STATE OF NEW HAMPSHIRE
BEFORE THE
PUBLIC UTILITIES COMMISSION

In the matter of

Liberty Utilities (Granite State Electric) Corp.

Docket No. DE 19-064

Petition for Permanent Rate Increase

DIRECT TESTIMONY

OF

Dr. Pradip K. Chattopadhyay
Assistant Consumer Advocate

December 6, 2019

TABLE OF CONTENTS

I. INTRODUCTION

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

A. My name is Pradip K. Chattopadhyay. My business address is 21 South Fruit Street, Suite 18, Concord, New Hampshire. I am employed as the Assistant Consumer Advocate/Rate and Market Policy Director with the New Hampshire Office of Consumer Advocate (OCA).

Q. Please describe your formal education and professional experience.

A. I have a Ph.D. in Economics from the University of Washington, Seattle, which I earned in 1997. I have also taken courses in City and Regional Planning with applications to Energy Planning from Ohio State University, Columbus OH, in 2001-02. I have taught several courses in economics at the University of Washington as an instructor and adjunct faculty at its Business School. I am also associated with the Southern New Hampshire University (SNHU) as an adjunct faculty, where I teach several courses in economics.

From March 1998 to October 1999, I was a consultant with the National Council of Applied Economic Research, New Delhi, India. From November 1999 to August 2001, I was the Economist at the Uttar Pradesh Electricity Regulatory Commission (UPERC) in India, and advised UPERC on tariff issues. From September 2001 to June 2002, I worked at the National Regulatory Research Institute, Columbus, Ohio, as a graduate research associate while pursuing advanced courses in Energy Planning in the City and Regional Planning Program at Ohio State University. From June 2002 to July 2002, I worked at the World Bank, Washington D.C. as a short-term consultant/intern with its Energy and Water Division.

I worked at the New Hampshire Public Utilities Commission (Commission) from August 2002 to January 2007 in the capacity of a Utility Analyst. My responsibilities at the Commission as an analyst were in electric utility issues including analyzing and advising the Commission on rate design, cost of capital issues, wholesale market issues, and other regional matters. I briefly worked at the Massachusetts Department of Telecommunications and Energy (later reorganized into Department of Public Utilities (MA-DPU)) starting in January 2007 as an Economist. At MA-DPU, I represented the staff and examined gas demand estimation and forecasting, decoupling issues, and environmental remediation matters.

I returned to the Commission in June 2007 to join its Telecom Division as its Assistant Director, and continued in that position until December 2010. I was also helping other divisions as an expert witness in economics-related issues as well as advising the Commission on regional electric matters including FERC jurisdictional issues. I joined the Commission's Regional Energy Division in January 2010 as the Regional Energy Analyst, and was advising the Commission in that capacity until I joined the Antitrust and Utilities Division, Office of the Minnesota Attorney General, in August 2013.

I came back to New Hampshire in March 2014 and worked as an independent consultant until the end of August, 2014, representing the Minnesota Attorney General. I joined Liberty Utilities at the end of August, 2014 as a Forecasting Analyst for its Energy Procurement Department. I worked with Liberty Utilities for about three months, before starting my own consultancy firm. In December 2014, I joined the OCA as its Rate and Market Policy Director. I was later appointed the Assistant Consumer Advocate at the OCA.

Q. Have you previously provided testimony before this Commission?

A. Yes.

Q. In which dockets did you testify?

A. I provided testimony before the Commission in the following dockets:

- DE 03-200 – Rate design testimony which was about delivery rates for retail ratepayers of Public Service of New Hampshire (PSNH);
- DE 06-028 – Cost of capital testimony which was also about PSNH's delivery rates;
- DT 07-027 – Status of competition in retail telephony under TDS;
- DG 08-009 – Cost of equity testimony related to gas delivery rates of National Grid NH;
- DE 09-035 – Cost of equity testimony in the matter of electric distribution rates (PSNH);
- DG 14-380 – Petition of Liberty Utilities (EnergyNorth Natural Gas) requesting approval of firm transportation contract (North East Direct (NED));
- DG 15-155 – Petition of Valley Green, LLC requesting franchise in City of Lebanon and Town of Hanover, New Hampshire;
- DG 15-289 – Petition of Liberty Utilities (EnergyNorth Natural Gas) requesting franchise in City of Lebanon and Town of Hanover, New Hampshire;
- DG 15-494 – Petition of Liberty Utilities (EnergyNorth Natural Gas) requesting approval of firm transportation contract (NED);
- DE 16-383 – Petition of Liberty Utilities (Granite State Electric) for Permanent Rate Increase;
- DE 16-384 – Petition of Unitil for Permanent Rate Increase;

- DG 16-852 – EnergyNorth's Petition for Lebanon-Hanover Franchise Approval;
- DG 17-048 – EnergyNorth's Gas Distribution Service Rate Case;
- DG 17-070 – Northern Utilities' Gas Distribution Service Rate Case;
- DW 18-165 – Abenaki-Rosebrook Rate Case; Oral Testimony on Return on Equity;
- DW 18 –118 – HAWC Rate Case; Oral Testimony on Return on Equity;
- DG 18-140 – Liberty Utilities' Petition for Approval of RNG Supply and Transportation Contract; and
- DG 17-198 – Liberty Utilities' Petition for Approval of Natural Gas Supply Strategy.

Q. Have you ever provided testimony and affidavits before other Commissions?

A. Yes. I have testified on cost of capital before the Minnesota Public Utilities Commission in dockets G008/GR-13-316 and GR 13-617. I have also provided an affidavit before the Federal Energy Regulatory Commission in a FERC Docket ER 09-14-000 on NSTAR's petition for ROE incentive adders on behalf of the New England Conference of Public Utilities Commissioners (NECPUC).

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to recommend, for Granite State Electric, the rate of return on equity in accordance with standards set forth in *Bluefield Water Works v. Public Service Comm'n*, 262 U.S. 679, 692-93 (1923), (*Bluefield*) and *Federal Power Comm'n v. Hope Natural Gas Co.*, 320 U.S. 591, 605, (1944) (*Hope*). On advice of counsel, I understand that the standard set forth by the U.S. Supreme Court is that a public utility may be allowed to earn a return comparable to a return on investments in other enterprises having similar risks in order to allow the utility the opportunity to attract capital and to maintain its credit. "The return should

be reasonably sufficient to assure confidence in the financial soundness of the utility and should be adequate, under efficient and economical management, to maintain and support its credit and enable it to raise the money necessary for the proper discharge of its public duties." *Bluefield*, 262 U.S. at 693. I also state my views on Granite State Electric's recommendations on cost of equity, and articulate reasons why I agree or disagree with those recommendations.

Q. What Rate of Return on Equity (ROE) and Rate of Return on Capital are the Company requesting in this case?

A. The Company is requesting a return on common equity of 10 percent. Based on the actual net cost of debt, and the requested capital structure, the Company is seeking approval of 8.19 percent return on capital.

Q. What do you recommend as the allowed ROE for the company?

A. I am recommending a return of 8.23 percent as a specific point estimate. Based on my analysis, I am also recommending a range of returns on equity that I consider reasonable for the company, i.e., 8.15 percent to 8.35 percent.

Q. Please discuss how your testimony is organized.

A. Section II briefly reports my analysis of implications of observed market-to-book ratios[1] in the electric utility industry. In Section III, which has three subsections, I use several approaches to derive estimates of the cost of equity and I conclude by stating my recommendation on the cost of equity. Finally, Section IV includes the schedules that inform the OCA's analysis.

[1] This ratio relates the market price of stock to its book value.

II. MARKET-TO-BOOK RATIO, EXPECTED RETURN ON EQUITY AND REQUIRED RETURN ON EQUITY

Q. Why is it important to analyze observed market-to-book ratios of the electric utility industry and Granite State Electric's proxy group?

A. It is important to investigate market-to-book ratios essentially for three reasons. First, the current level of market-to-book ratio for a regulated company (which, of course, compares the market value of its common stock to the value of its assets as reflected on the company's books) is very telling with respect to the divergence between the expected return on equity and the opportunity cost of equity with respect to the regulated company's common stock. (I explain why this divergence is an important factor in the discussion that immediately follows.) Second, whether the market-to-book ratio is significantly higher than one has implications for the application of the Discounted Cash Flow (DCF) approach to estimating the opportunity cost of equity. Finally, one of the DCF approaches that I have relied on uses market-to-book ratios as an input. What follows in this section is predominantly the discussion of the first two reasons mentioned above. The need for tracking the market-to-book ratios of the constituent companies in the proxy group is primarily taken up in detail in subsection III.A.

Q. What is the relevance of the market-to-book ratio in the determination of the cost of equity?

A. When the market-to-book ratio of a utility is significantly higher than one, it indicates that the return on equity that is *expected* by investors, which is greatly influenced by the allowed rate of return for a regulated entity, exceeds the true opportunity cost of equity. In other words,

in the prevailing economic environment, the return that investors *expect* to receive is greater than the return they would *require* in order to invest in the stock.

This has another important implication. While the DCF construct is predicated on using long-term expectations, in practice the DCF method relies on investors' expectations over the medium term. Analysts' projections about investors' sentiments on relevant variables are not available beyond three to five years into the future. The DCF method in practice therefore captures investors' medium-term expectations that the market-to-book ratio will continue to remain substantially higher than one, assuming the ratio is already at that level. I delve into this issue in greater detail (Pages 14-18 of my testimony) in my discussion of the characteristics of the DCF method, especially as it is implemented in practical terms. The methods in the current environment, therefore, tend to produce estimates for ROE that reasonably exceed the "true" cost of equity.[2]

Q. Please explain why the expected return on equity exceeds the cost of equity when the market-to-book ratio is significantly greater than one.

A. This fundamental result stems from the seminal Discounted Cash Flow (DCF) analysis, which succinctly translates into the equation

$$\frac{P}{B} = \frac{r_e - b_e r_e}{K - b_e r_e} \quad \text{..... Equation (1)}$$

[2] I use the phrase "true cost of equity" interchangeably with "cost of equity." I use both to refer to the opportunity cost associated with purchasing equity, i.e. the minimum return necessary to attract sufficient capital.

where r_e is the expected return on equity, *B* is the book value of stock, b_e is the expected retention ratio,[3] *P* is the market stock price, and *K* is the cost of equity, i.e., the required return on equity. [4]

The DCF approach is based on the premise that the market price of a particular stock equilibrates to the sum of the stream of returns expected in the future from the stock by investors, discounted by the market cost of equity. This is an explicit way of modeling investor behavior, and is a well-accepted way of explaining observed investor behavior. Heuristically speaking, if the stock price is lower than the market-equilibrium price, the demand for the stock would be greater than the supply, and stock sellers would raise their price to take advantage of the situation. Likewise, if the price of the stock was higher than the market-equilibrium price, the demand would be less than the supply of stocks, putting pressure on the sellers to lower their price to reduce excess supply. It follows that when the expected return on equity is greater (smaller) than the cost of equity, the market-to-book ratio would be greater (smaller) than one.

Q. Can you explain Equation (1) in greater detail?

A. Yes. If the expected return on equity exceeds the market cost of equity, the price of the stock would have to be higher relative to the book value to ensure that the expected dividend on the stock, i.e., $B(r_e - b_e r_e)$, equals the minimum required dividend, i.e. $P(K - b_e r_e)$. A look at comparative statics is helpful.[5] Everything else being equal, if the expected return on equity

[3] Retention ratio is the percentage of earnings that is retained to grow a business.
[4] *See* Roger Morin's *Regulatory Finance*, Utilities' Cost of Capital, Public Utilities Report, Inc. (1994), Page 248. The result holds even if we model new equity financing, as long as the growth in the number of outstanding stocks is reasonably low ceteris paribus, which in practice is generally true. Retention ratio is the proportion of earnings that is kept back as retained earnings; i.e. (net income *less* dividends)/net income.
[5] Comparative statics is a comparison of two economic outcomes when a pertinent variable is changed from one level to another, ceteris paribus.

increases (decreases), the expected dividend would momentarily be higher (lower) than $P(K - b_e r_e)$. Ceteris paribus, this would trigger a greater (lower) demand for the stock than the supply, which would consequently lead to a higher (lower) market price for the stock. The adjustments would continue until Equation (1) holds, i.e. until there is equilibrium.

A simple numerical example would be helpful. Suppose the expected return on equity, r, is 10 percent, and the expected retention ratio, b, is 30 percent. Based on these numbers, $r_e - b_e r_e$ is 7 percent.[6] However, if the cost of equity for the same stock, *K*, is 8 percent, then $(K - b_e r_e)$ must be 5 percent.[7] To ensure that 7 percent of the book value, i.e. the expected dividend, is exactly equal to 5 percent of the stock price, i.e. the minimum required dividend, the only way that equation (1) can hold is through an adjustment to the price of the stock until it is 40 percent higher than the book value of the stock, i.e., the market-to-book ratio is exactly equal to 1.4.

Q. Please explain the difference between the cost of equity and the expected return on equity in greater detail.

A. While the expected rate of return on equity for a regulated utility is an accounting return, i.e., it depends on the return allowed by the regulator as well as how the utility performs operationally, the cost of equity is the opportunity cost of equity, which is the minimum return required to attract investment by investors.[8]

[6] $(r_e - b_e r_e)$ =10 - 0.30*10= 10-3 = 7.

[7] $(K - b_e r_e)$ =8 - 0.30*10= 8-3= 5.

[8] "A rate of return may be reasonable at one time and become too high or too low by changes affecting opportunities for investment, the money market and business conditions in general." *Bluefield*, 262 U.S. at 693.

Ideally, a fair and reasonable return on equity for a regulated utility would equal the opportunity cost of equity. A look at a group of regulated utilities of comparable risk is instructive in estimating the opportunity cost of equity. Intrinsic to the determination of the allowed return at any point in time is the need to avoid unnecessary wealth transfer from ratepayers to shareholders, given the prevailing economic environment. To balance the interests of ratepayers and the financial viability of the utility properly, any approach to determine the cost of equity must reasonably target the need to encourage investment in the utility's equity at the least cost to its ratepayers.

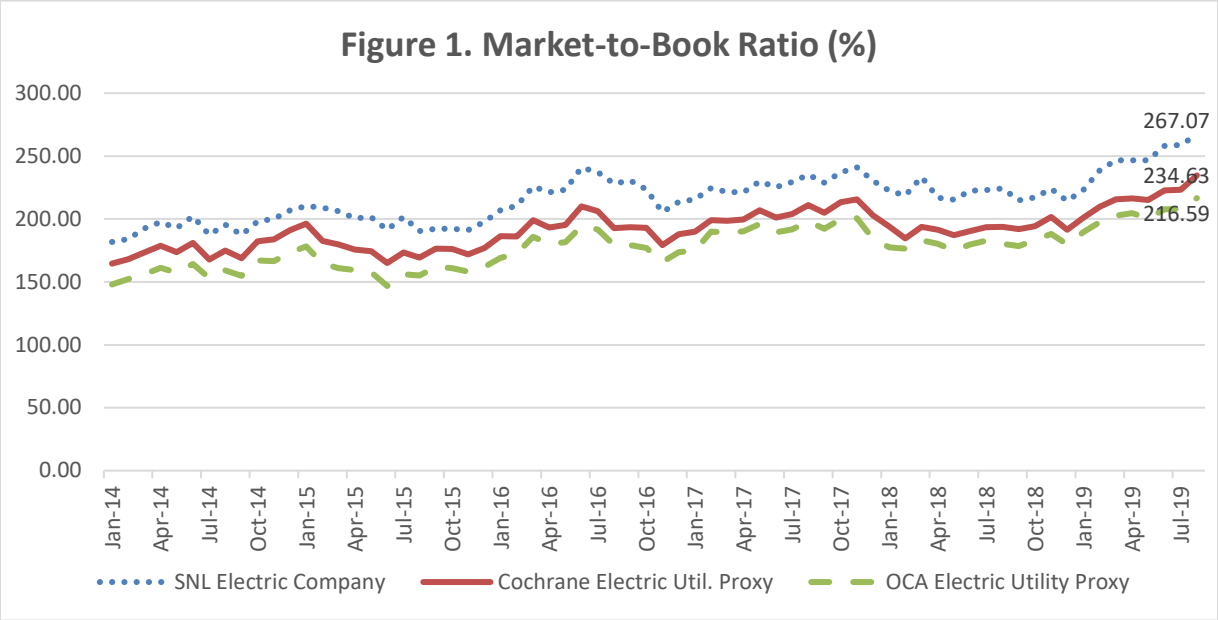
The expected return on equity for investment in a regulated utility at any point in time is influenced by the return currently allowed on such investment, as authorized by the regulator in the previous determination of such return. It is also influenced by investors' expectations about possible changes in the future, especially with respect to operating efficiency and income opportunities. The expected return on equity for a regulated utility can be greater, lesser or the same as the cost of equity at any point in time.

Q. Have you analyzed the electric utility industry's market-to-book ratios?

A. Yes, I have. In order to recommend the rate of return on Granite State Electric's equity, I have analyzed the market-to-book ratios for the electric utility industry, Granite State Electric's witness Mr. Cochrane's recommended proxy group, and OCA's recommended proxy group. These are depicted in Figure 1 below. As for the electric industry's situation, I have used SNL's Index, SNL Electric Company, which includes all publicly traded (NYSE, NYSE MKT, NASDAQ, OTC) Electric Utilities and Transmission companies in SNL's coverage universe.

Q. What do the electric utilities' market-to-book ratios indicate about the relationship between the investors' expected return on equity and the cost of equity in the current environment?

A. Figure 1 shows that the average market-to-book-ratio of SNL electric companies as well as Mr. Cochrane's proxy group have remained persistently well above one over the past six years; the average market-to-book ratios for SNL electric utilities and Mr. Cochrane's proxy group over the last six years have been 2.17 and 1.92, respectively.[9] As for the OCA's proxy group, the average market-to-book ratio for the corresponding period has been 1.78.



More importantly, as for the more current market-to-book ratios (August, 2019), they are 2.67, 2.35 and 2.17 for SNL electric companies, Mr. Cochrane's proxy group and the OCA's proxy group, respectively. This indicates that the true cost of equity currently is comfortably less than the return on equity expected by investors in electric utilities. In view of that, it is plain that

[9] Data downloaded from SNL on October 28th, 2019.

if the cost of equity is estimated based on existing expected return on common equity, the resulting return would unreasonably benefit shareholders at the expense of ratepayers.

Q. In view of the observed market-to-book ratio being considerably higher than one, do you have any recommendation on your preferred approach on estimating the cost of equity?

A. Yes, I do. I recommend relying predominantly on the DCF approach in determining the allowed return on equity for Granite State Electric.

One of the methods that Mr. Cochrane used to estimate his recommended cost of equity, the Capital Asset Pricing Model (CAPM) predominantly uses historical stock-price appreciation as the basis for measuring the expected return on common equity. Even when attempting to look at forward-looking estimates, the method relies considerably on the historical trends in stock prices. Not trivially, the betas under the CAPM approach are generally based on historical prices. In a climate of market-to-book ratios being significantly greater than one, if historically prices have tended to appreciate significantly because allowed returns (that are to begin with higher than the true cost of equity) have moved further away from the true cost of equity, the method will tend to produce estimates that will also be further away from the true cost of equity.

In contrast, the forward-looking DCF approach tends to correct somewhat for the deviation between stock prices and book values. While the growth component is influenced positively by price appreciation, the dividend yield component is negatively influenced by price appreciation, thus producing a cost of equity estimate that relative to the other methods is more in line with the true market cost of equity. It is true that investors' medium-term expectation about ongoing sales in shares and the persistence of a greater-than-one market-to-book ratio, and

our reliance in practice on expectations of growth over the medium-term, tend to produce a higher DCF estimate of cost of equity than the true cost of equity. However, investors understand that a continuing divergence between the stock price and the book value is unsustainable in the long-run. That understanding gets somewhat reflected in the forward-looking DCF method, even as it is usually implemented. In view of that, I recommend reliance on methods that are based on the DCF approach.

Q. Do you have any additional observations on the application of DCF in estimating the cost of equity?

A. Yes. In the application of DCF it is important to ensure that the inputs are estimated reasonably accurately. Myron J. Gordon, who popularized the use of the DCF method for estimating ROE, states that "the perfect capital markets cost of capital can be measured without bias only in the special and uninteresting case where the allowed rate of return already is equal to the cost of capital. When the allowed rate of return is above (below) the "true" cost of capital, the measured cost of capital is biased up (down)."[10] In the traditional model (wherein debt is valued at embedded cost, not at the market cost of debt), the conclusion that the allowed rate of return is above (below) the cost of capital when the market-to-book value ratio is above (below) one remains true.[11] The traditional estimate of the cost of capital is however not too problematic as long as the inputs to the return on equity estimation are reflected reasonably accurately. There are compelling reasons to conclude however that the company's implementation of the DCF approach leads to an upward-biased estimate of the cost of equity, precisely due to the reliance on inaccurate inputs.

[10] *See* "The Cost of Capital to a Public Utility", Myron J. Gordon, 1974, Pages 9-10.

[11] *Id.* at 8.

First, the standard DCF model is based on the premise that all key variables like the stock price, book value, earnings, and dividends grow at the same rate in the long-run, and in the absence of external financing, market price converges to the book value. Theoretically, a market-to-book ratio that is significantly greater than one at any point in time implies that investors in general expect the price over earnings ratio to decrease in the long-run. This translates into a growth projection for stock price that lags the growth projection for earnings growth. Under the standard DCF construct, since in the long-run both the stock price and earnings are premised to grow at the same rate, the long-term equilibrium growth lies somewhere between the expected earnings growth and the expected growth in price. In the current environment, the exclusive use of earnings growth projections theoretically leads to an upward-biased estimate of the DCF growth component, and consequently produces an upward-biased estimate of the opportunity cost of equity.[12]

Second, very importantly, analysts' growth estimates have been shown to be overly optimistic and overstate the actual reported earnings. It is instructive to look at "The Cost of Capital - A Practioner's Guide," by David C. Parcell, prepared for the Society of Utility and Regulatory Financial Analysts (2010 edition), pages 142-43, specifically for the insight that follows:

[12] It is instructive to see Roger Morin's *Regulatory Finance*, Utilities' Cost of Capital, Public Utilities Report, Inc. (1994), page 123. Dr. Morin states that the "[a]pplication of the standard DCF model would result in a downward-biased estimate of the cost of equity to a public utility whose current market-to-book ratio is less than 1 and that is expected to converge toward 1 by investors." This is because investors recognize that a continuous divergence away from a market-to-book ratio equal to one is unsustainable. Investors' expectation about increase or decrease in the market-to-book ratio affects the growth component of the DCF model, biasing its result positively or negatively. When the market-to-book ratio is less than one, it is reasonable to assume that the investors expect the ratio to increase. The expected growth increase in market-to-book ratio results in price appreciation that exceeds the growth in earnings and application of the standard DCF approach will lead to a downward-biased estimate of the cost of equity. In contrast, when the market-to-book ratio is significantly greater than one, it is reasonable to assume that the investors expect the ratio to decrease. In that case, the expected decrease in the market-to-book ratio results in price appreciation that lags the growth in earnings and the application of the standard DCF approach will produce an upward-biased estimate of the cost of equity (k).

> A study by Dreman and Berry concluded that consensus estimates of EPS differ significantly from actual reported earnings. They also concluded that the average error appears to be increasing over time and that analysts are optimistic on average. They conclude "These findings question the use of finely calibrated earnings forecasts that are integral to the most common valuation/models and indirectly question the valuation methods themselves" (Dreman and Berry, 1995, 30). A similar study by Clayman and Schwartz compared Zacks Investment Research EPS projections with actual EPS for 399 companies for the period 1982-1992. They concluded that analysts' forecasts of EPS overstated actual EPS by as much as fifty percent. They conclude "…market participants should take analysts' innate overestimation biases into account when making stock valuation judgments" (Clayman and Schwartz, 1994, 68). Still another study by Chopra (1998) concluded 'Analysts' forecasts of EPS and growth in EPS tend to be overly optimistic. He concluded that analysts' forecasts of EPS over the past 13 years have been more than twice actual growth rate.[13]

To prevent reliance on overly optimistic and overstated growth earnings, it is important that at the minimum the DCF growth variable input should not be solely based on earnings growth projections or any other solitary variable's growth projections. I discuss this issue in greater detail in subsection III.A to further support this conclusion.

III. ESTIMATING COST OF EQUITY USING SEVERAL APPROACHES

Q. Which approaches have you used to estimate the cost of equity?

A. While I have relied primarily on the DCF construct to estimate the cost of equity for the utility, I have also estimated the cost of equity using the CAPM construct. As for the DCF construct, I have used the standard DCF approach (subsection III.A), where the cost of equity is estimated as the sum of the dividend yield and a measure of the growth component. While I

[13] Not surprisingly, one research thread on investors' projection of earnings per share (EPS) growth has been to explain the "optimistic bias in earnings forecasts by security analysts". The explanations include strategic reporting bias, selection bias, cognitive bias, and bias due to skewed distribution of earnings and analysts' efforts to produce more accurate forecast. See "Earnings skewness and analyst forecast bias", Zhaoyang Gu & Joanna Shuang Wu, Journal of Accounting & Economics 35(2003) 5-29, page 6.

have derived an estimate of the cost of equity using the CAPM approach (subsection III.B), for reasons I discuss later, I do not base my point-estimate recommendation on that method. The CAPM estimation is nevertheless useful as it provides a check on the reasonableness of the DCF estimates.[14] In each of these subsections I comment on Mr. Cochrane's analysis to the extent it is relevant to my recommendation. Finally, I conclude this section with my recommendation on the cost of equity for Granite State Electric.

Q. Apart from your preference for the DCF approach due to market-to-book ratio consideration, are there other reasons why you rely primarily on the DCF construct to estimate the cost of equity?

A. Of the methods that Mr. Cochrane used to estimate his recommended cost of equity, CAPM predominantly uses historical data as the basis for measuring the expected return on common equity. Compared to attempts at forward-looking estimations, CAPM relies to a great extent on the historical trends in stock prices, for example, to measure the betas required for the CAPM analysis. This may provide insight into what returns investors expect based on past experience, but it has somewhat limited value in assessing what returns are necessary to attract needed capital going forward. By contrast, the DCF approach is essentially forward looking. Also, the fundamental underlying construct behind the DCF analysis, i.e., the value of a common stock equating to the sum of the discounted stream of future income from that stock, is widely accepted. Further, regarding the techniques that are used to estimate the cost of equity for regulated utilities, the DCF model is the most commonly used model for estimating the cost of

[14] When the market-to-book ratio remains consistently significantly higher than 1, the CAPM estimate tends to be upward biased and provides some direction towards what would be a reasonable allowed return on equity, even when one bases that allowed return on the DCF construct.

common equity for public utilities.[15] In fact, the Commission in New Hampshire has predominantly relied on the DCF construct previously.

III.A Discounted Cash Flow Approach

Q. Which DCF model do you use to estimate the cost of equity?

A. I use a single-stage DCF model to derive estimates for the cost of equity for a group of companies that forms a reasonable proxy for Granite State Electric. The two essential elements of this method are the dividend yield and the growth component. While I discuss the estimation of both elements later in detail, it is important to point out that the growth component of the DCF equation tends to be the most critical element in the use of the DCF methodology. A couple of things render the estimation of the growth component somewhat challenging. First, while the growth component of the single-stage DCF model is in principle meant to be based on long-term projections, in practice, it is based at most on three-to-five-years' projections, since long-term projections are seldom available. Second, "it is reasonable to believe that investors, as a group, do not utilize a single growth estimate when they price a utility's stock."[16] While growth projections by equity analysts are available on variables like earnings, dividends, book value per share, among other things, what weight one should give to different projections is often a matter of contention. Unlike Mr. Cochrane's approach, which relies only on earnings growth to estimate the growth component, I have relied on three estimates for the growth component: (1) the average of the growth rates in earnings per share (EPS), book value per share (BVPS), and

[15] See "*The Cost of Capital - A Practioner's Guide*," by David C. Parcell, prepared for the Society of Utility and Regulatory Financial Analysts (2010 edition), Page 124.

[16] *The Cost of Capital - A Practitioner's Guide*, by David C. Parcell, prepared for the Society of Utility and Regulatory Financial Analysts (2010 edition), page 146.

dividends per share (DPS); (2) earnings growth only; and (3) sum of internal growth rate, i.e., *br*, and the external growth component, i.e., *sv*.[17] Of course, I strongly disagree with Mr. Cochrane's sole reliance on earnings growth projections for reasons already discussed, but also I do not believe that investors rely only on earnings growth rates when they price a utility's stock. I discuss this in greater detail later.

Q. Briefly describe the Single Stage DCF Method.

A. The single-stage DCF model is typically represented by the equation, $K = \frac{D_1}{P} + g$ where *K* is the estimate of the cost of equity, $\frac{D_1}{P}$ is next period's dividend yield, i.e. next period's dividend divided by the stock price, and *g* is the expected (constant) growth rate in dividends. The model is based on the premise that since cash dividends are the only income from a share of stock held in perpetuity, the value of that stock is the present value of its stream of future cash dividends, where the discount rate is the market's required return, i.e., *K*. Expected future dividends are represented by applying a constant growth rate to the current observable dividend, to obtain the functionally elegant expression for *K*.

Q. What criteria did you use to select the DCF proxy group?

A. When choosing my recommended sample, I effectively began with Value Line's universe of electric companies (Value Line Electric Universe) that Mr. Cochrane subjected to his proxy screening analysis. I find that all but the fourth criteria that were used by him are reasonable; see Company's Testimony at page II-465, lines 13-21. To ensure that the companies selected for Granite State Electric's proxy group are predominantly regulated electric utilities, I only

[17] The alternative is based on the formula, *br + sv*, where *b* is the retention ratio, *r* is the expected return on equity, *s* is the expected funds raised from the sale of stock as a fraction of existing equity, and *v* is (1-(B/P)), where B is the book value of the share and P is the price of the share.

included them in the proxy group if at least 70 percent of the revenues over 2015 are attributable to regulated electric business and at least 80 percent of the assets are attributable to regulated business over 2016-2018.

Q. Why do your criteria differ from that of Mr. Cochrane's criteria?

A. In creating a reasonably "pure play" proxy group that is comparable to Granite State Electric it is important that these companies exhibit a fairly high percentage of regulated assets in total assets and have the majority of their revenue coming from electric regulated operations. To better assess whether a company should be included in a proxy for Granite State Electric, I believe we should strive to have it sufficiently reflective of a "pure play" regulated electric utility. I find that cut-offs of at least 80 percent for regulated assets and at least 70 percent for regulated electric revenues are reasonable, given the dearth of standalone companies that are publicly traded and consist solely of regulated electric business.

Q. What is your recommended DCF proxy?

A. Using information provided by the Company in response to data requests about Value Line electric companies and additional research of 10-K forms and SNL data, and applying the cut-offs of 70 percent for electric revenue in total revenue and 80 percent for regulated assets in total assets, I preliminarily determined the list of companies that exceed those cutoffs. I then, based on the latest information, applied the other screening criteria (same as Mr. Cochrane's criteria) to determine that the appropriate proxy group consists of (1) Alliant Energy Corporation (LNT), (2) Ameren Corporation (AEE), (3) American Electric Power Inc. (AEP), (4) Avista Corporation (AVA), (5) Consolidated Edison (ED), (6) Duke Energy Corporation (DUK), (7) Edison International (EIX), (8) Evergy Inc. (EVRG), (9) Eversource Energy (ES), (10) Entergy Corporation (ETR), (11) First Energy Corporation, (12) IDACORP, Inc. (IDA), (13)

NorthWestern Corporation (NWE), (14) OGE Energy Corporation (OGE), (15) Pinnacle West Capital Corporation (PNW), (16) PNM Resources Inc. (PNM),(17) Portland General Electric Company (POR), (18) PPL Corporation (PPL), (19) Southern Company (SO), and (20) XCEL Energy Inc. (XEL).[18] I have eliminated El Paso Electric Company from the proxy group as it in the process of being acquired by Infrastructure Investments Fund (IIF). The transaction will require approvals from Public Utilities of Texas, New Mexico Public Regulation Commission and Federal Energy Regulatory Commission. That creates some uncertainty as to whether the transaction will materialize. I would also consider such a transaction transformative enough that it is reasonable to exclude the Company from the proxy group.

Q. Do you believe that the group listed above is a reasonable proxy for Granite State Electric?

A. Yes, I do. The screening criteria go a long way in ensuring that my proxy group reasonably reflects the risk profile of Granite State Electric's electric utility business. For example, the proxy group's average percentage of assets subject to electric utility regulation is 95 percent and the average percentage of revenue subject to regulated electric business is 90.8 percent in 2015, which are reasonably close to complete regulation as is the case for the distribution business of Granite State Electric in New Hampshire. Also, a check (see Schedule PKC-1) reveals that the S&P credit-ratings for the group range between BBB to A-. The rating associated with Algonquin Power & Utilities Corporation (Granite State Electric's parent) is BBB. As for the capital structure, the company has proposed a common equity ratio of 55 percent. A look at the proxy group indicates that over 2016 to 2018 the average equity ratio has been 46.7 percent. (Schedule PKC-2 for Value Line data). While Granite State Electric's parent has a rating that is lower than the average credit rating of the proxy group, the company's

[18] The abbreviations represent the ticker symbols.

proposed capital structure is less leveraged than that of the proxy group's capital structure. It is reasonable to conclude that the proxy group's cost of equity estimate would reasonably inform what the allowed returns on equity and capital should be for the company.

Q. Did you consider any additional check on the reasonableness of your DCF proxy?

A. Yes. As a rough check to examine the reasonableness of the OCA proxy group, I also briefly looked at the economic conditions characterizing New Hampshire relative to the nation based on state coincident index data provided by the Federal Reserve Bank of Philadelphia. As for August 2019 year-to-year growth in the index, while New Hampshire grew by 3.5 percent, the US economy grew by only 2.85 percent. Also, as for the states served by the companies included in the proxy, the corresponding growth rates varied between -0.12 percent and 4.35 percent. Only 6 of the relevant 41 states registered higher growth compared to New Hampshire.[19]

Q. What bearing do the economic conditions, as described above, have on the reasonableness of the DCF proxy group?

A. Investors are assumed to be aware of current regional and national economic conditions. Investors in Granite State Electric's distribution business in New Hampshire are expected to know that the local economy has been outperforming the national economy as well as states in which the proxy group's businesses operate. An investor's opportunity cost of equity, i.e., investor's required return, is expected to be lower for investing in an economic activity in New Hampshire when compared to investing in a comparable activity operating in an environment

[19] "The coincident indexes combine four state-level indicators to summarize current economic conditions in a single statistic. The four state-level variables in each coincident index are nonfarm payroll employment, average hours worked in manufacturing by production workers, the unemployment rate, and wage and salary disbursements deflated by the consumer price index (U.S. city average). The trend for each state's index is set to the trend of its gross domestic product (GDP), so long-term growth in the state's index matches long-term growth in its GDP." *See* https://www.philadelphiafed.org/research-and-data/regional-economy/indexes/coincident.

that is relatively less robust, all else equal. In view of all of these considerations, it is my conclusion that the proxy group, as chosen is rather conservative and reasonable.

Q. Please explain why you used pricing data from October 31, 2019 to November 29, 2019 to measure the dividend yields for the proxy's constituent companies.

A. Investors' expectations about how companies will fare in the future are captured in the most recently observed market price and dividend data. Data from fairly long historical periods are unlikely to reflect investors' current expectations. That said, it is also true that some smoothing of the price trend is useful as it filters possible transitory and temporary changes that characterize daily movements in prices. I have, therefore, as of preparing this testimony, used daily pricing data from the most recent month to calculate the average price, which in conjunction with the annualized dividend helps measure the dividend yield (Schedule PKC-4) component of the DCF based cost of equity.

Q. Mr. Cochrane exclusively uses expected earnings growth rates for the growth component in his single-stage DCF analysis. Do you agree with his approach?

A. No. It is unreasonable to assume that investors use a single growth estimate when pricing a utility's stock.

Both market realities and research indicate that not all investors are alike and they do not only care about earnings growth. While providing a review of dividend policy theories and evidence, Malkawi, Rafferty and Pillai (2010) survey academic research that explores why dividends matter to investors.[20] Different researchers have provided empirical support for different theories. To just note a couple of them, some have argued that dividends are sought as

[20] *See* "*Dividend Policy: A Review of Theories and Empirical Evidence*," Malkawi, Rafferty, and Pillai, International Bulletin of Business Administration, ISSN: 1451-243X Issue 9 (2010). Even managers need to consider dividends policy carefully because investors not only view dividends as being a return to shareholders but also watch movements in dividends to infer about the health of the firm. *See* "*Topics in Finance Part VII – Dividend Policy*" Judy Laux, American Journal of Business Education – November 2011, Volume 4, Number 11.

investors prefer "bird in the hand" dividends rather than "two in the bush" future capital gains. Others have argued that investors care about after-tax return and the differential tax treatment of capital gains and dividends influences their demand for shares. In discussing why dividends matter, some of the theories and empirical analysis directly stress how different investors may view dividends differently. For example, investors whose dividends are taxed higher than their capital gains may prefer earnings-driven stocks rather than dividends paying stocks, or how institutional investors as opposed to individual investors are more attracted towards dividend-paying stocks, etc. It also remains true that companies pay out dividends in billions of dollars in the marketplace suggesting that companies recognize that investors value them. I believe it is inappropriate to assume that only earnings growth expectations matter to investors.[21]

Q. What measures of the growth component do you consider?

A. Since the DCF estimate is derived from the concept that cash dividends are the only income from a share of stock held to infinity, in principle, it is the growth in dividends that should be used for the growth component. Investors, however, have different expectations about growth and no single indicator captures the expectations of all investors. Also, whether growth in dividends per share (DPS) is sustainable or not is pertinent and its sustainability is affected by how both earnings per share (EPS) and book value per share (BVPS) perform in the future. Sustainability of growth in dividends under the DCF construct assumes that EPS, DPS and BVPS will grow at the same rate in the future. Value Line five-year projections for the growth rates in earnings, dividends and book value, however, reveal that these financial variables are expected to grow at significantly different rates over the next three to five years.

[21] *See also The Cost of Capital - A Practitioner's Guide*, by David C. Parcell, prepared for the Society of Utility and Regulatory Financial Analysts (2010 edition), page 146.

In view of that, sole reliance on either dividends growth rate, book value growth rate or earnings growth rate is unlikely to produce a reliable measure of the DCF growth component. I instead use the average of the three expected growth rates as one of the measures for the growth component to represent the growth component in the DCF analysis. One may reasonably assume that the sustainable long-run growth rate to which earnings, dividends and book value growth rates may converge in the future is represented by their average, rather than just one of those variables. I have used the average of the Value Line five-year projections for growth in DPS and BVPS *and* the average of the Value Line, Zacks and SNL median long-term projections for EPS growth rates to calculate the growth component. While in principle the single-stage DCF model is meant to be based on long-term projections, its application however is based on at most five-year projections, as truly long-term projections are seldom available.

I have also considered a second measure of the growth component, which is based on estimates for the internal and external components for growth, retention ratio, expected return on common equity, market-to-book ratio, and growth in the number of outstanding shares (called retention growth). Finally, even though I have reservations about Mr. Cochrane's sole reliance on earnings growth as a measure of the growth component, I considered and applied that approach to my proxy to derive another DCF estimate for the cost of equity (*see* Schedule PKC-5 for the calculation of the growth components; *see also* Schedules PKC-6 and PKC-7 for the inputs for external and internal growth components).

Q. Please explain how you estimate the growth component based on the retention ratio, expected return on common equity, market-to-book ratio, and growth in the number of outstanding stocks.

A. I have used Value Line's expectation regarding retention ratios and returns on equity for five years into the future to derive estimates for *b* and *r* and have used them to calculate the expected internal growth component, i.e. *br*. To account for growth expectations from external financing and derive estimates of the external growth component, I have also used the latest market-to-book ratios from Yahoo Finance and the average of Value Line's five-year projections for the number of outstanding shares. That is helpful in calculating the external growth component, i.e. $s_e v$, where s_e = expected funds raised from sale of stock as a fraction of existing equity, and $v = \left(1 - \frac{B}{P}\right)$.[22] The revised formulation for the growth component can be alternatively expressed as $b_e r_e + g_e\left(\frac{P}{B} - 1\right)$, where g_e is the expected growth rate in the number of outstanding shares. In short, the growth component can be viewed as the sum of the "internal" growth rate, i.e. $b_e r_e$, and the "external" growth rate, i.e. $g_e\left(\frac{P}{B} - 1\right)$.

Q. Do you employ any outlier-determination approach?

A. Yes.

Q. Please describe your outlier-determination approach.

A. I have employed the statistical outlier-determination approach that cost of equity estimates lying outside the bandwidth of the mean plus or minus two times the variance are not statistically representative of the proxy. In terms of probabilistic distribution terminology, this selection criterion effectively mimics the widely-used statistical confidence interval of 95 percent. I have also eliminated ROE estimates that are less than the recent yield on Utility A

[22] See "*The Cost of Capital to a Public Utility*," Myron Gordon, MSU Public Utilities Studies (1974), page 30.

preferred stocks, i.e. 5.99 percent *plus* 50 basis points (see Value Line's Selection & Opinion, November 29, 2019).

Q. What are the DCF estimates for your proxy?

A. The single-stage DCF estimate, based on the average expected growth rates in earnings, dividends and book value, is 8.05 percent. Schedule PKC-8 provides the calculations. When only the EPS growth rate is used for the growth component, the single-stage DCF method produces an estimate of 8.48 percent. When the "internal-plus-external" growth approach is used, the DCF method produces an estimate of 8.15 percent. I have applied my recommended outlier-determination criteria in deriving these estimates.

Q. While Mr. Cochrane provides DCF estimates using the multi-stage DCF approach, you have not done so. Why?

A. The Multi-Stage approach relies on one's judgment over how growth rates will pan out in the future. It is no different from the kind of judgment I have applied with respect to weighting different growth estimates even though they are all derived from applying the single-stage DCF approach. Also, one of the primary uses of the Multi-Stage DCF approach is for a company that is not in a sufficiently stable environment. Certainly, with respect to Granite State Electric, there is no reason to believe that is the case. I, therefore, do not conduct a Multi-Stage DCF estimation for the return on equity.

Q. Mr. Cochrane recommends adjustment for flotation costs in his estimates of the cost of equity. Do you agree with that adjustment?

A. No. As I have noted already, the DCF approach, informed by equity analysts' projections, in practice relies on investors' expectations about earnings and dividends and other relevant variables over three to five years. Even with reasonable treatment of the DCF growth

component, the approach tends to internalize the medium term expectation that the market-to-book ratio will persist at levels relatively close to what is currently being observed. Given the reliance at best on medium term expectations, we tend to derive estimates of the ROE that are sufficiently above the true cost of equity in a setting where the stock prices are significantly above the book value. Flotation cost is effectively small enough that my recommended return on equity, which relies on investors' expectations of persistence in the market-to-book ratio being significantly greater than one, already accounts for such costs adequately. Any further adjustment would simply unnecessarily transfer wealth from ratepayers to shareholders.

Q. Do you agree with Mr. Cochrane that there is a need to adjust the return on equity upward due to the consideration of small-size premium?

A. No. Even though he does not recommend an explicit adjustment for small-firm effect, Mr. Cochrane devotes part of his testimony to why he thinks the allowed return on equity should build in some slack for such an adjustment. The Commission should not allow any accommodation of the small size premium. First, there is counter-evidence indicating that the small-firm effect is too dependent on the time-period chosen for analysis, and is dependent on the month of January for high stock price returns. Second, there is also counter-evidence that the size effect may not apply to regulated utility operations.[23]

III.B Capital Asset Pricing Model (CAPM)

Q. Briefly describe the CAPM method.

A. The CAPM method recognizes that common equity capital is more risky than debt from an investor's standpoint, and that investors require higher returns on stocks than on bonds to be

[23] *See, e.g.*,, Block, S.B., "*A Study of Financial Analysts: Practice and Theory*," Association for Investment Management Research (July/August 1999); and Wong, A., "*Utility Stocks and the Size Effect: An Empirical Analysis*," Journal of the Midwest Finance Association (1993).

compensated for the additional risk. The cost of common equity under CAPM is represented by the following equation: $K = R_f + \beta_s * (R_M - R_f)$ where *K* is the cost of equity, R_f is the yield on risk free securities, R_M is the expected return on the overall market and $(R_M - R_f)$ is the equity risk premium demanded by shareholders to accept equity relative to debt. β_s is the average beta of a group of comparable-risk companies that is used to adjust the risk premium to measure risks specific to the regulated utility in question.

Q. What is Mr. Cochrane's estimate of the cost of equity based on the CAPM method?

A. Mr. Cochrane derives a CAPM estimate of ROE using information from SP 500 stocks by applying the DCF construct to those stocks to estimate the expected return on equity and the yield on 30-year Treasury Bond. His CAPM-based ROE estimate is 10.66 percent.

Q. Do you agree with Mr. Cochrane's CAPM approach? Please explain.

A. No. I do not agree with his approach to measure market risk premium. The disagreement is both with respect to how he measures risk-free return and how he calculates market returns. I discuss these considerations below.

Q. Why do you disagree with Mr. Cochrane's specification of the risk-free rate?

A. I do not agree that the yield on 30-year Treasury bond is a reasonable proxy for the risk-free rate. Strictly speaking, the risk-free return is best captured by short-term Treasury bills, but in recognition that utility rates are usually set for longer periods and interested investors typically have relative long investment time horizons, longer-term bonds are used to capture the risk-free rate when applying CAPM to estimate the cost of equity.

It should be understood that long-term bonds are not risk-free for two main reasons: default (credit) risk and interest rate risk. As for the interest rate risk, the longer termed a default-free bond is, the greater is its interest rate risk. The 10-year Treasury long-term bond is

my preferred metric for the risk-free rate when conducting CAPM analysis for regulated companies. It strikes a reasonable balance between choosing a truly interest rate risk-free instrument (like the shortest of short term Treasury bills) and a consideration that investors have relatively long investment horizons and that regulated utility rates are usually set for longer terms than just a few months. [24]

Q. You stated that you do not agree with Mr. Cochrane's approach to calculate market returns. Please explain why.

A. My reservations about Mr. Cochrane's approach stem from two reasons that are related to how he employs the DCF approach in estimating the market returns.

First, I disagree with the sole reliance on earnings growth projections to estimate the DCF growth components, as was discussed before in the section on DCF estimation of the proxy group's cost of equity.

Second, I do not agree that information from stocks that have zero dividend yields should be relied upon significantly to estimate the DCF based market returns. The DCF construct is intrinsically based on modeling net present value of dividend yields that investors receive. Such a construct ideally should not be applied on stocks that do not provide any dividends.

The OCA's CAPM estimation is discussed below in detail by going through the inputs one-by-one.

Q. What beta measures do you use for your sample?

A. I use Value Line beta estimates for the companies that are in the OCA's proxy group (see Schedule PKC-9) to derive the average beta for those companies. The proxy beta is 0.58.

Q. How do you calculate the equity risk premium?

[24] For a good discussion on the determination of risk-free rate, see "*What is the Risk Free Rate? A Search for the Basic Building Block,*" Aswath Damodaran, Stern School of Business, New York University, December 2008.

A. Two key elements in the determination of the equity risk premium are the risk-free rate and the expected return on the market portfolio. As a proxy for the risk-free rate, as already discussed earlier, the OCA relies on the average of the current yields on the 10-Year Treasury bond observed over the last month. The average yield over October 31, 2019 to November 29, 2019 has been 1.81 percent.

As for the expected market returns, I applied the DCF construct to the S&P 500 companies essentially using the same approach that Mr. Cochrane followed, but for the DCF growth components, I use not only earnings growth projections, but also latest Value Line dividends and book value growth projections to derive three capitalization-weighted estimates of the expected market return.

Q. How did you derive the three market return estimates?

A. First, using data for only dividend paying stocks from the S&P 500 universe, I derive an estimate of market return that relies on only earnings growth projections. Again using data from only dividend paying stocks, I derive the second estimate of market return relying on the average of the earnings, dividends, and book value growth projections. Finally, using data for all stocks in the S&P 500 universe, I derive the third market return estimate relying on only earnings growth projections. The calculations are reported in Table 1.

As for the sample of companies, while the starting group of companies is same as the S&P 500 companies analyzed by Mr. Cochrane, to ensure that we are consistently looking at the same companies as a group in deriving the market returns for each of the samples informing the three estimates, I have only considered companies for which information is available for all of the required input variables.

Table 1: CAPM Cost of Equity Estimates			
	CAPM1	**CAPM2**	**CAPM3**
	Dividend Paying S&P 500		**All S&P 500**
	EPS growth projection	***Average EPS, DPS & BVPS growth projections***	***EPS growth projection***
DCF Market Return (a)	12.83	11.96	14.41
Risk Free Return (b)	1.81	1.81	1.81
Market Beta (c)	1.003	1.006	1.023
Risk Premium (a)-(b)	11.02	10.15	12.60
Beta adjusted RP (d) = ((a)-(b))/(c)	10.99	10.09	12.32
Proxy group beta (e)	0.58	0.58	0.58
CAPM ROE estimate (b)+(e)* (d)	8.20	7.68	8.98

For the first estimate that relies on information from only dividend-paying stocks, a company is dropped if Value Line does not have data on earnings growth projections, market capitalization or betas. For the second estimate, a company is dropped if Value Line does not have its data for any one of the growth projections (earnings per share, dividends per share or book value per share), market capitalization or betas. For the third estimate, that uses information from all stocks (irrespective of whether those stocks pay dividends) I ignore the companies for which I did not have data for market capitalization, earnings growth projections, or betas (as downloaded from Value Line).

Q. Please summarize the market return estimates.

A. Schedule PKC-11a and PKC-11b report the OCA analyses that rely on Value Line data latest as of November 21, 2019. The resulting expected market returns for the apposite Value Line samples are 12.83 percent, 11.96 percent and 14.41; *see* Table 1. For these estimates, I appropriately adjusted the market capitalization weights to ensure that the weights added up to one for the different samples associated with the estimations. Also, in deriving the projected dividend yields, I applied the same approach that Mr. Cochrane used in his testimony.

Q. Please describe how you estimate the market risk premiums.

A. To derive the market risk premium, the difference between the relevant market return and the bond yield is *divided* by the market-capitalization weighted mean of Value Line betas of the constituent stocks. Doing so is appropriate, as the market proxy in the derivation of the Value Line betas (that would be associated with a beta of one) is expected to be different from that associated with the S&P 500 universe. The betas associated with the proxy groups associated with estimates CAPM1, CAPM2, and CAPM3 are 1.003, 1.006 and 1.023, respectively.

Q. What are your estimates for market-risk premium?

A. When only the dividend-paying subset of stocks in the S&P 500 index is considered, and only EPS growth projections are relied upon to measure the market returns, the estimate of equity risk premium is (12.83 percent *less* 1.81 percent) divided by 1.003, which is the market-capitalization weighted mean Value Line beta for the dividend-paying subset of the sample. The estimate is 10.99 percent.

The same approach was employed to derive the second estimate of the market risk premium relying on the average of EPS, DPS, and BVPS growth projections and information from only dividend-paying S&P 500 stocks. The estimate is 10.09 percent.[25]

Finally, using all stocks in the S&P 500 index, when only EPS growth projections are relied upon to measure the DCF based market returns, the estimate for equity risk premium, is 12.32 percent.

Q. What are the estimates of the cost of equity for the Granite State Electric proxy group based on the three estimated market risk premiums?

A. The last row of Table 1 reports the three estimates. CAPM1, CAPM2 and CAPM3 ROE estimates are 8.20 percent, 7.68 percent and 8.98 percent, respectively.

[25] All numbers reported here are rounded.

III.C Conclusion

Q. Please summarize your cost of equity estimates.

A. The table below reports the cost of equity estimates based on the different methodologies that the OCA relied on.

Table 2: Summary of Cost of Equity Estimates	
DCF (traditional: EPS, BVPS & DPS average)	8.05
DCF (traditional: EPS)	8.48
DCF ($g=br+sv$ Method)	8.15
CAPM1	8.20
CAPM2	7.68
CAPM3	8.98

Q. What is your recommendation on the allowed rate of return on equity?

A. Table 2 above summarizes estimates of cost of equity that the OCA's analysis produced. The average of those estimates is 8.26 percent. The range of estimates is 7.68 percent to 8.98 percent. The OCA recommends using solely the DCF approach in estimating the cost of equity, for reasons that were discussed in Sections II and subsection III.A. As stated earlier, the CAPM based cost of equity was estimated mainly as a check. The average of all of the DCF estimates is 8.23 percent. As for a specific point estimate, the OCA therefore recommends an allowed return of 8.23 percent. With respect to what constitutes a reasonable range of allowed return on equity, the OCA recommends 8.15 to 8.35 percent.

Q. Does this conclude your testimony?

A. Yes, it does.