Exhibit No.___(SCH-1T)
Docket UE-13____
Witness: Samuel C. Hadaway

BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, Complainant, vs. PACIFICORP dba Pacific Power & Light Company Respondent.	Docket UE-13____

PACIFICORP

DIRECT TESTIMONY OF SAMUEL C. HADAWAY

January 2013

Introduction

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 d/b/a Pacific Power & Light Company (PacifiCorp or Company).

Q. Please describe your education and professional experience.

A. I have a Bachelor's degree in economics from Southern Methodist University, as well as MBA and Ph.D. degrees with concentrations in finance and economics from the University of Texas at Austin (UT Austin). I am an owner and full-time employee of FINANCO, Inc. FINANCO provides financial research concerning the cost of capital and financial condition for regulated companies, as well as financial modeling and other economic studies in litigation support. In addition to my work at FINANCO, I have served as an adjunct professor in the McCombs School of Business at UT Austin and in what is now the McCoy College of Business at Texas State University. In my prior academic work, I taught economics and finance courses, and I conducted research and directed graduate students in the areas of investments and capital market research. I was previously Director of the Economic Research Division at the Public Utility Commission of Texas (Texas Commission), where I supervised the Texas Commission's finance, economics, and accounting staff, and served as the Texas Commission's chief financial witness in electric and telephone rate cases. I have taught courses at

various utility conferences on cost of capital, capital structure, utility financial condition, and cost allocation and rate design issues. I have made presentations before the New York Society of Security Analysts, the National Rate of Return Analysts Forum, the Society of Utility Regulatory and Financial Analysts, and various other professional and legislative groups. I have served as a vice president and on the board of directors of the Financial Management Association.

A list of my publications and previous testimony before various regulatory bodies and in state and federal courts is contained in my resume, which is included as Exhibit No.___(SCH-2).

Purpose of Testimony

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to estimate the Company's cost of equity capital.

Q. Please define the term "cost of equity capital" (COE).

A. COE is the rate of return that equity investors require or expect to receive from their investments in common stocks. Conceptually, COE is no different than the interest rate on debt or the cost of preferred stock. 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.

Q. Have you determined the COE for a group of utilities comparable to the Company?

A. Yes. I have used a comparable company approach in my discounted cash flow (DCF) analysis to estimate COE for a group of utilities comparable to the Company. The results of that analysis indicate that the comparable group's COE

is in the range of 9.4 percent to 10.0 percent. The Commission should be aware, however, that the results of DCF, equity risk premium, and capital asset pricing models are all unduly influenced by the current, artificially low interest rate environment and low bond yields caused by the federal government's monetary policy. The Commission should moderate the impact of these conditions to prevent either over- or under-earnings, and view both interest rates and bond yields over the longer term. To do so, the Commission should select an allowed return on common equity (ROE) at the higher end of the COE range. Equity investors rely on long-term market conditions and equity estimation techniques, like the DCF model, require a long-term, equilibrium view, which is not reflected in the current environment.

Based on the upper end of my DCF results and my further review of the other economic data, I recommend that the allowed rate of return on equity (ROE) for PacifiCorp be set at 10.0 percent. This compares favorably with the average allowed ROE for vertically integrated utilities for the first three quarters of 2012 of 10.05 percent. While this requested ROE is above the midpoint of my quantitative DCF results, under current market conditions and economic circumstances, I believe this is a reasonable ROE for establishing the Company's rates at this time and should be authorized by the Commission.

Q. How is your analysis structured?

A. I apply the DCF model to a 14-company group of vertically-integrated electric utilities with financial and operating characteristics similar to the Company. The Company's COE cannot be estimated directly from its own market data because

the Company is a wholly-owned subsidiary of MidAmerican Energy Holdings Company. As such, the Company does not have publicly traded common stock or other independent market data that would be required to estimate its DCF cost directly. Therefore, I begin my comparable company review with all the vertically-integrated electric utilities that are included in the *Value Line Investment Survey* (Value Line). Value Line is a widely-followed, reputable source of financial data that is often used by professional regulatory economists. To improve the group's comparability with the Company, which has a senior secured bond rating of A from Standard & Poor's (S&P) and A2 from Moody's Investors Service (Moody's), I restricted the group to integrated electric utilities with senior secured bond ratings of at least A- by S&P or A3 by Moody's. I also required that the companies derive at least 70 percent of their revenues from regulated utility sales, to have consistent financial records not affected by recent mergers or restructuring, and to have a consistent dividend record with no dividend cuts or resumptions during the past two years. The fundamental characteristics and bond ratings of the 14 companies in my comparable group are presented in Exhibit No.___(SCH-3).

In my risk premium analysis, I present COE estimates based on both current and projected single-A utility bond yields. These rates are consistent with the Company's single-A bond ratings and reflect both the currently low, government-induced interest rate environment and the resulting relatively low interest forecasts for the next few years. As I will discuss later in this testimony, these risk premium estimates continue to be depressed by the Federal Reserve

System's (Fed) stated intentions to keep interest rates low. For these reasons, I do not believe that the lowest DCF or the risk premium results are reasonable estimates of the Company's market-required COE. The data sources and the details of my COE studies are contained in Exhibit No.___(SCH-3) through Exhibit No.___(SCH-8).

Q. How is the remainder of your testimony organized?

A. My testimony is divided into three additional sections. Following this introduction, 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 the following section, I discuss various methods for estimating COE, including comparable earnings methods, equity risk premium methods, and the DCF. In the final section, I apply the DCF and risk premium models to estimate the Company's COE, I discuss the details of my COE studies, and I summarize my ROE recommendation.

Fundamental Factors that Affect the Cost of Equity

Q. What is the current outlook for the U.S. economy?

A. Growth for the U.S. economy is improving but is expected to remain slow in the near term. While most economists expect the growth rate to be positive, unemployment is also expected to remain stubbornly high near the eight percent range. Forecasts for 2013 and beyond indicate continuing recovery, with new job creation a fundamental concern. Based on these conditions, the Fed has

announced its intention to keep interest rates at their current historically low levels.[1]

Q. What has been the experience in the U.S. capital markets for the past ten years?

A. In Exhibit No.___(SCH-4), page 1, I provide a 10-year review of annual interest rates and rates of inflation. Although corporate interest rates rose somewhat in the 2006–2008 period, during this time, interest rates and inflation have generally declined to lower levels than existed in the previous decade. Inflation, as measured by the Consumer Price Index (CPI), has fluctuated between a low of zero percent (in 2008) and 4.1 percent in 2007 (caused by the spike in energy costs that occurred in during that year). The decade's average annual inflation rate (2.4 percent) was approximately 100 basis points lower than the longer-term

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[1]On October 24, 2012 the Federal Open Market Committee of the Fed issued the following additional policy statement reiterating its commitment to Quantitative Easing 3 (QE3) and the continuation of Operation Twist:

> Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. The Committee remains concerned that, without sufficient policy accommodation, economic growth might not be strong enough to generate sustained improvement in labor market conditions. Furthermore, strains in global financial markets continue to pose significant downside risks to the economic outlook. The Committee also anticipates that inflation over the medium term likely would run at or below its 2 percent objective.
>
> To support a stronger economic recovery and to help ensure that inflation, over time, is at the rate most consistent with its dual mandate, the Committee will continue purchasing additional agency mortgage-backed securities at a pace of $40 billion per month. The Committee also will continue through the end of the year its program to extend the average maturity of its holdings of Treasury securities, and it is maintaining its existing policy of reinvesting principal payments from its holdings of agency debt and agency mortgage-backed securities in agency mortgage-backed securities. These actions, which together will increase the Committee's holdings of longer-term securities by about $85 billion each month through the end of the year, should put downward pressure on longer-term interest rates, support mortgage markets, and help to make broader financial conditions more accommodative.

average rate of the past 60 years (see Exhibit No.___(SCH-6)). Interest rates generally declined over most of the period, with the 2011 average utility rate at its lowest level in more than 30 years (see Exhibit No. ___(SCH-8), page 1).

Q. What has been the more recent trend in long-term interest rates?

A. The month-by-month interest rate data for the past three years are presented in Exhibit No.___(SCH-4), page 2, and summarized below:

Table 1
Long-Term Interest Rate Trends

Month	Single-A Utility Rate	30-Year Treasury Rate	Single-A Utility Spread
Jan-10	5.77	4.60	1.17
Feb-10	5.87	4.62	1.25
Mar-10	5.84	4.64	1.20
Apr-10	5.81	4.69	1.12
May-10	5.50	4.29	1.21
Jun-10	5.46	4.13	1.33
Jul-10	5.26	3.99	1.27
Aug-10	5.01	3.80	1.21
Sep-10	5.01	3.77	1.24
Oct-10	5.10	3.87	1.23
Nov-10	5.37	4.19	1.18
Dec-10	5.56	4.42	1.14
Jan-11	5.57	4.52	1.05
Feb-11	5.68	4.65	1.03
Mar-11	5.56	4.51	1.05
Apr-11	5.55	4.50	1.05
May-11	5.32	4.29	1.03
Jun-11	5.26	4.23	1.03
Jul-11	5.27	4.27	1.00
Aug-11	4.69	3.65	1.04
Sep-11	4.48	3.18	1.30
Oct-11	4.52	3.13	1.39
Nov-11	4.25	3.02	1.23
Dec-11	4.33	2.98	1.35
Jan-12	4.34	3.03	1.31
Feb-12	4.36	3.11	1.25
Mar-12	4.48	3.28	1.20
Apr-12	4.40	3.18	1.22
May-12	4.20	2.93	1.27
Jun-12	4.08	2.70	1.38
Jul-12	3.93	2.59	1.34
Aug-12	4.00	2.77	1.23
Sep-12	4.02	2.88	1.14
Oct-12	3.91	2.90	1.01
Nov-12	3.84	2.80	1.04
Dec-12	4.00	2.88	1.12
3-Mo Avg	**3.92**	**2.86**	**1.06**
12-Mo Avg	**4.13**	**2.92**	**1.21**

Sources: Mergent Bond Record (Utility Rates); www.federalreserve.gov (Treasury Rates).

Monthly averages are for the respective period ending December 2012.

The data in Table 1 track the steady interest rate since 2010. The Fed's continuing intervention in the financial markets, and its efforts to keep short-term rates near zero and rates on longer-term U.S. Treasury bonds at historically low levels, are affecting yields on high quality corporate debt as well. While the effects of these monetary policy efforts are not easily captured in financial models for estimating COE (models that assume market equilibrium exists), equity market turbulence and the resulting elevated level of risk aversion indicate that the decline in COE has not been nearly as large as the decline in borrowing costs.

Q. Do the smaller spreads between yields on single-A utility bonds and U.S. Treasury bonds mean that the markets have fully recovered from the economic turmoil that resulted from the financial crisis?

A. No. People have not forgotten that one-half of their retirement savings disappeared by early 2009, that housing prices fell precipitously, and that unemployment rates have generally been near eight percent for the past four years. While markets have stabilized considerably from the conditions that existed in early 2009, investors remain concerned about high unemployment, large federal deficits, the Mideast turmoil, and European as well as domestic economic issues. These factors combined with sluggish growth in gross domestic product (GDP) continue to raise substantial equity market concerns and contribute to heightened investor risk aversion.

Q. What do forecasts for the economy and interest rates show for the coming year?

A. Interest rates are expected to increase moderately from their recent historically

low levels. In Exhibit No.___(SCH-4), page 3, I provide Bloomberg's Forward Curve forecast for U.S. Treasury yields. Table 2 below summarizes the interest rate forecasts:

Table 2
Interest Rate Forecast

	Jan 2013	2013E	2014E	2015E
1-Yr. Treasuries	0.1%	0.4%	0.7%	1.2%
10-Yr. Treasuries	1.9%	2.2%	2.4%	2.7%
30-Yr. Treasuries	3.1%	3.2%	3.4%	3.5%

Bloomberg U.S. Treasury Actives Curve, January 3, 2013.

These data show that long-term Treasury yields are expected to rise gradually over the next three years. In this low interest rate environment, traditional cost of equity estimation models produce low COE estimates that do not reflect the continuing risk aversion that exists in the equity markets.

Q. How have utility stocks performed during the past several years?

A. The government's stated policy of intervening in the capital markets to keep interest rates low has disrupted normal supply and demand relationships. Under these circumstances, dividend-paying stocks, like utilities, have become highly sought-after by income-seeking investors, pushing up prices and reducing the dividend yield percentage. This sentiment is echoed in Value Line's recent review of its Electric Utility Industry group:

> Electric utility issues usually trade at a below-market price-earnings ratio….However, several utilities are now trading at a price-earnings ratio that is above the market's. This is an indication of how expensively priced many of these equities have become. Another indication of their high valuation is the fact that many of them are trading within their 2015–2017 Target Price Range.[2]

[2] Value Line Investment Survey, Electric Utility (Central) Industry, September 21, 2012, p. 901.

In this market environment, dividend oriented stocks, like utilities, have become relatively more attractive for income-oriented investors. The resulting relatively better performance for utilities has produced lower dividend yields in the DCF model. That is the DCF model results, with respect to dividend yields, do not reflect the overall market's volatility and heightened risk aversion. In the basic constant growth version of the model, the results are therefore negatively skewed by flight to safety and income-seeking investor behavior. This anomaly makes it more difficult to interpret current DCF cost of equity estimates for utility companies. Similarly, in the equity risk premium models, like the Capital asset pricing model (CAPM), artificially low interest rates directly reduce COE estimates. The currently low dividend yields for utilities produce lower DCF estimates and low interest rates produce lower COE estimates from equity risk premium models.

Q. What is the industry's current fundamental position?

A. The industry has seen significant volatility in both fundamental operating characteristics and the effects of the economy. Both reduced sales volumes from slow economic growth and uncertain environmental rules have increased the difficulty of planning for future load requirements. Additionally, environmental issues are expected to require significant new capital investment.

In the summary in its assessment of the Electric Utility Industry, Standard & Poor's provided perspective for investors' concerns for 2012:

> **Standard & Poor's**
> Regulated U.S. electric utility companies will begin implementing Environmental Protection Agency (EPA) rules concerning carbon and other pollutants in 2012. Other challenges include the

> continued need for substantial capital spending, the potential for rate pressure in a slow growth period, and the changing global capital markets.[3]

In the equity markets, ongoing turmoil has increased investors' preferences for safer, dividend paying companies. Value Line discusses this phenomenon and provides a warning of possible over-valuation in its recent Electric Utility update.

> **Value Line Investor Survey**
> The prices of many electric utility issues have risen to atypically high valuations. Several utility stocks are trading at a premium to the market price-earnings ratio. The vast majority have share prices that are within their 2015–2017 Target Price Ranges. Thus, it has become hard to find attractive electric utility selections. In particular, we would avoid the shares of *PG&E* and *Edison International*.[4]

Credit market gyrations and the volatility of utility shares demonstrate the increased uncertainties that utility investors face. These uncertainties translate into a higher cost of equity capital.

Q. How do capital market concerns and financial risk perceptions affect the cost of equity capital?

A. As I discussed previously, 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

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[3] The Top 10 Investor Questions for U.S. Regulated Electric Utilities In 2012," Standard & Poor's Ratings Direct, January 3, 2012, p. 2.
[4] *Value Line Investor Survey*, November 2, 2012, p. 2235.

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 earn a higher cost of capital on existing and new investments just to maintain the stock's new lower price level and the reality that the firm must issue more shares to raise any given amount of capital for future investment. The additional shares also impose additional future dividend requirements and may reduce future earnings per share growth prospects if the proceeds of the share issuance are unable to earn their expected rate of return.

Q. How have regulatory commissions responded to these changing market and industry conditions?

A. Over the past five years, allowed ROEs for vertically-integrated utilities have averaged above 10 percent. The quarterly averages are shown in Table 3 below:

Table 3
Authorized Equity Returns for Vertically-Integrated Electric Utilities

	2008	2009	2010	2011	2012
1st Quarter	10.49%	10.57%	10.59%	10.09%	10.30%
2nd Quarter	10.48%	10.75%	10.18%	10.26%	9.95%
3rd Quarter	10.48%	10.50%	10.32%	10.11%	9.90%
4th Quarter	10.38%	10.59%	10.32%	10.39%	
Full Year Average	10.45%	10.63%	10.38%	10.24%	10.05%

Source: Regulatory Focus, SNL Regulatory Research Associates, Major Rate Case Decisions, October 4; Exhibit No.___(SCH-5).

For integrated electrics, like the Company, the average allowed rate for 2011 was 10.24 percent, and for the first three quarters of 2012 it was 10.05 percent.

Estimating the Cost of Equity Capital

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

A. The purpose of this section is to compare the strengths and weaknesses of several of the most widely used methods for estimating the COE. Estimating the COE 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 COE estimation process. Please see Appendix A for further technical discussion of the DCF and risk premium models.

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

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.[5]

> 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.[6]

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[5] *Bluefield Water Works & Improvement Company v. Public Service Commission of West Virginia,* 262 U.S. 679, 692–693 (1923).

[6] *Federal Power Commission 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 COE, neither its stockholders nor its customers should be disadvantaged.

Q. Please provide an overview of the COE estimation process.

A. The COE 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 over the long term. 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 COE concept. Assume that an investor buys a share of common stock for $20 per share. If the stock's expected dividend is $0.80 per share, the expected dividend yield is 4.0 percent ($0.80/$20 = 4.0%). If the stock price is also expected to increase to $21.25 after one year, this $1.25 expected gain adds an additional 6.25 percent to the expected total rate of return ($1.25/$20 = 6.25%). Therefore, buying the stock at $20 per share, the investor expects a total return of 10.25 percent: 4.0 percent dividend yield, plus 6.25 percent price appreciation. In this example, the total expected rate of return of 10.25 percent is the appropriate measure of the COE, 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. These continuous market adjustments are one reason that the COE for utilities should be viewed over the long-term. Therefore, to estimate the COE one must apply informed judgment about the relative risk of the company in question as well as knowledge about the risk and expected rate of return characteristics of other available investments.

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

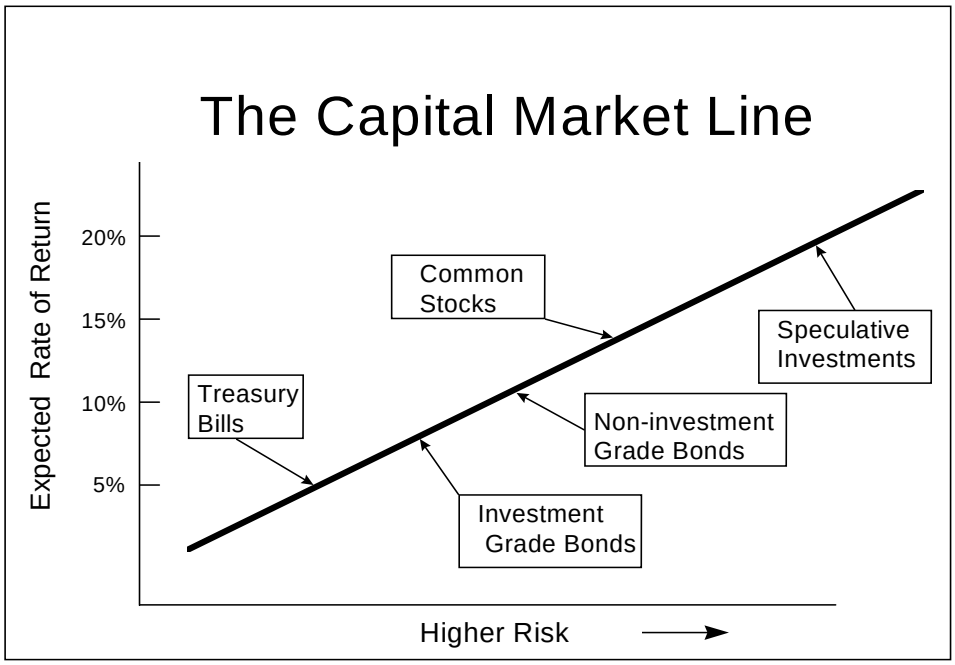
A. Risk-return tradeoffs among capital market investments have been the subject of extensive financial research. Literally dozens of textbooks and hundreds of academic articles have addressed the issue. Generally, this research confirms the common sense conclusion that investors will take additional 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 COE. 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. Before considering the potential effects of inflation, these types of 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 they therefore 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. What specific methods and capital market data are used to evaluate the COE?

A. Techniques for estimating the COE normally fall into three groups: comparable earnings methods, risk premium methods, and DCF methods.

The first set of estimation techniques, the comparable earnings methods, has evolved over time. The original comparable earnings methods were based on book accounting returns. This approach developed COE estimates by reviewing accounting returns for unregulated companies thought to have risks similar to those of the regulated company in question. These methods have generally 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 do not generally provide reliable COE 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 COE 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 CAPM and arbitrage pricing theory (APT) model are more sophisticated risk premium approaches. The CAPM and APT methods estimate the COE directly by combining the "risk-free" government bond rate with explicit risk measures to determine the risk premium required by the market. Although these more sophisticated 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 many regulatory jurisdictions. On the other hand, the basic risk premium methods generally provide a useful parallel approach with the DCF model and assure consistency with other capital market data in the equity cost estimation process.

The third set of estimation techniques, based on the DCF model, is the most widely used regulatory COE estimation method. Like the risk premium approach, 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 COE is simply the sum of the expected dividend yield and the expected long-term dividend, earnings, or price growth rate (all of which are assumed to grow at the same rate). While dividend yields are easy to obtain, estimating long-term growth is more difficult. Because the

constant growth DCF model also requires very long-term growth estimates (technically to infinity), some argue that its application is too speculative to provide reliable results, resulting in the preference for the multistage growth DCF analysis.

Q. Of the three estimation methods, which do you believe provides the most reliable results?

A. From my experience, in periods of reasonable capital market equilibrium, a combination of DCF and the basic risk premium methods usually provide the most reliable approach. While the caveat about estimating long-term growth must be observed, the DCF model's other inputs are readily obtainable, and the model's results typically are consistent with equilibrium capital market behavior. The basic risk premium methods provide a parallel approach to the DCF model and would typically ensure that current market conditions are accurately reflected in the COE estimate. However, due to ongoing market turmoil and current government monetary policy, which I discussed previously, COE estimates obtained from all of these methods, especially equity risk premium methods, are understated.

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 COE for the Company and to discuss the details and results of my analysis.

Q. How are your studies organized?

A. In the first part of my analysis, I apply the DCF model to the 14-company

comparable group of electric utilities based on the selection criteria discussed previously. In the second part of my analysis, I apply the equity risk premium models and review projected economic conditions and projected capital costs for the coming year.

My DCF analysis is based on three versions of the DCF model. In the first version of the DCF model, I use the constant growth format with long-term expected growth based on analysts' estimates of five-year utility earnings growth. While I endorse a longer-term growth estimation approach based on growth in nominal GDP, I show the analyst growth rate DCF results because this is the approach that has traditionally been used by many regulators. In the second version of the DCF model, for the estimated growth rate, I use only the long-term estimated GDP growth rate. Finally, in the third version of the DCF model, I use a two-stage growth approach, with stage one growth based on Value Line's three-to-five-year dividend projections and stage two growth based on long-term projected GDP growth. The dividend yields in all three of the models are from Value Line's projections of dividends for the coming year, and stock prices are from the three-month average for the months that correspond to the Value Line editions from which the underlying financial data are taken.

Q. Why do you believe the long-term GDP growth rate should be used to estimate long-term growth expectations in the DCF model?

A. Growth in nominal GDP (real GDP plus inflation) is the most general measure of economic growth in the U.S. economy. For long time periods, such as those used in the Morningstar/Ibbotson Associates rate of return data, nominal GDP growth

has averaged between five percent and eight percent per year. From this observation, Professors Brigham and Houston offer the following observation concerning the appropriate long-term growth rate in the DCF Model:

> Expected growth rates vary somewhat among companies, but dividends for mature firms are often expected to grow in the future at about the same rate as nominal gross domestic product (real GDP plus inflation). On this basis, one might expect the dividend of an average, or "normal," company to grow at a rate of 5 to 8 percent a year.[7]

Other academic research on corporate growth rates offers similar conclusions about GDP growth, as well as concerns about the long-term adequacy of analysts' forecasts:

> Our estimated median growth rate is reasonable when compared to the overall economy's growth rate. On average over the sample period, the median growth rate over 10 years for income before extraordinary items is about 10 percent for all firms....After deducting the dividend yield (the median yield is 2.5 percent per year), as well as inflation (which averages 4 percent per year over the sample period), the growth in real income before extraordinary items is roughly 3.5 percent per year. This is consistent with the historical growth rate in real gross domestic product, which has averaged about 3.4 percent per year over the period 1950-1998.[8]

> IBES long-term growth estimates are associated with realized growth in the immediate short-term future. Over long horizons, however, there is little forecastability in earnings, and analysts' estimates tend to be overly optimistic….On the whole, the absence of predictability in growth fits in with the economic intuition that competitive pressures ultimately work to correct excessively high or excessively low profitability growth.[9]

These findings support the notion that long-term growth expectations are more closely predicted by broader measures of economic growth than by near-term

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[7] Eugene F. Brigham and Joel F. Houston, *Fundamentals of Financial Management*, 11th Ed. 2007, p. 298.
[8] Louis K. C. Chan, Jason Karceski, and Josef Lakonishok, "The Level and Persistence of Growth Rates," The Journal of Finance, April 2003, p. 649.
[9] *Id.* at 683.

analysts' estimates. Especially for the very long-term growth rate requirements of the DCF model, the growth in nominal GDP should be considered an important input.

Q. How did you estimate the expected long-run GDP growth rate?

A. I developed my long-term GDP growth forecast from nominal GDP data contained in the St. Louis Federal Reserve Bank data base. That data for the period 1951 through 2011 are summarized in my Exhibit No.___(SCH-6). As shown at the bottom of that exhibit, the 60-year average GDP growth rate was 6.6 percent. The data also show, however, that after the early 1980s, lower inflation has resulted in lower nominal GDP growth. For this reason I have given more weight to the more recent years in my GDP forecast. Based on this approach, my long-term-term GDP growth rate forecast, at 5.7 percent, is almost 100 basis points lower than the long-term average 6.6 percent GDP growth rate.

Q. Why do you believe your forecast of GDP growth based on long-term historical data is appropriate in the DCF model?

A. There are at least three reasons. First, most econometric forecasts are derived from the trending of historical data or the use of weighted averages. This is the approach I have taken in Exhibit No.___(SCH-6). The long-run historical average GDP growth rate is 6.6 percent, but my estimate of long-term expected growth is lower, at 5.7 percent. My forecast is lower because my forecasting method gives much more weight to the more recent 10- and 20-year periods.

Second, some current, much lower GDP growth forecasts likely understate the long growth rate expectations that are required in the DCF model. Many of

these government forecasts are currently low because they are based on the assumption of permanently low inflation rates, in the range of two percent. As shown in my Exhibit No.___(SCH-6), the average long-term inflation rate measured by CPI has been over three percent in all but the most recent 10- and 20-year periods. Also, as shown in Exhibit No.___(SCH-4), page 1, from December 2008 to December 2009, even with the continuing effects of the economic recession, the CPI increased by 2.8 percent, and in 2007 the CPI increased by over four percent. Long-term estimated inflation rates of two percent or less are not consistent with reasonable long-term expectations for the U.S. economy, or with investors' long-term experience.

Finally, the recent economic turmoil makes it even more important to consider longer-term economic data in the growth rate estimate. As discussed in the previous section, current near-term forecasts for both real GDP and inflation are severely depressed. The longer-term forecasts of professional economists are also low because they generally follow the government forecasts. Under these circumstances, a longer-term balance is even more important. For all these reasons, while I present analysts' growth rate estimates, I believe it is also important to consider long-term GDP growth in the DCF growth rate estimate.

Q. Please summarize the results of your DCF analyses.

A. The DCF results for my comparable company group are presented in Exhibit No.___(SCH-7). As shown in the first column of page 1 of that exhibit, the traditional constant growth model indicates a COE range of 9.4 percent to 9.5 percent. In the second column of page 1, I recalculate the constant growth results

with the growth rate based on long-term forecasted growth in GDP. With the GDP growth rate, the constant growth model indicates a cost of common equity range of 9.9 percent to 10.0 percent. Finally, in the third column of page 1, I present the results from the multistage DCF model. The multistage model indicates a cost of common equity range of 9.8 percent to 9.9 percent. The results from the DCF model, therefore, indicate a cost of common equity range of 9.4 percent to 10.0 percent.

Q. What are the results of your basic equity risk premium studies?

A. The details and results of my basic equity risk premium studies are shown in my Exhibit No.___(SCH-8). These studies indicate a cost of common equity range of 9.3 percent to 9.6 percent. As noted previously, I discount the low end of my DCF results, as well as my risk premium estimates, because they are directly affected by the government's ongoing efforts to keep interest rates artificially low.

Q. How are your basic equity risk premium studies structured?

A. My basic equity risk premium studies are divided into two parts. First, I compare electric utility authorized ROEs for the period 1980–2011 to contemporaneous long-term utility interest rates. The differences between the average authorized ROEs and the average interest rate for each year is the indicated equity risk premium. I then add the indicated equity risk premium to the forecasted and current single-A utility bond interest rate to estimate the cost of common equity. Because there is a strong inverse relationship between equity risk premiums and interest rates (when interest rates are high, risk premiums are low and vice versa), further analysis is required to estimate the current equity risk premium level.

The inverse relationship between equity risk premiums and interest rate levels is well documented in numerous, well-respected academic studies. These studies typically use regression analysis or other statistical methods to predict or measure the equity risk premium relationship under varying interest rate conditions. On page 3 of Exhibit No.___(SCH-8), I provide a regression analysis of the allowed annual equity risk premiums relative to interest rate levels. The negative and statistically significant regression coefficients confirm the inverse relationship between equity risk premiums and interest rates. This means that when interest rates rise by one percentage point, the COE increases, but by a smaller amount. Similarly, when interest rates decline by one percentage point, the COE will also decline but by less than one percentage point. I use this negative interest rate change coefficient in conjunction with current and forecasted interest rates to estimate the appropriate cost of common equity.

Q. Can you illustrate the inverse relationship between equity risk premiums and interest rates without using the statistical analysis described above?

A. Yes. Statistical analysis is often used, especially in academic research, to substantiate certain economic and financial relationships. For equity risk premium analysis, however, the fundamental issue can be observed by simply averaging the data for various time periods without further statistical analysis. The data in Table 4 below show average utility bond yields and equity risk premiums for each non-overlapping, five-year period between 1980 and 2011.

Table 4
Average Five-Year Utility Bond Yields and Equity Risk Premiums
(1980-2011)

Period	Average Utility Bond Interest Rate	Average Equity Risk Premium
1980-1986	13.31%	1.69%
1987-1991	9.81%	2.99%
1992-1996	8.02%	3.54%
1997-2001	7.61%	3.66%
2002-2006	6.42%	4.34%
2007-2011	5.95%	4.42%

Source: Exhibit No.___(SCH-8), page 1.

These data show that equity risk premiums have consistently increased as interest rates have declined, and that they were lower when interest rates were high. This result is a market-based reflection, which shows that required rates of return in the stock market do not move in lockstep with changes in interest rates. Because utilities must compete with other types of equity investments for capital, the COE for utilities does not change by as much as the observed changes in interest rates. Arguments that unadjusted, long-term average risk premiums can be used with current, historically low interest rates to estimate COE are mistaken. That approach to equity risk premium analysis will consistently understate the required rate of return.

Q. Please explain why you have not relied upon COE estimates from the CAPM.

A. I have not relied upon the CAPM because, under current market conditions, the CAPM does not provide reliable estimates of the cost of equity. This situation is caused by the U.S. Government's intervention in the credit markets and the

resulting artificially low U.S. Treasury bond interest rates that have resulted, as well as the recent market turmoil's effects on the CAPM's other required inputs. The traditional CAPM estimate of COE is calculated as:

$$COE = R_f + \beta[E(R_m) - R_f]$$

The model's three principal inputs are:

1) R_f (the risk-free interest rate);

2) $E(R_m) - R_f$ (the market risk premium, which is the expected return from the overall market minus the risk-free rate; and

3) β or beta (a measure of market-related risk).

Under present market conditions, potentially all three of the CAPM's principal inputs tend to understate ROE. The risk-free rate (R_f) is understated because the U.S. Treasury rates used for R_f are artificially low due to governmental credit market policies and investors' increased risk aversion. The second input, the expected market risk premium [$E(R_m) - R_f$], when based on historical data, is also understated because such data cannot reflect the heightened investor risk aversion that resulted from the financial crisis or the current exceptionally low risk-free rate. Finally, utility beta coefficients have fluctuated in recent years because utility stocks first underperformed the broader market index during the market recovery and have recently outperformed the overall market. All these factors cause the CAPM to produce unreliable COE estimates.

Q. Have you prepared a CAPM analysis that illustrates these points?

A. Yes. That analysis is contained in Exhibit No.___(SCH-9). In my CAPM analysis, the risk-free rate (R_f) is based on current and projected 30-year Treasury

yields (2.86%–3.39%), the market risk premium (Rm – Rf) is Ibbotson's long-term, large company (S&P 500) risk premium (6.7%), and the betas are from Value Line for the companies in my comparable group (average beta 0.73). From this analysis based on current Treasury bond yields, the CAPM indicates a COE range of 7.55 percent to 7.72 percent and, based on projected Treasury bond yields, 8.08 percent to 8.25 percent. These results are generally 200 to 300 basis points below the average rates of return being allowed by state regulatory commissions for integrated electric utilities like PacifiCorp (see Table 3 above). The CAPM estimates of COE are, therefore, below any sensible test of reasonableness and should not be included in the determination of the Company's allowed ROE.

Q. Please summarize the results of your COE analysis.

A. Table 5 below summarizes my results:

Table 5
Summary of Cost of Equity Estimates

DCF Analysis	Indicated Cost
Constant Growth (Analysts' Growth)	9.4–9.5%
Constant Growth (GDP Growth)	9.9%–10.0%
Multistage Growth Model	9.8%–9.9%
Indicated DCF Range	9.4%–10.0%
Equity Risk Premium Analysis	**Indicated Cost**
Forecast Utility Debt Yield+ Equity Risk Premium	
Equity Risk Premium COE (4.45% + 5.15%)	9.6%
Current Utility Debt + Equity Risk Premium	
Equity Risk Premium COE (3.92% + 5.37%)	9.3%
PacifiCorp Cost of Equity	10.0%

Q. How should these results be interpreted to determine a reasonable ROE upon which to base rates for the Company?

A. The fair and reasonable ROE for the Company is 10.0 percent. This requested ROE, at the top of my DCF range, is appropriate given the ongoing effects of U.S. and global economic turmoil on the equity market for utility shares. Recent market turmoil and the continuing effects on capital markets make it difficult to strictly interpret quantitative model estimates for the cost of equity. While corporate interest rates have dropped to record low levels and the DCF results have declined as utility dividend yields have dropped, equity market risk aversion remains high. Under these conditions, use of a lower DCF range or equity risk premium estimates based strictly on historical risk premium relationships will understate the market cost of equity. Based on all these factors, a reasonable ROE to be used for setting rates in this case is 10.0 percent.

Q. Does this conclude your direct testimony?

A. Yes.