BEFORE THE IDAHO PUBLIC UTILITIES COMMISSION

IN THE MATTER OF THE APPLICATION OF PACIFICORP DBA UTAH POWER & LIGHT COMPANY FOR APPROVAL OF CHANGES TO ITS ELECTRIC SERVICE SCHEDULES	) CASE NO. PAC-E-05-1)) Direct Testimony of Samuel C. Hadaway))

PACIFICORP

CASE NO. PAC-E-05-1

January 2005

I. Introduction and Summary of Recommendations

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

A. My name is Samuel C. Hadaway. I am a Principal in FINANCO, Inc., Financial Analysis Consultants, 3520 Executive Center Drive, Austin, Texas 78731.

Q. On whose behalf are you testifying?

A. I am testifying on behalf of PacifiCorp (the Company).

Q. Please state your educational background and describe your professional training and experience.

A. I have an economics degree from Southern Methodist University and MBA and Ph.D. degrees in finance from the University of Texas at Austin (UT Austin). I am presently an adjunct professor in the McCombs School of Business at UT Austin. I have taught economics and finance courses at several universities, and I have conducted research and directed graduate students writing in these areas. I was previously Director of the Economic Research Division at the Public Utility Commission of Texas, where I supervised the Commission's finance, economics, and accounting staff and served as the Commission's chief financial witness in electric and telephone utility rate cases. In various utility conferences I have taught courses on cost of capital, capital structure, utility financial condition, and cost allocation and rate design methods. I have made presentations before the New York Society of Security Analysts, the National Rate of Return Analysts Forum, and various other professional and legislative groups. I have served on the board of directors and as a vice president of the Financial Management Association.

A list of my publications and testimony I have given before various regulatory bodies and in state and federal courts is contained in my resume, which is included as Exhibit No. 1.

Q. What is the purpose of your present testimony?

A. The purpose of my testimony is to estimate PacifiCorp's market required rate of return on equity (ROE).

Q. Please outline and describe the testimony you will present.

A. My testimony is divided into four sections. Following this introduction, in Section II, I review various methods for estimating the cost of equity capital. In this section, I discuss the discounted cash flow (DCF) model as well as risk premium methods and other approaches often used to estimate the cost of capital. In Section III, I review general capital market costs and conditions and discuss recent developments in the electric utility industry that may affect the cost of capital. In Section IV, I present the details of my cost of equity studies and provide a summary table of my ROE results.

Q. Please summarize your cost of equity studies and state your ROE recommendation.

A. My ROE estimate is based on alternative versions of the constant growth and multistage growth DCF model and is confirmed by my risk premium analysis and my review of economic conditions expected to prevail during the rate effective period. PacifiCorp's cost of equity cannot be estimated directly from its own market data because PacifiCorp is a wholly-owned subsidiary of ScottishPower. As such, PacifiCorp does not have publicly traded common stock or other

independent market data that would be required to estimate its cost of equity directly. I apply the DCF models to a conservative sample of electric utilities selected from the *Value Line Investment Survey*. To be included in my comparable company group, companies were required to have a single-A bond rating by either Moody's or Standard and Poor's, to derive at least 70 percent of revenues from regulated utility sales, to have consistent financial records not affected by recent mergers or restructuring, and to have a consistent dividend record as required by the DCF model.

To test my DCF results, I provide a bond-yield-plus-equity risk-premium analysis based on Moody's single-A cost of utility debt. This is the appropriate basis for the risk premium analysis, since PacifiCorp's senior debt is rated single-A by both Moody's and Standard & Poor's (A3 by Moody's and A- by S&P).

I also present S&P's forecasts for economic growth and for expected interest rates over the next year. The S&P forecasts indicate improving economic conditions and rising interest rates during the rate effective period. Under current economic, market, and electric utility industry conditions, this combination approach is the most appropriate for estimating the fair cost of equity capital. The data sources and the details of my rate of return analysis are contained in Exhibits 2 through 4.

My DCF analysis indicates that an ROE range of 10.7 percent to 11.4 percent is appropriate. As I will explain in more detail later, the lower end of my DCF results, from the traditional constant growth DCF model at 9.4 percent to 9.5 percent, fails to meet basic checks of reasonableness and, therefore, those results

are not included in the estimated DCF range. The traditional constant growth DCF results do not reasonably reflect the current cost of equity, because its results depend on historically low dividend yields and pessimistic analysts' growth forecasts, which do not adequately reflect current consensus expectations for increasing capital costs. My risk premium analysis serves as a check of reasonableness for the DCF results. That analysis indicates an ROE of 10.9 percent, with other risk premium approaches indicating ROEs as high as 11.8 percent.

Because recent historical data have a significant effect in the traditional constant growth DCF model, and because recent data appear to represent historic lows in the economic cycle, those data should not be the primary basis for setting PacifiCorp's allowed rate of return. In my DCF analysis, I offer several alternatives for estimating the long-term DCF growth rate.

Based on the combination of my quantitative model results, and my review of the current economic, market, and electric utility industry conditions, I estimate PacifiCorp's fair cost of equity capital at 11.125 percent. This estimate is consistent with capital market trends and projections and is a reasonable estimate of capital market costs that will prevail while the rates from this case are in effect.

II. Estimating the Cost of Equity

Q. What is the purpose of this section of your testimony?

A. The purpose of this section is to present a general definition of the cost of equity and to compare the strengths and weaknesses of several of the most widely used

methods for estimating the cost of equity. Estimating the cost of equity is fundamentally a matter of informed judgment. The various models provide a concrete link to actual capital market data and assist with defining the various relationships that underlie the ROE estimation process.

Q. Please define the term "cost of equity capital" and provide an overview of the cost estimation process.

A. The cost of equity capital is the profit or rate of return that equity investors expect to receive. In concept it is no different than the cost of debt or the cost of preferred stock. The cost of equity is the rate of return that common stockholders expect, just as interest on bonds and dividends on preferred stock are the returns that investors in those securities expect. Equity investors expect a return on their capital commensurate with the risks they take and consistent with returns that might be available from other similar investments. Unlike returns from debt and preferred stocks, however, the equity return is not directly observable in advance and, therefore, it must be estimated or inferred from capital market data and trading activity.

An example helps to illustrate the cost of equity concept. Assume that an investor buys a share of common stock for $20 per share. If the stock's expected dividend during the coming year is $1.00, the expected dividend yield is 5 percent ($1.00 / $20 = 5.0 percent). If the stock price is also expected to increase to $21.20 after one year, this $1.20 expected gain adds an additional 6 percent to the expected total rate of return ($1.20 / $20 = 6 percent). Therefore, buying the stock at $20 per share, the investor expects a total return of 11 percent: 5 percent

dividend yield, plus 6 percent price appreciation. In this example, the total expected rate of return at 11 percent is the appropriate measure of the cost of equity capital, because it is this rate of return that caused the investor to commit the $20 of equity capital in the first place. If the stock were riskier, or if expected returns from other investments were higher, investors would have required a higher rate of return from the stock, which would have resulted in a lower initial purchase price in market trading.

Each day, market rates of return and prices change to reflect new investor expectations and requirements. For example, when interest rates on bonds and savings accounts rise, utility stock prices usually fall. This is true, at least in part, because higher interest rates on these alternative investments make utility stocks relatively less attractive, which causes utility stock prices to decline in market trading. This competitive market adjustment process is quick and continuous, so that market prices generally reflect investor expectations and the relative attractiveness of one investment versus another. In this context, to estimate the cost of equity one must apply informed judgment about the relative risk of the Company in question and knowledge about the risk and expected rate of return characteristics of other available investments as well.

Q. How does the market account for risk differences among the various investments?

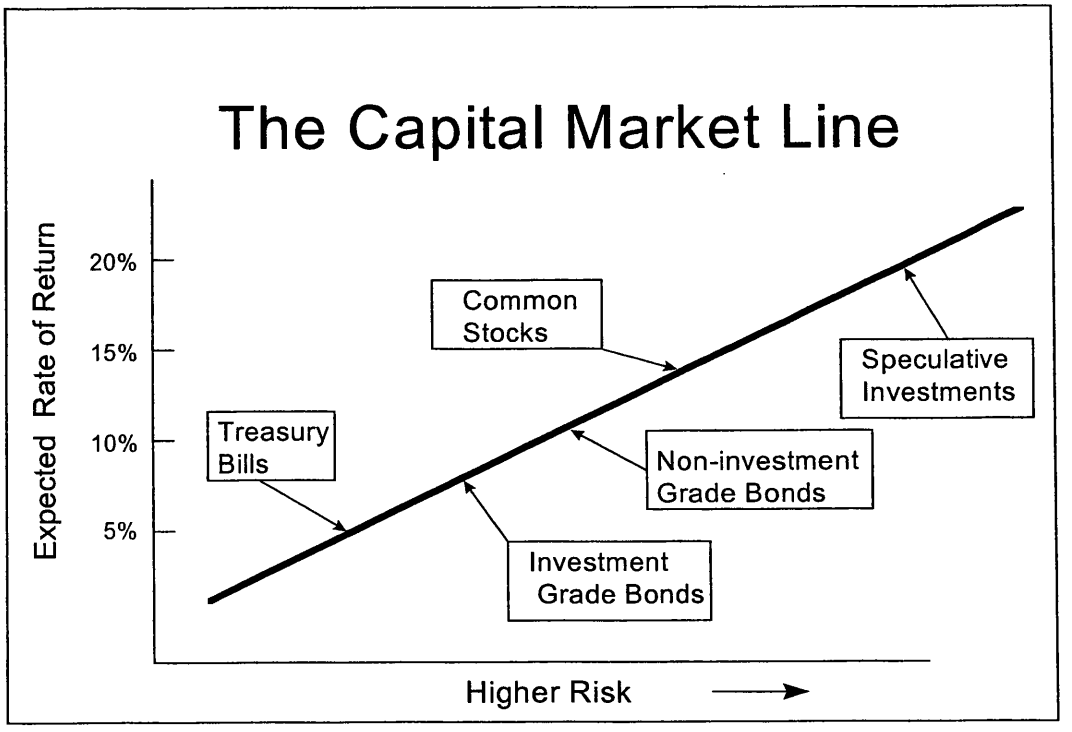
A. Risk-return tradeoffs among capital market investments have been the subject of extensive financial research. Literally dozens of textbooks and hundreds of academic articles have addressed the issue. Generally, such research confirms the

common sense conclusion that investors will take additional risks only if they expect to receive a higher rate of return. Empirical tests consistently show that returns from low risk securities, such as U.S. Treasury bills, are the lowest; that returns from longer-term Treasury bonds and corporate bonds are increasingly higher as risks increase; and generally, returns from common stocks and other more risky investments are even higher. These observations provide a sound theoretical foundation for both the DCF and risk premium methods for estimating the cost of equity capital. These methods attempt to capture the well-founded risk-return principle and explicitly measure investors' rate of return requirements.

Q. Can you illustrate the capital market risk-return principle that you just described?

A. Yes. The following graph depicts the risk-return relationship that has become widely known as the Capital Market Line (CML). The CML offers a graphical representation of the capital market risk-return principle. The graph is not meant to illustrate the actual expected rate of return for any particular investment, but merely to illustrate in a general way the risk-return relationship.

Risk-Return Tradeoffs



As a continuum, the CML can be viewed as an available opportunity set for investors. Those investors with low risk tolerance or investment objectives that mandate a low risk profile should invest in assets depicted in the lower left-hand portion of the graph. Investments in this area, such as Treasury bills and short-maturity, high quality corporate commercial paper, offer a high degree of investor certainty. In nominal terms (before considering the potential effects of inflation), such assets are virtually risk-free.

Investment risks increase as one moves up and to the right along the CML. A higher degree of uncertainty exists about the level of investment value at any point in time and about the level of income payments that may be received. Among these investments, long-term bonds and preferred stocks, which offer

priority claims to assets and income payments, are relatively low risk, but they are not risk-free. The market value of long-term bonds, even those issued by the U.S. Treasury, often fluctuates widely when government policies or other factors cause interest rates to change.

Farther up the CML continuum, common stocks are exposed to even more risk, depending on the nature of the underlying business and the financial strength of the issuing corporation. Common stock risks include market-wide factors, such as general changes in capital costs, as well as industry and company specific elements that may add further to the volatility of a given company's performance. As I will illustrate in my risk premium analysis, common stocks typically are more volatile (have higher risk) than high quality bond investments and, therefore, they reside above and to the right of bonds on the CML graph. Other more speculative investments, such as stock options and commodity futures contracts, offer even higher risks (and higher potential returns). The CML's depiction of the risk-return tradeoffs available in the capital markets provides a useful perspective for estimating investors' required rates of return.

Q. How is the fair rate of return in the regulatory process related to the estimated cost of equity capital?

A. The regulatory process is guided by fair rate of return principles established in the U.S. Supreme Court cases, *Bluefield Water Works* and *Hope Natural Gas*:

> A public utility is entitled to such rates as will permit it to earn a return on the value of the property which it employs for the convenience of the public equal to that generally being made at the same time and in the same general part of the country on investments in other business undertakings which are attended by corresponding risks and uncertainties; but it has no constitutional

> right to profits such as are realized or anticipated in highly profitable enterprises or speculative ventures. *Bluefield Waterworks & Imp. Co. v. West Virginia Public Service Commission*, 262 U.S. 679, 692-693 (1923).
>
> From the investor or company point of view, it is important that there be enough revenue not only for operating expenses, but also for the capital costs of the business. These include service on the debt and dividends on the stock. By that standard the return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital. *Federal Power Comm. v. Hope Natural Gas Co.*, 320 U.S. 591, 603 (1944).

Based on these principles, the fair rate of return should closely parallel investor opportunity costs as discussed above. If a utility earns its market cost of equity, neither its stockholders nor its customers should be disadvantaged.

Q. What specific methods and capital market data are used to evaluate the cost of equity?

A. Techniques for estimating the cost of equity normally fall into three groups: comparable earnings methods, risk premium methods, and DCF methods. Comparable earnings methods have evolved over time. The original comparable earnings methods were based on book accounting returns. This approach developed ROE estimates by reviewing accounting returns for unregulated companies thought to have risks similar to those of the regulated company in question. These methods generally have been rejected because they assume that the unregulated group is earning its actual cost of capital, and that its equity book value is the same as its market value. In most situations these assumptions are not

valid and, therefore, accounting-based methods generally do not provide reliable cost of equity estimates.

More recent comparable earnings methods are based on historical stock market returns rather than book accounting returns. While this approach has some merit, it too has been criticized because there can be no assurance that historical returns actually reflect current or future market requirements. Also, in practical application, earned market returns tend to fluctuate widely from year to year. For these reasons, a current cost of equity estimate (based on the DCF model or a risk premium analysis) is usually required.

The second set of estimation techniques is grouped under the heading of risk premium methods. These methods begin with currently observable market returns, such as yields on government or corporate bonds, and add an increment to account for the additional equity risk. The capital asset pricing model (CAPM) and arbitrage pricing theory (APT) model are more sophisticated risk premium approaches. The CAPM and APT methods estimate the cost of equity directly by combining the "risk-free" government bond rate with explicit risk measures to determine the risk premium required by the market. Although these methods are widely used in academic cost of capital research, their additional data requirements and their potentially questionable underlying assumptions have detracted from their use in most regulatory jurisdictions. .

The DCF model is the most widely used approach in regulatory proceedings. Like the risk premium method, the DCF model has a sound basis in theory, and many argue that it has the additional advantage of simplicity. I will

describe the DCF model in detail below, but in essence its estimate of ROE is simply the sum of the expected dividend yield and the expected long-term dividend (or price) growth rate. While dividend yields are readily available, long-term growth estimates are more difficult to obtain. Because the constant growth DCF model requires very long-term growth estimates (technically to infinity), some argue that its application is subjective and that more explicit multistage growth DCF models are preferred. In the final analysis, ROE estimates are subjective and should be based on sound, informed judgment. To accomplish this task, I apply several versions of the DCF and risk premium models, which results in an ROE range that I believe brackets the fair cost of equity capital.

Q. Please explain the DCF model.

A. The DCF model is predicated on the concept, or in fact the definition, that a stock's price represents the present value of all future cash flows expected from the stock. In the most general form, the model is expressed in the following formula:

$$P_0 = D_1/(1+k) + D_2/(1+k)^2 + ... + D_\infty/(1+k)^\infty \qquad (1)$$

where P_0 is today's stock price; D_1, D_2, etc. are all expected future dividends and k is the discount rate, or the investor's required rate of return on equity. Equation (1) is a routine present value calculation with the difficult data requirement of estimating all future dividends. (As a practical matter, the present value of dividends expected in the very distant future is typically insignificant, and operationally the DCF model can be reasonably estimated by discounting a long, but finite dividend stream, or with the assumption that the stock will be sold for

some estimated price in the future.)

Under the additional assumption that dividends are expected to grow at a constant rate "g," equation (1) can be solved for k and rearranged into the simple form:

$$k = D_1/P_0 + g \qquad (2)$$

Equation (2) is the familiar constant growth DCF model for cost of equity estimation, where D_1/P_0 is the expected dividend yield and g is the long-term expected dividend growth rate.

Under circumstances when growth rates are expected to fluctuate or when future growth rates are highly uncertain, the constant growth model may be questionable, and explicit changing growth estimates may be required. Although the DCF model itself is still valid (equation (1) is mathematically correct), under the assumption of fluctuating growth the simplified form of the model must be modified to capture market expectations accurately.

Q. How is the DCF model applied when the growth rates fluctuate?

A. When growth rates are expected to fluctuate, the more general version of the model represented in equation (1) should be solved explicitly over a finite "transition" period while uncertainty prevails. The constant growth version of the model can then be applied after the transition period, under the assumption that more stable conditions will prevail in the future. There are two alternatives for dealing with the nonconstant growth transition period.

Under the "Market Price" version of the DCF model, equation (1) is written in a slightly different form:

$$P_0 = D_1/(1+k) + D_2/(1+k)^2 + ... + P_T/(1+k)^T \quad (3)$$

where the variables are the same as in equation (1) except that P_T is the estimated Market Price at the end of the transition period T. Under the assumption that constant growth resumes after the transition period, the price P_T is then expected to be based on constant growth assumptions. As with the general form of the DCF model in equation (1), in the Market Price approach the current stock price (P_0) is the present value of expected cash inflows, but the cash flows are comprised of dividends and an ultimate selling price for the stock. The estimated cost of equity, k, is just the rate of return that investors would expect if they bought the stock at today's price, held it and received dividends through the transition period (until period T), and then sold it for price P_T.

Under the "Multistage" growth DCF approach, equation (1) is expanded to incorporate two or more growth rate periods, with the assumption that a permanent constant growth rate can be estimated for some point in the future:

$$P_0 = D_0(1+g_1)/(1+k) + ... + D_0(1+g_2)^n/(1+k)^n + ... + D_0(1+g_T)^{(T+1)}/(k-g_T) \quad (4)$$

where the variables are the same as in equation (1), but g_1 represents the growth rate for the first period, g_2 for a second period, and g_T for the period from year T (the end of the transition period) to infinity. The first two growth rates are estimates of fluctuating growth over "n" years (typically 5 or 10 years), and g_T is a constant growth rate assumed to prevail forever after year T.

Although less convenient for exposition purposes, the nonconstant growth models are based on the same valid capital market assumptions as the constant

growth version. The nonconstant growth approach simply requires more explicit data inputs and more work to solve for the discount rate, k. Fortunately, the required data are generally available from investment and economic forecasting services, and computer algorithms can easily produce the required solutions. Both constant and nonconstant growth DCF analyses are presented in the following section.

Q. Please explain the risk premium methodology.

A. Risk premium methods are based on the assumption that equity securities are riskier than debt and, therefore, that equity investors require a higher rate of return. This basic premise is well supported by legal and economic distinctions between debt and equity securities, and it is widely accepted as a fundamental capital market principle. For example, debt holders' claims to the earnings and assets have priority over all claims of equity investors. The contractual interest on mortgage debt generally must be paid in full before any dividends can be paid to shareholders, and secured mortgage claims must be fully satisfied before any assets can be distributed to shareholders in bankruptcy. Also, the guaranteed, fixed-income nature of interest payments on debt makes year-to-year returns from bonds typically more stable than capital gains and dividend payments on stocks. All these factors support the proposition that stockholders are exposed to more risk and that shareholders should reasonably expect a positive equity risk premium.

Q. Are risk premium estimates of the cost of equity consistent with other current capital market costs?

A. Yes. The risk premium approach is especially useful because it is founded on current market interest rates, which are directly observable. This feature assures that risk premium estimates of the cost of equity begin with a sound basis, which is tied directly to current capital market costs.

Q. Is there similar consensus about how risk premium data should be employed?

A. No. In regulatory practice, there is often considerable debate about how risk premium data should be interpreted and used. Since the analyst's basic task is to gauge investors' required returns on long-term investments, some argue that the estimated equity spread should be based on the longest possible time period. Others argue that market relationships between debt and equity from several decades ago are irrelevant and that recent debt-equity observations should be given more weight in estimating investor requirements. There is no consensus on this issue. Since analysts cannot observe or measure investors' actual expectations, it is not possible to know exactly how such expectations are formed or, therefore, exactly what time period is most appropriate in a risk premium analysis.

The important question to answer is the following: "What rate of return should equity investors reasonably expect relative to returns currently available from long-term bonds?" The risk premium studies and analyses I discuss in Section IV address this question. My risk premium recommendation is based on

an intermediate position that avoids some of the problems and concerns that have been expressed about both very long and very short periods of analysis with the risk premium model.

Q. Please summarize your discussion of cost of equity estimation techniques.

A. Estimating the cost of equity is a controversial issue in utility ratemaking. Because actual investor requirements are not directly observable, analysts have developed several methods to assist in the process. The comparable earnings method is the oldest but perhaps least reliable. Its use of accounting rates of return, or even historical market returns, may or may not reflect current investor requirements. Differences in accounting methods among companies and issues of comparability also detract from this approach.

The DCF and market-based risk premium methods are more widely accepted in regulatory practice. I believe that a combination of the DCF model and a review of risk premium data provide the most reliable approach. While the DCF model requires judgment about future growth rates, the dividend yield portion of the model is straightforward, and the model's results are generally consistent with actual capital market behavior. For these reasons, I rely principally upon the DCF model, and I test the reasonableness of the DCF results by comparing to market-based risk premiums.

III. Fundamental Factors That Affect the Cost of Equity Capital

Q. What is the purpose of this section of your testimony?

A. The purpose of this section is to review recent and future capital market costs and conditions as well as industry- and company-specific factors that should be

reflected in the cost of equity estimate.

Q. What has been the recent experience in the U.S. capital markets?

A. Exhibit 2, page 1 provides a review of annual interest rates and rates of inflation in the U.S. economy over the past ten years. During that time period, inflation and capital market costs have declined and, generally, have been lower than rates that prevailed in the previous decade. Inflation, as measured by the Consumer Price Index, has remained at historically low levels not seen consistently since the early 1960s. Until the first quarter of 2004, the uneven pace of economic recovery kept consumer price increases in check and resulted in the lowest interest rates in four decades. Since March 2004, however, improving economic growth and concerns about renewed inflation have led to fluctuating interest rates. Estimates for the next 12 months are for continued economic growth and further interest rate increases.

Exhibit 2, page 2 provides a summary of Moody's Average Utility and Single-A Utility Bond Yields. For the most recent three months ended December 2004, Moody's Average Utility Rate was 5.97percent and the Single-A Utility Rate was 5.95 percent.

Exhibit 2, page 3 provides S&P's *Economic Trends & Projections* for December 2004. The forecast data show clear expectations for continuing economic growth, with growth in real Gross Domestic Product (GDP) for 2005 projected at 3.6 percent. This GDP growth rate compares to rates of less than 2 percent in 2001, 2.4 percent for 2002, and 3 percent for 2003. Consistent with these sound economic conditions, S&P also forecasts unemployment below 5.5

percent and that interest rates will rise an additional 70 to 90 basis points (0.7 percent to 0.9 percent) from current levels. The 10-year Treasury Note is projected to increase from its current level of about 4.5 percent to 5.4 percent by the 1st quarter of 2006. Long-term Treasury Bonds are projected to increase from current levels of about 4.8 percent to 5.1 percent, and Corporate Bonds are projected to increase from current levels of about 5.8 percent to 6.6 percent. These increasing interest rate trends offer important perspective for judging the cost of capital in the present case.

Q. What are the key factors currently affecting electric utility investments?

A. Expectations for utility stocks are negatively affected by projections for higher interest rates. *Value Line* has consistently reflected this concern over the past year:

> The yield on 10-year U.S. Treasury notes has been fluctuating around 4.5 percent lately. Our 2007-2009 economic projections call for this rate to rise to 6.0 percent. If our forecast is on the mark, this would hurt the price of utility stocks (everything else being equal). In fact, the current price of many utility equities is within our 3- to 5-year target price ranges. Such a scenario doesn't provide for attractive long-term total-return potential, even for those stocks that offer the potential for dividend growth. (*Value Line Investment Survey*, May 14, 2004, p. 1774.)

Expectations for rising interest rates also make it more difficult to estimate utilities' cost of capital. In this environment of increased interest rates, the traditional DCF model does not produce reasonable cost of capital estimates.

Q. Is PacifiCorp affected by these same market uncertainties and concerns?

A. Yes. To varying extents, all utilities are affected by market uncertainties and the changes affecting the energy industry. PacifiCorp's 2003 IRP projects the need

for substantial new generation resources. Demands to expand the transmission and distribution resources are also growing rapidly. This situation drives increased capital investment needs. In this setting it is essential for PacifiCorp to have a sound earnings base to support its capital investment needs.

Q. How do capital market concerns affect the cost of equity capital?

A. As I discussed previously in Section II, equity investors respond to changing assessments of risk and financial prospects by changing the price they are willing to pay for a given security. When the risk perceptions increase or financial prospects decline, investors refuse to pay the previously existing market price for a company's securities, and market supply and demand forces then establish a new lower price. The lower market price typically translates into a higher cost of capital through a higher dividend yield requirement as well as the potential for increased capital gains if prospects improve. In addition to market losses for prior shareholders, the higher cost of capital is transmitted directly to the company by the need to issue more shares to raise any given amount of capital for future investment. The additional shares also impose additional future dividend requirements and reduce future earnings per share growth prospects.

IV. Cost of Equity Capital for PacifiCorp

Q. What is the purpose of this section of your testimony?

A. The purpose of this section is to present my quantitative studies of the cost of equity capital for PacifiCorp and to discuss the details and results of my analyses.

Q. How are your studies organized?

A. In the first part of my analysis, I apply alternative versions of the constant

growth DCF and multistage DCF model to a comparable company group of electric utilities. For inclusion in the group, each company is required to have at least a single-A bond rating, to have at least 70 percent of its revenues from regulated utility sales, to have consistent financial records not affected by recent mergers or restructuring, and to have a consistent dividend payment record with no recent dividend reductions or eliminations. Application of the minimum 70 percent regulated utility revenues filter results in a group *average* percentage of revenues from regulated utility sales of 83.9 percent, which helps to assure that non-regulated activities are not a significant influence for the group. The results of my DCF analyses are shown in Exhibit 3. In total, the DCF models produce an ROE range of 9.4 percent to 11.4 percent. As discussed previously, the 9.4 percent to 9.5 percent result from the traditional constant growth DCF model is not consistent with risk premium checks of reasonableness or other consensus economic forecasts for higher interest rates. Therefore, I do not include that result in my estimated DCF range. The appropriate range from the remaining DCF models is 10.7 percent to 11.4 percent.

In the second part of my analysis, I develop and review cost of capital estimates based on the risk premium methodology. I present my risk premium study in Exhibit 4. That analysis, based on allowed regulatory ROEs relative to contemporaneous utility debt costs, indicates that a cost of equity of 10.9 percent is appropriate. Other risk premium approaches indicate ROEs as high as 11.8 percent. Given current market and utility industry conditions, the risk premium approach adds useful perspective for judging investor requirements. Based on the

DCF and risk premium results, and with consideration for current market, industry, and company-specific factors appropriate for the present case, I estimate the cost of equity for PacifiCorp at 11.125 percent.

A. Discounted Cash Flow Analysis

Q. What stock prices are used in your DCF analyses?

A. My analysis is based on the average of high and low stock prices for each company for each of three recent months (August - October 2004). Although in theory either average or "spot" stock prices can be used in a DCF analysis, a reasonably current price consistent with present market conditions and with the other data employed in the analysis is most appropriate. Since the cost of equity is a current and forward-looking concept, the important issue is that the price should be representative of current market conditions and not unduly influenced by unusual or special circumstances.

Q. Please summarize the results of your comparable company DCF analyses.

A. I apply three versions of the DCF model to estimate ROE. The traditional Constant Growth version of the DCF model produces an ROE estimate of only 9.4 percent to 9.5 percent. As shown in Exhibit3, page 2 the average dividend yield in this model is just over 4.5 percent and the average growth rate is just under 5.0 percent. The average growth rate is derived from traditional sources for estimating growth in the DCF model. Specifically, equal weight is given to (1) the sustainable growth "b times r" method, (2) Zacks' survey of individual company 5-year analysts' earnings estimates, (3) *Value Line's* projected 3-to-5 year earnings growth rate, and (4) long-term growth in nominal Gross Domestic

Product (GDP). The "b times r" method and the analyst and *Value Line* earnings projections are significantly and negatively influenced by the uncertainties, discussed previously, that are currently affecting the industry. The "b times r," Zacks, and *Value Line* growth rates average only about 4.5 percent, which is only two-thirds of the 6.6 percent growth rate for long-term GDP. The 9.4 percent to 9.5 percent ROE estimate from the traditional constant growth DCF approach is not consistent with consensus economic projections for higher interest rates and is 1.5 percent to 2.0 percent below current risk premium checks of reasonableness. For these reasons, I do not include the traditional constant growth DCF result in my recommended ROE range.

The non-constant growth Two-Stage DCF model indicates an ROE of 10.7 percent to 10.9 percent. For stage one of this model (years 1 through 4), the growth rate is based on *Value Line's* projected dividends. The average growth rate for stage 1 of this model is only 2.79 percent. The growth rate for stage 2 is the nominal growth rate in GDP noted above. In combination with the 4.5 percent average dividend yield, the 10.7 percent to 10.9 percent ROE range from this model implies an overall growth expectation of 6.2 percent to 6.4 percent. This implied growth rate is based on the traditional yield plus growth DCF format (10.7 percent ROE = 4.5 percent yield + 6.2 percent growth; 10.9 percent ROE = 4.5 percent yield + 6.4 percent growth).

My third DCF model is based on the constant growth approach, but with the growth rate strictly proxied by the 6.6 percent long-term GDP growth rate. That model indicates an ROE of 11.1 percent to 11.4 percent. As discussed

previously, based on expected further increases in market interest rates and other capital market costs, it is my judgment that the fair cost of equity range should be based on the Two-Stage growth DCF model and the Constant Growth model with long-term GDP used as a proxy for long-term investor growth rate expectations. Based on these two versions of the DCF model, the ROE range is 10.7 percent to 11.4 percent.

B. Risk Premium Analysis

Q. How is your risk premium study structured?

A. In my risk premium analysis, I compare authorized electric utility ROEs to contemporaneous long-term interest rates on utility bonds. The equity risk premium then is measured by the difference between the average authorized ROE and the average debt cost for each year. This calculation for the period, 1980-September 2004, is presented in Exhibit 4. The data show that risk premiums are smaller when interest rates are high and larger when interest rates are low. For example, in the early 1980s when utility interest rates exceeded fifteen percent, allowed equity risk premiums were generally less than two percent. In more recent years, with lower interest rates, allowed regulatory risk premiums have generally been in the three- to four-percent range.

The inverse relationship between risk premiums and interest rate levels is well documented in numerous, well-respected academic studies. (See, for example, Robert S. Harris and Felicia C. Marston, "Estimating Shareholder Risk Premia Using Analysts' Growth Forecasts," Financial Management, Summer 1992.)

These studies typically use regression analysis or other statistical methods to predict or measure the risk premium relationship under varying interest rate conditions. In Exhibit 4, page 2 I present a regression analysis of the allowed annual equity risk premiums relative to interest rate levels. The regression coefficient of –41.80 percent confirms the inverse relationship between risk premiums and interest rates and indicates that risk premiums expand and contract by about fifty-eight percent of the change in interest rates. This means that when interest rates rise by one percentage point, the cost of equity increases by only 0.58 of a percentage point, because the risk premium declines by about 0.42 percentage points. Similarly, when interest rates decline by one percentage point, the cost of equity declines by only 0.58 of a percentage point. I use the –41.80 percent interest rate change coefficient in conjunction with current interest rates to establish the appropriate current equity risk premium. This calculation is shown in the lower portion of page 1 of Exhibit 4. When the resulting risk premium of 4.2 percent is added to the projected single-A utility debt cost of 6.7 percent, the indicated ROE is 10.9 percent.

Q. How do the results of your risk premium studies compare to levels found in other risk premium studies?

A. My risk premium estimate is lower than those often found in other risk premium studies. From the most widely followed data published by Ibbotson Associates (Ibbotson Associates, *Stocks, Bonds, Bills and Inflation 2004 Yearbook)*, for the period 1926-2003, the indicated arithmetic mean risk premium for common stocks versus long-term corporate bonds is 6.2 percent. Under the more

conservative assumption of geometric mean compounding, the Ibbotson risk premium is 4.5 percent. Ibbotson argues extensively for the arithmetic mean approach as the appropriate basis for estimating the cost of equity. Even with the more conservative geometric mean risk premium, Ibbotson's data indicate a single-A cost of equity of 11.2 percent (6.7 percent debt cost + 4.5 percent risk premium = 11.2 percent).

The Harris and Marston (H&M) study noted above also provides specific equity risk premium estimates. Using analysts' growth estimates to estimate equity returns, H&M found equity risk premiums of 6.47 percent relative to U.S. Government bonds and 5.13 percent relative to yields on corporate debt. H&M's equity risk premium relative to corporate debt indicates a current single-A cost of equity of 11.8 percent (6.7 percent debt cost + 5.13 percent risk premium = 11.83 percent).

Q. Please summarize the results of your cost of equity analysis.

A. The following table summarizes my results:

Summary of Cost of Equity Estimates	
DCF Analysis	Indicated Cost
Constant Growth Model (traditional growth)	9.4% - 9.5%
Constant Growth Model (GDP growth)	11.1% - 11.4%
Two-Stage Growth Model	10.7% - 10.9%
Estimated DCF Model Range	10.7% - 11.4%
Risk Premium Analysis	
Utility Debt + Risk Premium	
Risk Premium Analysis (6.7% + 4.2%)	10.9%
Ibbotson Risk Premium Analysis	
Risk Premium (6.7% + 4.5%)	11.2%
Harris-Marston Risk Premium	
Risk Premium (6.7% + 5.13%)	11.8%
PacifiCorp Fair Cost of Equity Capital	11.125%

Q. How should these results be interpreted to determine the fair cost of equity for PacifiCorp?

A. At 11.125 percent, my recommended ROE is near the middle of the appropriate DCF model range and the lower end of the risk premium range. This ROE level represents a reasonable balance between consensus economic forecasts for significantly higher interest rates during the rate effective period and the lower ROEs that can be obtained from traditional DCF methods based on recent historically low dividend yields and traditional DCF growth estimate methodologies. Under present market conditions, I believe that this is the most appropriate approach for estimating the fair cost of equity capital.

Q. Does this conclude your direct testimony?

A. Yes.