BEFORE THE WASHINGTON

UTILITIES & TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

V.

PUGET SOUND ENERGY, INC.

Dockets UE-121697 and UG-121705

AND

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

V.

PUGET SOUND ENERGY, INC.

Dockets UE-130137 and UG-130138

DIRECT TESTIMONY OF STEPHEN G. HILL (SGH-2T)

ON BEHALF OF

PUBLIC COUNSEL

DECEMBER 3, 2014

DIRECT TESTIMONY OF STEPHEN G. HILL (SGH-2T)
DOCKETS UE-121697, UG-121705, UE-130137 & UG-130138

TABLE OF CONTENTS

TABLES

CHARTS

DIRECT TESTIMONY OF STEPHEN G. HILL (SGH-2T)
DOCKETS UE-121697, UG-121705, UE-130137 & UG-130138

Stephen G. Hill's Exhibit List

Exhibit No. SGH-3	Sustainable Growth
Exhibit No. SGH-4	PSE Electric Utility Sample Group Selection
Exhibit No. SGH-5	PSE DCF Growth Rate Parameters
Exhibit No. SGH-6	PSE DCF Growth Rates
Exhibit No. SGH-7	PSE Proof
Exhibit No. SGH-8	PSE Stock Price, Dividends, Yields
Exhibit No. SGH-9	PSE DCF Cost of Equity Capital
Exhibit No. SGH-10	PSE Mechanical DCF Cost of Equity Capital
Exhibit No. SGH-11	PSE CAPM Cost of Equity Capital
Exhibit No. SGH-12	PSE Earnings-Price Ratio Proof
Exhibit No. SGH-13	PSE Modified Earnings-Price Analysis
Exhibit No. SGH-14	PSE Market-To-Book Ratio Analysis
Exhibit No. SGH-15	PSE Dr. Morin's 2013 DCF Analyses
Exhibit No. SGH-16	The Brattle Group Report (March 20, 2014)
Exhibit No. SGH-17	PSE Cost of Equity Impact of a 41 to 49 Basis Point Reduction in After-tax weighted average cost of capital
Exhibit No. SGH-18	CA/HECO-IR-57, Docket No. 2013-0141
Exhibit No. SGH-19	PSE Combined Electric and Gas Operations Multiple Regression Analysis of Historical Net Revenues
Exhibit No. SGH-20	Qualifications of Stephen G. Hill

I. INTRODUCTION / SUMMARY

Q: Please state your name and business address.

A: My name is Stephen G. Hill. My business address is P.O. Box 587, Hurricane, West Virginia 25526 [hillassociates@gmail.com].

Q: By whom are you employed and in what capacity?

A: I am Principal of Hill Associates, a consulting firm specializing in financial and economic issues in regulated industries.

Q: On behalf of whom are you testifying?

A: I am testifying on behalf of the Public Counsel Section of the Washington Attorney General's Office (Public Counsel).

Q: Briefly, what is your educational background?

A: After graduating with a Bachelor of Science degree in Chemical Engineering from Auburn University in Auburn, Alabama, I was awarded a scholarship to attend Tulane Graduate School of Business Administration at Tulane University in New Orleans, Louisiana. There I received a Master's Degree in Business Administration. Subsequently, I was awarded the professional designation of "Certified Rate of Return Analyst," by the Society of Utility and Regulatory Financial Analysts. This designation is based upon education, experience and the successful completion of a comprehensive examination. I have also served on the Board of Directors and am currently Vice President of that national organization. A more detailed account of my educational background and occupational experience appears in Exhibit No. SGH-20.

Q: Have you testified before this or other regulatory commissions?

A: Yes, I have testified previously in this regulatory jurisdiction and, over the past 30 years, I have testified on cost of capital, corporate finance and capital market issues in more than 300 regulatory proceedings before the following regulatory bodies: the West Virginia Public Service Commission, the Connecticut Department of Public Utility Control, the Oklahoma State Corporation Commission, the Public Utilities Commission of the State of California, the Pennsylvania Public Utilities Commission, the Maryland Public Service Commission, the Public Utilities Commission of the State of Minnesota, the Ohio Public Utilities Commission, the Insurance Commissioner of the State of Texas, the North Carolina Insurance Commissioner, the Rhode Island Public Utilities Commission, the City Council of Austin, Texas, the Texas Railroad Commission, the Arizona Corporation Commission, the South Carolina Public Service Commission, the Public Utilities Commission of the State of Hawaii, the New Mexico Corporation Commission, the Texas Public Service Commission, the Georgia Public Service Commission, the Public Service Commission of Utah, the Kentucky Public Utilities Commission, the Illinois Commerce Commission, the Kansas Corporation Commission, the Indiana Utility Regulatory Commission, the Virginia Corporation Commission, the Montana Public Service Commission, the Public Service Commission of the State of Maine, the Public Service Commission of Wisconsin, the Vermont Public Service Board, the Federal Communications Commission and the Federal Energy Regulatory Commission. I have also testified before the West Virginia Air Pollution Control Commission regarding

appropriate pollution control technology and its financial impact on the company under review and have been an advisor to the Arizona Corporation Commission on matters of utility finance.

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

A: In the initial phase of this proceeding, this Commission set rates for Puget Sound Energy (Puget, PSE, the Company) employing an expedited rate filing in lieu of a traditional general rate case proceeding. As such, the Commission elected to set rates for Puget relying on the cost of capital and capital structure deemed appropriate in the Company's most recent full rate case[1] and also allowed the Company to implement a decoupling ratemaking regime along with an attrition adjustment. The initial Order in this proceeding[2] was appealed to Superior Court. On the issue of the appropriate cost of equity, the case was remanded back to this Commission for further hearing.

Therefore, as set out by the Commission in Orders 10 and 11 in these proceedings, the purpose of these proceedings is to estimate the cost of equity capital of Puget Sound Energy during the first half of 2013, prior to the original Final Order[3] issued June 25, 2013. The evidence I present here will be that which would be presented in a "contested general rate proceeding"[4] regarding the cost of common equity capital for Puget Sound Energy at the time prior to the original decision in these proceedings. In addition, although I did not perform a separate

[1] *Washington Utilities and Transportation Comm'n v. Puget Sound Energy, Inc.*, Dockets UE-110488 & UG-110489 (PSE 2011 GRC).
[2] Order 07.
[3] Order 07.
[4] Order 10, ¶ 25.

cost of capital analysis to determine a current cost of equity capital, I do reference cost of capital analyses I have undertaken recently in this jurisdiction and analyze other capital cost indications as a check on the reasonableness of my recommended return of equity (ROE) for the rate plan at issue in this proceeding.

Just as it would in a contested rate proceeding, my testimony in these proceedings will address the market-based cost of equity capital as determined through standard economic models (DCF, CAPM, etc.) and will also review other factors that impact the cost of equity. Chief among those other factors is decoupling, a rate design methodology that reduces the Company's revenue volatility and operating risk. As discussed in more detail in the body of my testimony, this Commission and the Commission Staff have recognized that decoupling lowers utility risk. A reduction in risk must be recognized in the allowed return on common equity (or in a reduced common equity ratio), or ratepayers will be disadvantaged through providing a return that exceeds the Company's actual cost of common equity capital.

The Company has estimated its 2013 cost of equity capital to be in a range of 9.8 percent to 10.7 percent, with a mid-point of 10.3 percent.[5] The Company also testifies that there is no reduction to the cost of common equity due to decoupling.[6] Based on that testimony, the Company's position here is that the Commission's reliance on the 9.8 percent return on equity, awarded in Puget's last fully-adjudicated rate proceeding in 2011[7], continues to be reasonable

[5] Prefiled Direct Testimony of Dr. Roger A. Morin, Exhibit No. RAM-1T, p. 2.
[6] Prefiled Direct Testimony of Dr. Michael J. Vilbert, Exhibit No. MJV-1T, p. 5.
[7] *PSE 2011 GRC*, Order 08.

because it falls within the Company's estimated zone of reasonableness in this case. Public Counsel has requested that I review the rate of return and decoupling/capital cost impact evidence submitted by the Company and, in addition, undertake my own analysis of Puget's 2013 market-based cost of common equity, an appropriate ratemaking capital structure, and a quantification of the impact of decoupling on the cost of common equity capital.

Q: Have you prepared exhibits in support or your testimony?

A: Yes. Attached to this testimony are 18 exhibits (Exhibit Nos. SGH-3 through SGH-20) that provide the analytical support for the conclusions reached regarding the historical, but forward-looking 2013 cost of equity for Puget Sound Energy's utility operations and the quantification of the risk reduction afforded by PSE's electric and gas full decoupling mechanisms, which are discussed in the body of this testimony. These exhibits were prepared by me and are correct to the best of my knowledge and belief.

Q: Please summarize your findings.

A: My testimony is organized into four sections. First, I discuss the cost of capital standard as a measure of the return to be allowed for regulated industries, and review the economic environment existing in the first half of 2013 in which the equity return estimate is made.

Second, I evaluate the cost of equity capital for similar-risk operations using Discounted Cash Flow (DCF), Capital Asset Pricing Model (CAPM), Modified Earnings-Price Ratio (MEPR), and Market-to-Book Ratio (MTB) analyses. In this section of my testimony, I also confirm that the cost of equity I

estimate for the historical period at issue in these proceedings (2013) remains appropriate currently and for the rate-effective period.

Third, I discuss the shortcomings contained in the cost of capital analysis presented by Puget witness Dr. Roger Morin. Dr. Morin's cost of capital analysis is somewhat overstated in several instances and results in an equity cost estimate that exceeds the actual market-based cost of equity capital. Ultimately, Dr. Morin's testimony does *not* support the Company's contention that a 9.8 percent return on equity is within a zone of reasonableness for Puget, either currently or at mid-year 2013.

Fourth, I estimate the cost of equity impact of the decoupling rate design that this Commission has allowed for Puget. I analyze the impact of decoupling in two ways—through the impact on the market-based cost of capital and through an analysis of the actual historical net revenue volatility of Puget's utility operations. In the initial portion of my decoupling analysis, I review the testimony of Company witness Dr. Vilbert who has presented analyses of the impact of decoupling on the market-based cost of capital and, through his firm, the Brattle Group (Brattle), which has recently published a study of decoupling on the cost of common equity capital for electric utilities.[8] This body of work by Dr. Vilbert shows, via the preponderance of the evidence in his studies, that decoupling lowers the cost of capital for utility operations. While Dr. Vilbert

[8] Michael J. Vilbert, Joseph B. Wharton, Charles Gibbons, Melanie Rosenberg, and Yang Wei Neo, *The Impact of Revenue Decoupling on the Cost of Capital for Electric Utilities: An Empirical Investigation*, Prepared for The Energy Foundation, March 20, 2014. (A copy of this study is attached as Exhibit No. SGH-16.) The study was published by the Brattle Group and prepared for the Energy Foundation. The term published here does not denote publication in a scientific journal for peer-review.

testifies that his studies show that the cost of capital is *not* affected by decoupling, that conclusion is based on his application of an unnecessarily strict statistical threshold. As noted in the testimony of Public Counsel and ICNU witness Dr. Christopher Adolph, using a more reasonable statistical confidence level, the results of Dr. Vilbert's studies show that decoupling does, indeed, lower the cost of capital—and that the effect is substantial.

In the second portion of my decoupling analysis, I study the actual historical volatility of the Company's net revenues. In a decoupling ratemaking regime, where the company is made whole for its promised regulatory revenues per customer no matter what its unit sales are, the volatility of corporate revenues normally due to changes in the service territory economy or weather (or any other exogenous factor) will be significantly reduced. Through a statistical examination of the Company's actual electric and gas utility operating results over the past fifteen years I have quantified the cost of equity impact of the reduced revenue volatility risk estimated to be imparted by decoupling.

I have estimated the equity capital cost of utility operations similar in operating (business) risk to the Washington operations of Puget to be within the range of 8.50 percent to 9.50 percent, with a midpoint of 9.00 percent. Absent decoupling, the Company's cost of equity capital should be set at the mid-point of that range because its bond ratings are equivalent to that of the sample group of companies used to estimate the market-based cost of equity. However, because the Company has been allowed a decoupling rate design with a true-up that will improve its ability to realize its allowed revenue requirement, and because

decoupling lowers the Company's risk and cost of capital, a 35 basis point reduction in the cost of common equity capital would be reasonable in mid-year 2013. Therefore, the cost of equity capital for Puget at mid-year 2013 (the time of Order 07 in these proceedings) is 8.65 percent.

Q: Why should the cost of capital serve as a basis for the proper allowed rate of return?

A: The Supreme Court of the United States has established, as a guide to assessing an appropriate level of profitability for regulated operations, that investors in such firms are to be given an opportunity to earn returns that are sufficient to attract capital and are comparable to returns investors would expect in the unregulated sector for assuming the same degree of risk. The *Bluefield* and *Hope* cases provide the seminal decisions.[9] These criteria were restated in the *Permian Basin Area Rate Cases*.[10] However, the Court also makes quite clear in *Hope* that regulation does not guarantee profitability and, in *Permian Basin* that, while investor interests (profitability) are certainly pertinent to setting adequate rates, those interests do not exhaust the relevant considerations.

As a starting point in the rate-setting process, then, the cost of capital of a regulated firm represents the return investors could expect from other investments, while assuming no more and no less risk. Since financial theory holds that investors will not provide capital for a particular investment unless that investment is expected to yield their opportunity cost of capital, the

[9] *Bluefield Water Works v. PSC,* 262 US 679 (1923); *FPC v. Hope Natural Gas Company,* 320 US 591 (1944).
[10] *Permian Basin Area Rate Case,* 390 US 747 (1968).

correspondence of the cost of capital with the Court's guidelines for appropriate earnings is clear.

Q: The requirement in these proceedings, i.e., to estimate the forward-looking cost of equity capital during a historical time period, is unusual. How were you able to undertake such an analysis?

A: As long as the cost of capital analyst has available to them market data (e.g., bond yields, stock prices, growth rate projections) that are contemporaneous with the targeted time period (in this case, "early 2013"), the analysis is relatively unremarkable and proceeds as it normally would in a fully-developed rate proceeding. If there is a difficulty in this process, it is that the cost of capital is based on expectations and one important part of those expectations is related to the anticipated change in interest rates. Interest rates in 2013 were expected to increase and that fact would have been incorporated into market prices and any unbiased estimate of the cost of equity capital. One difficulty with "back-casting" a cost of equity analysis is that the analysts now know interest rates did not increase in 2014 and, in fact, have declined a bit since the original hearing in these proceedings. However, the target period 2013 analysis must ignore that subsequent reality and estimate the cost of equity as if those results did not exist. That is the manner in which I have prepared the target period cost of equity capital estimate presented in Section III of my testimony.

II. ECONOMIC ENVIRONMENT

Q: Why is it necessary to review the economic environment in which an equity cost estimate is made?

A: The cost of equity capital is an expectational, or *ex ante*, concept. In seeking to estimate the cost of equity capital of a firm, it is necessary to gauge investor expectations with regard to the relative risk and return of that firm, as well as that for the particular risk-class of investments in which that firm resides. Because this exercise is, necessarily, based on understanding and accurately assessing investor expectations, a review of the larger economic environment within which the investor makes his or her decision is most important. Investor expectations regarding the strength of the U.S. economy, the direction of interest rates and the level of inflation (factors that are determinative of capital costs) are key building blocks in the investment decision. The analyst and the regulatory body should review those factors in order to assess accurately investors' required return—the cost of equity capital to the regulated firm.

Q: What were the cost of capital implications of the capital market environment in the first half of 2013?

A: The changes in U.S. government interest rates over the ten years prior to 2013 provide a useful description of the state of the economy because those interest rates have a fundamental impact on economic activity. The Federal Reserve (Fed) acts to exert control on the economy through its ability to withhold or inject money into the economy and in so doing control short-term Treasury yields. When the economy is "overheated" and inflation is above acceptable levels due to

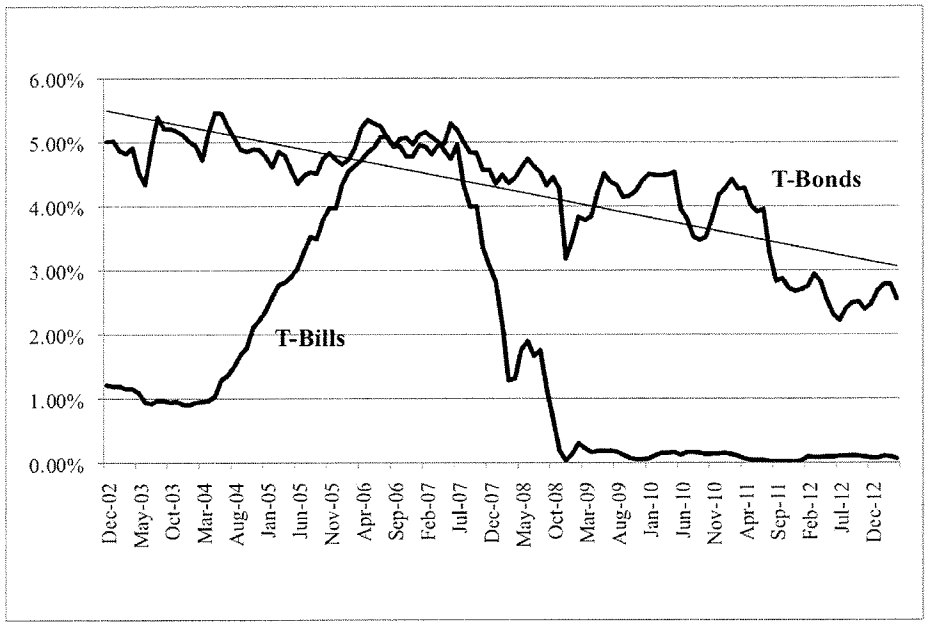
a rapidly growing economy and commodity shortages, the Fed will raise short-term rates, which acts to retard economic growth. As shown in Chart I below, during the 2004-2007 period the Fed raised short-term interest rates to levels equivalent to long-term Treasury rates (long-term Treasury yields are usually 2 percent higher than short-term debt yields). That action worked to reduce economic growth and alleviate inflation concerns and, as a result, the Fed began to lower short-term interest rates.

The financial crisis, initiated by a collapse in the real estate market in 2008, required the Fed to reduce short-term debt rates in order to attempt to keep the U.S. economy from falling into a severe recession. The financial crisis did cause a recession in the U.S., but the Fed's actions to inject money into the economy, through not only lowering short-term rates, but also through buying back outstanding long-term U.S. debt (propping up those prices and keeping yields relatively low), mitigated the economic downturn.

Therefore, as shown in Chart I below, over the past decade there have been wide fluctuations in *short-term* interest rate levels as the Fed raised and lowered the Federal Funds rate to slow down and encourage (respectively) economic growth. However, *long-term* interest rates (20-year T-bonds) have ranged from 3.5 percent to 5 percent over most of that time period, with a slow and relatively steady downward trend. As a result of the 2008/09 economic downturn and the Fed's open-market purchase of long-term Treasury bonds, those yields dipped in 2013, below the lower end of that historical range.

Chart I

Long- and Short-term U.S. Treasury Interest Rates



Absent the 2012 downturn in T-Bond yields due to international sovereign banking concerns, the trend in 20-year T-Bond yields, as shown in Chart I, above, indicates, in mid-year 2013, a "normalized" long-term risk-free yield expectation of approximately 3.0 percent, based on the long-term trend shown. Also, during the first half of 2013, the yield difference between 30-year T-Bonds and 20-year T-Bonds has been approximately 40 basis points, indicating a current "normalized" long-term risk-free rate of 3.40 percent. Therefore, this fundamental building block of capital costs (long-term T-bond yields) provides an indication that in the current economic environment, capital costs are lower in 2013 than they were prior to the economic troubles of late 2008 and early 2009.

Q: Did bond yields decline between the time of Puget's 2011 rate proceeding and the 2013 period targeted in these proceedings?

A: Yes. The Order in that prior rate proceeding[11] was issued in May of 2012 and the cost of capital evidence presented by the witnesses in that proceeding (Olson, Elgin and Gorman) was based on market data ranging from October 2010 through April 2011 (Olson), and September 2011 through November 2011 (Elgin and Gorman). Therefore, although the Order in PSE's most recent general rate case proceeding was issued in 2012, the cost of capital data on which the Commission's ROE determination was based came from early and late 2011.

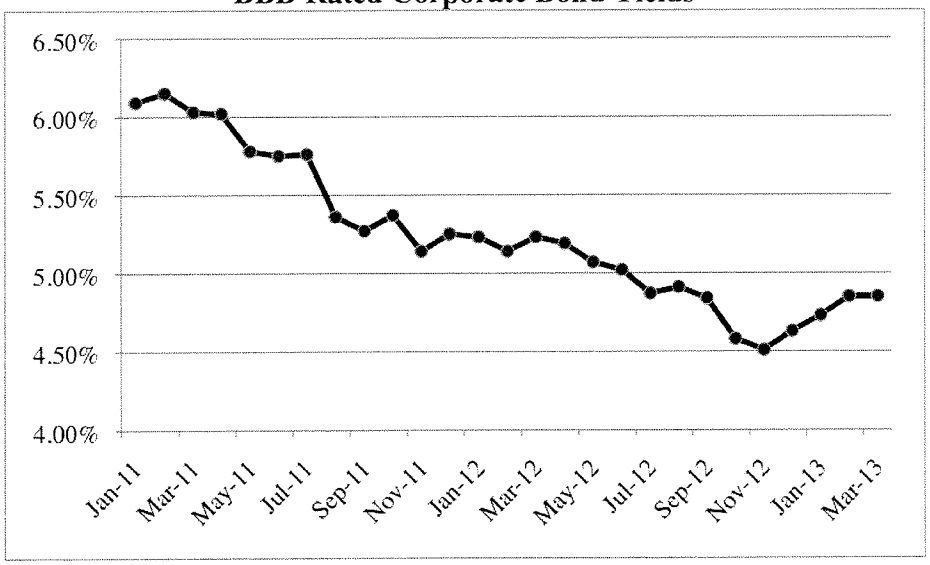
Based on the level of corporate bond yields, the 2013 cost of capital was lower than it was during 2011 (the time period in which the market based cost of capital analyses were undertaken for PSE's last rate proceeding). Bond yields are indicators of capital cost movements and are often used directly to estimate the cost of equity capital in rate proceedings in Risk Premium analyses, where an equity risk premium is added to current bond yields. Therefore, bond yields changes are indicative of changes in the cost of equity capital.

As shown in Chart II below, based on BBB-rated corporate debt yields published by the Federal Reserve (Fed) in its Statistical Release H.15, capital costs declined between 2011 and 2013.

[11] *PSE 2011 GRC*, Order 08.

Chart II

BBB-Rated Corporate Bond Yields



Data from the Federal Reserve Statistical Release H.15, Historical Data.

Corporate bond yields in the first part of 2013 were about 125 basis points below the levels that existed during the early part of 2011 and roughly 50 basis points below the level that existed during the latter portion of 2011 (when Staff and ICNU testimony was prepared). The available capital market evidence contained in corporate bond yields, therefore, indicates that capital costs in the targeted 2013 time period are definitely lower than they were when the cost of capital estimates presented in PSE's last rate case were prepared. Those data indicate that, assuming a 9.8 percent ROE was appropriate in 2011, a lower cost of equity capital would be appropriate in 2013.

Q: As of the early part of 2013, what were the expectations with regard to the economy and interest rates?

A: As The Value Line Investment Survey notes in its May 2013 Quarterly Review, the then-current expectation for the U.S. economy was that recovery from the economic recession would be likely to continue at a moderate pace, which would allow core inflation to remain moderate. Moreover, the Fed is expected to keep interest rates low for at least the next two years:

> **Economic Growth:** As we peer over the current quarter, we see a sequester-induced "spring swoon." Our sense is that the biggest impact of the spending cuts will be felt in the present period. The inconsistent pattern of the economic issuances is partly a function of the massive cuts in defense spending.... Many expect that as the deficit has fallen more than expected, Washington is less likely to see the full sequester go into effect. Still, growth may falter in the period, likely easing into the 1%-2% range [Chart omitted]. Thereafter, we think fundamentals will improve further, particularly in housing, car sales, and employment [Chart omitted], and that the Fed, armed with a benign inflation outlook, will have plenty of flexibility and [will] stay supportive. But possible headwinds remain, in particular on the fiscal side, where the automatic spending cuts will exact a toll in the near term, as well expiring stimulus, and the further reduction in discretionary spending....
>
> **Inflation:** Here, unlike the spotty situation chronicled above, the news has been consistently favorable, with consumer prices under tight control and showing few signs of deviating from that orderly path. In fact, such stability has been the rule for the past half decade—a period of occasionally heightened turbulence in other areas....
>
> **Interest Rates:** The central bank has given itself plenty of room to maneuver. In fact, the Federal Open Market Committee's policy statement on May 1st noted: "The Committee is prepared to increase or reduce the pace of its purchases to maintain appropriate policy accommodation as the outlook for the labor market or inflation changes." This is the dual mandate of the Fed.... In all, the Federal Reserve is holding its federal funds target at 0% to 0.25%, and plans to keep such rates in this historically low range

> for as long as the jobless rate holds above 6.5%. We believe that will be the case until at least 2015 [Chart omitted]. After than, a slow rise in short- and long-term interest rates is likely, as the seemingly sustainable expansion becomes better able to evolve on its own, and the inevitable creep higher in inflation becomes a reality.[12]

In the 2013 Quarterly Economic Review, cited above, Value Line projects long-term Treasury bond rates will average 3.1 percent through 2013 and 4.0 percent in 2015.[13] According to Value Line's Selection and Opinion, 30-year Treasury bond yields averaged 3.19 percent over the six weeks ending in June, 2013.[14] Therefore, the indicated expectation with regard to long-term interest rates is that they are expected to move somewhat higher in the future, provided the economic recovery continues to advance at a moderate pace. Simply put, due to the moderate pace of the economy and relatively low core inflation, capital costs are low and are expected to remain low until the economy shows more rapid growth, which Value Line now expects to occur in the 2016-2018 period.

III. METHODS OF EQUITY COST EVALUATION

A. Discounted Cash Flow.

Q: Please describe the discounted cash flow (DCF) model you used to arrive at an estimate of the cost of common equity capital for the Company in this proceeding.

A: The DCF model relies on the equivalence of the market price of the stock (P) with the present value of the cash flows investors expect from the stock, and assumes

[12] The Value Line Investment Survey, *Selection & Opinion*, at 944 (May 24, 2013).
[13] *Id.* at 943.
[14] The Value Line Investment Survey, *Selection & Opinion*, "Selected Yields," (May 17 through June 21, 2013).

that the percentage rate, which discounts the future cash flows (dividends) to the present value (the stock price), equals the cost of capital. The total return to the investor, which equals the required return according to this theory, is the sum of the dividend yield and the expected growth rate in the dividend.

The theory is represented by the equation,

$$k = D/P + g, \qquad (1)$$

where "k" is the equity capitalization rate (cost of equity, required return), "D/P" is the dividend yield (dividend divided by the stock price), and "g" is the expected sustainable growth rate.

Q: What growth rate (g) did you adopt in developing your DCF cost of common equity for the Company's Washington operations?

A: The growth rate variable in the traditional DCF model is quantified, theoretically, as the dividend growth rate investors expect to continue into the indefinite future. The DCF model is actually derived by 1) considering the dividend a growing perpetuity, that is, a payment to the stockholder which grows at a constant rate indefinitely, and 2) calculating the present value (the current stock price) of that perpetuity. The model also assumes that the company whose equity cost is to be measured exists in a steady state environment, i.e., the payout ratio and the expected return are constant and the earnings, dividends, book value and stock price all grow at the same rate, forever.

While that assumption appears to be somewhat unrealistic because, in the short term, growth rates in dividends, earnings and book value can be quite

different, over the long term it has proven to be true. For example, according to Value Line's published year-by-year retrospective of the Dow Jones Industrials Index (DJI) from 1920 through 2005, the average earnings, dividend, and book value growth rates for the companies in the DJI over that time period were 5.3 percent, 4.9 percent and 5.2 percent.[15] For utility companies, over the long term, average growth rates in earnings, dividends and book value are even closer. Moody's Public Utility Manual reports that, between 1947 and 1999, average growth in earnings, dividend and book value growth of Moody's Electric Utilities was 3.34 percent, 3.22 percent and 3.66 percent, respectively.[16] Therefore, the fundamental DCF assumption that earnings, dividends and book value are expected to grow, over the long-term, at the same sustainable rate of growth is reasonable and is an accurate representation of how firms actually grow over time.

However, even though in the long-term the fundamental assumptions of the DCF have proven to be sound, as with all mathematical models of real-world phenomena, the DCF theory does not precisely "track" reality in the shorter term. Payout ratios and expected equity returns as well as earnings and dividend growth rates do change at different rates over the short-term. Therefore, in order to properly apply the DCF model to any real-world situation and, in this case, to find the long-term sustainable growth rate called for in the DCF theory, it is essential to understand the determinants of long-run expected dividend growth.

[15] www.valueline.com, Dow Jones Long Term Chart (PDF).
[16] Moody's ceased publication of its Public Utility Manual in 2001.

Q: Can you provide an example to illustrate the determinants of the long-run sustainable growth called for in the DCF model?

A: Yes, in Exhibit No. SGH-3, I provide an example of the determinants of a sustainable growth rate on which to base a reliable DCF estimate. In addition, in Exhibit No. SGH-3, I show how reliance on earnings or dividend growth rates alone, absent an examination of the underlying determinants of long-run dividend growth, can produce inaccurate DCF results.

Q: How have you developed an estimate of the expected long-term growth in your application of the DCF model?

A: I have calculated both the historical and projected sustainable growth rates for a sample of utility firms with similar risk to the Company, and I have incorporated other growth rate indicators into the analysis as well. To estimate an appropriate DCF growth rate, I have also relied on published data regarding both historical and projected growth rates in earnings, dividends, and book value for the sample group of utility companies. Recall that DCF theory assumes that earnings, dividends and book value all grow at the same rate. Through an examination of all of those data, which are available to and used by investors, I estimate investors' long-term growth rate expectations. To that long-term growth rate estimate, I add any additional growth that is attributable to investors' expectations regarding the on-going sale of stock for each of the companies under review.

Q: Why have you analyzed the market data of several companies that are similar in risk to Puget?

A: I have used the "similar sample group" approach to cost of capital analysis because it yields a more accurate determination of the cost of equity capital than does the analysis of the data of one individual company. Any form of analysis, in which the result is an estimate, such as growth in the DCF model, is subject to measurement error, i.e., error induced by the measurement of a particular parameter or by variations in the estimate of the technique chosen. When the technique is applied to only one observation (e.g., estimating the DCF growth rate for a single company), the estimate is referred to, statistically, as having "zero degrees of freedom." This means, simply, that there is no way of knowing if any observed change in the growth rate estimate is due to measurement error or to an actual change in the cost of capital. The degrees of freedom can be increased and exposure to measurement error reduced by applying any given estimation technique to a sample of companies rather than to one single company. Therefore, by analyzing a group of firms with similar characteristics, the estimated value (the growth rate and the resultant cost of capital) is more likely to equal the "true" value for that type of operation.

Q: How were the companies selected to be included in the analysis?

A: For the similar-risk sample for Puget's electric and gas utility operations, all of the electric and combination electric and gas utility firms followed by Value Line were screened. Companies were selected from that group that had a continuous financial history, a senior bond rating between "BBB" and "A" (or "Baa2" and "A2"), and had 70 percent or more of revenues generated by utility operations. Companies that did not have generation assets, or were in the process of merging

or being acquired, or companies that had recently omitted dividends or had unstable book values were omitted from the sample. The data for the electric utility sample group were obtained from the most recent editions of Value Line Investment Survey, *Ratings and Reports*, available at the time of this analysis (May 3, May 24, and June 21, 2013), and A.U.S. Utility Reports, May 2013.

The integrated electric and combination electric and gas companies included in the similar-risk sample group for purposes of estimating the current cost of equity capital are: Southern Company (SO), ALLETE (ALE), Alliant Energy (LNT), American Electric Power (AEP), Cleco Corp. (CNL), Entergy (ETR), Westar Energy (WR), Wisconsin Energy (WEC), Edison International (EIX), IDACORP (IDA), Northwestern Corp. (NWE), PG&E Corporation (PCG), Pinnacle West Capital Corporation (PNW), Portland General (POR) and Xcel Energy (XLS). The statistical data for each of the Value Line electrics, the selection criteria, and the companies selected are shown in Exhibit No. SGH-4.[17]

Q: How have you calculated the DCF growth rates for the sample of comparable companies?

A: Exhibit No. SGH-5, pages 1 through 5, shows the retention ratios, equity returns, sustainable growth rates, book values per share and number of shares outstanding for the comparable sample companies for the past five years. Also included in the information presented in Exhibit No. SGH-5 are Value Line's projected 2013, 2014 and 2016-2018 values for equity return, retention ratio, book value growth

[17] In the Exhibits accompanying this Testimony, the sample group companies are referenced by their stock ticker symbols, which are shown here in parenthesis after the company name.

rates and number of shares outstanding.

In evaluating these data, I first calculate the five-year average sustainable growth rate, which is the product of the earned return on equity (r) and the ratio of earnings retained within the firm (b). For example, Exhibit No. SGH-5, page 1, shows that the five-year average sustainable growth rate of Southern Company (SO) is 3.28 percent. The simple five-year average sustainable growth value is used as a benchmark against which I measure the company's most recent growth rate trends. Recent growth rate trends are more investor influencing than are simple historical averages.

Continuing to focus on Southern Company, we see that sustainable growth has been higher in recent years during the historical period indicating increasing growth. By the 2016-2018 period, Value Line projects Southern Company's sustainable growth will increase from the recent five-year average, to 3.46 percent. These forward-looking data indicate that investors can expect Southern Company to grow at a rate slightly higher than the growth rate that has existed, on average, over the past five years, but, overall, they point to relative growth rate stability for Southern Company.

Another factor to consider is that Southern Company's book value growth is expected to increase at a 4.5 percent level over the next five years, which is lower than the 5.5 percent growth rate level that existed over the past five years. This information indicates an expectation for somewhat lower growth in the future. Also, as shown on Exhibit No. SGH-6, page 2, Southern Company's dividend growth rate, which was 4.0 percent historically, is projected at a 4.0

percent rate of growth in the future. Southern Company's dividend growth shows very stable growth expectations.

Projected earnings growth rate data available from Value Line indicate that investors can expect slightly higher growth rate in the future (4.5 percent), compared to the sustainable growth rate projections, and higher than historical earnings growth (3.0 percent). IBES and Zack's (investor advisory services that poll sell-side institutional analysts for growth earnings rate projections) also project slightly higher earnings growth rates for Southern Company—4.84 percent and 4.76 percent, respectively—over the next five years.

Southern Company's projected sustainable growth is expected to approach 3.5 percent, dividends are expected to increase at a 4.0 percent annual rate, and book value growth to increase at 4.5 percent. Per share earnings growth is expected to range from 4.5 percent to 4.8 percent, and Value Line's average earnings, dividends and book value growth projection for Southern Company is 4.33 percent. A long-term growth rate of 4.25 percent is a reasonable long-term growth rate expectation for Southern Company.

Q: Is the internal or "b times r" growth rate the final growth rate used in the DCF analysis?

A: No. An investor's long-term growth rate analysis does not end upon the determination of an internal growth rate. Investor expectations regarding growth from external sources (sales of stock) must also be considered and examined. For Southern Company, page 1 of Exhibit No. SGH-5, shows that the number of outstanding shares increased at a 2.80 percent rate over the most recent five-year

period (prior to June of 2013). In addition, Value Line expects the number of shares outstanding to increase at a much lower rate through the 2016-2018 period, bringing the share growth rate to a 0.84 percent rate by that time. Weighing both historical and projected data, an expectation of share growth of 1.5 percent is reasonable for this company.

Because Southern Company was trading (in May and June 2013) at a market price greater than book value, issuing additional shares would increase investors' growth rate expectations. Multiplying the expected growth rate in shares outstanding by (1-(Book Value/Market Value))[18] increases the investor-expected growth rate for Southern Company by seventy-eight basis points (0.77 percent). Therefore, the combined internal and external growth rate for Southern Company is 5.02 percent (4.25 percent internal growth and 0.77 percent external growth, see page 1 of Exhibit No. SGH-6. Exhibit No. SGH-6, page 1, shows the internal, external and resultant overall growth rates for each of the electric and combination electric and gas utility companies analyzed.

I have included the details of my growth rate analyses for Southern Company as an example of the methodology I use in determining the DCF growth rate for each company in the electric industry sample. A description of the growth rate analyses of each of the companies included in my sample group is set out in Exhibit No. SGH-7.

[18] Professor Myron Gordon is the originator of the DCF in regulation. This is Gordon's formula for "v" the accretion rate related to new stock issues. B=book value, M=market value. (M. J. Gordon, *The Cost of Capital to a Public Utility*, 30-33, MSU Public Utilities Studies, (East Lansing, Michigan, 1974).

Q: Have you checked the reasonableness of your growth rate estimates against other, publicly available growth rate data?

A: The reasonableness of the growth rate estimates for each company are checked against other publicly available sources in Exhibit No. SGH-6, page 2, which shows the DCF growth rates used in this analysis as well as 5-year historic and projected earnings, dividends, and book value growth rates from Value Line, earnings growth rate projections from Zacks or IBES, the average of Value Line and Zacks or IBES growth rates, and the 5-year historical compound growth rates for earnings, dividends and book value for each company under study.

For the electric and gas utility sample group, Exhibit No. SGH-6, page 2 shows that my DCF growth rate estimate for all the electric utility companies included in my analysis is 4.87 percent. This figure exceeds Value Line's projected average growth rate in earnings, dividends and book value for those same companies (4.23 percent), but is below the five-year historical average earnings, dividend and book value growth rate reported by Value Line for those companies (5.07 percent). My growth rate estimate for the similar-risk utility companies under review is above the IBES analysts' earnings growth rate projections—4.40 percent and similar to the average projected earnings growth estimate of those polled by Zack's (4.94 percent). Also, my growth rate estimate is similar to the projected dividend growth rate of the sample companies, 4.70 percent. Therefore, my average DCF growth rate is similar to or somewhat exceeds the growth rate data available to investors, and is likely to provide a

reasonable assessment of investors' long-term sustainable growth rate expectations for the electric utility companies under review.

Q: Some analysts rely heavily, if not exclusively, on analysts' earnings growth projections as the growth rate in the DCF; you have not done so. Can you explain why?

A: In my view, earnings growth rate projections are widely available, are used by investors, and, for those reasons, deserve consideration in an informed, accurate assessment of the investor expected growth rate to be included in a DCF model. However, projected earnings growth rates should not be used as the *only* source of a DCF growth estimate because projected earnings growth rates are influential in, but not solely determinative of, investor expectations. That is true for several reasons.

First, it is important to realize that, as I discuss in Exhibit No. SGH-3, projected earnings growth rates may over- or understate the growth that can be sustained over time by the companies under review. This is important because long-term sustainable growth is required in an accurate DCF assessment of the cost of equity capital. The efficacy of projected earnings growth rates in any specific DCF analysis can only be determined through a study of the underlying fundamentals of growth—something that those who rely exclusively on analysts' earnings growth rate projections fail to do.

Second, the studies that support the use of analysts' earnings projections measure the ability of analysts' estimates to predict stock prices versus simple historical averages of other parameters. In that sort of simplistic comparison,

analysts' projections perform better. However, I am not aware of any cost of capital analyst who relies exclusively on historical average growth rates, nor is it reasonable to believe that any astute investor would do so. Therefore, while studies do indicate that analysts' earnings growth estimates are better indicators of stock prices than simple historical averages of other growth rate parameters, those studies do not provide any basis for exclusive reliance on earnings growth projections in a DCF analysis.

Third, the sell-side institutional analysts that are polled by IBES, Zacks and similar services offer relatively "rosy" expectations for the stock they follow. Simply put, some analysts overstate growth expectations to make the stocks they want to sell look more attractive. Although claims are often made that the opinions of sell-side analysts are not affected by the profits made by the other parts of the business that actually trade those securities, the "Cinderella effect" (analysts' overstating stock expectations) is not a new phenomenon, and is recognized in academia. As the authors of a widely-used finance textbook note regarding the use of projected earnings growth rates in a DCF analysis:

> Estimates of this kind are only as good as the long-term forecasts on which they are based. For example, several studies have observed that security analysts are subject to behavioral biases and their forecasts tend to be over-optimistic [footnote omitted]. If so, such DCF estimates of the cost of equity should be regarded as upper estimates of the true figure. [footnote omitted]. *See, for example,* A. Dugar and S. Nathan, "The Effect of Investment Banking Relationships on Financial Analysts' Earnings Investment Recommendations." [19]

[19] *Contemporary Accounting Research* 12 (1995), pp. 131-160. Brealey, Meyers, Allen, *Principles of Corporate Finance, 8th Ed.,* McGraw-Hill Irwin, Boston, MA, (2006), p. 67.

As Chan and Lakonishok note in "The Level and Persistence of Growth Rates," published in the *Journal of Finance* (Vol. LVIII, No. 2, April 2003, p. 643), "[t]here is no persistence in long-term earnings growth beyond chance, and there is low predictability even with a wide variety of predictor variables. Specifically, IBES growth forecasts are overly optimistic and add little predictive power." This concern regarding investors' use of analysts' growth estimates is also underscored by an investor service sponsored by the *Wall Street Journal*:

> You should be careful when looking at analyst recommendations for several reasons. First of all, many analysts suffer from a conflict of interest between the firm that employs them and the company whose stock they track. Often times, an analyst will be responsible for issuing reports on a company that is a current or potential client of their employer (usually an investment bank). Since they know that their employer would like to keep the client's business, the analyst may be tempted to issue a rosier outlook for the stock than what it really deserves.[20]

Also, as reported in an April 2010 article in McKinsey Quarterly, entitled "Equity Analysts: Still too bullish," over the past 25 years the equity analysts polled by IBES have projected long-term earnings growth of 10 percent to 12 percent for unregulated companies, whereas actual (realized) growth has been about 6.0 percent.[21]

Fourth, much of the academic work touted as support for reliance on earnings growth is based on data from the IBES database (now owned by Thomson); however, academic research recently published in the *Journal of*

[20] Investorguide.com, "University," Analysts and Earnings Estimates, www.investorguide.com/igustockanalyst.html.
[21] McKinsey & Company is a global management-consulting firm.

Finance indicates that there have been non-random, systematic errors in that database, which call into question the reliability of research (such as the research on the reliability of analysts' earnings estimates) based on those data. The researchers document that the historical contents of the IBES data base have been "quite unstable over time," and state:

> Data are the bedrock of empirical research in finance. When there are questions about the accuracy or completeness of a data source, researchers routinely go to great lengths to investigate measurement error, selection bias, or reliability. But what if the very contents of a historical database were to change, in error, over time? Such changes to the historical record would have important implications for empirical research. They could undermine the principle of replicability, which in the absence of controlled experiments is the foundation of empirical research in finance. They could result in over- or underestimates of the magnitude of empirical effects, leading researchers down blind alleys. Also to the extent that financial-market participants use academic research for trading purposes, they could lead to resource allocation.... We document that the historical contents of the I/B/E/S recommendations database have been quite unstable over time.[22]

Therefore, even the research that purports to show analysts' earnings growth rates are "superior" to simple historical average growth rates is called into question due to the above-cited flaws in the historical IBES database.

In summary, exclusive reliance on projected earnings growth for determining a DCF growth rate in a cost of capital analysis is not a reliable method of analysis and is likely to lead to an equity cost estimate that overstates

[22] Lungqvist, Malloy, Marston, "Rewriting History," *The Journal of Finance*, Vol. 64, No. 4, August 2009, pp. 1935-1960.

the actual market-determined cost of equity capital.

Q: Does this conclude the growth rate portion of your DCF?

A: Yes.

Q: How have you calculated the DCF dividend yields?

A: The current dividend yields for each of the sample group companies are shown in Exhibit No. SGH-8. The per share dividend is that projected over the next year by Value Line, and the stock price is the daily closing average stock price for each company over the recent six-week period ending June 21, 2013. Exhibit No. SGH-8 shows that the average dividend yield of the similar-risk sample group of integrated electric and gas companies is 3.83 percent.

Q: What is the cost of equity capital estimate for the electric utility sample group utilizing the DCF model?

A: Exhibit No. SGH-9 combines the long-term sustainable growth rate for each of the companies in the sample group with the expected dividend yield. The result is an average DCF equity cost estimate of 8.69 percent.

Q: Have you prepared another type of DCF analysis in this proceeding?

A: Yes. In an effort to minimize the impact of judgment on the outcome of the cost of equity estimate for Puget, in addition to a traditional DCF analysis, I also employed a "mechanical" DCF analysis.

This type of DCF analysis utilizes dividend yield and growth rate data provided in investor-service publications as the basis for determining a DCF equity cost estimate. Published data for all the electric and gas utilities in the sample group are utilized. All growth-rate data are projected. That is, both

dividend yields and growth rates are projected for the future (as called for in theory). The projected year-ahead dividend yield for each company is published in The Value Line Investment Survey. In addition, Value Line also publishes projected earnings, dividend, and book value for each of the electric and gas utilities it follows. In addition to those growth rates, projected earnings growth rates for each company published by IBES and Zack's are also used to determine an average projected DCF growth rate for each company.

Exhibit No. SGH-10 shows that the projected year-ahead dividend yield for each electric company is added to the average of all available projected growth rates (Value Line's earnings, dividends, book value, as well as Zack's and IBES earnings growth rate projections). The only growth rates that are not included in the analysis are those that are non-positive (i.e., zero or negative), because it is reasonable to believe that investors do not expect zero or negative long-term growth in a viable investment.

However, it is not appropriate to remove only the lowest growth rate estimates because that would skew the results upward. Therefore, in Exhibit No. SGH-10 I analyzed the average growth rates for all of the companies in the sample, found their standard deviation and searched for outliers which were beyond two standard deviation units above and below the mean. In this instance there was one company with an average projected growth rate above the two standard deviation threshold and one company with an average growth rate below the threshold.

The result of the mechanical DCF shown in Exhibit No. SGH-10, based on

the electric and gas utility sample and forward-looking dividend yield and growth rate projections is an average DCF equity cost estimate of 8.33 percent. Eliminating the high and low growth rate outliers produces an average mechanical DCF equity cost estimate of 8.30 percent.

B. Capital Asset Pricing Model.

Q: Please describe the Capital Asset Pricing Model (CAPM) you used to arrive at an estimate for the cost rate of equity capital for Puget in this proceeding.

A: The CAPM states that the expected rate of return on a security is determined by a risk-free rate of return plus a risk premium, which is proportional to the non-diversifiable (systematic) risk of a security. Systematic risk refers to the risk associated with movements in the macro-economy (the economic "system") and thus, cannot be eliminated through diversification by holding a portfolio of securities. The beta coefficient (β) is a statistical measure that attempts to quantify the non-diversifiable risk of the return on a particular security against the returns inherent in general stock market fluctuations. The formula is expressed as follows:

$$k = r_f + \beta(r_m - r_f), \qquad (2)$$

where "k" is the cost of equity capital of an individual security, "r_f" is the risk-free rate of return, "β" is the beta coefficient (a measure of relative volatility), "r_m" is the average market return and "$r_m - r_f$" is the market risk premium.

Q: What have you chosen for a risk-free rate of return in your CAPM analysis?

A: As the CAPM is designed, the risk-free rate is that rate of return investors can

realize with certainty. The nearest analog in the investment spectrum is the 13-week U. S. Treasury bill. However, T-Bills can be heavily influenced by Federal Reserve policy, as they have been over the past three years. While longer-term Treasury bonds have equivalent default risk to T-Bills, those longer-term government securities carry maturity risk that the T-Bills do not have. When investors tie up their money for longer periods of time, as they do when purchasing a long-term Treasury, they must be compensated for future investment opportunities forgone as well as the potential for future changes in inflation. Investors are compensated for this increased investment risk by receiving a higher yield on T-Bonds. When T-Bills and T-Bonds exhibit a "normal" (historical average) spread of about 1.5 percent to 2 percent, the results of a CAPM analysis that matches a higher market risk premium with lower T-Bill yields or a lower market risk premium with higher T-Bond yields, are very similar.

As noted in the previous discussion of the macro-economy, in an attempt to fend off a recession and to inject liquidity into the financial system, the Fed acted vigorously over the past four years to lower short-term interest rates. Recently, T-Bills have produced an average yield just above zero. Also, as noted in my discussion of the current economic environment, the long-term trend of T-Bond pricing would indicate a current yield of approximately 3.4 percent. Therefore, for purposes of a forward-looking CAPM analysis in this proceeding I will use 3.4 percent as the long-term risk-free rate.

Q: What market risk premium have you used in your CAPM analysis?

A: In their 2011 edition of *Stocks, Bonds, Bills and Inflation*, Morningstar indicates

that the average market risk premium between stocks and T-Bills over the 1926–2010 time period is 6.0 percent (based on an arithmetic average), and 4.4 percent (based on a geometric average). Those long-term average values are widely used as an estimate of the forward-looking market risk premium in the CAPM analysis.

As noted previously, immediately following the 2008/09 financial crisis and again last year, investor worries regarding the international financial system caused investors to be more concerned about default risk and seek the safety of risk-free investments. Because of that fact, the yields on long-term U.S. Treasury bonds declined more rapidly than the yields on corporate debt. For that reason, it is reasonable to rely on the upper end of the historical risk premium range (6.0 percent) published by Morningstar/Ibbotson in calculating a current cost of equity capital.

Q: What values have you chosen for the beta coefficients in the CAPM analysis?

A: With regard to the CAPM beta coefficient, Value Line reports beta coefficients for all the stocks it follows. Value Line's beta is derived from a regression analysis between weekly percentage changes in the market price of a stock and weekly percentage changes in the New York Stock Exchange Composite Index over a period of five years. The average beta coefficient of the sample of the electric utility companies in the May/June period of 2013 was 0.67.

Q: What is your cost of equity estimate for the sample of electric utility companies using the CAPM?

A: Exhibit No. SGH-11 shows that the combination of a 3.40 percent risk-free rate, with an average beta of 0.67 and a market risk premium of 6.0 percent is 7.42

percent. That result is considerably lower than the DCF results previously presented.

C. Modified Earnings-Price Ratio.

Q: Please describe the modified earnings-price ratio (MEPR) analysis you use to estimate the cost of equity capital.

A: The earnings-price ratio is the expected earnings per share divided by the current market price. In cost of capital analysis, the earnings-price ratio alone (which is only one portion of this MEPR analysis) can be useful in a corroborative sense, since it can be a good indicator of the proper range of equity costs when the market price of a stock is near its book value. When the market price of a stock is *above* its book value, the earnings-price ratio *understates* the cost of equity capital Exhibit No. SGH-12 contains mathematical proof for this concept. The opposite is also true, i.e.; the earnings-price ratio *overstates* the cost of equity capital when the market price of a stock is *below* book value.

Under the target market conditions of 2013, the electric and gas utilities under study have an average market-to-book ratio of 1.58 and, therefore, the average earnings-price ratio, alone, will understate the cost of equity for the sample group. However, the earnings-price ratio is not used alone as an indicator of equity capital cost rates. Because of the relationship among the earnings-price ratio, the market-to-book ratio and the investor-expected return on equity, described mathematically in Exhibit No. SGH-12, the earnings-price ratio is modified by averaging projected equity returns with the current earnings-price ratio for the companies under study. It is that modified analysis that will assist in

estimating an appropriate range of equity capital costs in this proceeding.

Q: What is the relationship between the earnings-price ratio, the expected return on equity, and the market-to-book ratio?

A: When the expected return (ROE) approximates the cost of equity, the market price of the utility approximates its book value and the earnings-price ratio provides an accurate estimate of the cost of equity. As the investor-expected return on equity for a utility (ROE) begins to exceed the investor-required return (the cost of equity capital), the market price of the firm will tend to exceed its book value. Also as explained above, in that instance the earnings-price ratio understates the cost of equity capital.

Conversely, in situations where the expected equity return is below what investors require, market prices fall below book value. Further, when market-to-book ratios are below 1.0, the earnings-price ratio overstates the cost of equity capital. Thus, the expected rate of return on equity and the earnings-price ratio tend to move in a countervailing fashion around a central locus, and that central locus is the cost of equity capital. Therefore, the average of the expected book return and the earnings price ratio provides a reasonable estimate of the cost of equity capital.

These relationships represent general rather than precisely quantifiable tendencies but are useful in corroborating other cost of capital methodologies. The Federal Energy Regulatory Commission, in its generic rate of return hearings, found this technique useful and indicated that under the circumstances of market-to-book ratios exceeding unity, the cost of equity is bounded above by the

expected equity return and below by the earnings-price ratio.[23] The mid-point of these two parameters, therefore, produces an estimate of the cost of equity capital which, when market-to-book ratios are different from unity, is considerably more accurate than the earnings-price ratio alone.

Q: Is there theoretical support for the use of an earnings-price ratio in conjunction with an expected return on equity as an indicator of the cost of equity capital?

A: Yes. Elton and Gruber, *Modern Portfolio Theory and Investment Analysis* (New York University, Wiley & Sons, New York, 1995, pp. 401-404) provide support for reliance on the modified earnings price ratio analysis.

The Elton and Gruber text posits the following formula,

$$k = (1-b)E/(1-cb)P, \text{ where} \qquad (3)$$

"k" is the cost of equity capital, "b" is the retention ratio, "E" is earnings, "P" is market price, and "c" is the ratio of the expected return on equity to the cost of equity capital (ROE/k). This formula shows that when ROE = k, "c" equals 1.0, and the cost of equity capital equals the earnings-price ratio. Moreover, in that case, ROE is greater than "k" (as it is in today's market), "c" is greater than 1.0, and the earnings-price ratio will understate the cost of equity. Also, the more that ROE exceeds "k," the more the earnings price ratio will understate "k." In other words, those two parameters, the earnings-price ratio and the expected return on

[23] E.g., 50 *Fed Reg,* 1985, p. 21822; 51; *Fed Reg,* 1986, pp. 361, 362; 37 FERC ¶¶ 61,287.

equity (ROE), orbit around the cost of equity capital, with the cost of equity as the locus, and fluctuate so that their mid-point approximates the cost of equity capital.

Assuming an industry average retention ratio of about 30 percent (i.e., 70 percent of earnings are paid out as dividends), the stochastic relationship between the expected return (ROE) and the earnings price ratio can be determined from Equation (5), above, as shown in Table I below. Most importantly, Equation (3) shows that the average of the EPR and ROE (which is my MEPR analysis) will approximate "k," the cost of equity capital.

Table I

SUPPORT FOR THE MODIFIED EARNINGS PRICE RATIO ANALYSIS

Cost of Equity	Retention Ratio	ROE	ROE/k	Earn-Price Ratio	M.E.P.R. (ROE+EPR)/2
[1]	[2]	[3]	[4]=[3]/[1]	[5]	[6]=([3]+[5])/2
10.00%	35.00%	13.00%	1.3	8.38%	10.69%
10.00%	35.00%	12.00%	1.2	8.92%	10.46%
10.00%	35.00%	11.00%	1.1	9.46%	10.23%
10.00%	35.00%	10.00%	1.0	10.00%	10.00%
10.00%	35.00%	9.00%	0.9	10.54%	9.77%
10.00%	35.00%	8.00%	0.8	11.08%	9.54%
10.00%	35.00%	7.00%	0.7	11.62%	9.31%

[5] From Equation (3): $E/P = k(1-cb)/(1-b)$

As the data in Table I show, the average of the expected return (ROE) and the earnings price ratio (EPR) produces an MEPR estimate of the cost of common equity capital of sufficient accuracy to serve as a check of other analyses, which is how I use the model in my testimony.

Q: What are the results of your MEPR analysis for the sample group?

A: Exhibit No. SGH-13 shows the IBES projected 2014 per share earnings for each of the firms in the sample groups. Recent 2013 market prices (the same market prices used in the DCF analysis), and Value Line's projected return on equity for 2013 and 2016-2018 for each of the sample group companies are also shown.

The average earnings-price ratio for the electric and gas utility sample group, 6.69 percent, is below the cost of equity for those companies due to the fact that their average market-to-book ratio is currently well above unity (average M/B = 1.58). The sample companies' 2013 expected book equity return averages 9.73 percent. For the entire sample group, then, the mid-point of the earnings-price ratio and the current equity return is 8.21 percent.

Exhibit No. SGH-13 also shows that the average expected book equity return for the sample of electric utilities over the next three- to five-year period is 10.20 percent. The midpoint of that long-term projected return on book equity (10.20 percent) and the current earnings-price ratio (6.69 percent) is 8.45 percent. Both of those results are below the cost of equity estimate provided by the DCF, indicating the DCF result may be somewhat overstated.

D. Market-To-Book Ratio Analysis.

Q: Please describe your market-to-book (MTB) analysis of the cost of common equity capital for the sample group.

A: The Market-to-Book Ratio (MTB) technique of cost of equity analysis is a derivative of the DCF model that adjusts the capital cost derived for inequalities that exist in the market-to-book ratio. This method is derived algebraically from

the DCF model and therefore, cannot be considered a strictly independent check of that method. However, the MTB analysis is useful in a corroborative sense. The MTB seeks to determine the cost of equity using market-determined parameters in a format different from that employed in the DCF analysis. In the DCF analysis, the available data is "smoothed" to identify investors' long-term sustainable expectations. The MTB analysis, while based on the DCF theory, relies instead on different point-in-time data projected one year and five years into the future and thus, offers a practical corroborative check on the traditional DCF. The MTB formula is derived as follows:

Solving for "P" from Equation (1), the standard DCF model, we have

$$P = D/(k-g). \quad (4)$$

But the dividend (D) is equal to the earnings (E) times the earnings payout ratio, or one minus the retention ratio (b), or

$$D = E(1-b). \quad (5)$$

Substituting Equation (5) into Equation (4), we have

$$P = \frac{E(1-b)}{k-g} . \quad (6)$$

The earnings (E) are equal to the return on equity (r) times the book value of that equity (B). Making that substitution into Equation (6), we have

$$P = \frac{rB(1-b)}{k-g} \quad . \qquad (7)$$

Dividing both sides of Equation (7) by the book value (B) and noting from the discussion of the DCF model that g = br+sv,

$$\frac{P}{B} = \frac{r(1-b)}{k-br-sv} \quad . \qquad (8)$$

Finally, solving Equation (8) for the cost of equity capital (k) yields the MTB formula:

$$k = \frac{r(1-b)}{P/B} + br + sv. \qquad (9)$$

Equation (9) indicates that the cost of equity capital equals the expected return on equity multiplied by the payout ratio, divided by the market-to-book ratio plus growth. Exhibit No. SGH-14 shows the results of applying Equation (9) to the defined parameters for the similar-risk electric utility firms in the comparable sample group. Page 1 of Exhibit No. SGH-14 utilizes target year (2013) data for the MTB analysis, while page 2 utilizes Value Line's 2016-2018 projections

(published in 2013). The MTB cost of equity for the sample of electric utility firms, recognizing a current average market-to-book ratio of 1.58 is 8.63 percent using the target year (2013) data, and 8.73 percent using projected three- to five-year data available in 2013. Those point-in-time estimates approximate the DCF equity cost estimates derived previously.

E. Summary.

Q: Please summarize the results of your 2013 equity capital cost analyses for the sample group of similar-risk companies.

A: The results of the cost of equity analyses described herein are shown in Table II below.

Table II
2013 Cost of Equity Analyses

Method	Cost of Equity
Discounted Cash Flow	8.69%
Mechanical DCF	8.33%
Capital Asset Pricing Model	7.42%
Modified Earnings Price Ratio	8.21%/8.45%
Market-to-Book Ratio	8.63%/8.73%

The DCF, which is the most reliable indicator of the current cost of equity, indicates a cost of equity capital of 8.69 percent. The average of the corroborating analyses (Mechanical DCF, CAPM, MEPR, and MTB) indicates a cost of equity ranging from 8.15 percent to 8.23 percent. That information indicates that the 8.69 percent traditional DCF result may be somewhat overstated as an estimate of the target 2013 cost of common equity capital for Puget.

Given the results described and rounding to the nearest quarter percent, a reasonable point-estimate for the current cost of common equity capital for an electric utility with risk characteristics similar to Puget and sample group analyzed is 8.75 percent. As noted in the discussion of the economic environment, however, the expectation in May and June of 2013 with regard to the economy and interest rates is that with a continued economic expansion, interest rates will increase over the next two years.[24] Therefore, taking that expectation into account a reasonable range for setting equity capital cost rates ranges from 8.50 percent to 9.50 percent. The mid-point of that range is 9.00 percent.

According to the May 2013 edition of AUS Utility Reports, the average senior bond rating of the sample group of companies used to estimate the cost of common equity is "BBB+" (Standard & Poor's) and "A3" (Moody's). Puget Sound Energy's senior bond rating is "A-" from S&P and "A3" from Moody's. Therefore, Puget Sound Energy's senior bond rating is slightly higher than that of the sample group, but generally quite similar. In addition, the Company's ratemaking common equity ratio (48 percent) is similar to the average common equity ratio of the sample group of companies (47.7 percent). For these reasons, absent any other adjustments for risk, a return on common equity at the mid-point established by the sample group would be appropriate.

[24] As note previously in this testimony, with the 20-20 hindsight afforded by this investigation, we know now that interest rates did not rise as predicted and it was not necessary to include those expectations in the equity cost estimate. However, we did not have that knowledge in 2013 and it is not applied after-the-fact here.

An allowed return on common equity of 9.0 percent would have been a reasonable allowed return for Puget's electric utility operations, absent the implementation of a decoupling rate design. However, as I will discuss in detail subsequently, decoupling does lower the Company's operating risk and with that additional risk reduction, Puget's allowed return should be reduced below the 9.0 percent mid-point of a reasonable range. With decoupling, the Company's allowed return on common equity at mid-year 2013 should be 8.65 percent--35 basis points below the market-based cost of equity.

Q: If the Commission reduced PSE's allowed profit from the 9.8 percent allowed in the Company's 2011 rate proceeding to your recommended 8.65 percent, which recognizes current capital costs and a decoupling risk reduction, would that reduce the Company's rates?

A: Yes. The difference in the cost of equity capital is 115 basis points (9.80 percent-8.65 percent). The common equity ratio is 48.00 percent. The combined gas and electric rate base for Puget (as of the last rate proceeding) is $4,214 Million (Electric: $2,622 Million; Gas: $1,592 Million). If the Commission lowered the Company's allowed ROE to 8.65 percent, PSE's ratepayers would save approximately $35.8 Million every year through the lower allowed profit. [9.80%-8.65% ROE x 48% Equity Ratio x $4,214 Mill. Rate Base ÷ (1-35% tax rate) = $35.8 Million annual rate reduction]

F. Other Cost of Equity Issues.

Q: In the initial portion of these proceedings your recommendation to this Commission was an ROE of 9.0 percent, which included a decoupling-related

decrement of 50 basis points. Can you briefly explain why your recommendation is different in the Remand portion of these proceedings?

A: Yes. My initial recommendation was not based on a detailed analysis of the cost of equity capital for Puget, but was based on the Commission's prior equity return allowance and the change in observable capital costs (bond yields) that had occurred since that prior rate proceeding. That analysis indicated a 30 basis point reduction in the cost of common equity for Puget from 9.80 percent to 9.50 percent. I then applied a decoupling decrement of 50 basis points from a prior study of PSE's historical revenue volatility to reach my recommended 9.00 percent. Finally, I noted that that result was within a reasonable range of equity costs based on my cost of capital testimony in another regulatory jurisdiction.

In this proceeding, I have analyzed Puget's 2013 cost of equity capital directly, using companies with revenues primarily derived from regulated electric and gas operations and with similar bond ratings. That analysis indicated an appropriate cost of equity of 9.0 percent for Puget, absent any consideration of the impact of decoupling on the Company's investment risk. My current, detailed analysis of the cost of equity impact of decoupling indicates that a reasonable and conservative estimate is 35 basis points. Hence, because decoupling has been granted Puget and the ROE allowed in these proceedings should recognize that fact, I recommend that the Company's ROE be set at 8.65 percent [9.0 percent less 35 basis points for decoupling].

Q: The Company has been granted a rate plan attrition adjustment as well as decoupling in this proceeding. Have you undertaken an analysis to quantify

the extent to which that aspect of the Commission's Order 7 has reduced the Company's risk?

A: I have not undertaken such an analysis in this proceeding. Nevertheless, my opinion about the rate plan (K-factor) has not changed since my initial testimony in this proceeding. Because the rate plan adopted by this Commission calls for automatic between-rate-case rate increases for the Company, it would provide additional protection for the Company's income stream not available under the traditional regulation that existed in Washington prior to the adoption of that rate plan. While I have not attempted to quantify the extent to which the K-factor would lower the Company's cost of capital, it is reasonable to believe that it would lower PSE's risk compared to traditional regulation. Therefore, due to this additional risk-reducing factor, the equity return I recommend, 8.65 percent, which includes no additional decrement for PSE"s K-factor rate plan, should be considered to be conservative in nature.

Q: Company witness Mr. Doyle identifies what he believes to be risk factors related to weather volatility and earnings sharing above the Company's allowed return. What are your comments?

A: Mr. Doyle testifies that weather-related volatility, which he estimates comprises much of Puget's overall revenue volatility, should not be considered when assessing the reduction in risk imparted by decoupling. His position is that because weather-related revenue fluctuations are normal and they are both above and below average, they do not add to operational risk. Mr. Doyle also opines that the 50/50 earnings sharing with ratepayers above the allowed ROE imparts

additional risk to the Company that it would not have with a "dead band" above the allowed ROE within which the Company would retain all of its over-earnings. In my view, Mr. Doyle's claims regarding increased risks due to these measures are incorrect.

First, with regard to whether or not weather-related fluctuations should be removed from consideration in determining the impact of decoupling on the Company's cost of capital, the fact that weather impacts can be positive or negative or that such fluctuations are normal is not relevant to the determination of the cost of capital impact. The salient point is that revenue fluctuations due to weather in Puget's service territory, absent decoupling, add to the overall volatility of the Company's revenues. With decoupling, all revenue fluctuations due to weather—up and down—will be trued up after the fact and, therefore, decoupling will reduce the volatility that would have existed otherwise. Revenues will be more certain in that instance (with decoupling) and will, therefore, impart lower risk to investors.

With regard to the earnings sharing issue, it is important to recall that, in the Multiparty Settlement agreement, PSE proposed an earnings test *as part of* their amended decoupling petition.[25] That earnings test proposed by Puget would allow the Company to earn up to 25 basis points above its authorized return, and then, if earnings exceeded that amount, the Company and ratepayers would share "50-50" any earnings exceeding that limit. The Commission modified the earnings test in its Order approving decoupling and the rate plan and required the

[25] Order 07, ¶ 159.

Company share *any* over-earnings with customers "50-50," i.e., eliminating the 25 basis point "dead band" sought by the Company.[26]

Company witness Mr. Doyle recognized that the sharing mechanism instituted by the Commission is linked to decoupling. He notes at pages 18 and 19 of Exhibit No. DAD-4T that in setting the earnings sharing requirement, the Commission sought to provide an incentive for PSE to identify efficiencies in its cost structure, and believed that the 9.8 percent allowed return was "at the high end of a range of reasonableness." Therefore, the Commission instituted a sharing system in Order 07 in order to provide operating incentive to the Company and—after the Company earned its allowed return—some relief to ratepayers.

Finally, the sharing ordered by the Commission does not start until the Company has earned its allowed return. Therefore, assuming that return allowed is the return required by investors, the Company's risk is not raised by the sharing mechanism—the Company is earning its investor-required return prior to sharing any additional return above the cost of capital. Also, while it would certainly be true that the Company would be able to earn *more* money in excess of its allowed return if the Commission allowed a 25 basis points "dead band" requested by the Company, it is not clear that beginning the sharing after the allowed return is reached is unfair to the Company or works to unbalance the interests of the Company and its ratepayers established by the allowed return on equity. Therefore, because the earnings sharing does not affect the Company's ability to

[26] *Id.*, ¶ 165.

earn its cost of capital, it should not affect the Company's overall investment risk. Therefore, the Company's testimony to re-institute the "dead band" prior to the net income sharing beyond the allowed ROE should be ignored.

Q: Mr. Doyle also discusses the Commission's comments in Order 07 indicating that decoupling could be studied after-the-fact or that evidence could be brought forward that markets do respond to decoupling as a rationale for not addressing the impact of decoupling at that time. What are your comments?

A: With regard to the last point first, as I show in Section V of this testimony, there is substantial evidence that markets do, indeed, respond to decoupling. The evidence shows that the cost of capital declines considerably when a revenue decoupling regime similar to that granted to the Company is employed by electric utilities. Additionally, I provide a direct analysis of Puget's actual historical net revenue volatility from 1999 forward, and through a determination of the degree to which decoupling is likely to reduce the average volatility over time, I am able to quantify, based on Puget's historical capital structure and rate base, the impact of decoupling on the cost of equity. Therefore, there is substantial evidence in the record of this proceeding from both market-based and income-statement based analyses that show decoupling lowers the cost of equity capital.

Q: Is it appropriate to undertake an after-the-fact analysis of the impact of decoupling on the cost of capital?

A: No. As noted, due to the substantial direct evidence regarding the impact of decoupling available to the Commission in this proceeding, there is no need to

wait for an after-the-fact analysis of the Company's debt instruments to assess any impact on the cost of capital.[27]

The fundamental flaw in this "after the fact" approach, also recommended by Commission Staff in the initial phase of these proceedings, is that the determination of the cost of capital is forward-looking and expectational. The cost of capital must be determined at the time rates are set as an essential cost component to those rates. Cost of capital is not set for ratemaking purposes by looking back at what happened in the past. Substantial evidence now exists in the record of these proceedings to support the link between decoupling and lower equity capital costs. The Commission does not require, nor would it be reasonable to seek some other future signposts to confirm the evidence currently before it. Also, in response to Public Counsel Data Request No. 56, Puget indicates that determining the impact of decoupling on the cost of debt for electric utility companies "is likely to be impossible."

Failing to address cost of capital here has the effect of requiring ratepayers to provide a return in their cost of service that exceeds the Company's cost of capital, during a "wait and see" period that cannot be unwound. That would not provide the balancing of investor and consumer interests called for in *Hope* and *Bluefield*. Moreover, it is not clear what, if any, analytical guidelines would allow the Commission to discern from the tea-leaves of Puget's next bond issue's coupon yield what portion of the difference between that yield and the Company's embedded cost of debt might be attributable to decoupling or to the

[27] Order 07, ¶¶ 105-106 (postponing the analysis of the impact of decoupling on ROE).

increase/decline in capital costs generally, changes in utility financial risk, or any other of many factors.

Q: At page 9 of Order 10 in these proceedings, the Commission indicates that the parties should prepare cost of equity studies for the early 2013 period that would provide an update for the 9.8 percent determined in 2012 and be appropriate for "continued application through the rate plan period." Is the 9.0 percent cost of equity estimate you have provided (absent decoupling) appropriate for application through the rate plan period?

A: Yes. Equity capital cost estimates are forward-looking and must take into account current market expectations for the future. That is accomplished through the use of current market prices (which take into account the market's collective expectations), expected dividends, forward-looking growth rate expectations as well as projections about probable changes in the macro-economy, inflation and interest rates in the future. Therefore, my 2013 target period cost of equity estimate is appropriate for the future rate plan period.

In addition, my most recent cost of capital estimate prepared for the Public Counsel in the on-going PacifiCorp rate proceeding indicates that the current cost of equity capital is in the same range as that determined for the target 2013 time period in this case.[28] My PacifiCorp testimony was submitted on October 10, 2014, and studied fully-integrated gas and electric utilities with senior bond ratings between BBB and A (the same bond rating parameters used for the target

[28] *Washington Utilities & Transportation Commission v. PacifiCorp*, Docket UE-140762 et al, Direct Testimony of Stephen G. Hill, Exhibit No. SGH-1CT.

period sample selection for Puget). In fact, ten of the fifteen companies in the Puget sample were also in my PacifiCorp sample group. The reasonable range of the cost of equity capital determined in that recent PacifiCorp case was the same as determined from my analysis in this proceeding: 8.5 percent to 9.5 percent.

Also, the average 20-year "Baa" utility bond yield during the 2013 target period was 4.52 percent while the most recent data indicate that average "Baa" utility bond yields have not changed significantly and, in fact, have declined somewhat. According to Value Line's *Selection & Opinion* the average 20-year "Baa" utility bond yield over the most recent six week period (October 17 through November 21, 2014), was 4.42 percent--very similar to, but below, the level in 2013. In addition, long-term Treasury bond yields have not changed much between "early 2013" and "late 2014,"—3.19 percent and 3.03 percent, respectively.[29] Therefore, the cost of equity estimate I have provided in this Remand proceeding for the target time period ("early 2013") is reasonable for that time period and appropriate for the rate effective period as well. My analysis also indicates that the 9.8 percent ROE previously awarded to PSE by the Commission is higher than the uppermost end of a reasonable range and, thus, overstates the Company's 2013 and 2014 cost of equity.

IV. COMPANY COST OF CAPITAL ANALYSIS

Q: With what methods has Company witness Morin estimated the cost of equity capital in this proceeding?

[29] The Value Line Investment Survey, *Selection & Opinion*, "Selected Yields" (May 17, 2013, through June 21, 2013 and October 17, 2014 through November 21, 2014.

A: Dr. Morin has based his equity return recommendation for Puget's Washington operations, in part, on a DCF analysis of a sample group of electric utilities that have at least 50 percent of their operations generated by utility operations. Dr. Morin provides analyses that focus on the target period of the first half of 2013. In addition he provides a current (2014) cost of equity estimate. The methodology for both periods is the same and the results are slightly different. My comments here will focus on Dr. Morin's 2013 equity cost analyses.

In addition, Dr. Morin has relied on a CAPM analysis that utilizes a DCF estimate of the cost of equity of the companies in a market index as a basis for determining the market risk premium, along with a Risk Premium analysis based on allowed returns. With those methods, based on his judgment, Dr. Morin estimates the current cost of equity for Puget to be in the range of 9.8 percent to 10.7 percent, with a mid-point of 10.3 percent.

Dr. Morin's equity cost analyses suffer from flaws that cause his equity cost estimates to be overstated. I will discuss the shortcomings of each of Dr. Morin's cost of capital methods in the order in which they are presented in his Direct Testimony: DCF, CAPM, and Risk Premium.

A. Dr. Morin's DCF Analysis.

Q: What are your comments regarding Dr. Morin's DCF analysis?

A: Dr. Morin's 2013 DCF analyses of electric utility companies, shown in his Exhibit Nos. RAM-4 and RAM-5 overstates the 2013 cost of utility company common equity for several reasons. First, his DCF results rely exclusively on projected earnings growth. As I discussed in Section III of my testimony, sell-