Witness CCS-4

BEFORE THE PUBLIC SERVICE COMMISSION OF UTAH

In the Matter of the Application	**:**	**Docket No. 01-035-01**
of PacifiCorp for Approval of its	**:**	**PREFILED DIRECT TESTIMONY OF**
Proposed Electric Rate Schedules	**:**	**JOHN B. LEGLER**
and Electric Service Regulations	**:**	**FOR THE COMMITTEE OF**
	:	**CONSUMER SERVICES**

June 4, 2001

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Q. PLEASE STATE YOUR NAME AND ADDRESS.

A. John B. Legler, 1040 St. Andrews Court, Bogart, Georgia 30622.

Q. WHAT IS YOUR OCCUPATION?

A. Until my retirement in October of 1999, I was a professor of Banking and Finance in the Terry College of Business at the University of Georgia, Athens, Georgia 30602. At this time I am a private consultant specializing in utility finance. This testimony represents the opinion of the author. It carries no official endorsement by the University of Georgia.

Q. ON WHOSE BEHALF ARE YOU APPEARING?

A. I was retained to represent the Committee of Consumer Services in this case.

Q. WHAT IS YOUR EDUCATIONAL BACKGROUND AND EXPERIENCE?

A. I received my B.A. with Honors in Economics from Allegheny College in 1962, and my M.S. and Ph.D. degrees in Economics from Purdue University in 1965 and 1967, respectively. I was an assistant professor of economics at Washington University, St. Louis, Missouri, where I also served as the Assistant Director of the Institute for Urban and Regional Studies from 1966-1971. I joined the University of Georgia faculty in the Fall of 1971 as an associate professor of banking and finance. From 1971 to 1974, I served as administrator of the Research Division in the Institute of Government in addition to my teaching

duties in the Department of Banking and Finance. I became Director of the Georgia Economic Forecasting Project on July 1, 1974, and served in that capacity until September 15, 1982. I was promoted to full professor in 1977. I have been a consultant to federal, state and local government agencies in Alabama, Arizona, California, Connecticut, Florida, Georgia, Hawaii, Illinois, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Mississippi, Missouri, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Pennsylvania, Rhode Island, South Carolina, Texas, Utah, Virginia and Washington. My consulting has been mainly in areas of economic forecasting, governmental finance, and the cost of capital. I have testified before the House Utilities Study Committee of the Georgia Legislature, the State Board of Equalization in Georgia, the Chatham County (Savannah) Superior Court, and the National Association of Security Dealers.

My publications include many articles in professional journals, books and monographs. I am a member of Beta Gamma Sigma, a business honorary. Until recently, I was a research associate of the National Bureau of Economic Research, Inc.

Q. HAVE YOU SUBMITTED TESTIMONY IN OTHER HEARINGS BEFORE PUBLIC SERVICE COMMISSIONS OR OTHER REGULATORY AGENCIES?

A. Yes, I have testified extensively before commissions on the cost of capital. My

participation in hearings before regulatory agencies is indicated in Exhibit CCS 4.1. I have testified before the Utah Public Service Commission (Commission) on several previous occasions in cases involving Mountain Fuel Supply/Questar Gas, U.S. West and PacifiCorp (Company).

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. I was retained by the Committee of Consumer Services (Committee) to review PacifiCorp's cost of capital testimony and to prepare a study on which to base an independent estimate of the Company's cost of capital in this rate case.

Q. HAVE YOU REVIEWED THE TESTIMONY ON THE COST OF CAPITAL SUBMITTED BY THE COMPANY?

A. Yes, I have. I have reviewed the testimonies of Dr. Samuel C. Hadaway and Mr. Bruce N. Williams presented on behalf of the Company.

Q. DO YOU HAVE ANY GENERAL COMMENTS ON THE APPLICATION OF FINANCE THEORY TO THE REGULATORY PROCESS BEFORE DEVELOPING YOUR ESTIMATE OF THE COST OF CAPITAL?

A. It is my opinion that the application of finance theory can provide help and guidance in the decision process, but that the issue of the fair rate of return is still largely judgmental. This is particularly true with respect to the return on equity component of the overall rate of return. Each finance theory suffers from

the necessity of making crucial assumptions requiring judgment in the process of its application. Although proponents of any particular theory tend to minimize or even overlook the importance of the necessary assumptions, often the assumptions that are necessarily made are crucial to their results. It is for this reason that I use several methods to estimate the cost of equity capital, using one method to check on the reasonableness of another. In addition, using several methods enables me to estimate a range rather than a single value for the rate of return on equity. I believe that providing the Commission with a zone of reasonableness with respect to the cost of equity capital permits the Commission the flexibility of weighing other factors such as rate base and capital structure in its decision, with the assurance that the estimate of the cost of capital is within a reasonable range. I believe that, should this Commission adopt my recommendation, the Company would be afforded the opportunity to earn a fair rate of return consistent with the Hope and Bluefield decisions.

It is also my opinion that reasoned judgment is important at this time because of the volatility in interest rates. The results of mechanical approaches to estimating the cost of equity are likely to change even on a daily basis. While these changes in the calculated cost of equity may be relevant for market investment decisions, I believe that estimating the cost of equity for ratemaking purposes must take a longer term view.

Q. HOW DO YOU PROPOSE TO ORGANIZE YOUR TESTIMONY?

A. My testimony is organized around the specific tasks necessary to estimate the cost of capital. Those tasks are as follows:

1) I discuss the appropriate capital structure;

2) I discuss the embedded cost rates for senior securities;

3) I estimate the cost of common equity; and

4) I apply my proposed cost rates to the capital structure thereby arriving at my recommendation regarding the Company's cost of capital.

Capital Structure

Q. WHAT BASIS DID YOU USE TO DETERMINE THE CAPITAL STRUCTURE FOR THE COMPANY IN THIS CASE?

A. Obviously, the return on common equity allowed in this proceeding will impact the earnings of the Company, which in turn will affect retained earnings and ultimately the capital structure. I believe that alternative capital structures should be judged on the basis of their reasonableness and attainability.

The Company proposes a capital structure consisting of 49.2% debt, 3.2% preferred stock, and 47.6% common equity. This capital structure contains slightly less common equity than the Company proposed in its last general rate case. This capital structure is based on the average capitalization ratios for the group of comparable companies used to develop the Company's recommended cost of equity. In PacifiCorp’s last rate case, the Company was concerned, as was I, that ratepayers in one jurisdiction do not subsidize and are not subsidized by ratepayers in other jurisdictions. The Company also recognized that its non-regulated businesses have different capital structure requirements and influence its consolidated capital structure. I was also aware of the Company's position that PacifiCorp's capital structure cannot be separated jurisdictionally. The Company describes its rationale for using a hypothetical capital structure as being the Commission's requirement for merger approval that Scottish Power maintain its practice whereby an A-rated hypothetical capital structure is used for regulatory determination of PacifiCorp's cost of capital. Accordingly, I accept

the use of a hypothetical capital structure based on the capital structure of comparable companies.

The Company developed such a capital structure based on the average capitalization ratios of single-A electrics followed by Value Line which have at least 75% of revenues from their electric business. I have consistently recommended that the capital structures be updated for known and measurable changes at the time the Commission renders its decision. I recommend that this be done in this case, and have updated the Company's capital structure with more recent Value Line editions than were available at the time Dr. Hadaway prepared his testimony. Using the same group of companies as used by Dr. Hadaway (except for a name change as a result of a merger, CP&L Energy merged with Florida Progress, and the elimination of IPALCO acquired by AES). I updated his analysis for year end 2000. I used actual 2000-reported figures from Value Line rather than projected 2001 figures. That simple updating resulted in a capital structure consisting of 51.3% debt, 4.1% preferred stock, and 44.7% common equity (shown in CCS 4.2), which I recommend be adopted in this case.

Cost of Debt

Q. WHAT IS THE BASIS FOR DETERMINING THE COST OF DEBT?

A. The cost incurred by the company for debt is determined in the capital market at the time the debt is issued. Once issued, the debt becomes, in effect, a contractual arrangement between the company and the creditor. The cost will remain constant during the term of the debt and will not be altered by changes in the company's financial integrity or in general economic conditions. Thus, the cost of debt is the weighted average cost of the company's embedded debt.

Q. WHAT RATE DO YOU PROPOSE TO ASSIGN TO LONG-TERM DEBT?

A. Embedded cost rates are easily calculated and usually there is little disagreement among witnesses as to the cost of long-term debt. For purposes of calculating a weighted average cost of capital, I will accept the Company's proposed rate of 7.092%. The details of this calculation are contained in Mr. Williams' testimony and he states that it was developed in a manner consistent with Commission practice in previous cases. I do note that several issues of Pollution Control Revenue Bonds become due during the first eight months of 2001. I do not know if these bonds were refinanced, and if so, at what rate(s). The Company should be obligated to update Mr. Williams' schedules to eliminate or update the relevant information. Since this rate is being used with a hypothetical capital structure there is going to be some mismatch regardless.

<u>Cost of Preferred Stock</u>

Q. WHAT RATE DO YOU PROPOSE ASSIGNING TO PREFERRED STOCK?

A. As in the case of long-term debt, the proper cost for preferred stock is the embedded cost rate. Also, as in the case of long-term debt, there is usually little disagreement among witnesses as to the cost of preferred stock. Further, as a practical matter, preferred stock is usually a small proportion of a utility's capitalization and differences among witnesses frequently have a minimal effect on the overall cost of capital.

The Company proposes a cost rate for preferred stock of 6.055%. The details of this calculation are shown in Mr. Williams' testimony and he states that it was developed consistently with Commission practice in previous cases. This rate is slightly higher than proposed by the Company in the last case. For the purpose of calculating a weighted average cost of capital I will accept the Company's proposed rate of 6.055%.

Cost of Equity

Q. PLEASE DESCRIBE THE METHODS YOU USE IN ESTIMATING THE COST

OF EQUITY CAPITAL FOR PACIFICORP.

A. I have used three applications of finance theory to estimate the cost of equity capital for PacifiCorp. There are several applications of finance theory that may be considered: (1) the Capital Asset Pricing Model (CAPM), (2) the bond yield plus risk premium method, and (3) the dividend yield plus growth or simply the DCF method. The applications of finance theory rely on data on stock market returns and are considered indirect measures. The ultimate task requires that these returns on market be translated into return on book for regulatory purposes.

Q. ARE THESE THE SAME METHODS YOU HAVE USED IN COST OF CAPITAL TESTIMONY IN YOUR APPEARANCES BEFORE COMMISSIONS?

A. Yes, they are. Over the years I have made certain refinements in my testimony, but the basic methods remain the same. I have expanded my risk premium analysis by adding the Capital Asset Pricing Model approach to estimating risk premiums. Also, despite my reservations about the CAPM, as well as recent contributions to the financial literature questioning the use of beta as a measure of risk, its usage and acceptance in rate cases are increasing, and I have made estimates of the cost of equity using it.

Discounted Cash Flow Method

Q. DID YOU USE THE "DIVIDEND YIELD PLUS GROWTH RATE METHOD" TO

ASSIST IN ESTIMATING THE COST OF EQUITY FOR PACIFICORP?

A. Yes, I did.

Q. PLEASE EXPLAIN THE METHOD AND HOW YOU USED IT IN THIS CASE.

A. This method recognizes that investors in stocks expect to receive total returns consisting of dividends and capital gains. Although investors may in fact suffer capital losses, it is reasonable to assume that most investors would not buy a common stock unless there were reasonably good prospects that the stock would increase in value over time. The basic equation used to describe this method, which is commonly known as the DCF method and is widely used in rate of return testimony, is:

$$k = D_1/P_0 + g$$

where,

k = the cost of equity

D_1 = the dividend next period

P_0 = the market price of the stock

g = the expected growth rate.

This is a "constant growth model"; and in its simplest form it is assumed that a company has a constant payout ratio and its earnings are expected to grow at a constant rate. Thus, if a stock has a market price of $30 a share and an expected annual dividend in the coming year of $3 a share, and if its earnings were expected to grow at 5% a year, then the cost of equity for the company is

the 10% dividend yield plus the growth rate of 5% or a total of 15%.

Q. DO YOU BELIEVE THAT THE ANNUAL VERSION OF THE DCF MODEL IS ADEQUATE FOR MEASURING A UTILITY'S COST OF EQUITY?

A. Yes, I do. The annual version of the DCF model typically is criticized for its failure to recognize that dividends are paid on a quarterly basis. In my opinion, it is important to remember the context in which the DCF model is being used. Essentially, the purpose of estimating the cost of equity is to enable the calculation of the revenues required to meet investors' return requirements. The ultimate question is with respect to the adequacy of the revenue dollars to meet those requirements. While it may be argued that reinvestment of quarterly dividends during the year has the effect of raising investors' expected returns compared to the returns produced by the annual version of the model, the reinvestment of earnings during the year also will provide additional compensation to investors. Clearly, dividends are not paid at the end of the year, but neither do ratepayers pay their bills at the end of the year. The irrelevance of the quarterly adjustment is considered in the professional literature in an article by Charles M. Linke and J. Kenton Zumwalt, "The Irrelevance of Compounding Frequency in Determining a Utility's Cost of Equity," which appeared in Financial Management, Volume 16, Number 3 (Autumn 1987), pages 65-69.

As a practical consideration, the accuracy of a quarterly dividend version of the DCF model depends on the validity of the assumptions made regarding the

pattern of dividends and the timing of dividend increases. Obviously, it is invalid to assume that the quarterly dividend is increased each and every quarter. The computationally easy version of the quarterly model makes this assumption. A more rigorous version of the model assumes that the dividend will be increased once a year. If this is the assumption, the quarter in which the dividend is increased relative to the point in time the DCF estimate is calculated is relevant.

Marvin Rosenberg and Ronald N. Lafferty in an article, The FERC's Discounted Cash Flow: The Right Direction Without Compromise," Public Utilities Fortnightly, February 4, 1988, pages 46-48, demonstrate that the quarterly dividend DCF model equates to the annual version of the DCF model with an adjustment of half the annual dividend growth. That is:

$$k = D_0(1 + .5g)/P_0 + g$$

Thus, if a stock has a market price of $30 a share and if the last annual dividend paid was $3 a share, and if its earnings were expected to grow at 5% a year, then the cost of equity for the company is an adjusted dividend yield of 10.25% plus the growth rate of 5% or a total of 15.25%.

Based on these considerations, I believe that the annual version of the DCF model is adequate for the purposes it is intended and the context in which it is used.

Q. DO YOU BELIEVE THAT THE CONSTANT GROWTH VERSION OF THE DCF MODEL IS ADEQUATE FOR PURPOSES OF ESTIMATING THE COST OF

EQUITY?

A. Yes, I do, but certainly the results must be used with judgment in setting the cost of equity. The constant growth version of the model assumes that a company's dividends, earnings, book value and stock price increase at the same constant rate. I agree that dividends, earnings, and stock prices are not likely to grow at the same rate as required by the model. Indeed, the model can be modified to incorporate more than one growth rate. But this certainly adds to the mathematical complexity of the model and further complicates an already difficult process of selecting the growth rate. I do note that Dr. Hadaway used this version of the DCF model.

I believe that it is important to consider what version of the model is likely to be used by investors themselves, not what another witness or I believe to be more acceptable. In this regard, I doubt that the average investor has the ability or inclination to attempt the mathematics required by the multiple growth version of the model. As stated by the Commission in its Order in Docket No. 93-057-01, under this version of the model it is relatively easy to determine the reasons for the differences in results among the witnesses.

I agree with the Commission's policy to use the basic version of the DCF model. Further, I believe that this version of the model is adequate to the task, and the Commission's decision is well founded and does not compromise the integrity or intent of the model.

As I understand Dr. Hadaway's testimony, he is proposing the use of the multi-growth period model. This model requires that a constant growth rate be adopted at some point in the future. When this constant rate is incorporated into the model, and the growth rate adopted prior to this constant rate are controversial issues. Some witnesses adopt a short-term growth rate and a long-term growth rate and build in a transition period between the two which may be nothing more than a mechanical smoothing of the two rates. In any event, the length of the transition period will be subjective and more than likely controversial. In my opinion, these modifications to the basic model are unnecessary and contribute little, if anything, to the estimate of the cost of equity.

Q. HOW HAVE YOU APPLIED THE DCF MODEL IN THIS CASE?

A. I have applied the DCF model to a group of reasonably comparable electric utilities. I have selected a group of single-A rated electrics starting with the group of companies selected by Dr. Hadaway. Usually, I begin my application of the DCF method by applying it to the company under review, but that was not possible in this case.

Q. HOW DID YOU SELECT THE GROUP OF COMPARABLE ELECTRIC COMPANIES?

A. The group was selected from the electric utilities followed by Value Line. To be included in the group, a company had to have a single-A bond rating and receive

75% of its revenues from sales of electricity. I used the same group of comparable companies selected by Dr. Hadaway except for my inclusion of Progress Energy which resulted from the combination of CP&L Energy and Florida Progress. Dr. Hadaway included CP&L Energy in his group of comparables. I also eliminated IPALCO acquired by AES. Additional screening criteria could have been applied, but I chose to make my estimates based on this fairly broad group and then adjust for risk differences, if necessary, between PacifiCorp and the group.

Many factors could be used to include or exclude companies from the group of comparables, and while I find the use of the 75% of revenues criterion no more compelling than some of these other factors, I do believe that it is reasonable.

Q. PLEASE CONTINUE WITH YOUR DISCUSSION OF THE DCF METHOD.

A. The most difficult aspect of implementing the DCF method is estimating the future growth rate. If a company's past trend in growth has been erratic, it is difficult to project future growth on the basis of past trends. Since the DCF method requires a constant or sustainable growth rate, it is apparent that growth rates based upon recent realized rates are too volatile to provide a basis for future projections for most utilities.

Q. ARE THERE OTHER METHODS OF FORECASTING GROWTH RATES?

A. Another method used by security analysts is to estimate future growth based on the percentage of retained earnings and the rate of return on book equity. Quite simply, if we call the percentage of earnings retained (b), and multiply it by the rate of return on equity (R), the estimate of future growth (g) is: g = b x R. For example, if a company earns 10% on equity, but pays all the earnings out in dividends, the "plowback" factor will be zero and earnings per share will not grow. Conversely, if the company retains all of its earnings and pays no dividend, it would grow at an annual rate of 10%.

Q. DOES THIS PROCEDURE FOR ESTIMATING FUTURE GROWTH REQUIRE ANY ASSUMPTIONS?

A. Three assumptions must hold for the procedure to produce an accurate (exactly correct) estimate:

1. The rate of return on equity is constant over time;
2. The percentage of retained earnings is constant over time;
3. The company sells no new common stock or sells it only at book.

While these assumptions have not held in the past for most utilities in general, it is the future, not the past, that is relevant. Also, while year-to-year fluctuations in the variables may be expected, the average return on equity and retention rate over time may be expected to be reasonably stable.

If a company were to sell common equity at above book value, proceeds from

the sale possibly could be used to support a somewhat higher growth rate than suggested by the basic equation. Since most utility stocks are now selling well above book value this is more of a consideration then when utility stocks were selling below book value. For this reason, I do not believe exclusive reliance should be placed on this method of estimating the dividend growth rate at this time.

In my opinion the retention growth rate method provides a useful check on the sustainability of adopted growth rates. For any particular growth rate, the combinations of retention rates and returns on equity necessary to produce that growth rate can be determined. For example, we can see from the table below that for a growth rate of 6%, with retention rates of 25% to 40%, returns on equity from 15.0% to 24.0% must be sustainable.

Retention Rate	x Return on Equity	= Growth Rate
25%	24.0%	6.0%
30	20.0	6.0
35	17.1	6.0
40	15.0	6.0

In my opinion these returns and retention rates are unlikely on a sustainable basis. Accordingly, the acceptability of a 6.0% or higher growth rate in DCF calculations is questionable, and I believe even my estimates for individual companies reflecting growth rates above this level should be viewed with some skepticism.

Q. HAVE YOU APPLIED THIS TECHNIQUE TO THE GROUP OF COMPARABLE COMPANIES?

A. Despite its limitations, it is still useful and I have applied it in this case. To apply it, we need two numbers, a company's expected retention rate and an estimate of its future return on common equity. Value Line forecasts a longer-term (2004-2006) earnings and dividend estimate for each company in the group of comparables. Value Line also forecasts a longer-term (2004-2006) return on common equity for each company. I have used these Value Line projections to calculate the retention growth for each company in the group of comparables. In applying the formula, I have increased Value Line's return on equity by 0.5% to reflect conversion from a year end to an average year basis.

Q. HAVE YOU EMPLOYED ANY OTHER GROWTH RATES IN YOUR DCF ANALYSIS?

A. Yes, I have also made DCF estimates based on Value Line's direct dividend and earnings forecasted growth rates.

Q. WHAT PRICES WILL YOU ADOPT FOR PURPOSES OF YOUR DCF ESTIMATES?

A. The price of a stock is likely to fluctuate from day to day because of market conditions and factors such as dividend payments. In my opinion, in applying the DCF method to a single company, it would be appropriate to use the average

price of the company's stock over a period of time rather than the price on a particular day. The time period is admittedly judgmental, but it is my opinion that it is still better than a spot price. The use of a spot price in a situation where there are wide swings in the stock market over relatively short periods of time makes the resulting DCF calculation very much dependent upon the particular day chosen to perform the analysis. While the most recent stock price may be quite relevant for market investment decisions based on DCF calculations, I believe the use of the DCF method for ratemaking purposes must take a longer term view.

I have consistently used three-month average prices in my DCF analysis in prior testimony. I have also provided estimates using the closing prices on the last day of the three-month period. I will continue my practice in this case. I believe that these prices are reflective of current market conditions while the average price smooths out day-to-day fluctuations. The current time period in this testimony is February through April 2001.

Q. WHAT DIVIDENDS DO YOU ADOPT FOR PURPOSES OF THE DCF CALCULATION?

A. Conceptually, the appropriate dividend is the expected dividend for the coming year. Defined as D_1, it is equal to the current dividend times 1 plus the growth rate [$D_1 = D_0(1+g)$]. I believe the straightforward calculation suggested above

reflects a reasonable approach to estimating the dividend for the coming year for the group of companies used in the DCF analysis.

Q. WHAT COST OF EQUITY DID YOUR DCF ANALYSIS PRODUCE FOR THE GROUP OF COMPARABLE ELECTRICS?

A. The results are shown on Exhibit CCS 4.3. For the single-A electrics, the projected dividend yield based on retention growth and average prices was 5.37%. Retention growth averaged 6.58% resulting in an average expected return on common equity of 11.96%. Based on Value Line's direct dividend growth rate forecast, the average expected dividend was 5.12% resulting in an average expected return on equity of 6.49%. The expected returns based on April 30, 2001, stock prices are 11.78% and 6.32%, respectively. A third set of estimates was based on Value Line projected earnings growth. Based on average prices, the cost of equity is 10.62% and based on April 30, 2001, prices, the cost of equity is 10.45%.

I have revised these estimates to exclude companies for which the Value Line projections are not meaningful, zero, or negative. The revised estimates are:

	Average Prices	April 30, 2001, Prices
Retention Growth	11.96%	11.78%
Dividend Growth	8.31%	8.16%
Earnings Growth	11.88%	11.22%

Average	10.72%	10.39%

Q. DO YOU BELIEVE THAT THESE AVERAGE EXPECTED RETURNS ON COMMON EQUITY ARE APPROPRIATE FOR PACIFICORP?

A. I would not recommend this approach for estimating the expected return on equity to any individual company without examining the factors influencing a particular company. I do believe, however, that the averages are useful in forming a judgment about PacifiCorp's cost of equity. Although the companies are similar in certain respects, we would expect there to be some differences in perceived riskiness of the individual companies, and accordingly, would expect some variation in the estimated cost of equity by company.

Q. HAVE YOU EXAMINED THE RELATIVE RISKINESS OF PACIFICORP IN COMPARISON TO THE GROUP OF COMPARABLE ELECTRIC UTILITIES?

A. Yes, I have. Risk differences may be divided into financial risk and business risk. Financial risk, as I am sure this Commission is aware, is concerned with the proportion of debt in a company's capital structure. The higher the proportion of debt, or, conversely, the lower the proportion of common equity, the greater the financial risk. As shown in Exhibit CCS 4.3, the average common equity ratio for the group of single-A rated electric companies was estimated at 44.7% in 2000. By comparison PacifiCorp's equity ratio was 43.5% (Value Line) in 1998. I believe that PacifiCorp is reasonably comparable, perhaps somewhat more risky,

in terms of the financial risk of the group of comparables.

Business risk in a formal sense is defined as the uncertainty involved in the projections of future operating income. Many things can affect business risk and in the case of a utility, the size and economic base of a company's territory certainly would be one. Dr. Hadaway suggested that comparability could be established using bond ratings and percentage of revenues generated by sales of electricity. Since I am using the same set of comparable companies, we must be in agreement that the riskiness of the group approximates the riskiness of PacifiCorp.

Risk Premium Method

Q. DID YOU USE THE "BOND YIELD PLUS RISK PREMIUM METHOD" TO ASSIST IN THE PREPARATION OF THE ESTIMATED COST OF EQUITY CAPITAL?

A. In virtually all the cases in which I have testified on the cost of capital I have

utilized this method. Because of the volatile conditions in the bond market, there are problems with this method and its application in the traditional manner often used by analysts. I will discuss this method, the problems associated with it and why, at the present time, I do not believe exclusive reliance should be placed upon it for estimating the cost of equity. I do believe, however, that the Commission should give it consideration in setting the cost of equity. All methods suffer from the necessity of making assumptions and judgments in their application. The risk premium method is not an exception.

Q. WHAT CONCLUSIONS HAVE YOU REACHED REGARDING THE RISK PREMIUM APPROACH?

A. I believe it should be used with care and be reflective of current conditions. Therefore, I believe it should not stand on its own but be used in conjunction with other estimating techniques.

Q. WHAT IS THE THEORETICAL BASIS OF THE BOND YIELD PLUS RISK PREMIUM METHOD?

A. Basically, the theory suggests that the required rate of return is higher for riskier securities than less risky securities. Thus, normally we would expect that corporate bonds would carry a higher cost than U.S. Government securities. Accordingly, corporate equity securities would have a higher return than its debt. The theory usually is implemented by adding a risk premium to the yield on a

company's long-term debt or utility bonds of the same rating. The yield on the company's long-term debt would be established by market conditions; relative riskiness of a company's bonds, basically, is assessed by bond ratings. Alternatively, a risk premium may be developed relative to a risk-free U.S. Government security and the cost of equity estimated by applying that risk premium to the currently prevailing rate on the government security.

Q. IS A COMMON EQUITY INVESTMENT IN A PUBLIC UTILITY INVARIABLY MORE RISKY THAN AN INVESTMENT IN THE DEBT OF A PUBLIC UTILITY?

A. Circumstances may exist such that a negative risk premium or well below average risk premium may be calculated. The conventional approach states that equity is more risky than debt because the equity holder stands last in line as a claimant on the earnings of a corporation. Bonds represent a long-term commitment at a fixed interest rate. The return on common equity is not fixed at the time of purchase and will change in response to changing financial and economic conditions. Thus, in the case of a regulated industry, the return on common equity may be adjusted to reflect current money cost, more than likely with some lag. In the case of the bondholder, however, no adjustment in the interest rate takes place after the bond is issued. If the bondholder did not correctly anticipate future rates of inflation at the time of purchase, the transaction may turn out to be a poor investment despite the fact that interest payments continue and the principal is repaid at maturity.

This additional risk is called interest-rate risk. It has nothing to do with the financial condition of the company issuing bonds and can only be protected against by demanding a higher interest rate when the bond is issued. In my opinion, this is one important reason for the high interest rates experienced during the 1980s, despite substantial slowing in the rate of inflation. Investors recognize that interest rate risk is important and have demanded higher interest rates as protection against a possible future decline in economic conditions.

As a practical consideration bondholders have suffered low returns on public utility bonds for several decades despite the industry's good record of interest and principal payments. In my opinion, the perception that interest-rate risk is important has increased the relative riskiness of debt compared to equity.

Q. IS THE EXISTENCE OF A NEGATIVE RISK PREMIUM CRUCIAL TO YOUR REJECTION OF THE RISK PREMIUM METHOD AS THE PRIMARY METHOD OF ESTIMATING THE COST OF EQUITY IN A RATE CASE?

A. No, it is not. The point of my risk premium discussion and presentation of data is not to establish a negative risk premium. My point is that the method, as conventionally applied in rate cases, may produce an unreliable estimate of the cost of equity. The conventional approach adds an average long-term risk premium calculated in a variety of ways to a current bond yield to arrive at a cost

of equity. Implicitly, this assumes that the risk premium is constant. My analysis raises serious doubts about the validity of this assumption, and consequently, the usefulness of the method.

I do not disagree with the basic finance theory which indicates that investors expect higher returns on riskier investments. I do believe, however, that contemporary institutional market factors affecting relative risk should not be ignored for the sake of the simplicity found in historical relationships.

Q. DESPITE YOUR RESERVATIONS ABOUT THIS METHOD, HAVE YOU DONE ANY STUDIES OF RISK PREMIUMS FOR PACIFICORP OR THE GROUP OF COMPARABLE ELECTRICS?

A. Yes, I have prepared a study for PacifiCorp as part of my testimony in this case. I have developed risk premiums based on a discounted cash flow approach. For the DCF based approach, I based the necessary growth rate on Value Line's projected data for dividends per share, earnings per share and return on equity from its published reports on the company toward the end of each year. In addition, I performed the same analysis using Value Line's direct forecasted dividend growth rates from those same reports. I also calculated a third set of risk premium estimates for PacifiCorp using the Capital Asset Pricing Model. Thus, my risk premium estimates for PacifiCorp are based on three estimates of the returns on common equity. The dates of the Value Line reports and the

necessary data for PacifiCorp are shown in Exhibits CCS 4.4, CCS 4.5, and CCS 4.6.

Q. WHAT RISK PREMIUMS DOES YOUR ANALYSIS INDICATE FOR PACIFICORP?

A. The results of my study are shown in Exhibits CCS 4.5 and CCS 4.6. The exhibits may be viewed in the following way: an estimate of the cost of equity for PacifiCorp is made for the first of January of each year. It is then compared to the existing bond yield at the time which I have assumed to be the reported December Moody's public utility bond yield of the single-A rating class of the previous year. Alternatively, the expected return is compared with the 30-year Treasury bond rate for December of the previous year. The expected risk premium is the difference between the DCF calculated return on equity and the then current bond yield, whether it is based on the Treasury or utility bond rate. The risk premiums are summarized below.

	Based on Treasury Rate: 1978-1999	Based on Utility Rate: 1978-1999
Return based on:		
Retention Growth	3.41%	1.87%
Analysts' Growth	4.66%	3.45%
CAPM	5.27%	3.72%
Average	4.45%	3.01%

The calculated expected risk premium for PacifiCorp has averaged 3.01% relative to the utility bond rate and has averaged 4.45% relative to the Treasury

bond rate for the period from 1978 to 1999 based on the three estimates of the returns on equity. (The merger with Scottish Power precluded using more recent data). In calculating these average risk premiums, all negative risk premiums for individual years have been deleted.

The current yield on 30-Year Treasury bonds is approximately 5.8%. The current yield on Moody's single-A rated public utility debt is approximately 7.6% (7.63% as of March 21, 2000). Thus, adding the average risk premiums for the 1978-1999 time period to current yields produces a required return in a range from 10.25% to 10.61%. Moody's Bond yields are shown in CCS 4.7.

Longer-term Risk Premiums

5.8% + 4.45% = 10.25%

7.6% + 3.01% = 10.61%

Capital Asset Pricing Model

Q. DID YOU USE THE CAPITAL ASSET PRICING MODEL (CAPM) TO ESTIMATE THE COST OF EQUITY TO PACIFICORP?

A. I consider the CAPM to be a subset of the risk premium approach. As with all the methods we use, assumptions are required in its application. There are fairly severe problems with the required data inputs usually employed by analysts using this method. This results in internal inconsistencies which I discuss below. For this reason I usually have preferred not to use this method in my testimony.

However, since the method has grown in popularity, I believe a comment on the use of this model is appropriate. I have also provided estimates of the cost of equity based on it.

Q. CAN YOU BRIEFLY DESCRIBE THE CAPITAL ASSET PRICING MODEL?

A. Very briefly, the model states that the cost of equity to a company is equal to a risk-free rate, usually approximated by the yield on a government security, plus a risk adjusted premium for equity compared to the risk-free rate. The risk adjustment factor is called beta, which is a measure of the relative volatility of the stock in question to the volatility of the market. The equation used to estimate the cost of equity is:

$$k_j = k_{rf} + \beta(k_m - k_{rf})$$

where, k_j is the return on the stock

k_{rf} is the risk-free rate

β is beta

k_m is the return on the market

Q. WOULD YOU BE MORE SPECIFIC ABOUT THE INTERNAL INCONSISTENCIES?

A. Yes, I will. The Value Line betas are commonly used in the implementation of the capital asset pricing model. The Value Line beta is an adjusted beta and the New York Stock Exchange Composite Index is used in its construction as a surrogate for the market. A long-term (1926-1999) historical market premium provided by Ibbotson Associates is often used as the surrogate for the expected market premium. The surrogate for the market in the Ibbotson study is the S&P 500. To the extent that the surrogate for the market and the estimating technique affect the beta, the estimated return will be affected. This may not be of great concern, but the use of an adjusted beta compared to a raw beta certainly affects the return substantially. The Value Line betas "are adjusted for their long-term tendency to converge toward 1.00." (Arnold Bernhard, How To Use the Value Line Investment Survey, page 61) The actual adjustment procedure involves the application of a regression equation which may be closely approximated by averaging the raw beta with 1.0 giving twice the weight to the raw beta. All stocks are adjusted in the same manner and also they are rounded to .00 or .05.

While the adjustment procedure may be appropriate for the construction of a risk indicator, the theoretical linkage between the adjusted beta and the CAPM model is tenuous, at best. I know of no recent empirical tests which indicate that the beta of all stocks converge toward 1.0 or even that utility stocks converge the same way as other stocks. The CAPM, unlike the DCF, is a one period model. Thus, even if a forward-looking beta is appropriate, the adjustment to the raw

beta is too large to be realized in the near term.

Furthermore, I also should note that the beta is estimated relative to a risk-free rate. The estimated beta will vary depending upon whether a short-term or long-term government security rate is used as the proxy for the risk-free rate. There has been growing support among analysts for the use of a long-term government security rate as a proxy for the risk-free rate when using the CAPM in regulatory proceedings. However, it is possible that the beta was estimated relative to a different risk-free rate or no risk-free rate at all. The market premium is often based on the long-term historical spread between realized market returns and risk-free rates.

The Ibbotson study, covering a very long time period beginning in 1926, often is used in developing this estimate. That long-term risk premium through 1999 is 8.1% based on the difference in the arithmetic returns on common stock and the income returns on long-term government bonds.

Q. DESPITE YOUR RESERVATIONS HAVE YOU CALCULATED THE COST OF EQUITY FOR PACIFICORP OR THE GROUP OF REASONABLY COMPARABLE ELECTRICS USING THE CAPITAL ASSET PRICING MODEL?

A. I have calculated the cost of equity for the group of comparable electrics. I have used the current yield on 30-year Treasury bonds as the risk-free rate.

Consistent with my risk premium estimates, I will use a rate of 5.8%. I will also use the historical risk premium of 8.1% in my analysis. I have made the calculations using both S&P and Value Line betas, although the estimates using the S&P betas are unusual, and I don't believe that they are reasonable. The average S&P beta for the group of single-A electric companies is .06. The average Value Line beta for the group of single-A electrics is .50. The betas are shown in Exhibit CCS 4.8. Based on the long-term historical market risk premium of 8.1% and a risk-free rate of 5.8% for 30-year Treasury bonds, the CAPM estimated return for the group of single-A electrics is 9.85%.

Single-A Electrics:

5.8% + .50(8.1%) = 9.85%

Cost of Equity Summary

Q. PLEASE SUMMARIZE YOUR ANALYSIS OF THE COST OF COMMON EQUITY TO PACIFICORP.

A. I have placed reliance on the discounted cash flow method, the risk premium method, and the Capital Asset Pricing Model. I have applied the DCF method to a group of single-A rated electric utilities. I applied the risk premium method to PacifiCorp. I applied the Capital Asset Pricing Model to the group of single-A rated electrics used in my DCF analysis. The results from my applications of these financial models are summarized below.

DCF Method:	Based on: Average Price	Current Price
Single-A Electrics:		
Retention Growth	11.96%	11.78%
Value Line Dividend Growth	8.31%	8.16%
Value Line Earnings Growth	11.88%	11.22%
Average	10.72%	10.39%

Risk Premium Method:

Single-A Electrics 10.25%-10.61%

Capital Asset Pricing Model:

Single-A Electrics 9.85%

Q. PLEASE STATE YOUR RECOMMENDED RETURN ON COMMON EQUITY FOR PACIFICPORP AND YOUR REASONS FOR SELECTING THIS POINT ESTIMATE.

A. The estimates are very much dependent on the state of the financial markets. Although all of the financial models suffer from limitations in their applications, it is my opinion that all of the results should be considered and none abandoned by the Commission. I believe that the cost of equity lies in a range from 10.25% to 11.25%. For purposes of calculating a weighted average cost of capital, I will use the midpoint of this range, 10.75%. In my opinion, this average DCF result is consistent with a DCF model incorporating lower short-term growth in dividends and longer-term (normalized) dividend growth.

My adopted cost rate for equity is virtually the same as the average DCF result based on average prices.

WEIGHTED AVERAGE COST OF CAPITAL

Q. HAVING ASSIGNED COST RATES TO THE CAPITAL COMPONENTS AND ADOPTED A CAPITAL STRUCTURE, WHAT WEIGHTED AVERAGE COST OF CAPITAL DO YOU RECOMMEND?

A. I have calculated the weighted average cost of capital based on my adopted capital structure and embedded cost rates for long-term debt and preferred stock, and a return on common equity of 10.75%. I recommend an average cost of capital to PacifiCorp of 8.70%. If the Commission were to adopt the

Company's proposed capital structure, the weighted average cost of capital would be 8.80%. These calculations are shown in Exhibit CCS 4.9.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes, it does.

Exhibit CCS-4D (Legler)

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