for Bell Atlantic as he did in Massachusetts for NYNEX, that the TELRIC standard requires state commissions to assume that the supplier of unbundled network elements faces significant competition, whether or not it actually existed. The Delaware commission rejected this argument for the same reasons I offer here. Bell Atlantic appealed to the United States District Court in Delaware. The court upheld the Delaware commission on this point, again for the same reasons I have offered here:

Bell points to an apparent contradiction in assuming instantly competitive prices for network elements (even though no such competition now exists) but, in the context of determining cost of capital, assuming little competition and, consequently, low costs of capital. ... The Telecommunications Act attempts to recreate the prices that a hypothetical efficient company would charge for its network elements and services in a competitive market. Indulging in this fiction, however, does not change the fact that ILECs like Bell do not face the same competitive risks as firms operating in a competitive market. Indeed, ILECs have had no competition for decades, and they will face little competition in the market for network elements in the near future. *See August 8, 1996 Order* ¶702, at 353. Therefore, in introducing competition in the local telephone market, it makes perfect sense to recreate competitive prices while acknowledging that the current lack of competition warrants reduced costs of capital.(50)

YOU ALSO INDICATE THAT THE DEPARTMENT MADE A HYPOTHETICAL ASSESSMENT OF RISKS INDEPENDENT OF MARKET ASSESSMENTS. PLEASE EXPLAIN.

The Department was concerned with the notion that it had to determine a hypothetical "forward looking" cost of capital. It stated that,

We seek to estimate the cost of equity for a service offering that does not yet exist in a marketplace that is about to come into existence. We recognize that our finding must be inherently qualitative, and we are aware of the possibility that the S&P 400 might be less risky or more risky than a company selling unbundled network elements. We have already acknowledged that, based on this record, we cannot precisely determine the degree of risk associated with offering unbundled network elements. We know it is more risky than the provision of monopoly services. We know it is less risky than speculative real estate or power plant projects. It has

some characteristics of the two, in that, for common carriers who lack the capital or the ability to build facilities, it does provide an essential service. For other carriers, however, it offers a no-obligation option to use and later abandon, perhaps to preserve capital in the short run and then to spend it on those facilities that have a high financial priority. [Phase 4 Order, pg. 50]

Q. DID THE DEPARTMENT'S 1996 PHASE 4 ORDER RECOGNIZE THAT COST OF CAPITAL ESTIMATES ARE ALWAYS FORWARD LOOKING?

I don't believe so. As Ibbotson Associates correctly note, "the cost of capital is always an expectational or forward-looking concept."[(51)] Because costs of capital have always been oriented toward future risks, it is clear that the FCC did not coin a novel concept for TELRIC purposes that required hypothetical risk assumptions on the part of state commissions. Therefore, a cost of capital determined for any company, whether it be in the network element leasing business, or in completely unregulated businesses, will incorporate all future risks that the market anticipates for it on average.

DID THE DEPARTMENT ACCEPT THE SINGLE-STAGE DCF MODEL ADVOCATED BY NYNEX?

No. The choice of the correct DCF model to use is not influenced by the question of the amount of risk that will affect a company in the future. The Department accurately concluded that,

On this matter, we agree with Dr. Hubbard. The mathematical result of Dr. Vander Weide's analysis [sic][(52)] is uncontroverted and reasonable. Dr. Vander Weide's testimony [that the Value Line short-term growth estimates are in fact projections of long run earnings growth] is not documented on the record, and, even if it were, does not address the underlying problem explained by Dr. Hubbard with regard to the model.

Accordingly, the Department directed NYNEX to resubmit its cost study based on a cost of capital conducted "in accordance with the three-stage growth methodology used by Dr. Hubbard."[(53)]

The Department then reconsidered its position regarding the appropriate cost of equity estimate. On February 5, 1997, the DTE changed its position in response to NYNEX's motion for reconsideration.[(54)] The DTE stated its concern that substituting a three-stage DCF model would reduce Dr. Vander Weide's cost of capital by such a large amount:

We expected, based on [Dr. Vander Weide's] testimony, that use of the multi-stage model would produce a minor adjustment to NYNEX's proposed 14.8 percent return on equity . . . Unfortunately, we did not actually ask for the model to be run during the course of the proceeding and only now learn that our interpretation of Dr. Vander Weide's testimony was mistaken . . .[(55)]

Such a large downward adjustment, the DTE continued, "produces results that are not reasonable, *given our more qualitative findings concerning the relative risk of providing unbundled network elements.*"[(56)]

ISN'T THE CHOICE OF A DCF MODEL INDEPENDENT OF ANY ASSESSMENTS OF RISK, QUALITATIVE OR OTHERWISE?

It should be, yes. Like NYNEX, the Department failed to explain how the 11.38 percent result of a three-stage DCF analysis of Dr. Vander Weide's own data, which continued to incorporate the 400-firm comparison group of industrial companies represented by NYNEX as fully reflective of its forward-looking business risk--failed to reflect the "relative risk of providing unbundled network elements."

Q. WHAT DID THE DEPARTMENT ULTIMATELY DECIDE FOR THE COST OF EQUITY?

A. The Department declined to adopt either the 14.8 percent cost of equity offered by Dr. Vander Weide or the 11.5 percent cost of equity offered by Dr. Hubbard. Instead, the Department asserted that the witnesses' "extensive qualitative discussion" of risk factors supported a 13.5 percent return on equity. The Department deemed this figure to be reasonable "viewing the entire record in this proceeding," but did not offer any explanation of how it had derived the number.(57) Combined with the debt cost and capital structure previously adopted by the Department, the 13.5 percent cost of equity produced a weighted average cost of capital of 12.16 percent.(58) It is this attempt to qualitatively and hypothetically split the baby that explains why the Department arrived at an estimate far higher than cost of capital estimates made by other commissions or by financial analysts.

HAS THE FCC ITSELF RAISED SOME QUESTION ABOUT THE 12.16 PERCENT COST OF CAPITAL RATE PREVIOUSLY DECIDED BY THE DEPARTMENT?

Yes. In its recent order approving VZ-NE's application to provide long distance service in Massachusetts, the FCC noted that:

Commenters have raised legitimate concerns regarding some of the inputs used by Massachusetts in calculating its loop rates. In particular, we note that the Massachusetts Department utilized a cost of capital of 12.16 percent. This is higher than the cost of capital that the Massachusetts Department has used in setting Verizon's local rates and substantially higher than the cost of capital employed by any of the other states in Verizon's region. AT&T questions whether there is any reason to believe that offering UNEs on a wholesale basis, where Verizon faces no competition, is riskier than offering retail service, where it now has competition. *We question whether this relatively high cost of capital is sufficiently justified by state-specific factors.*(59)

Q. DO YOU RECOMMEND THAT THE DEPARTMENT CHANGE FROM THE HYPOTHETICAL APPROACH IT USED IN THE 1996 ARBITRATION REGARDING NYNEX'S UNE COSTS, TO A FORWARD-LOOKING APPROACH FOR DETERMINING THE COST OF EQUITY IN THIS PROCEEDING?

A. Yes. As the cost of capital is always a forward-looking concept, I believe that the Department will be better served, as will be the objective of encouraging facilities-based competition in Massachusetts, if the Department relies on forward-looking, market-based estimates of the cost of equity using a suitable multiple-stage DCF model, and using a suitable CAPM model, applied to a sample of telecommunications companies which own underlying network elements.

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

The cost of capital rate that the Department will determine in this proceeding will be used as a mechanism to compensate VZ-NE. It is Verizon's investors that receive their dividends quarterly, not VZ-NE. Telephone operating companies like VZ-NE 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. This is a more frequent basis than investors receive their quarterly dividends from the telephone holding companies. Thus, the effective rate that the telephone operating companies receive is the allowed rate-- as determined in this hearing-- compounded monthly, regardless of the fact that a telephone holding company pays dividends to investors quarterly. If the Department allows a rate which is estimated using a quarterly compounding DCF model, VZ-NE will get an effective rate compounded both quarterly (as allowed) and monthly (as actually received).

For comparison, think of a public company which is not subject to rate regulation. Such a company would never be able to sell services or products to customers at an agreed price, and then demand that the customers increase those payments by adding quarterly compounded interest to it. It is clear that the unregulated public company never gets the benefit of quarterly compounding. It gets the benefit of depositing customer payments into the bank and earning compounded interest on those revenues net of expenses. It then pays its investors quarterly, who reinvest the dividends and thus get the benefit of quarterly compounding.

To be precise, therefore, if quarterly compounding is allowed, the cost of equity would also have to be "decompounded" to account for the fact that the telephone holding companies will be able to reinvest proceeds on a monthly basis. The net effect would result in a *lower* allowed rate than the annual DCF cost of equity proposed by me. Consequently, the use of a DCF cost of equity determined using the annual formula is conservatively high.

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

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

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

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

Q. YOUR STUDY HAS BEEN PREPARED WITH DATA AS OF JUNE 30, 2000. WILL YOU CONSIDER MORE CURRENT INFORMATION?

A. I have not attempted to do a complete update of my study at this juncture, as the full set of data that I would use in a new analysis as of December 31, 2000 is just becoming available.

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VIII.

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 VZ-NE's provision of UNEs as of June 30, 2000 is in a range between 9.17 and 9.91 percent with a best point estimate of **9.54 percent**.

I have also stressed, however, that at least the higher side of the range represents an upward-biased estimate of the cost of capital for the provision of network elements because it incorporates the risks of multi-business telephone holding companies. In this proceeding,

VZ-NE'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.

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

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

3. 3 Alltel also had about 26% of its revenues from wireline, but had significantly more access lines (2,519,952) than Telephone and Data Systems (682,200). I have judgmentally included Alltel in my sample.

4. 4 *Stocks, Bonds, Bills and Inflation*, *1998 Yearbook*, Ibbotson Associates, Chicago, Illinois, pg. 150.

5. 5 The Bond Guide does not include commercial paper and 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.

6. 6 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.

7. 7 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.

8. 8 *Stock, Bonds, Bills and Inflation, 1998 Yearbook*, Ibbotson Associates, Chicago, pp. 161-162.

9. 9 Dr. Sharpe is a Nobel-prize winning financial economist.

10. 10 Sharpe, William F., Gordon J. Alexander and Jeffrey V. Bailey, *Investments*, Fifth Edition, Prentice Hall, Englewood Cliffs, New Jersey, 1995, pp. 590-591.

11. 11 Damodaran, Aswath, *Damodaran on Valuation: Security Analysis for Investment and Corporate Finance*, John Wiley & Sons, New York, 1994, pp. 99-101.

12. 12 Copeland, Tom, Tim Koller, and Jack Murrin, *Valuation: Measuring and Managing the Value of Companies*, John Wiley & Sons, New York, 1994, pg. 295.

13. 13 There are numerous formulations of the DCF model of varying complexity.

14. 14 I/B/E/S website, www.ibes.com.

15. 15 I refer to estimation error and the desirability of using averages in several discussions in my testimony. The following excerpt from *A Guide to Econometrics*, (3rd Edition, The MIT Press, Cambridge, MA, 1992) by Peter Kennedy summarizes the purpose for using larger samples:

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

16. 16 I utilize an annual DCF model because VZ-NE receives payments for the use of its 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 VZ-NE receives 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.

17. 17 Because Century Telephone has a very small dividend yield of 0.54%, applying the DCF model yields a cost of equity estimate that is not meaningful. As I note later in my testimony, the DCF approach may be less accurate for companies that pay small dividends. Consequently, I exclude Century Telephone from the DCF cost of equity calculation. However, I still include Century Telephone's CAPM cost of equity estimate. Because Century Telephone has a small market value of equity, its exclusion from the DCF calculation has a minimal (although slightly conservative) effect on the DCF cost of equity estimate for Verizon.

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

19. 19 Barr Rosenberg, "Prediction of Common Stock Betas", Reprinted with permission from The Journal of Portfolio Management, Winter, 1985, on www.Barra.com/ResearchPub/NonBarraPub/pocs/pocs-j.html.

20. 20 Copeland, Tom, Tim Koller, and Jack Murrin, *Valuation: Measuring and Managing the Value of Companies*, John Wiley & Sons, New York, 1994, at pg. 264.

21. 21 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.

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

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

24. 24 Damodaran, Aswath, *Damodaran On Valuation: Security Analysis for Investment and Corporate Finance*, John Wiley & Sons, 1994, at p. 22.

25. 25 Stocks, Bonds, Bills and Inflation, 2000 Yearbook, Valuation Edition, Ibbotson Associates, Chicago, Illinois, p. 66.

26. 26 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.

27. 27 *Ibid.*

28. 28 Brown, Stephen J., William N. Goetzmann and Stephen A. Ross, "Survival", *The Journal of Finance,* Vol. L, No. 3, July 1995.

29. 29 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.

30. 30 Blanchard, Oliver, "Movements in the Equity Premium", *Brookings Papers on Economic Activity*, 75 (2) 1993.

31. 31 Rappaport, Alfred, *Creating Shareholder Value,* The Free Press, New York, 1998.

32. 32 Clements, Jonathan, "Value Judgment: Getting a Handle on Stocks' Worth," *Wall Street Journal*, January 11, 2000.

33. 33 *See, e.g.,* Glassman, James K. and Kevin A. Hassett, "Are Stocks Overvalued? Not a Chance." *Wall Street Journal* (March 30, 1998) ("the [downward trend in the] risk premium required by shareholders . . . may not be over").

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

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

36. **36 As rounded.**

37. 37 As rounded.

38. 38 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.

39. 39 Bell Atlantic Investment Reference Guide, Mid-Year 1999, p. 22 (emphasis added).

40. 40 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.

41. 41 Damodaran, for example, states that "[f]irms operating in businesses with volatile earnings and cash flows should use debt less than should otherwise similar firms with stable cash flows. For instance, regulated utilities in the United States have high leverage because regulation and the monopolistic nature of their businesses result in stable earnings and cash flows. At the other extreme, toy manufacturing firms such as Mattel can have large shifts in income from one year to another, based upon the commercial success or failure of a single toy. These firms should use leverage far less in meeting their funding needs." Damodaran A., "Applied Corporate Finance: A User's Manual," John Wiley & Sons, 1999, p. 231.

42. 42 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."

43. 43 Morgan Stanley Dean Witter, "Alltel Corporation", March 10, 2000, p. 4, and March 13, 2000, p. 3.

44. 44 BHF-Bank, "Deutsche Telekom", April 27, 2000, p. 6.

45. 45 *Prescribing the Authorized Unitary Rate of Return for Interstate Services of Local Exchange Carriers*, CC Docket No. 98-166, "Notice Initiating a Prescription Proceeding and Notice of Proposed Rulemaking," (rel. October 5, 1998).

46. 46 United States Court of Appeals for the Eighth Circuit, No. 96-3321, July 18, 2000.

47. 47 *See, e.g.*, Findings and Recommendations of Hearing Examiners, Delaware PSC Docket No. 96-324, ¶¶ 68 (De. PSC Apr. 7, 1997) (10.28 percent), *affirmed*, Order No. 4542, at ¶ 29 (De. PSC July 8, 1997), *affirmed*, *Bell Atlantic-Delaware, Inc. v. McMahon*, 80 F.Supp.2d 218, 239-41 (D.Del. 2000); Order, Case No. PUC970005, at 11 (Va. SCC May 22, 1998) at 6 (10.12 percent); Order, Case No. 8731, at 29 (Md. PSC Sept. 22, 1997) (10.1 percent).

48. 48 *See MCI Telecommunications Corp. v. Bell Atlantic-Pennsylvania, Inc.*, Civil No. 1:CV-97-1857 (M.D. Pa., June 30, 2000), Memorandum and Order at pp. 10-13.

49. 49 D.P.U. 96-73/74, 96-75, 96-80/81, 96-83, 96-94 - Phase 4 (December 4, 1996) at 41.

50. 50 *Bell Atlantic-Delaware, Inc. v. McMahon*, 80 F.Supp.2d 218 (D. Del. 2000) at 240 n. 19.

51. 51 SBBI 2000 Valuation Edition, p. 9

52. 52 This appears to be an error; the Department appears to have intended "Dr. Hubbard's analysis."

53. 53 D.P.U. 96-73/74, 96-75, 96-80/81, 96-83, 96-94 - Phase 4 (December 4, 1996) at 51-52.

54. 54 Decision served February 5 1997 ("Phase 4-A Decision").

55. 55 *Id*. at 5.

56. 56 *Ibid*., [emphasis added]

57. 57 *Ibid*.

58. 58 (13.5*0.7649) + (7.8*0.2351)

59. 59 FCC Memorandum Opinion and Order, *In the Matter of Application of Verizon New England Inc., Bell Atlantic Communications, Inc. (d/b/a Verizon Long Distance), NYNEX Long Distance Company (d/b/a Verizon Enterprise Solutions) And Verizon Global Networks Inc., For Authorization to Provide In-Region, InterLATA Services in Massachusetts*, CC Docket No. 01-9, Adopted and released: April 16, 2001, ¶ 38, at 19-20 (footnotes omitted) (emphasis added).