BEFORE THE PUBLIC SERVICE COMMISSION OF UTAH

In the Matter of the Application of Rocky Mountain Power for Authority to Increase Its Retail Electric Service Rates in Utah and for Approval of Its Proposed Electric Service Schedules and Electric Service Regulations	)))))))))	**DOCKET NO. 08-035-38** **Exhibit No. DPU 2.0** **Direct Testimony and Exhibits** **Charles E. Peterson**

FOR THE DIVISION OF PUBLIC UTILITIES
DEPARTMENT OF COMMERCE
STATE OF UTAH

Direct Testimony of

Charles E. Peterson

January 8, 2009

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Testimony of Charles E. Peterson

I. INTRODUCTION AND SUMMARY

Q: Please state your name, business address and title.

A: My name is Charles E. Peterson; my business address is 160 East 300 South, Salt Lake City, Utah 84114; I am a Technical Consultant in the Utah Division of Public Utilities (Division).

Q: On whose behalf are you testifying?

A: The Division.

Q: Please summarize your educational and professional experience.

A: I attended the University of Utah and earned a B.A. in mathematics in 1978 and a Master of Statistics (M.Stat.) through the Graduate School of Business in 1980. In 1990, I earned an M.S. in economics, also from the University of Utah.

Between 1980 and 1991, I worked as an economic and financial consultant and business appraiser for several local firms or local offices of national firms. My work frequently involved litigation support consulting and I have testified as an expert witness in both federal and state courts.

In 1991, I joined the Property Tax Division of the Utah State Tax Commission. In 1992, I was promoted to manager over the Centrally Assessed Utility Valuation Section. I have provided expert testimony regarding valuation, economic and cost of capital issues, both in deposition and formal hearing before the Utah State Tax Commission.

I joined the Division in January 2005 as a Utility Analyst; in May 2006, I was promoted to Technical Consultant. I have worked primarily in the energy section of the Division. In 2007, I earned the Certified Rate of Return Analyst (CRRA) from the Society of Utility and Regulatory Financial Analysts (SURFA).

My current resume is attached as DPU Exhibit 2.1.

Q: Please outline the projects you have worked on since coming to the Division.

A: I was involved in evaluating cost of capital issues in the 2004 rate case that was settled in February 2005. I subsequently co-authored a paper regarding the Capital Asset Pricing Model (CAPM) published in *The NRRI Journal of Applied Regulation.*[1] In 2008 I co-authored an article related to ring-fencing that was published in Public Utilities Fortnightly.[2]

In 2006 I provided written and oral testimony on cost equity supporting the stipulation that settled most issues in the PacifiCorp general rate case in Docket No. 06-035-21. In May 2008 I provided written and oral testimony on cost of capital and related issues in both the PacifiCorp and Questar Gas general rate cases (Docket Nos. 07-035-93 and 07-057-13).

[1] The NRRI Journal of Applied Research, vol. 3, December 2005, Ohio State University, Columbus, OH, pp. 57-70.
[2] Public Utilities Fortnightly, Vol. 146, No. 2, February 2008, pp. 32-35, 66.

I have worked on DSM, HELP, and service quality and customer guarantees involving PacifiCorp. I was the Division lead on an internal research project regarding ring-fencing that resulted in a report to the Utah Public Service Commission (Commission). I was the lead of the economics and finance group within the Division assigned to evaluate the proposed acquisition (Acquisition) of PacifiCorp (Company) by MidAmerican Energy Holdings Company (MEHC). Please see Docket No. 05-035-54. I testified on behalf of the Division in PacifiCorp's purchase of the Chehalis power plant on July 17, 2008 (see Docket No. 08-035-35). I have been the lead on a number of QF contract cases.

Q: What is the purpose of your testimony in this matter?

A: My testimony discusses issues related to the cost of capital of the Company. Cost of capital includes capital structure, cost of common equity, cost of debt and cost of preferred stock. Cost of equity and overall cost of capital are important parts of the revenue requirement of a regulated utility. I provide testimony supporting the Division's position that currently the appropriate cost of equity for PacifiCorp is 10.75 percent. As discussed below, the Division questions the need and propriety of the Company's requested capital structure and recommends that the equity capital structure remain at its September 30, 2008 level as reported in the Company's SEC 10-Q report. Consequently, the Division's recommended capital structure is 50.82 percent common equity, 0.37 percent preferred stock and 48.81 percent long-term debt. With respect to the cost of long-term debt, the Division also questions the Company's assumptions regarding the cost of debt relative to the Company's proposed issuance of $800 million in first mortgage bonds on December 31, 2009. The

Division believes the Company's assumptions are speculative and contrary to strong policy efforts of the United States Government. The Division recommends that the Commission eliminate this proposed debt issuance from its initial rate order, but provide that rates could be adjusted when and if the Company actually issues this large amount of debt based upon the amount and terms of the debt at that time. The Division has no disagreement with the Company's preferred stock return of 5.41 percent.

Q: In the previous PacifiCorp rate case, you testified last spring that you were asking the Commission to modify its view of the use of different methodologies. What is your position on this subject in this rate case?

A: The Commission's decisions in Docket Nos. 07-035-93 and 07-057-13 made reference to different methodologies, but did not discuss the merits of the methodologies.[3] In this case I continue to use the same methodologies (cost of equity estimation techniques) as I did last time. However, the current turmoil in the financial markets the last three or four months and the reaction of the United States federal government, particularly the Federal Reserve and the U.S. Treasury, strains the assumptions of all of the methods used, making it particularly difficult to arrive at reliable cost of equity and even cost of debt estimates at this time.

Q: Please outline the scope of your testimony.

A: First I will review and comment on the basis of the Company's capital structure request. Next I will review and comment on the Company's requests for cost of preferred stock and long-

[3] In particular, I advocated giving some credence to the Capital Asset Pricing Model (CAPM) due to its wide use and acceptance, while at the same time recognizing the difficulties previously discussed by the Commission in implementing this model in practice. I also suggested that the Commission may want to consider other models as they are from time to time offered and supported by testimony.

term debt. Then I will describe the methods, data, and analyses that I used to arrive at the Division's recommendation for cost of equity including the selection of comparable companies. Finally, I will review and comment on those areas of the testimony of the Company's cost of capital witnesses, Dr. Samuel Hadaway and Mr. Bruce Williams, with which I agree and disagree. I review Mr. Williams' testimony in the sections on capital structure, cost of debt and cost of preferred stock; and Dr. Hadaway's testimony in a section following the discussion of cost of equity.

In order to prepare testimony, I set a cut-off of December 17, 2008 for stock prices and debt yields.

Q: Please briefly summarize the work and investigations that you have performed in this matter.

A: I have reviewed and analyzed the testimonies of PacifiCorp witnesses Bruce N. Williams, the Company's Treasurer, and Samuel C. Hadaway, Ph.D., an outside cost of equity witness. Mr. Williams provided testimony regarding cost of debt, cost of preferred stock and capital structure. Dr. Hadaway filed testimony on cost of equity. I have also performed my own independent estimation of cost of capital, particularly with respect to cost of equity.

Q: What was the Company's original filed position regarding cost of capital?

A: Originally, for a June 30, 2009 test year, the Company asked for the following cost of capital rates of return:[4]

[4] Direct Testimony of Bruce N. Williams, December 2007, page 3.

Component	Structure	Cost
Long-Term Debt	47.7%	6.24%
Preferred Stock	0.4%	5.41%
Common Stock	51.9%	10.75%
WACC	100.0%	8.58%

Subsequently the Commission ordered that the test year end December 31, 2009 causing the Company to file revised testimony. Mr. Williams revised the Company's cost of capital request to the following:[5]

Component	Structure	Cost
Long-Term Debt	48.2%	6.23%
Preferred Stock	0.3%	5.41%
Common Stock	51.5%	11.00%
WACC	100.0%	8.69%

Q: With respect to the Company's filed testimony, what have you concluded?

A: As outlined above, I concluded that the cost of the preferred stock recommended by the Company is reasonable. As noted above, I believe the cost of debt and the overall capital structure recommended by the Company is aggressive due to its unnecessary growth. While I believe that the cost of equity range estimate recommendation by Dr. Hadaway is on the high side, Dr. Hadaway's estimate lies within what I would consider a reasonable range for

[5] Direct Testimony of Bruce N. Williams, July 2008, page 3.

PacifiCorp. However, I believe the public interest would be better served if PacifiCorp's authorized cost of equity were set lower at about 10.75 percent.

Division Exhibit 2.2 summarizes the capital structure and cost of capital point estimates supported by the Division. The final weighted average cost of capital is 8.45 percent. The following table summarizes the capital structure and cost of capital point estimates supported by the Division.

Component	Structure	Cost
Long-Term Debt	48.81%	6.07%
Preferred Stock	0.37%	5.41%
Common Stock	50.82%	10.75%
WACC	100.00%	8.45%

II. CAPITAL STRUCTURE

Q: What is PacifiCorp's current capital structure?

A: I examined the latest actual capital structure of the Company that was available from the Company's SEC Form 10-K as of December 31, 2007, along with third quarter, September 30, 2008 10-Q results. As of September 30, 2008, the capital structure was 50.82 percent common equity, 48.81 percent long-term debt and 0.37 percent preferred stock. I note that the equity percentage is about 40 basis points higher than the 50.4 percent the Company defended in its rate case last spring (Docket No. 07-035-93).

Q. What are the capital structures of your comparable, or guideline, companies? [6]

A. Exhibit 2.3 sets forth calculated capital structures for my comparable companies. It shows that as of September 30, 2008, only three companies, Alliant Energy, Ameren and Southern Company, have higher total equity percentages than PacifiCorp's; the average is about 48 percent.

Q. Dr. Hadaway uses some companies as comparables that you did not use. Do Dr. Hadaway's comparable companies support an equity percentage above 50 percent?

A. No. There are seven companies in Dr. Hadaway's comparable list that I did not include in my. Of these seven companies only one, ALLETE at about 58 percent, has an equity capital percentage above 50 percent. The average of these seven companies is 47 percent equity; and, if you exclude ALLETE, the average drops to 45 percent.[7]

Q. What are the pros and cons of PacifiCorp having a stronger balance sheet, as represented by the equity percentage, than the average of your comparable companies?

A. Having a stronger balance sheet helps PacifiCorp maintain its A- bond rating, which in turn helps the Company to obtain debt financing at relatively favorable interest rates. On the negative side, increasing the equity capital percentage and combining that with a higher cost of equity rate unduly increases costs to the Company's ratepayers.

Q, Why do you say this "unduly" increases costs to ratepayers?

[6] The selection of the comparable companies will be described in detail in the cost of equity section of my testimony.
[7] See DPU Exhibit 2.4. The equity percentage data is from AUS Monthly Report, December 2008.

A. Because in my view there is no reason to increase the equity percentage structure at this time. The proposed increase in the equity structure is neither likely to result in an increase in the Company's bond rating, either as part of MEHC or on a stand-alone basis, nor is it likely to result in any measurable decrease in its cost of debt.[8] Thus there is no benefit to ratepayers, only the Company's shareholder. As I pointed out above, neither Dr. Hadaway's nor my list of comparable companies suggests a current weakness in PacifiCorp's capital structure *vis-á-vis* the publicly traded companies we have chosen to be reflective of PacifiCorp.

Therefore I do not support PacifiCorp's proposed capital structure and instead recommend that PacifiCorp's equity percentage remain for the time being at the level the Company reported in its September 30, 2008 10-Q report.

Q. Is PacifiCorp able to control what its capital structure is?

A. Yes, PacifiCorp and/or its parent, MEHC can take actions which affect capital structure. For example, in the instant matter, Mr. Williams testifies that he expects further equity capital contributions from MEHC.[9,10] The Company's equity capital percentage could be kept at, or near, 50.8 percent through reduced capital contributions from its parent (or dividend payments, as necessary).

[8] Moody's suggests that a capital structure of 50 percent equity should be adequate to maintain an A- rating. In fact Moody's gives a range of 40 to 60 percent for equity. See Moody's Investors Service, Credit Opinion: PacifiCorp, October 17, 2008, esp. last page.

[9] Williams, page 1, lines 20 to 23.

[10] Although PacifiCorp has not paid dividends on its common stock to its parent since the Acquisition in March 2006, and has indicated that it doesn't expect to pay dividends in the coming year. Payment of common stock dividends is another way the Company (or its parent) can control its equity capital percentage.

Q. What are you recommending with respect to the capital structures of long-term debt and preferred stock?

A. I recommend that the capital structure be kept at the September 30, 2008 level of 50.82 percent common equity, 0.37 percent preferred stock, and 48.81 percent long-term debt.

III. COST OF DEBT AND PREFERRED STOCK

Q: What did you do with respect to the cost of preferred stock?

A: I studied the testimony of Company witness Bruce Williams and the related exhibits. Mr. Williams requested the cost of preferred stock be set at 5.41 percent. The 5.41 percent figure is the imbedded cost of preferred stock. PacifiCorp has not issued new preferred stock in several years and has, in fact, retired most of the preferred stock it had outstanding at the start of this decade. The Company has not indicated any intention of issuing new preferred stock in the future. I recommend accepting the Company's cost of preferred stock rate of 5.41 percent.

Q: What are your issues with the Company's long-term debt rate?

A: First I would note that both the December 31, 2008 (essentially the "base") and December 31, 2009 long-term debt balances are forecasts. The December 31, 2008 debt balance can probably be forecast with a fairly high degree of accuracy; however, the changes between December 31, 2008 and December 31, 2009 are more assumption-driven and speculative.

The primary issue I see is with the assumption that the Company will sell $800 million in long-term debt on December 31, 2009 at an 8.472 percent cost.

The Company issuance of debt on December 31, 2009 may have been in the budget at the time of Mr. Williams' testimony, but whether or not it happens and whether or not it happens in the $800 million amount is less certain. What I consider to be even more speculative is the 8.472 percent cost of this debt. Mr. Williams bases this figure on a forward Treasury bond yield of 4.51 percent and a 3.875 percent spread between long-term treasury debt and "A" rated corporate bonds, plus a 0.09 percent amount for issuance costs.[11]

The 3.875 percent rate spread is about 2.0 percentage points higher than a recent 12 month average found in Dr. Hadaway's Schedule 2SS, page 1, and about 2.7 percentage point higher than the average for the years 2006 and 2007 based on the same Schedule 2SS. Dr. Hadaway's rate spread data highlight an aspect of the turmoil in the financial markets that began about August 2007. What Mr. Williams is assuming is that the market turmoil we see today will be still in effect one year from now.

However, the stated policies of the U.S. Government entail "flooding" the economy with money in order to encourage banks and other lenders to lend money once again at relatively favorable interest rates. Given the massive efforts of the federal government to bring "normalcy" back to the financial markets, there seems to be little basis to assume that these high rate spreads will continue for another twelve months.

[11] Willliams December 2008 testimony, p. 4, lines 70-74.

Another point is that page 2 of Dr. Hadaway's Exhibit 2SS is a page from Standard & Poor's "Trends and Projections," dated October 2008. This document may have been produced before the panic in the financial markets that occurred in the first two weeks of October. However, the document clearly shows that the economy was forecast to be in recession for the fourth quarter 2008 through the first half of 2009 with the unemployment rate continuing to increase through the end of 2009. This shows that Standard & Poor's was expecting poor economic performance for nine months or longer. What is noteworthy is that Standard & Poor's predicts that the interest rates on new issue corporate bonds in the fourth quarter 2009 will be 5.5 percent, which is less than its forecast for fourth quarter 2008. This is consistent with economic theory that as demand for money declines during a recession interest rates would tend to decline.

Q. What do you conclude from this information?

Based on the government policy and, to a lesser extent, the Standard & Poor's forecast in Dr. Hadaway's testimony, I believe that the issuance of the debt in December 2009 is speculative as to the timing, the amount, and the interest rate. I recommend that this $800 million debt issuance, which would amount to a 15 percent increase in outstanding long-term debt, be eliminated from current consideration. If and when the Company does issue this debt, I recommend further that the Commission's order in this rate case include that PacifiCorp be allowed to apply for inclusion of this debt issuance in its rates up through June 30, 2010. At the time of actual issuance the amount, the interest rate and other terms can then be included through an additional review and Commission order. A similar procedure was approved by

the Commission in the 2006 PacifiCorp rate case, Docket 06-035-21, in which the revenue requirement was implemented in two steps.

Q. What is the result of this condition?

A. This results in the December 31, 2009 embedded cost of debt to be reduced to 6.02 percent. Using Mr. Williams' method of averaging the embedded debt cost at December 31, 2008 with December 31, 2009 gives a cost of debt figure of 6.07 percent, which I accept as the cost of debt for the Company in this rate case.

In addition, if the Commission adopts this recommendation, then the parties can recommend how to implement the change in the cost of service/rate design phase of this case. For example, the change could be implemented as a tariff rider or as an equal percentage increase of all tariffed rates.

Q. If the Commission does not want to have an additional proceeding to determine the inclusion of a large future debt issuance in rates, what alternative do you recommend?

A. I recommend that the cost of debt service on the debt issuance be set at 6.50 percent which is approximately the cost PacifiCorp incurred with a debt issuance in July 2008, i.e. during a period of relative stability in the credit markets. This would have the effect of setting the cost of debt at 6.10 percent and the overall cost of capital at 8.46 percent, keeping all of my other assumptions and recommendations the same.

IV. COST OF COMMON EQUITY

A. SUMMARY AND CONCLUSIONS

Q: Please summarize your cost of equity calculations and conclusion.

A: First I identified comparable (proxy or guideline) companies that I would use to estimate the cost of equity for PacifiCorp. These comparable companies are summarized in Division Exhibit 2.4. I will explain the selection process for the comparable companies later in my testimony. Using data from public sources related to the comparable companies, I calculated several variations of the standard single-stage discounted cash flow (DCF) model and the two-stage DCF model. In calculating these models, I used both the closing (spot) price of the common stock of these companies as of December 17, 2008 and the 30-day average closing stock price. I considered several variations of the capital asset pricing model (CAPM) using different historical periods to estimate the market risk premium, different sources of beta, and the 20-year U.S. Treasury bond and the 90-day U.S. Treasury bill rates as estimates of the risk-free rate. Finally, similar to what I did in my previous testimony in Docket No. 07-035-93, I constructed estimates using a risk-premium model based upon Value Line financial strength ratings. As explained further below, after calculating both the CAPM and risk premium models, I calculated adjusted models in an effort to "normalize" the results in the face of the market turmoil of the last three or four months.

Division Exhibit 2.5a sets forth a detailed summary of the results of the models and calculations that I have made. Exhibit 2.5 sets forth my final recommendation which is a point estimate of 10.75 percent as the cost of common equity applicable to PacifiCorp at this

point in time. I would consider a reasonable range to be between 10.25 percent and 11.25 percent.

B. AN OVERVIEW OF COST OF COMMON EQUITY MODELS

Q: What methods did you look at in order to estimate the current market cost of equity for PacifiCorp?

A: I used standard discounted cash flow models (DCF) coupled with two types of risk premium models to support and complement the DCF analyses. Regarding the DCF models, I considered both the simple or single stage model and two-stage DCF models. Within each model, I considered variations of different growth rates.

Risk premium models included the CAPM and a model I used at the Utah State Tax Commission that uses factors based upon Value Line financial strength ratings to adjust the expected market return for varying risk.

Q: Please briefly describe the Single-Stage DCF model.

A: The single-stage DCF model is based upon the assumption that the value of ownership in a common stock is based upon the returns the stockholder expects to receive into perpetuity. It incorporates the current dividend and the prospects for growth in that dividend over time. Among other things, the model assumes that the expected price-to-earnings ratio for the company's stock will remain constant at the current level. In the single-stage model it is assumed that there exists a growth rate "g" that is constant; that is, this "g" will adequately

serve as a surrogate for the growth in dividends for all periods of time in the future. The formula used is

$$k_e = D_0*(1+g)/P_0 + g$$

Where: k_e is the cost of common equity
D_0 is the current dividend
P_0 is the current stock price
g is the (constant) growth rate

Q: Please describe Two-Stage DCF models.

A: Two-stage DCF models are based upon the same principles and assumptions that the single-stage models are based upon except that for an initial period of years, usually five to ten years, the dividends are explicitly forecast. Following this initial period, a "terminal value" or lump-sum price is calculated which represents the estimated present value of the future dividends following the initial period. A discount rate is found for the explicitly forecast initial period dividends and the terminal value such that the present value of the forecast dividends and terminal value equals the current stock price. This discount rate is the cost of equity in the two-stage DCF model.

Q: What are the strengths and weaknesses of the DCF models?

A: Briefly, the strengths of the model are its simplicity and ease of application, particularly in the single-stage version of the model. DCF models are derived directly from the financial theory that the price of a common stock is equal to the present value of the future cash flow available to stockholders. Two of the three principal components of the model are directly observable in the market: the dividend and the stock price. The future growth rate is necessarily an estimate, and thus can be controversial. The single-stage model can be faulted

for the assumption that there is a single growth rate that will apply to the company into the indefinite future (theoretically, forever). Non-constant and multi-stage DCF models can handle changing growth rates in the future and even changing discount rates, but they are increasingly complex.

Q: As you cited earlier, the Utah Public Service Commission in the 2002 Questar Gas Company general rate case adopted a 75 percent weighting on earnings growth estimates and a 25 percent weighting on dividend growth estimates. Do you have any comments on this weighting scheme?

A: For a single-stage model, this weighting appears reasonable to me. It gives consideration to the fact that the model is theoretically about dividends and not earnings, but also reflects that dividend growth is related to earnings growth. Implicit as well is the concept that differences between dividend growth and earnings growth rates in the near-term have a greater effect on the cost of equity than any such differentials in the far future. Therefore, I find that this weighting scheme is reasonable and I use it as part of my analysis.

Q: Do you have any comments comparing Single-Stage DCF models with Two-Stage models?

A: Yes I do. The main advantage of two-stage (and even three-stage, or more) models is simply the ability to separate out the estimate into two or more components. If the analyst has a good basis for the specific separation of future cash flows into two or more components and has a good basis for the length of time of the initial stage(s) as well as the growth differentials for different components, then these models can be very useful. They would

also be useful if the goal was to develop "what if" scenarios. However, in the case of cost of equity estimates, even for a company in a mature industry, the time periods used and the growth rate differentials tend to be subjective and even arbitrary. The analyst has to make more judgments and assumptions including the length of the periods of different growth rates, the growth rates for different periods, the calculation of the terminal value (if any), and whether, or not, to assume the discount rate should remain constant and if not, how is it going to be estimated. Given these complexities with two-stage or higher multi-stage DCF models, it is difficult to imagine that they will generally be better estimators of cost of capital.

In the final analysis, the results of a two- or more stage DCF model has a single-stage equivalent with a growth rate that is unlikely to be much different from the growth rates used in a multi-stage model especially in a mature and price-regulated industry such as the electric utility industry.

For these reasons, I do not believe two-stage DCF models currently add a lot of new information to the estimate of cost of equity for electric utilities. However, further theoretical developments or better data, or both, for multi-stage models may increase the usefulness of these types of models.

Q: Please briefly describe the CAPM model.

A: The CAPM is a type of risk premium model. CAPM grew out of theoretical work in modern portfolio theory in the 1960s. Modern portfolio theory had shown that diversified portfolios could reduce the variability in the value of those portfolios and that a risk factor called "beta"

could be used to estimate the relative variability of a portfolio to the market portfolio. The theory of CAPM is that the cost of equity is equal to the risk free rate plus a market risk premium adjusted by the risk factor beta. The market risk premium is the additional return over the risk free rate that a portfolio of all risky investments, i.e. the "market," would expect to earn. One of the theoretical underpinnings of CAPM is that through a diversified portfolio investors could virtually eliminate risk specific to a particular investment such that if the investor were sufficiently diversified, he would only face the risk of the market, which is also called systematic risk. Beta is a measure of the volatility of an investment's value compared to the market as a whole and will indicate to an investor how a given investment will affect the systematic risk of his portfolio.

Under CAPM theory investors are not rewarded for the specific risks of a particular investment because these risks can be diversified away. The only reward the investor receives is the systematic risk, represented by the beta that an investment brings with it to the portfolio.

The calculation of the CAPM cost of equity for a company is straightforward and is based upon readily available information. This model is widely taught in the academic literature and is widely used in industry.[12]

[12] Modern portfolio theory and the capital asset pricing model are discussed in detail in texts on corporate finance and investment valuation. See, for example:

Brealey, Richard A., Stewart C Myers and Franklin Allen. (2006). *Principles of Corporate Finance 8th ed*. New York: McGraw-Hill Irwin.

Brigham, Eugene F. and Joel F. Houston. (2007). *Fundamentals of Financial Management 5th ed*. Mason, Ohio: Thomson South-Western.

Damodaran, Aswarh. (2002). *Investment Valuation*. New York: John Wiley & Sons, Inc.

Parcell, David C. (1997). *The Cost of Capital – A Practitioners Guide*.

The formula for the CAPM is as follows:

$$k_e = RFR_0 + \beta * (MR\text{-}RFR)$$

Where: k_e is the cost of common equity
RFR_0 is the current risk free rate
β is beta, the risk adjustment factor
(MR-RFR) is the market risk premium, which can be decomposed into two factors: the overall market return, MR, and the RFR that is compatible with the way the MR was estimated.

Q: Please briefly discuss the strengths and weaknesses of the CAPM.

A: The strengths include a firm theoretical basis for the model, its relative simplicity and intuitive appeal. The model is widely taught and apparently widely used in corporate America. The downside of the model is that there is little consensus on how each of the factors are developed and the model implemented.

Different analysts will choose different risk free rates, which will affect the outcome as I demonstrate in my application. Academics sometimes favor using a Treasury Bill rate as the most nearly true risk free security, while practitioners (including this one) favor longer-term bond rates to match the apparent holding period of the asset. Beta is calculated in various ways using different base periods, market proxies and other measurement differences such as the frequency of the observations and even the day of the week the observations are made. Some services offer "adjusted" betas that "correct" the calculated or "raw" beta to account for the apparent tendency of betas to revert to a mean over time. The available services assume that the mean that the betas revert to is the market beta, 1.0.

There is evidence that utility company betas should not be assumed to revert to a mean of 1.0. Gombola and Kahl studied 109 utilities and found that the mean that their betas reverted to was 0.52. (Gombola, Michael J., and Douglas R. Kahl, "Time-Series Processes of Utility Betas: Implications for Forecasting Systematic Risk," Financial Management, Autumn 1990, pp. 84-93). A more recent study by Buckland and Fraser of British water utilities found a mean of about 0.7. However, this study is less compelling due to its limited scope and geographic location (Buckland, Roger and Patricia Fraser, "Political and Regulatory Risk in Water Utilities: Beta Sensitivity in the United Kingdom," Journal of Business Finance & Accounting, 28(7) & (8), September/October 2001, pp. 877-904.) In addition to these studies, I compiled betas on the comparable companies and their predecessors from Value Line data back to 1981. These data are set forth in DPU Exhibit 2.16. This shows an average over this period of 0.67. There is no clear indication of a trend to 1.0. Given the way Value Line adjusts its betas, this would correspond to a raw beta of about 0.49, which is very close to the Gombola and Kahl results. These data suggest that Value Line's, and other similarly adjusted betas, may be too high for regulated utilities and their use in CAPM for regulated utilities may overstate the cost of equity for utility companies. In my analyses I use Value Line betas and betas from other sources.

Perhaps the most hotly debated factor is the market risk premium; that is, the premium return investors demand from stocks over the risk free rate. Some practitioners support the use of the arithmetic average of the difference between historical stock market returns (with the Standard & Poor's 500 Index as a proxy) and long-term (approximately 20 years) treasury

bond returns since 1926 as popularized by Ibbotson Associates over the last 30 years or so.[13] However this approach has been criticized by academics and others on a number of grounds. Some say the historical time period is too long reaching back to a much different economy than we have today. Others have cited technical problems with the data Ibbotson compiled. One technical problem is referred to as "survivor bias." Survivor bias refers to the fact that the underlying Ibbotson data is composed of companies that were successful; losers are not included. Studies indicate that this bias inflates the Ibbotson-based market risk premiums by about 1 to 2 percentage points.[14]

Another issue is the use of arithmetic averages versus geometric averages. Ibbotson Associates, Brealey, Myers, and Allen among others, argue that arithmetic averages produce the appropriate unbiased estimates of returns. Usually a decision tree-type analysis covering one or two years is produced showing how this would work. However, the use of arithmetic averages significantly overstates the actual returns an investor would have actually received over a long historical period of time, a time period in which the geometric average much more accurately reflects the actual experiences of investors. Indro and Lee demonstrated that both the arithmetic and geometric returns are biased estimates of investor returns over more than one period of time (they used months as their units of time), but that for longer periods of time, the geometric return becomes the better estimator. That is, for one period forward the arithmetic average is an unbiased estimator of investor returns, but if the returns are to be calculated for longer terms, the geometric return becomes better. Indro and Lee advocate using a weighted average between arithmetic and geometric returns for terms of more than

[13] Stocks, Bonds, Bills, and Inflation (SBBI), any edition, published annually by Ibbotson Associates (now a division of Morningstar).
[14] Brigham and Houston, supra, p. 272.

one period.[15] For these reasons and others, some experts advocate geometric returns.[16] In short there is great dispute about how the market risk premium should be estimated.

I have used the Ibbotson Associates data because it is readily available and widely used. The errors that are known, primarily the survivorship bias, can be corrected for or otherwise taken into account. A distinction must be made between the Ibbotson data and the "Ibbotson method." The "Ibbotson method" primarily refers to using an arithmetic average of the entire historical period since 1926, without any adjustment, to calculate the market risk premium. It is this "Ibbotson method" that I disagree with.

Empirical studies of stock returns have turned up anomalies that have suggested flaws in the CAPM. In order to correct for these anomalies (and save the basic theoretical construction) additional factors have been specified for the model such as the Fama-French three-factor model or add-ons to the model such as adjustments for size or industry. None of these adjustments have avoided controversy.

The practical implementation of the model has resulted in much controversy and consternation. Despite these problems the CAPM is a widely used in academic literature, by corporate chief financial officers, and Wall Street analysts, and has an established theoretical

[15] Indro, Daniel C. and Wayne Y. Lee, "Biases in Arithmetic and Geometric Averages as Estimates of Long-Run Expected Returns and Risk Premia," Financial Management, Vol. 26, No. 4, Winter 1997, pp. 81-90.
[16] For a discussion of geometric versus arithmetic averages, see Damodaran, Op. Cit. pp. 161-162.
PPC's Guide to Business Valuations, Volume 1, paragraph 502.8, Practitioners Publishing Company, Fort Worth Texas, February 2006.
and
Damodaran, Aswath, "Equity Risk Premiums (ERP): Determinants, Estimation and Implications," September 2008 (with an October update reflecting the market crisis)" http://www.damodaran.com, see recently published articles.

basis. These facts necessitate that an analyst at least consider the CAPM in evaluating a cost of equity problem.

Q: Please briefly describe the model based upon Value Line financial strength ratings.

A: This model begins with an estimate of the expected market return on common stock derived in the same manner as with the CAPM. The expected return for the entire market is then adjusted by a risk factor based upon the average Value Line financial strength rating for the comparable companies. Using the entire Value Line data set, a regression equation is matched to the average forecast total returns by financial strength rating class; this equation is constructed, in part, to estimate the returns between whole ratings. Starting with a weighted average rating for the entire Value Line universe of companies, a ratio of the expected returns to this average return is constructed. This ratio becomes the "risk factor" that adjusts the expected market return. Algebraically the formula is

$$k_e = f * MR = f * (MRP + RFR)$$

Where: k_e is the cost of common equity
RFR is the risk free rate
MR is the expected market return
MRP is the market risk premium
f is the risk adjustment factor

Generally, the higher the rating (i.e., the lower the risks as measured by that rating), the lower the expected return. Thus, higher ratings than the weighted average will result in a risk factor less than one; the highest financial strength rating should have the lowest risk factor, and vice versa. This all comports with current financial theory: the higher the risk, the higher the expected return; the lower the risk, the lower the return.

Q: Where has this model been used?

A: I used this model as a secondary estimate of cost of equity at the Utah State Tax Commission for about ten years.[17] Its use has been included in contested cases heard by the Tax Commission where other parties' experts had the opportunity to review and comment on it and I was subject to cross-examination.

Q: Do you expect the Utah Public Service Commission to rely on this model now, or in the future?

A: Not necessarily. I offer it because I personally use it and compare it with other estimates.

Q: What are the strengths and weaknesses of the model?

A: The model is an alternative risk premium model that uses a factor based upon Value Line's widely known financial strength rating to adjust the expected market return. The market return is derived in the same way as the CAPM market return is estimated, so this provides an accepted starting point for the method. The risk factor is then empirically calculated based upon the industry financial strength rating (as represented by the comparable companies). Over several years the model has yielded reasonable results.

The weaknesses include the reliance on Value Line as the source of the financial strength ratings and the relative forecast returns of the individual companies. The risks of a particular industry, e.g. the electric utility industry, may differ from companies in the Value Line universe even though they share the same financial strength rating. Finally, the model has not been published and consequently is not widely known or tested.

[17] By Tax Commission rule, the primary cost of equity model is a variation of CAPM.

C. COMPARABLE (PROXY) COMPANIES

Q: What are the "comparable companies" you referred to and how were they chosen?

A: One of the first steps in the estimate of cost of equity was the selection of publicly traded "comparable" companies whose market returns and characteristics would be studied in order to infer from them what the appropriate cost of equity should be for PacifiCorp. The selection and use of comparable companies is obviously critical since PacifiCorp itself is not an independent, publicly traded company. However, even if PacifiCorp were publicly traded it would be advisable to compare it with closely related companies in its industry. The Company's witness, Dr. Hadaway, chose 15 companies as cited in his testimony. I made a selection of 13 companies, but only eight overlapped with Dr. Hadaway's list. The criteria I used to select comparable companies included (1) similar bond ratings to PacifiCorp; (2) similar size to PacifiCorp; (3) significant thermal generation capacity; (4) at least 60 percent of revenue and/or income derived from electric utility operations; and (5) "Other."

More specifically, I chose companies whose bond ratings ranged from BBB to A (Moody's Baa2 to A2). This range is based upon PacifiCorp's bond rating of A- as part of MEHC and BBB as a free-standing firm. For size the company's revenues and net plant in service had to be within plus or minus 2.5 times that of PacifiCorp. Thermal generation capacity was considered "significant" if it was at least 30 percent of the total. Percent of revenues and income was explained above, although I stretched this a bit in the case of DTE (which was also selected by Dr. Hadaway) since it otherwise met my criteria and had significant regulated gas operations which I gave some credit for in this selection process; DTE received

65 percent of its income from its electric operations and 14 percent from its regulated natural gas business.

DPU Exhibit 2.4 lists my selection of comparable companies along with summary data supporting their selection. I will discuss the issues I have with the additional companies Dr. Hadaway uses later in my discussion of Dr. Hadaway's analysis.

Q. Did you perform any other analyses that show that the companies you selected are generally comparable to PacifiCorp?

A. Yes. DPU Exhibit 2.17 was created to compare PacifiCorp with my list of comparable companies using ratio and other financial measures. For a number of these measures PacifiCorp is fairly typical of the comparable companies. However, the Company is consistently below average in return on equity and in revenues per fixed assets. Part of the reason for this may be due to the Company's wide geographic area that services a relatively small population base (i.e. the Company's customers per square mile of service territory is below average). This requires PacifiCorp to invest in plant to service this large region without the population density that other utilities have.

On the other hand the Company's operating income as a percentage of revenues is favorable compared to the other companies which suggests relatively good cost control performance by the Company. Despite this favorable performance, the Company has failed to earn its authorized return on equity for a number of years.

D. APPLICATION OF COST OF EQUITY MODELS

Q. What affect has the recent turmoil in the financial markets on your equity models?

A. In the first instance, all of the cost of equity models assume the existence of functioning markets that are reasonably stable and rational. It is questionable that this underlying assumption has been valid for the past three months. This makes any estimates of cost of equity more uncertain than usual.

Q. Could you give examples of specific issues with respect to the models raised by the market crisis?

A. Yes. With respect to the DCF models, the current dividend yields while directly measurable may be subject to significant revision in time as the markets calm down and order restored. There is some question about average analyst growth rate forecasts that are available through financial service media as to whether they have been updated recently, or, even if they have, have the analysts taken (or even can the analysts take) adequate account of the financial crisis and the apparent economic recession that is upon us. The CAPM and Risk Premium models potentially suffer from these same questions.

Additional questions that might be raised with respect to CAPM in the present financial tumult include: Do historical betas represent adequately the risk associated with common stocks? Do the current risk free bond yields represent a rational estimate of the risk free rate? Can historical risk premiums of any length be applied? Then too, as mentioned above, the spreads on bond yields have dramatically increased over historic norms, and the daily yields on government debt, particularly T-bills have been subject to sometimes violent swings.

With the answers to these questions in doubt, and the observed market tumult makes estimating a cost of equity more difficult than usual. However, with these issues in mind as caveats, I present my analyses below.

1. Single-Stage DCF Models

Q: Please describe how you developed the Single-Stage DCF models.

A: First, I calculated the current dividend yield for each of the comparable companies. The dividend was based upon annualizing the latest quarterly dividend. I considered both a spot price and a 30-trading day average closing price. The 30-trading day average closing price was used to smooth out random noise that might exist in the stock price data. These stock prices were based upon the closing prices as of December 17, 2008 and were obtained from Yahoo! Finance. Next, I took earnings and dividend growth rates from the latest Value Line reports on each comparable company as well as the latest updates on Value Line's web site accessed December 22, 2008 and combined those with the consensus earnings growth estimates reported on the Yahoo! Finance, Zack's and Reuters web sites for each comparable company. The Zack's, Reuters, and Yahoo's web sites were accessed after the markets closed on December 17, 2008. Value Line and Standard & Poor's Data were accessed December 22, 2008. DPU Exhibit 2.6 sets forth the earnings growth rate forecasts. Included in Exhibit 2.6 is an alternative Value Line calculation explicitly based upon the latest historical earnings per share as reported by Value Line in its 3- to 5-year forecast.

I considered several different growth rate estimates for the single-stage models. First I calculated growth rates based upon a weighted-average by applying a 75 percent weight to the average earnings growth rate from Value Line, Zack's, Reuters, and Yahoo!, and a 25 percent weight to the dividend growth rate (from Value Line) and to the earnings growth-only models pursuant to the Commission's decision in Questar Gas, Docket No. 02-057-02. For comparison I have also made dividend growth-only calculations. Division Exhibit 2.7a sets forth these calculations of the DCF model using this weighted growth rate and the December 17th spot price and Exhibit 2.7b sets forth the same calculations but based upon the 30-day average price. Exhibit 2.8a and 2.8b set forth my adjusted rates using the spot and 30-day average prices, respectively. The adjusted rates were derived by eliminating any cost of equity estimates that were less than 9.5 percent or equal to or greater than 13.5. The 9.5 percent lower bound was selected based upon my judgment that a rate less than 9.5 percent is unreasonable within this particular exercise. The upper bound is approximately two standard deviations above the mean cost of equity estimate based upon the 75-25 percent weighting. All of these estimates are summarized on Exhibit 2.5.

An additional set of single-stage DCF estimates is included on Exhibits 2.9a and 2.9b; where again Exhibit 2.9a is based upon the spot price and Exhibit 2.9b is based upon the 30-day average price. In these exhibits I have calculated cost of equity estimates using the historical10-year average growth in earnings and dividends as reported by Value Line. In the lower portion of these exhibits I have calculated an adjusted cost of equity by eliminating certain estimates that were, in my judgment, too low or too high. In this case I do not believe these results based upon historical growth rates warrant significant consideration in the final

676 estimate of the cost of equity for PacifiCorp. However, a comparison between the actual
677 growth rates and the forecast growth rates is useful, and highlights the possibility that analyst
678 forecast growth rates may be optimistic.
679
680 As set forth on DPU Exhibit 2.5a, the results of the single-stage models using the 75-25
681 percent weighting on earnings and dividend growth resulted in a range of 11.15 to 11.36
682 percent. The adjusted earnings-only growth models yielded an average of 11.59 percent. The
683 dividend-only growth models ranged from 10.25 to 10.77 percent.
684
685 In each growth case with the single-stage models, I prefer the "adjusted" models since they,
686 in my judgment, remove outliers that distort the results. This would make the range of
687 single-stage DCF models 10.74 to 11.65 percent.
688
689 2. Two-Stage DCF Models
690 **Q: Please describe the Two-Stage DCF models you used.**
691 A: In developing two-stage DCF models I forecast the current dividends of each comparable
692 company out five years a couple of different ways. First I assumed that the dividends grew at
693 the dividend growth rate forecast by Value Line. Second I assumed that the dividends grew at
694 the weighted average of 25 percent forecast dividend growth rate and 75 percent forecast
695 earnings growth rate. In each case, for discounting purposes, the dividends were assumed to
696 occur in the middle of the year. A "sixth" dividend was forecasted to occur at the end of the
697 fifth year. This sixth dividend was used as a factor to estimate the terminal value.
698

The terminal value was calculated by dividing the sixth dividend by the cost of equity less a terminal growth rate. The terminal growth rate was assumed in the first instance to equal the forecast earnings growth rate. In the second instance the terminal growth rate was assumed to be equal to the yield on 20-year U.S. Treasury bonds, which was 3.01 percent on December 17, 2008. This latter terminal rate is a significant change from what I did in the previous PacifiCorp rate case (Docket 07-035-93). Use of a long-term interest rate is based upon the assumption that the real rate of return component of the bond yield is equal to the real growth rate, thus the long-term growth rate is equal to the U.S. Treasury bond rate.[18] DPU Exhibits 2.10a and 2.10b set forth the calculations of the two-stage DCF growth rates based upon spot prices and 30-day average prices, respectively. The estimates from these two-stage DCF models ranged from 9.34 percent to 11.31 percent.

By design, the estimate based upon a terminal value using earnings growth is likely to be toward the higher end of the range, because the terminal value arrived at by capitalizing dividends at the earnings forecast growth rate gives the highest likely estimate.[19] Similarly, the estimate using the Treasury bond yield in the terminal value may be at the low end because of the relatively low Treasury bond yields.

[18] Demodaran, October 2008, page 53, http://www.damodaran.com

[19] That is the 6 percent average estimated growth rate is a faster growth rate than the economy as a whole has grown in the last 20 years, and is about 50 percent higher than the forecast growth in GDP. A regulated utility is unlikely to grow faster than the economy for long periods of time. See Section VI. COMMENTS ON DR. HADAWAY'S COST OF EQUITY RESULTS for a discussion regarding GDP growth rates and utility companies.

Q. Earlier with the adjusted single-stage models, you eliminated cost of equity estimates below 9.5 percent. Are you including the 9.34 percent for consideration here, and if so is this a contradiction?

A. In the adjusted single-stage DCF models I was attempting to narrow the range of values in order to obtain a, possibly, different measurement of central tendency within those models. In the two-stage models, the measures of central tendency need to be viewed within the assumptions of these models. So, yes I am giving consideration to the results of these models and there is no contradiction.

3. CAPM Results

Q: How did you develop your CAPM models?

A: I looked at the CAPM model using different risk free rates, time periods, betas, and market risk premiums. I did this to give the flavor of how different factors in the CAPM affect the cost of equity estimate. As stated earlier, there is no consensus on precisely how the components of the CAPM should be estimated.

Q: What risk-free rates did you choose?

A: I chose the current 90-day Treasury bill (T-bill) yield, which is about 0.05 percent, and the 20-year Treasury bond, which is 3.01 percent. Academics have tended to use the T-bill rate, the closest rate to a "true" risk free rate since it contains inflation and time horizon risk. Practitioners often use longer-term rates in order to match the holding period of the asset under consideration. I favor the longer-term rate and use the 20-year Treasury bond since it is approximately equivalent to the long-term government bond historical series compiled by Ibbotson and Associates (now part of Morningstar). Nonetheless, I show the effects of the Treasury Bill rate. However, the estimated market risk premium should correspond to the type of risk free rate one chooses to be consistent.

The recent market turmoil has resulted in the decline of treasury yields, especially the short-term 90-day U.S. Treasury bill. The U.S. Treasury bill rate has been anything but stable bouncing between almost 1.0 percent and 0.0 (zero) percent, sometimes on the same day. Under these conditions of extreme instability, the Treasury bill rate cannot be used and is only presented here for informational purposes. The trading ranges of the U.S. Treasury bill alone highlights the difficulty in arriving at cost of equity calculations in the current environment.

Q: What beta estimates did you use?

A: For four of the five CAPM exhibits I used Value Line's latest adjusted beta. However, in DPU Exhibit 12e I use an average of betas derived from Zack's, Reuters and Yahoo! Finance web sites. DPU Exhibit 11 summarizes the beta estimates for each comparable company from the four sources.

Q: Please describe the market risk premiums you used?

A: All of my market risk premiums are derived from historical data published by Ibbotson Associates. These data have been the subject of criticism for a number of reasons, some of which were cited above. I consider the 82 year "Ibbotson period" to be problematic since it includes market situations much different than today. The most obvious examples are the rise of mutual funds for small investors and more recently exchange traded funds (EFTs) as well as the internet making publicly available information almost instantaneously available anywhere in the world. There are also institutional changes since 1926 such as the creation of the Securities and Exchange Commission, multitudinous changes in accounting rules, and Sarbanes-Oxley. Furthermore, there have been suggestions and studies that indicate investors' expectations may change over time. Thus a long historical period may not accurately reflect today's market and expectations.

Q: What historical period, if any, would you recommend?

A: I feel most comfortable with a 30- to 50-year time period. A 30- to 50-year period is long enough to smooth out the sometimes wide fluctuations in the data, but short enough to focus on the more recent data of the modern financial markets. However, a 30- to 50-year period does not avoid all of the pitfalls of using historical data. Some authorities recommend that at least 30 years be used when basing an estimate on historical data.[20]

Q: Why do you include calculations in three of your CAPM exhibits that reflect the 82-year time period?

[20] PPC's Guide to Business Valuations, Volume 1, paragraph 502.9, Practitioners Publishing Company, Fort Worth Texas, February 2006.

A: Because this time period has been widely promoted by Ibbotson and others as the "correct" time period, I did not want to exclude it completely from my analysis. I also wanted the Commission to be able to evaluate for itself the results of using that time period but applying different betas or using geometric as opposed to arithmetic averages.

However, the 82-year period market risk premium as advocated by Ibbotson represents an estimate that in my opinion is biased upwards. For example, in the proceedings of a conference on market risk premium sponsored by the AIMR published in November 2001, of all the experts presenting at the conference, the Ibbotson representative's calculation was at the top end at 7 percent. Most of the experts thought that the market risk premium should be 5 percent or less going forward, and some were as low as 2 percent, or even less.[21] Thus while I am willing to include the results for the 82-year period for the consideration of the Public Service Commission, I believe these estimates may not be appropriate.

Q: What were your results from CAPM?

A: The CAPM models using the 20-year T-bond yields as the risk free rate range from 6.85 percent to 7.44 percent with an average of 7.15 percent. DPU Exhibits 12a through 12e detail the CAPM calculations. DPU Exhibit 2.5a gives a summary of the results.

Q. These results are about 1.5 percentage points lower than the results you had last spring for Docket No. 07-035-93. Can these relatively low figures be considered reasonable?

[21] AIMR, Equity Risk Premium Forum Report, November, 2001, pp. 30-50. Also, see Shannon Pratt who discusses another reason to think the market risk premium is lower than the long-term historical Ibbotson data (Pratt, Shannon. "Valuers should lower equity risk premium component of discount rate," Business Valuation, 9 (11), November, 2003, pp. 1,6.).

A. I think they should be given some consideration since they reflect the current values given by this widely used model. I would point out too that even using the 82 year historical period the result only increases to 7.99 percent. The 7.0 to 8.0 percent range is 400 to 500 basis points above the risk free rate which is fairly typical for utility companies. Given the opportunity to earn 3 percent on a Treasury bond and 7 or 8 percent on a utility stock, an investor may well choose the utility stock as a reasonable expected return for the additional risk.

4. Risk Premium Results

Q: What were the results of your risk premium model based upon Value Line financial strength weightings?

A: The results ranged from about 7.1 to 7.8 percent based upon the 20-year Treasury bond, a little higher than the CAPM results. Again, I do not consider the Treasury bill-based results to be particularly useful. DPU Exhibit 2.13 details these results.

Q: What do the risk premium results suggest to you?

A: The risk premium results support the CAPM results, and as with the CAPM I give some consideration to them in that they are suggestive that the DCF model results may be too high.

5. Adjusted CAPM and Risk Premium Results

Q. Earlier you mentioned that you created some adjusted CAPM and Risk Premium calculations, why did you do this?

A. As is widely known the financial markets have been in turmoil, especially since October. They seem to be settling down the last half of December and the first week in January, but many difficulties and issues remain not the least of which is the general economic recession. I made adjustments to the CAPM and Risk Premium results to see if I could "normalize" the outcomes, that is, to smooth out the fluctuations. However, what I did can at best be considered *ad hoc* and should not be considered normal practice.

Q. Please describe what you did to adjust the CAPM and Risk Premium models.

A. I noted that the difference between the yield on the current 20-year Treasury bond and the similar yield on July 17, 2008 when PacifiCorp last issued first mortgage bonds, and the financial markets were more stable is a decline of about 170 basis points. At the same time it appears that the required coupon rates on "A" rated corporate bonds have risen about 200 basis points. This is an unusual situation where the returns on government bonds decline significantly but the required returns on investment grade corporate bond rate increases significantly. This is another indication of the fear and turmoil recently experienced in the credit markets. Combined, these differences amount to 370 basis points (3.70 percentage points). I added the 370 basis points to the CAPM models as an estimate of what a "normal" CAPM might currently be. The results ranged from 10.55 percent to 11.14 percent, which are similar to the DCF results.

For the Risk Premium adjustment I calculated the differences between the current Value Line estimates of the average market price-to-earnings (P/E) ratio and the similar Value Line ratio six months ago. Similarly, I looked at the Value Line estimated market dividend yields at the

present time compared to months ago. My thinking is that the differences in these market measures will highlight the abrupt and violent downturn in the stock market that occurred particularly in the first half of October and may give some insight into more "normal" conditions. Both the PE and dividend yields showed differences near 45.5 percent. Therefore I adjusted the Risk Premium models by 45.5 percent. The result was a range of 10.29 percent to 11.30 percent, which also overlaps the DCF results.

Q. **What consideration did you give to these adjusted results?**

A. Like the "raw" CAPM and Risk Premium models, I did not give significant weight to these adjusted results, but rather look at them as possibly modifying the DCF results.

V. MODELS AT THE UTAH STATE TAX COMMISSION

Q: When you worked at the Utah State Tax Commission what cost of equity models did you employ?

A: Since its adoption in December 1998, the Utah State Tax Commission's Property Tax Division (PTD) was obligated to follow Administrative Rule R884-24P-62 (commonly referred to as "Rule 62"). Rule 62 specified in some detail how cost of equity was to be calculated by the PTD for property tax valuation purposes. Specifically the PTD was to use primarily the CAPM using the full period Ibbotson data (now 82 years) and arithmetic averages to compute the market risk premium. The PTD was to use Value Line betas, and the risk free rate was to be based upon the 20-year Treasury bond. Originally the PTD was

867 told to put "at least" 75 percent weight on the specified CAPM, but this was later amended to
868 "at least" 50 percent weight. To my knowledge this amendment had no significant affect on
869 the actual practice of the PTD.
870
871 The PTD also used a single-stage DCF model similar to the one I have used here and the risk
872 premium model I have used here. However, relatively little weight was given to either model.
873
874 **Q: Did you agree with the "Rule 62" specification of CAPM?**
875 A: No. I personally disagreed with the formulation because it adopted many of the specific
876 procedures that I find particularly problematic in that they result in cost of equity estimates
877 that I believe to be strongly biased upward.
878
879 **Q: Prior to the adoption of "Rule 62," how did the PTD typically compute CAPM?**
880 A: The PTD would typically use a 30- to 35-year historical period to estimate the market risk
881 premium. The PTD also put less weight on the CAPM in arriving at a final cost of equity
882 estimate.
883
884 **Q: What relevance does "Rule 62" have in this proceeding?**
885 A: I think the only relevance would be to inform the Public Service Commission that another
886 Utah State agency has adopted the CAPM as its primary method of estimating cost of equity
887 and the Commission may wish to consider it.
888
889

VI. COMMENTS ON DR. HADAWAY'S COST OF EQUITY RESULTS

Q: Please outline your comments on Dr. Hadaway's cost of equity testimony.

A: I will first comment briefly on areas that I'm in general agreement with Dr. Hadaway. Then I will discuss areas of differences and disagreements.

Q: Please outline the areas of general agreement you have with Dr. Hadaway.

A: First and foremost I agree with Dr. Hadaway that the "current financial crisis"[22] makes it difficult to use standard models to estimate PacifiCorp's cost of equity for the 2009 calendar year. Usually I would indicate that Dr. Hadaway should have at least considered a CAPM estimate, but given the current market conditions I will not fault him for that.

As I alluded to earlier, I have included in my list of comparable companies eight of Dr. Hadaway's fifteen comparable or proxy companies, so I'm in agreement with his comparable companies to that extent. I agree with Dr. Hadaway's general formulation of his DCF model and agree with the use of analyst growth forecasts. I generally agree with Dr. Hadaway's discussion of the situation in the capital markets found on pages 3 to 5 of his Second Supplemental Testimony. Before I get into other areas of disagreement, I not that an area of debate relates to how long the financial turmoil will last. Mr. Williams assumes that conditions a year from now will be the same as today.

That outlines my general agreements.

[22] Second Supplemental Testimony of Samuel C. Hadaway, December 2008, p. 2, lines 34 to 36.

Q: With regard to differences or disagreements, let's start with the comparable companies. Why did you not include the other seven companies that Dr. Hadaway included?

A: The bottom part of DPU Exhibit 2.4 summarizes my reasons for exclusion. ALLETE and IDACORP were judged to be too small. ALLETE also has a significant real estate development operation in Florida that is affecting its earnings and outlook. Vectren has relatively low electric utility operations and is more of a natural gas utility than an electric utility. Consolidated Edison and NSTAR have essentially no generating capacity of their own; instead they purchase all of their power. I might have included Edison International and PG&E except that their thermal generation capacities are minimal. Based on these observations, I have elected to exclude these seven companies from my comparable list.

Q: What is your disagreement with Dr. Hadaway's DCF models?

A: While Dr. Hadaway computes DCF results based upon analyst forecasts, he puts little or no weight on these results. As he did in his testimony in Docket No. 07-035-93, Dr. Hadaway concludes that the best growth rate is his estimate of 6.5 percent which he calculates as a weighted average of change in nominal GDP back to 1947, basically the post World War II period. While it is omitted this time, in Docket No. 07-035-93, he sought to bolster his assertion that GDP is a proper growth estimate by presenting a chart on page 30 of his testimony comparing electric demand with real GDP. While he avoids providing the actual statistics with his chart, two things are completely clear from this chart: (1) real GDP and electric demand are positively correlated, and (2) electric demand has been growing at a noticeably slower rate than real GDP at least since 1982. It should not be surprising that electric demand grows at a slower rate than the economy as a whole since consumers at all

levels of the economy have various incentives to continuously improve their energy efficiency.

Assuming that GDP growth is a reasonable estimate for electric utilities, the growth rate used must reflect investors' expectations of future growth. Rather than calculate some weighted average of past GDP growth rates, I believe Dr. Hadaway would have better served the Commission by obtaining long-term GDP forecasts. For example, the U.S. Congressional Budget Office (CBO) publishes 10-year GDP forecasts annually; the current version is CBO's Economic Projections for Calendar Years 2008 to 2018 (updated September 2008). Likewise the Energy Information Administration (EIA) annually publishes their long-term GDP forecast in *Annual Energy Outlook 2009 (early release, December 2008)*. Currently the CBO forecast is for nominal GDP to grow 3.8 and 3.8 percent for 2008 and 2009, respectively; 5.2 percent annually over the period 2010 to 2013; and 4.3 percent annually from 2014 to 2018. The EIA's forecast is more up-to-date and forecasts growth rates of 3.7 percent for 2008 and 0.49 percent for 2009. Its long-term growth rate is about 4.12 percent over the period 2007-2030. If these estimates of GDP growth are used in Hadaway's DCF models, his results would be about two percentage points lower, i.e. in the 8 to 10 percent range.

Dr. Hadaway computed two risk premium models whereby he analyzes average electric utility authorized rates of return and compares them to average public utility bond yields as compiled by Moody's over the 1980 to 2006 time period. From these data Dr. Hadaway imputes an equity return of 10.84 percent for the first model, and 11.43 percent for the

second model. There are questions about the reliability of published authorized rates of return as estimates of cost of equity and the comparability of these rates of return to the average public utility bond yield. For example, many of the rates are based upon negotiated settlements for which tradeoffs between stated cost of equity rates and other parts of the rate case may have been made. Another question is the policies in the different jurisdictions in terms of what evidence for rate of return testimony is accepted and how the regulators ultimately use that testimony.

In a third risk premium model Dr. Hadaway adds 500 basis points to a 4.30 percent October 2008 yield on 30-year U.S. Treasury bonds to arrive at 9.30 percent which he postulates is the borrowing rate for a single-A utility bond. The 500 basis point add-on is based upon two debt issuances in mid-November 2008 for which Dr. Hadaway calculates a risk premium over Treasury bonds of a bit over 500 basis points. Dr. Hadaway then adds the 3.14 percent risk premium he calculated for common stock for his preceding risk premium analyses[23] to arrive at a cost of equity estimate of 12.44 percent. This is the highest estimate that Dr. Hadaway calculates.

The Federal Reserve Board reports that the average yield on Moody's Baa-rated corporate bonds began 2008 at 6.45 percent and spent most of the year in the 6 to low 7 percent range, then rose rapidly in October to peak at 9.54 percent on October 31, then steadily trended down to 8.84 percent on December 1 and 7.97 percent on December 30. The point is that in this third risk premium model Dr. Hadaway mixes an October Treasury yield with two mid-

[23] The 3.14 percent is apparently a typo since the risk premium Dr. Hadaway calculates in his supplemental schedules 4 and 5 is 3.17 percent.

November transactions. As events rapidly developed and things started to calm down (hopefully), interest rates, and presumably risk premia, started to return to more normal levels. At best Dr. Hadaway's third risk premium model is speculative based upon what appears to be data from the peak of the financial crisis.

A final observation regarding the average authorized rates of return analysis. If the point is to use these data to support Dr. Hadaway's estimate for an authorized rate of return, it seems straight forward to do a simple time-trend analysis. DPU Exhibit 2.15 analyzes the authorized return data found on Exhibit 4 of Dr. Hadaway's supplemental testimony in this docket. The simple trend analysis predicts that authorized returns in 2009 will approximate 9.5 percent. These data may indicate the principal of gradualism in regulation in response to changing interest rates and also may say something about the timing of rate applications; that is, a utility may choose when to come in for a rate case when the utility believes the results from the rate case will be most favorable to it.[24] However, a trend analysis doesn't predict changes in the trend which may have occurred beginning in October 2008. Thus my analysis here only serves to show an alternative way to analyze Dr. Hadaway's data and not, in this case at least, to estimate what PacifiCorp's allowed rate of return should be.

My conclusion is that while I reject Dr. Hadaway's 6.5 percent GDP-based growth rate, and question his use of historical authorized returns as a basis for a current cost of equity estimate, the range of his estimates 10.70 to 11.43 percent overlap my point estimate and my

[24] Phillips, Charles F. Jr. The Regulation of Public Utilities Theory and Practice. 1993. Public Utilities Reports, Inc. Arlington, VA, pp. 408-409.

reasonable range (excluding his 12.44 percent estimate), although they are oriented to the high end of my range. In this regard, Dr. Hadaway's results support my own conclusions.

VII. CONCLUSIONS AND RECOMMENDATIONS

Q: Please summarize your cost of capital and capital structure conclusions, excluding the cost of equity results.

A: I have concluded that the Company's requested cost of preferred stock is reasonable. The cost of debt needs to be adjusted downward by 16 basis points to reflect the current imbedded interest rates of the Company. I also recommend that the Company be allowed to update its authorized rates if and when it issues its proposed $800 million in long-term debt to reflect the actual terms and amount of that debt. I recommend that the Company be allowed to apply for the updating of its authorized rates due to the issuance of this debt through June 30, 2010.

With respect to cost of capital, I argue that the Company has supplied no basis for the need to continue to increase the equity percentage in its capital structure and that the equity percentage be kept at its September 30, 2008 percentages.

Q: What conclusions with respect to cost of equity have you come to?

A: The first conclusion is that the DCF models using analyst forecasts form a reasonable basis for a cost of equity estimate. These DCF models are compared to alternative CAPM

calculations as well as my own risk premium model. All of these models support an overall conclusion of a cost of equity estimate in the 10.25 to 11.25 percent range. After reviewing all of the data I concluded that a point estimate of 10.75 percent is appropriate.

I mention again that these estimates are done within the context of market conditions that may violate the underlying assumptions of all models. Specifically, the models assume that you have functioning markets that are relatively stable and rational. Over time as market conditions become more normal, I currently would expect the spread between the different models to narrow and generally for cost of equity to come down.

Q: Please discuss some of the implications of your weighted cost of capital estimate and specifically your cost of equity estimate.

A: In arriving at a decision on cost of capital, the Commission needs to consider principles and issues set forth in the well known U.S. Supreme Court decisions commonly referred to as the Bluefield and Hope cases.[25,26]

The Bluefield and Hope cases established economic and financial principles for proper regulation. These principles included (1) that the utility be allowed to earn a return on its utility property generally equal to returns earned by other companies of similar risk; (2) this return should assure confidence in the financial soundness of the utility; (3) this allowed return should maintain and support the credit of the company and allow it to attract capital; (4) recognition that a return a return that is "right" at one time may become high or low by

[25] Bluefield Water Works and Improvement Company v. Public Service Commission of the State of West Virginia (262 U.S. 679), decided in 1923.
[26] Federal Power Commission et. al. v. Hope Natural Gas Company (320 U.S. 591), decided in 1944.

changes in the economy regarding alternative investments; and (5) particularly in Hope, what is important is that the "end result" of the rate order be just and reasonable, it is less important how that result is arrived at. While the above list reflects the rights of the utility, Hope and Bluefield balance those rights with the obligation that "just and reasonable" rates include fairness to the customers.

Q: Do you believe your conclusions and recommendations arrive at a just and reasonable result in the public interest? Please explain.

A: Yes. My recommended capital structure is well within the norms of the Company's industry as indicated by the analysis comparing the Company's recommended capital structure with the comparable companies. It is also well within the range of equity capital percentages required by Moody's and other rating agencies for the maintenance of an "A-" debt rating. The use of embedded cost of debt and preferred stock is well established in regulation. The prospective future debt issuance is assumed to pay the forecast expected market return. I have demonstrated that my cost of equity estimate sits well within the estimates arrived at using standard financial models and forecasts derived from market participants. I have also taken into account the market turmoil of the most recent three or four months. Dr. Hadaway's results also support a 10.75 percent cost of equity. As a result, I conclude that the 10.75 percent cost of equity is not outside any range of expectations of Wall Street. Therefore I conclude that the cost of capital estimates set forth on DPU Exhibit 2.2 are just and reasonable and in the public interest at this time.

Q: What is your recommendation?

A: My recommendation is that the Commission adopt as the authorized cost of equity for PacifiCorp and its division Rocky Mountain Power for its operations in Utah of 10.75 percent and an overall weighted average cost of capital of 8.45 percent. This recommendation excludes the prospective $800 million debt issuance on December 31, 2009.

Q: Does this conclude your testimony?

A: Yes.