STATE OF NEW HAMPSHIRE
BEFORE THE
PUBLIC UTILITIES COMMISSION

In the matter of

Liberty Utilities (EnergyNorth Natural Gas) Corp.

Docket No. DG 17-048

Petition for Permanent Rate Increase

DIRECT TESTIMONY

OF

Dr. Pradip K. Chattopadhyay
Assistant Consumer Advocate

November 30, 2017

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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 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 16-384 – Petition of Unitil for Permanent Rate Increase
- DG 16-852 – EnergyNorth's Petition for Lebanon-Hanover Franchise Approval.

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 EnergyNorth Natural Gas ("EnergyNorth"), 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 EnergyNorth's recommendations on cost of equity, and articulate reasons why I agree or disagree with those recommendations.

Q. What Rate of Returns on Equity and Capital are the Company requesting in this case?

A. The Company is requesting a return on common equity (ROE) of 10.30 percent. Based on the embedded cost of debt, and the requested capital structure, the Company is seeking approval of 7.37 percent return on capital.

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

A. I am recommending a return of equity of 8.40 percent as a 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. 8.20 percent to 8.50 percent.

Q. Please discuss how your testimony is organized.

A. As for what follows, section II briefly reports my analysis of implications of observed market-to-book ratios in the natural gas utility industry.[1] 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. Section IV includes the schedules that inform the OCA's analysis. Finally, Section V provides Attachment 1.

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 natural gas utility industry and EnergyNorth'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 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.

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

Second, whether or not 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 the discussion of the first two reasons mentioned above, but I also focus on empirical evidence backing the theoretical underpinnings discussed. The need for tracking the market-to-book ratios of the constituent companies in the proxy group is primarily taken up in detail in section IIIA.

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, 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 would continue to remain substantially higher than one, if to begin with the market-to-book ratio is significantly greater than one. I delve into this issue in greater detail when I discuss the characteristics of the DCF approach, especially as it is practically implemented; *see infra* at Pages 16-19. The methods in the current environment, therefore, will 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

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

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

[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.

[3] Morin, R. *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.

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, i.e. $B(r_e - b_e r_e)$, on the stock equals the minimum required dividend, i.e. $P(K - b_e r_e)$. A look at comparative statics is helpful. Everything else being equal, if the expected return on equity 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.[4] However, if the cost of equity for the same stock, *K*, is 8 percent, then $(K - b_e r_e)$ must be 5 percent.[5] 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.[6]

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

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

[6] "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 is the need to avoid unnecessary wealth transfer from ratepayers to shareholders. To properly balance the interests of ratepayers and the financial viability of the utility, 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 natural gas utility industry's market-to-book ratios?

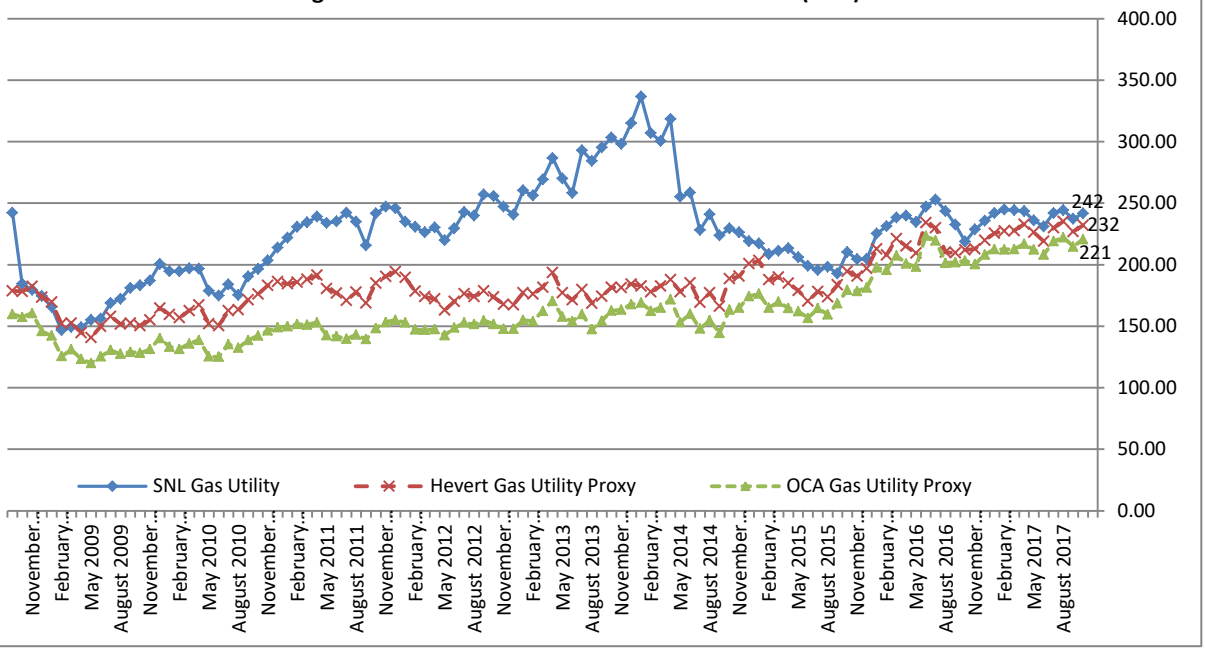
A. Yes, I have. But as the objective of my analysis is to recommend the rate of return on EnergyNorth's equity, I have also analyzed the market-to-book for Mr. Hevert's recommended proxy group and OCA's recommended proxy group. These are

depicted in Figure 1 below. As for the natural gas industry's situation, I have used SNL's Index, i.e. SNL Gas Utility.

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

A. Figure 1 shows that the average market-to-book-ratio of SNL Gas Utility index as well as Mr. Hevert's proxy group have remained persistently well above one over the past six years; the average market-to-book ratios for SNL Gas Utility and Mr. Hevert's proxy group over the last six years have been 2.44 and 1.93, respectively.[7] As for the OCA's proxy group, the average market-to-book ratio for the corresponding period has been 1.75.

Figure 1: Market-to-Book Ratios of Gas Utilities (in %)



[7] Data downloaded from SNL on October 26th, 2017.

More importantly, as for the more current market-to-book ratios (beginning of November, 2016), they are 2.42, 2.32 and 2.21 for SNL Gas Utility, Hevert's proxy and the OCA's proxy, respectively. This indicates that the true cost of equity currently is comfortably less than the return on equity expected by investors in natural gas utilities. In view of that, if the cost of equity is plainly 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. Out of the three primary methods that Mr. Hevert 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 be further away from the true cost of equity.

As for the Risk Premium Method (RPM), Mr. Hevert uses historically allowed returns on equity to calculate the risk premiums. Using historical data on allowed returns and treasury yields to inform cost of equity (which is inherently a forward-looking concept) is inappropriate. Even setting that issue aside, to the extent allowed returns have captured the impact of price appreciation resulting from greater divergence between allowed returns and the true cost of equity, the method is susceptible to producing estimates that will have the same problem that the CAPM approach has.

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 in 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 in 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. 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)."[8] In the traditional model (wherein debt is valued at embedded cost), while 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,[9] the estimate of the cost of capital is not problematic as long as the inputs to that estimation are reflected reasonably accurately. With respect to the practical implementation of DCF approach to the estimation of cost of equity though, there are compelling reasons to conclude that the approach as proposed by the company leads to an upward-biased estimate of the cost of equity, precisely due to the reliance on biased inputs.

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

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

[9] *id.* at 8.

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.[10]

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:

[10] 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 using expected growth in earnings as a proxy for the growth component 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.[11]

It is important that in determining the cost of equity, at the least, 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 section IIIA to further support this conclusion.

Q. Are you aware that the Company's witness Mr. Hevert appears to disagree that market-to-book-ratios in excess of unity indicate that investors' expected earnings exceed investors' requirements?

[11] Not surprisingly, one research thread on investors' projection of earnings 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 Gu, Z. and Shuang Wu J. "Earnings skewness and analyst forecast bias," Journal of Accounting & Economics 35(2003) 5-29, Page 6.

A. Yes. In his rebuttal testimony in Docket DE 16-383, that was filed beginning of this year, Mr. Hevert examined the empirical relationship between market-to-book ratio and the most recent twelve-month Return on Average Common Equity (See Docket 16-383, Mr. Hevert's Rebuttal Testimony, Bates page 380-81, and Attachment RBH-8) to conclude that there is no basis to conclude that "market-to-book ratios in excess of unity demonstrate earnings in excess of investors' requirements." Since the DCF theory actually models the relationship between *expected* return on equity and market-to-book ratio, not between the *actual earned* return on equity and market-to-book ratio, it is not entirely clear to me whether indeed Mr. Hevert was trying to make the point that market-to-book-ratios in excess of unity do not indicate that investors' *expected* earnings exceed investors' requirements. But, since Mr. Hevert's discussion in the referenced testimony was in response to the OCA's similar discussion about the theoretical relationship that equation (1) captures in this instant testimony, it is important that I share my thoughts about whether Mr. Hevert's empirical treatise in his rebuttal testimony, DE 16-383, at Bates page 380-81, informs the issue of whether market-to-book ratios in excess of unity indicate that investors' expected earnings exceed their earnings requirement.

Q. Please provide your thoughts on the aforementioned empirical evidence that Mr. Hevert had provided in Docket DE 16-383.

A. I respectfully conclude that Mr. Hevert's analysis was devoid of any merits. It is evident that Mr. Hevert, in conducting the empirical analysis, has not captured the

essence of the DCF theory that informs the finding that market-to-book ratios greater than one demonstrate that *expected* earnings are in excess of investors' requirements. First, using *actual* earned returns, as an explanatory variable in the regression, does not conform with the DCF's theoretical construct and has no value in demonstrating that the DCF's implication for the relationship between market-to-book ratio and *expected* return on equity does not hold. The proper approach would be to examine the relationship between current market-to-book ratios and the *expected returns on equity* if one is to objectively examine the veracity of the DCF-construct's implied relationship between market-to-book ratios and expected returns on equity.

Second, not trivially, the econometric framework that Mr. Hevert employs is overly simplistic and is not informed at all by the importance of the true cost of equity inherent to the theoretical DCF construct. His analysis models the market-to-book ratio as *only* a function of the most recent twelve-month Returns on Average Common Equity (ROACE). The correct approach would be to not only replace ROACE with *expected* returns on equity as an explanatory variable, but also to use at least some explanatory variables as a proxy for the cost of equity, if the DCF theoretical construct is to be acknowledged carefully, as explained later.

Q. Did you conduct any empirical analysis to vindicate the DCF based theoretical relationship between market-to-book ratio and expected return on equity?

A. Yes.

Q. Briefly describe your empirical approach and also discuss how it is informed by the DCF theory.

A. I have conducted Ordinary Least Square (OLS) regressions to capture the relationship between market-to-book ratio and *expected* return on equity. Before I delve into the analysis, it is important to emphasize that as far as the DCF theory goes, the relationship between expected returns and market-to-book ratio is not linear. We, therefore, need careful judgment in analyzing the results. For example, using equation (1), we find that the derivative of the market-to-book ratio with respect to *expected* return yields $\frac{(1-b_e)K}{(K-b_e r_e)^2}$. The derivative is clearly a function of K,b_e, and r_e. Also, strictly speaking, the derivative cannot be uniquely estimated for an entire group of Value Line companies. With that caveat, using an OLS regression to investigate the relationship between market-to-book ratio and expected return on equity using company-wise data is still generally helpful, and one would expect the market-to-book ratio would be positively related to the *expected* return on equity, everything else held constant, if the DCF theory is to be validated.

The OLS regressions between market-to-book ratio and *expected* return on equity were conducted using data from US electric and gas utilities analyzed by Value Line. To get a proxy for the cost of equity, I have used Value Line betas and a volatility measure which is calculated as the difference between the high price and low price Value Line projections for 2016-18 *relative to* the sum of those prices as additional

independent variables. Also, I have used a variable representing the share of regulated gas in a company's total assets to see whether there are differences between gas and electric utilities. The construct is in the same vein as James H. Vander Weide and Willard T. Carleton (1988), where the authors, in examining the relationship between growth and price/earnings ratio, used betas, stability of the firm's five-year historical Earnings Per Share (EPS), standard deviation in EPS projection, etc. as a proxy for the cost of equity.[12]

I have used econometric software STATA to conduct two OLS regressions that I have reported below. Both regressions model the key variables, market-to-book ratio (M-to-B ratio) and logarithm of expected return on equity (ln(EROE)), as the left-hand side variable and a right-hand side (RHS) variable respectively.[13] The semi-logarithmic form helps capture a form of a non-linear relationship between the market-to-book ratio and *expected* return on equity in all regressions. OLS1 also models BETA, PVAR, and RGA as the other RHS variables. [14] OLS2 models only PVAR and RGA as additional

[12] Vander Weide, J. and Carleton, W.T., "Investor growth expectations: Analysts versus history", Page 78-82, Spring 1988, The Journal of Portfolio Management.

[13] The dataset is based on Value Line one-pagers that were available latest on October 31, 2017.

[14] OLS1 is formulated as

$$\text{M-to-B Ratio} = \alpha_1 + \beta_1 \times \ln(\text{EROE}) + \beta_2 \times \text{BETA} + \beta_3 \times \text{PVAR} + \beta_4 \times \text{RGA} + \varepsilon_1,$$

OLS2 is formulated as

$$\text{M-to-B Ratio} = \alpha_2 + \beta_5 \times \ln(\text{EROE}) + \beta_6 \times \text{PVAR} + \beta_7 \times \text{RGA} + \varepsilon_2.$$

where ln(EROE) is the natural logarithm of expected return on equity, RGA is share of regulated gas in total assets, BETA is Value Line betas, and PVAR is the ratio of difference between 52-week high and low prices *and* the sum of the two. Also, ε_1 and ε_2 are the residual error terms for the two regressions.

explanatory variables. [15] When the aforementioned regressions are run based on all observations per Value Line's universe of Gas and Electric utilities, one cannot rule out the possibility of heteroscedasticity.[16] However, using an outlier determination diagnostic approach known as "Cook's distance", both OLS1 and OLS2 after dropping outliers yield results, for which, the null hypothesis of homoscedasticity cannot be rejected. As reported in Table 1, the regressions results are based on 1) running OLS1 and OLS2 after omitting AvanGrid (AGR), Scana (SCG) and WGL Holdings (WGL) from the sample, and 2) running OLS1 and OLS2 after omitting only Scana (SCG). I have used STATA's Cook's distance diagnostics to inform the omissions. [17]

Q. Please provide the finding of the analysis.

A. Table 1 below reports the findings. Using a null hypothesis of a coefficient being zero, the relationship between market-to-book ratio and expected return on equity is

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The β_is are the coefficients that linearly relate a variable on the right-hand side with the one on the left-hand side of the equation. For example, β_1 is the coefficient that linearly relates ln(EROE) with M-to-B Ratio. A positive β_1 indicates that Expected ROE is positively related to M-to-B Ratio based on the OLS1 regression. The intercept terms are represented by α_1 and α_2 respectively in the two regressions.

[15] OLS2 was prompted because OLS1 did not produce statistically significant results for BETA even at the 10 percent level of statistical significance. Dropping BETA as an independent variable reduces the R^2 only marginally.

[16] When an ordinary least square regression produces residuals that are not random and are systematically related to some of the independent variables, we get heteroscedasticity. Such a regression yields biased estimates of the regression coefficients. Since a crucial assumption underlying OLS regression is that residuals are randomly distributed, i.e. they exhibit homoscedasticity, it becomes imperative that any OLS regression that produces a statistically significant level of heteroscedasticity be corrected for heteroscedasticity to yield unbiased estimates of the regression coefficients.

[17] Intuitively, Cook's distance measures the influence of an observation by addressing both leverage and discrepancy. While leverage is a measure of how much deleting a particular observation affects the estimated regression coefficients, discrepancy captures the impact on the sum of residual squared errors when an observation is removed. See Attachment 1 for the STATA results.

comfortably statistically significant at the 1-percent level and is positive for all regressions. The R-squares for the regressions range from 0.69 to 0.71.

Table 1: OLS Regression Coefficients: Market-To-Book Ratio And Ln(Expected ROE)				
Outliers omitted	AGR, SCG, and WGL		SCG	
	OLS1	OLS2	OLS1	OLS2
R^2	0.70	0.68	0.71	0.71
Dependent Variable	M-to-B Ratio	M-to-B Ratio	M-to-B Ratio	M-to-B Ratio
Intercept	-3.97 (-6.13)	-3.69 (-5.96)	-3.54 (-6.05)	-3.48 (-6.02)
Ln(Expected ROE)	2.20 (9.33)	2.24 (9.47)	2.05 (9.06)	2.11 (10.00)
BETA	0.63 (1.34)	-	0.35 (0.80)	-
PVAR	3.38 (2.18)	4.05 (2.73)	4.59 (3.06)	4.88 (3.36)
RGA	0.25 (1.85)	0.26 (1.88)	0.27 (1.96)	0.28 (2.06)
The numbers in the brackets are t-statistics				

Q. Do you have additional observations?

A. Yes. Using the averages for the other independent variables, we can calculate the expected returns on equity that produce market-to-book ratios of 1.10 and 2.2 respectively. These are reported in Table 2 below.

Table 2: Implications of the Empirical Results				
Outliers omitted	AGR, SCG, and WGL		SCG	
	OLS1	OLS2	OLS1	OLS2
EROE when M/B=1.1	6.39%	6.46%	6.17%	6.29%
M/B ratio when EROE is approx. 8.40%	1.68	1.67	1.73	1.71
EROE when M/B ratio is 2.2	10.64%	10.65%	10.56%	10.58%

Based on the econometric finding, the return on equity expected with a market-to-book ratio of 1.1 is roughly around 6.30 percent, and at a market-to-book ratio of 2.2,

the return on equity expected is roughly 10.6 percent.[18] Also, it is instructive to see that at an expected return on equity for the proxy gas utility of approximately 8.40 percent, the market-to-book ratio is approximately around 1.7.

The important takeaway from my analysis is that even with my recommended allowed return of 8.40 percent, the market-to-book ratio would still be significantly above one. As will be discussed later in section III.B, this has implications for whether a flotation cost adjustment (as supported by the Company's witness) is reasonable or not.

Q. How do your results compare with that obtained by Mr. Hevert in Docket DE 16-383?

A. In Docket DE 16-383, in his rebuttal testimony, Mr. Hevert investigated the relationship between implied return on equity and market-to-book ratio to show that at market-to-book ratios of near about 1, the implied ROE is absurdly low and therefore disagreed that market-to-book ratios in excess of unity demonstrate earnings in excess of investors' requirements.[19] As I have discussed already, Mr. Hevert's application of the DCF theory to model his econometric analysis is misplaced and should be ignored. A proper modeling, where the relationship between the *expected* ROE and market-to-book ratio is investigated, as was done above, clearly demonstrates that the *expected*

[18] If one uses the OCA proxy's averages for the other independent variables, the expected return at market-to-book ratio of 1.1 for OLS1 and OLS2 is roughly 5.6 percent, and at a market-to-book ratio of 2.2, the expected return on equity is roughly 9.5 percent.

[19] At market-to-book ratios of 1 and 1.1, Mr. Hevert's analysis concluded that the ROEs are respectively 0.79 percent and 1.94 percent.

returns on equity are very realistic at market-to-book ratios of 1 and 1.1, i.e. around 6 percent.

Q. Do you believe that your analysis validates that when the difference between the expected return on equity and the true cost of equity is higher, the market-to-book ratio is higher?

A. Yes, I do.

Q. Please elaborate.

A. The statistically significant (at 1 percent level) positive OLS relationship between expected return on equity and market-to-book ratio indicates that the market-to-book ratio rises when the expected return on equity increases, *ceteris paribus*. Essentially, as the difference between expected return on equity and the true cost of equity increases, the market-to-book ratio increases.

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 (Section III.A), where the cost of equity is estimated as the sum of the dividend yield and a measure of the growth component. As for the CAPM approach (subsection III.B), while I have derived an estimate of the cost of equity, 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.[20] In each of these subsections I comment on Mr. Hevert's analysis to the extent it is relevant to my recommendation. I should also add that unlike Mr. Hevert, I did not use the RPM to derive an estimate of the cost of equity. While I have discussed briefly why previously, I discuss the reasons a little bit more in what follows. Finally, in subsection III.C, I conclude with additional observations and my recommendation on the cost of equity for EnergyNorth.

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. Hevert used to estimate his recommended cost of equity, CAPM and RPM predominantly use historical data as the basis for measuring the expected return on common equity. Compared to attempts at forward-looking estimations, these methods rely to a great extent on the historical trends in stock prices or other relevant variables. This may provide insight into what returns investors expect based on past experience, but it has limited value in assessing what returns are necessary to attract needed capital going forward. While the CAPM model relies on betas that are based on historical stock prices, Mr. Hevert's RPM approach relies on

[20] 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.

regressing risk premiums on 30-year Treasury yields using historic data for the period January, 1980 to March, 2017. Of course, Mr. Hevert also relies on historically allowed returns on equity to calculate historical risk premiums.[21] 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 equates 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 common equity for public utilities.[22] It should be noted that, as Mr. Hevert has acknowledged in his testimony, the Commission in New Hampshire has exclusively 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 EnergyNorth. 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

[21] While the reliance on historical data is problematic, as was discussed before, allowed return on equity in itself is not necessarily a good measure of the true cost of equity at any point in time.

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

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."[23] While growth projections by equity analysts are available on variables like earnings, dividends, and book value per share, among other things, what weight one should give to different projections is often a matter of contention. Unlike Mr. Hevert'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 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*.[24] Of course, I strongly disagree with Mr. Hevert's sole reliance on earnings growth projections for reasons already discussed above, 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.

[23] *id.* at 146.

[24] 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.

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 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* as shown above.

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

A. When choosing my recommended sample, I effectively began with Mr. Hevert's universe of gas and electric companies (Value Line Central, East and West Electric Utilities and Natural Gas Utilities) that he subjected to his proxy screening analysis. I find that all but the fourth criterion that was used by him are reasonable.[25] To ensure that the companies selected for EnergyNorth's proxy are predominantly regulated gas utilities, I only included them in the proxy if at least 50 percent of the revenues over 2014-16 on average are attributable to regulated natural gas business and at least 75 percent of the assets on average are attributable to regulated natural gas business over 2014-16.

[25] See Mr. Hevert's Testimony, Bates page 0385, Lines 12 through 17.

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

A. In creating a reasonably "pure play" proxy that is comparable to EnergyNorth it is important that these companies exhibit a fairly high percentage of *regulated assets* and have the majority of their revenue coming from regulated natural gas operations. A sufficiently high cut-off for share of regulated net operating income as a percentage of total net operating income may seem like an appropriate screen at first glance, but such a metric is prone to exaggerate the role of regulated operations when the non-regulated segment of a company is reporting significant losses on net operating income. For such a company, measuring the regulated share in total net operating income would tend to overstate its importance and may incorrectly allow the company's inclusion in the proxy, even as that company may be fundamentally different from a regulated company since it is exposed to significant market risks given a substantial presence in the non-regulated arena or a non-gas activity. In contrast, if the non-regulated segment of the company is reporting significant income, such an analysis may eliminate the company from the proxy, even though that company may otherwise consist predominantly of its regulated business. Such a company's foray into a non-regulated arena may be so insignificant that the company's risk profile actually matches that of a regulated company better than the one included erroneously by relying on net-income variable like net operating income. Accordingly, to better assess whether a company should be included in a proxy for EnergyNorth, I believe we should strive to have it sufficiently reflective of a "pure play" regulated natural gas utility. I find that cut-offs

of at least 75 percent for regulated natural gas assets and at least 50 percent for regulated natural gas revenues are reasonable, given the dearth of standalone companies that are publicly traded and consist solely of regulated natural gas business. Also, as I rely not only on earnings projections but also on dividends and book value projections in my DCF analysis, since to the best of my knowledge dividends and book value projections are covered only by Value Line Survey, I only consider companies that are covered by Value Line Survey.

Q. What is your recommended DCF proxy?

A. Using information provided by the Company in response to data requests about the percentages discussed above, and applying the mentioned cut-offs, I determined that the appropriate proxy group consists of Atmos Energy Corporation (ATO), Chesapeake Utilities Corporation (CPK), One Gas, Incorporated (OGS), Spire Incorporated (SR), Northwest Natural Gas (NWN), and Southwest Gas (SWX).[26]

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

A. Yes, I do. The screening criteria go a long way in ensuring that my proxy group reasonably reflects the risk profile of EnergyNorth's natural gas utility business. For example, the proxy group's average percentage of assets subject to natural gas utility regulation is 91.4 percent and the average percentage of revenue subject to regulated

[26] Mr. Hevert does not subject One Gas, Incorporated (OGS) to his screening analysis. It appears that the screening was done before Value Line included OGS in its universe of Gas Utilities. While SNL segment analysis is unavailable for OGS, the Company's 10-K filings indicate that it is a "100 percent regulated natural gas distribution utility." One Gas, Incorporated is therefore included in the proxy, per the screening that the OCA has relied on.

natural gas business is 81.2 percent over 2014-16, which are reasonably close to complete regulation as is the case for the distribution business of EnergyNorth 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 (EnergyNorth's parent) is BBB. As for the capital structure, the company has proposed a common equity ratio of 50 percent. A look at the proxy group indicates that over 2014 to 2016 while the average equity ratio has been 57 percent, the range is 47 to 71 percent (see Schedule PKC-2).[27] It is reasonable to conclude that the proxy group's cost of equity estimates would inform EnergyNorth's allowed return on equity.

Q. Please explain why you used data from October 26, 2017 to November 24, 2017 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, in preparing this testimony, used daily pricing data from the most recent month to

[27] The actual capital structure of EnergyNorth (FY2016) is significantly skewed toward equity (equity ratio of 63 percent). In contrast, Algonquin Power & Utilities had a Total Debt/Total Equity ratio of 1.73 (SNL data).

calculate the average price (Schedule PKC-3), which in conjunction with the annualized dividend helps measure the dividend yield (Schedule PKC-4) component of the DCF-based cost of equity.

Q. You had indicated earlier that you do not agree that investors use only expected earnings growth rates to inform the DCF growth component. Please elaborate further.

A. It is unreasonable to assume that investors use a single growth estimate when pricing a utility's stock. Mr. Hevert explains his disagreement with the use of other growth rates (expected dividends and book value per share growth rates) in his testimony, but does not provide empirical support that investors actually exclusively use expected earnings growth rates to inform the DCF growth component. The empirical papers that Mr. Hevert provides in response to data request OCA 1-13, do not directly speak to the issue of whether is it indeed proper to exclusively rely on expected earnings growth rates for the growth component in his DCF analysis. Later in my testimony, I discuss why the OCA does not agree with Mr. Hevert's position, and why the OCA contends that it is wholly appropriate to use expected dividends and book value growth rates along with expected earnings growth rates to inform the DCF growth component. Before explaining that contention, it is nevertheless useful to investigate the papers that Mr. Hevert provides in response to data request OCA 1-13, to see whether they provide any support for the exclusive use of expected earnings growth rates in setting the DCF growth component.

Q. Briefly discuss the empirical papers furnished by Mr. Hevert and comment on whether they provide support for solely using expected earnings growth rates to represent the DCF growth component.

A. Mr. Hevert utilizes five empirical papers to support his use of expected earnings growth rates to represent the DCF growth component:

- Vander Weide, J. H. and Carleton, W. *Investor Growth Expectations: Analysts vs. History*, The Journal of Portfolio Management (Spring 1998).
- Christophi, A. and Christophi, P. (et al.) *Evaluating Common Stocks Using Value Line's Projected Cash Flows and Implied Growth Rate*, Journal of Investing (Spring 1999).
- Harris, R., *Using Analysts' Growth Forecasts for Estimate Shareholder Required Rate of Return*, Financial Management (Spring 1986).
- Harris, R. and Marston, F., *Estimating Shareholder Risk Premia Using Analysts' Growth Forecast*, Financial Management (Summer 1992), at 21.
- Brigham, E. F. and Shome, D. K. (et al.), *The Risk Premium Approach to Measuring a Utility's Cost of Equity*, Financial Management (Spring 1985).

Below I discuss the papers one-by-one.

The article by Carleton and Vander Weide only looks at historical growth rate in dividends (See Page 79). As for analysts' growth forecasts, earnings growth is the only variable that the article investigates. The paper does provide evidence that it is better to use growth expectations rather than historical data to measure the growth component.

It does not, however, at all investigate whether analysts' earnings growth forecasts are better than their dividends growth forecasts in capturing investors' expectations. It also does not, more importantly, even remotely, demonstrate that investors use only earnings and not dividends growth in forming their investment decisions.

In the paper by Christofi, Lori and Moliver (1999), the word "dividend" appears few times in that article, but none of those references are about expectations of growth in dividends. More importantly, the paper has nothing to say about whether investors form their investment decisions only based on earnings and not dividends.

The articles by Harris – Harris (1996) and Harris and Marston (2001) – too did not investigate how dividends growth expectations perform. The articles rely solely on EPS growth expectations to measure the growth component of DCF by noting in footnote 7 (both Harris (1986)) and Harris and Marston (1992)) that "[while] the model calls for expected growth in dividends, no source of data on such projections is readily available." Most importantly again, these articles have nothing to offer on whether investors form their investment decisions based *only* on earnings and *not* dividends.

Brigham, Shome and Vinson (1985) is in the nature of investigating whether risk premiums used to estimate cost of capital in the CAPM framework should be based on future expectations or past realized holding period returns. The article does not at all inform whether in representing the DCF growth component only earnings growth expectations matter. Also, as for Charles Phillips, *The Economics of Regulation*, 1969, Chapter 9, while it points out how the market is also valuing utilities based on earnings

per share, it nowhere discredits the importance of dividends and more importantly has nothing to offer on whether *only* earnings growth forecasts should be used to estimate the DCF growth component. The references are clearly not useful if it is meant to show that investors demonstrably form their investment decisions based solely on expectations of growth in earnings, not dividends.

In conclusion, Mr. Hevert has not provided any persuasive evidence that only earnings growth expectations matter in forming investors' opinion about the DCF growth component.

Q. Please discuss evidence from research and market realities.

A. 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 argues why dividends matter to investors.[28] Different researchers have provided empirical support for different theories. To just note a couple of them, some have argued that dividends are sought as 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 informing why dividends matter, some of the theories and empirical analysis directly stress how different investors may

[28] See Malkawi and Rafferty (et al.) "*Dividend Policy: A Review of Theories and Empirical Evidence*", International Bulletin of Business Administration, ISSN: 1451-243X Issue 9 (2010). Even managers need to carefully consider dividends policy 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.

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. Also, it is well known that the main attraction of utility stocks is indeed their dividend income.[29] I believe it is inappropriate to assume that only earnings growth expectations matter to investors particularly ones interested in utilities.[30]

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 are all expected to 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

[29] See Value Line's One-pager on the Natural Gas Utility dated September 1, 2017.
[30] Parcell, *supra* note 22, at 146.

are expected to grow at significantly different rates over the next three to five years. 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, as Mr. Hevert's analysis suggests. 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, Yahoo Finance, 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. Hevert'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. Also, see Schedules PKC-6 and PKC-7 for the inputs for external and internal growth components, and Schedule PKC-13 for the calculation of the Value Line 3-5 years growth projections for EPS, DPS, and BVPS).

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 $v = \left(1 - \frac{B}{P}\right)$.[31] 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. $g_e\left(\frac{P}{B} - 1\right)$.

[31] Gordon, *supra note 8 at* 30.

Q. Do you employ any outlier-determination approach?

A. Yes.

Q. Please describe your outlier-determination approach.

A. I apply two outlier determination screenings. First, I have omitted any ROE estimate for company in the proxy group that is above the current yield on "Utility A" preferred stock, i.e. 5.81 percent (Value Line Investment Survey, Selection and Opinion, Dec. 1, 2017, Page 2633). Second, 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, the second screening criterion effectively mimics the widely-used statistical confidence interval of 95 percent.

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 produces an average of 8.14 percent. Schedule PKC-8 provides the calculations. All estimates pass the screenings mentioned above. When only the EPS growth rate is used for the growth component, the single-stage DCF method produces an average of 8.57 percent; again none of the individual estimates fail the outlier determination screenings. When only the "internal-plus-external" growth approach is used, the DCF method produces an average of 10.62 percent; none of the individual estimates fail the outlier determination screenings.

I also subjected all of the eighteen DCF estimates derived from all of the DCF methods to the afore-mentioned outlier determination screenings. For the All-Methods DCF estimate, the "internal-plus-external" estimate for Chesapeake Utilities Corporation fails the screening. The average All-Methods DCF estimate, after eliminating the outlier, is 8.48 percent.

Q. While Mr. Hevert 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 EnergyNorth, like most regulated gas companies, 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. Hevert recommends adjustment for flotation costs in his estimates of the cost of equity. Do you agree with those adjustments?

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. [32] 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. Are you suggesting that flotation cost adder should be allowed only if the market-to-book ratio was close to one?

A. Let's assume that the market-to-book ratio is actually close to one. If a new issuance is in the horizon out of necessity and there is a real risk of dilution hinting that the allowed return on equity in place at that time is not fair and trails the opportunity cost of equity, it may become necessary that a flotation cost recovery mechanism be allowed. Actually, anything that will help to instill investors' confidence in the utility would be worthwhile during such times. It may well be the case though, that something more fundamental than mere allowance of flotation cost would be needed. It would be

[32] Despite several rates cases and Commissions setting new ROEs since 2010, we have not witnessed a consistently significant movement towards a market-to-book ratio being one; while the SNL Gas Utility's M/B ratio has increased approximately from 2.14 to 2.42, Mr. Hevert's proxy's M/B ratio has increased approximately from 1.86 to 2.32 over 2010 to 2017 (as per data downloaded on October 26, 2017). Interestingly, there have been 185 gas rate-case decisions on ROEs since year 2010 in the US, and the average allowed-return on equity has fallen only from 10.22 percent to 9.75 percent between 2009 and 2017 (source: RRA's Regulatory Focus: Major Rate Case Decisions, October 26, 2017). As I have explained before, even as Commissions try to set the allowed return to be close to the true cost of equity, the application of different methodologies including the DCF approach, given current realities, tend to capture the persistence in the market-to-book ratio being greater than one enough that they produce estimates of cost of equity that comfortably exceed the true cost of equity.

in the interest of both the investors and the ratepayers to allow an upward adjustment to the allowed return on equity more generally for such a utility, if it is evident that the company is otherwise prudent in its operations.

Q. Since flotation costs are real regardless of whether the market-to-book ratio is greater than one or not, are you ignoring those costs in recommending disallowing flotation cost adder when market-to-book ratio is significantly higher than one?

A. Not at all. If a utility issues stocks and successfully sells them to raise the book value it needs, it must be true that investors expect a return on investment that is at least the cost of equity otherwise they would not have purchased the stock. Since an investor is completely aware that the utility's receipt per new share is definitely lower than the price paid for that stock (due to issuance cost), by buying the stock he or she reveals that the return on the book value is at least equal to the required return on the price of the stock. The mere fact that the stocks were bought by investors reveals that the allowed return on the book value adequately compensates for issuance costs. In an environment of market-to-book ratios being significantly greater than one, given the size of flotation costs relative to the market-to-book leverage, even with a reasonable application of the DCF approach to determine the cost of equity, the market-to-book ratio continues to remain sufficiently higher than one. Even without a flotation cost adder, one can conclude that going forward the utility will have little issue with attracting equity when it needs additional funds to ensure reliable service for the rate payers without compromising its financial viability.

Q. Do you agree with Mr. Hevert 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. Hevert devotes part of his testimony on why he thinks the allowed return on equity should build in some slack for such an adjustment, and he considers "the effect of small size in determining where the Company's ROE falls within the range of results". It is the OCA's position that 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.[33]

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 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

[33] See for example, 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).

to accept equity relative to debt. The coefficient 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. Hevert's estimate of the cost of equity based on the CAPM method?

A. Mr. Hevert derives two sets of CAPM estimates of the cost of equity (See Mr. Hevert's Testimony, Bates page 0520, Table 7). The pure "Bloomberg" estimates are 9.70 percent and 10.15 percent, and the pure "Value Line estimates are 11.11 percent and 11.56 percent. He also estimates two other sets of CAPM estimates that mix Bloomberg data with Value Line betas and Value Line data with Bloomberg betas. While the Bloomberg data/Value Line betas based estimates are 10.55 percent and 11.01 percent, the Value Line data/Bloomberg betas based estimates are 10.19 percent and 10.65 percent.

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

A. No. First, as I have already noted, Mr. Hevert's estimates are actually not ex-ante. The betas are estimated using historical stock prices. Since the CAPM approach relies on betas that are based on historical data, it cannot provide a truly forward-looking estimate of the cost of equity. Second, I do not agree even with his approach to measure ex-ante risk premiums. The disagreement is both with respect to how he measures risk-free return and how he calculates market returns. I discuss these considerations below, but as an initial observation, I disagree with his mixing market

return estimates from one source with betas from the other. While Value Line betas are based on a market return assumed to be that of the NYSE Composite Index, the Bloomberg betas are based on the S&P 500 Index. Only the pure estimates are the ones that are relevant; i.e. coupling Value Line betas with Value Line estimates of market return, and Bloomberg betas with Bloomberg estimates of market return.

Q. Why do you disagree with Mr. Hevert'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 risk-free interest rate 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.[34]

As for relying on the 10-year Treasury bond yield to measure the risk-free rate, since the easily available *market based* yield at any point in time is inherently based on future expectations of *market participants* about the economy, I do not find it appropriate to use any information about what *analysts* think the yields are going to be in the future, either near-term or long-term.[35] Also, it is appropriate to rely on the most recently-observed yields. I discuss my approach in detail later.

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

A. My reservation about Mr. Hevert's approach again stems from the overreliance on earnings growth projections that tend to be upward biased as discussed before in the section on DCF estimation of the proxy's cost of equity. As already noted, I also do not agree that the market-return estimates associated with the projected-yield are warranted (See Table 7 of Mr. Hevert's testimony). Additionally, even if those were warranted, I disagree with Mr. Hevert that the market premiums associated with the *projected-yield* based cost of equity estimations should be the difference between the DCF estimate of market return and the *observed yield* on bond. In estimating the

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

[35] Yields observable at any point in time in the market place is akin to price being observable in the market place at any point in time. In a competitive environment, they contain all the information about what economic agents expect will happen in the future, and are the best indicators to use when one is trying to estimate forward looking measures like the "risk-free" return or the cost of equity.

projected-yield based cost of equity for the proxy, the market premium for the proxy should more appropriately be the proxy's beta times the difference between DCF estimate of market return and the *projected-yield*. Even if one were to agree with Mr. Hevert's approach to rely on the projected bond yield, his approach results in an overstated cost of equity, given the mechanics he employs.[36]

Q. What do you consider to be a reasonable approach to estimating the market returns?

A. First, as already noted before, it is not appropriate to use projections on bond-yields to measure the "risk-free return" component of the CAPM approach. The OCA as mentioned before finds it reasonable to use the currently observed yields on the 10-year Treasury bond. Second, as for Bloomberg market return estimates, it is important that *only* market return information from Bloomberg is relied upon. Likewise, *only* market return information from Value Line should be used to derive the Value Line estimates. It should be recognized that the market portfolio as used by Bloomberg and Value Line are very different and the betas associated with one source should not be used to derive CAPM cost of equity estimates that relies on market data from the other. Therefore, in estimating the cost of equity using CAPM, the OCA has only relied on two CAPM

[36] Limiting the analysis to only the "pure" Bloomberg and Value Line estimations as reported in Table 7 of Mr. Hevert's testimony, given that the Bloomberg and Value Line betas for Mr. Hevert's proxy are 0.646 and 0.729, the projected bond yield is 3.52%, and the DCF ex-ante market risk premiums for Bloomberg and Value Line are respectively (13.34-3.52) and (14.11-3.52), i.e. 9.82% and 10.59%, the CAPM projected-yield based cost of equity estimates are 3.52 *plus* 0.646*9.82 and 3.52 *plus* 0.729*10.59, respectively. Therefore, the projected yield-based pure Bloomberg CAPM estimate of ROE is 9.67%, and the pure Value Line estimate of ROE is 11.24%. Mr. Hevert's corresponding estimates, i.e. 10.15% and 11.56% (See Table 8, Mr. Hevert's Testimony) are overstated by 48 and 32 basis points respectively.

estimates that are entirely based only on Bloomberg data and Value Line data, respectively.

The OCA's CAPM estimate of the cost of equity is the *average* of the pure Bloomberg and Value Line estimates (see Schedule PKC-10). The pure Bloomberg uses the data furnished by Mr. Hevert (Schedule RBH-5, Mr. Hevert's testimony) to derive a CAPM estimate (CAPM Method 1, see Schedule PKC-8) that uses only earnings growth projections as reported in Schedule RBH-5 of Mr. Hevert's testimony. The OCA's pure Value Line CAPM estimate (CAPM Method 2, see Schedule PKC-8), however, uses information on earnings growth, dividends growth as well as book value growth projections. Doing so is important and reasonable, as that ensures that the OCA's CAPM estimate is not entirely predicated on earnings growth projections. Finally, I reject the small size premium adjustment (explicitly or otherwise) for reasons discussed in section III.A. 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 and Bloomberg beta estimates for the companies in my DCF sample (see Schedule PKC-9). The proxy beta for the Bloomberg application is 0.63, while that for the Value Line estimation, it is 0.72.

Q. How do you calculate the equity risk premium?

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 27, 2017 to November 24, 2017 has been 2.36 percent.

As for the expected market returns, it is helpful to discuss the Bloomberg approach and the Value Line approach separately. As for Bloomberg, I rely on the long-term growth expectations furnished by Mr. Hevert and his application of the DCF approach, which produces an estimate of the expected market return of 13.83 percent (Company's response to OCA 4-15).

In the case of Value Line, I use not only earnings growth projections, but also latest Value Line dividends and book value growth projections to derive three capital-weighted estimates of the expected market return. While the starting group of companies is same as the S&P 500 companies analyzed by Mr. Hevert (Company response to OCA 4-15), to ensure that we are consistently looking at the same companies as a group in deriving the EPS, DPS, and BVPS projections, I only use companies for which the data is fully available for not only the aforementioned projections, but also for market capitalization, betas, and dividend yields. Schedule PKC-11 reports the OCA analysis. The number of companies that are subjected to that analysis is 408. The resulting expected market returns for this Value Line sample are 14.03 percent, 10.05 percent and 10.40 percent respectively for EPS and DPS and BVPS 3-5 years' growth projections. The average of these returns represents the estimate of the expected market return for the Value Line sample, i.e. 11.49 percent.

As for the Bloomberg and Value Line market risk premiums, their derivations differ in a crucial way. To derive the Bloomberg market risk premium, the average bond yield is simply subtracted from the Bloomberg estimate of market return. To derive the Value Line market risk premium, however, the difference between Value Line market return and the bond yield is *divided* by the market-capitalization weighted mean of Value Line betas of the 408 companies that constitute the OCA's Value Line sample. 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 potentially different from the group of companies that is used to estimate the Value Line market return.

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

A. As explained above, the Bloomberg estimate of the equity risk premium is 13.83 percent *less* 2.36 percent, i.e. 11.47 percent. The Value Line estimate of equity risk premium, however, is (11.49 percent *less* 2.36 percent) divided by 1.002, which is the market-capitalization weighted mean beta of the Value Line sample. The Value Line estimate of equity risk premium is therefore 9.13 percent divided by 1.002, i.e. 9.12 percent.[37]

Q. What are the Bloomberg and Value Line estimates of the cost of equity for the EnergyNorth proxy?

A. As for Bloomberg, using the recent average yield on 10-year Treasury bond, and the Bloomberg beta of 0.63, the proxy's cost of equity is estimated to be 2.36 *plus*

[37] All numbers reported here are rounded.

0.63×11.47 percent, i.e. 9.55 percent. The corresponding Value Line calculation yields 2.36 *plus* 0.72×9.12 percent, i.e. 8.89 percent.

Q. What is your CAPM cost of equity estimate for EnergyNorth?

A. As has been discussed above, the OCA relies on the average of the two estimates noted above to derive its CAPM estimate of EnergyNorth's cost of equity, i.e. 9.22 percent. While the OCA's recommended point-estimate is strictly based on DCF approaches, the CAPM estimate provides a useful check as to the reasonability of the DCF based estimate, and ultimately that of the OCA's recommended allowed return on equity.

III.C Conclusion

Q. Before summarizing your analysis, do you have any observation on Mr. Hevert's view on the impact of a Decoupling Mechanism on the allowed ROE?

A. Yes, I do. Mr. Hevert delves into the issue of whether the Company's requested Decoupling Mechanism should lead to a further adjustment in the allowed return on equity to account for lower risks. He concludes that EnergyNorth's proposed mechanism does not reduce its risk relative to the proxy group because decoupling is common among the companies in the proxy group. The OCA cannot agree that Mr. Hevert's analysis is comprehensive enough to conclude definitively that the Company's proposed mechanism does not reduce risk relative to either Mr. Hevert's or OCA's proxy groups. Attachment RBH-11 of Mr. Hevert's testimony indicates that some of the

companies don't have decoupling at all, and the majority of those proxy group members cited as decoupled have only partial decoupling. Partial decoupling and full decoupling are different regulatory regimes that carry different risk-profiles.[38] Given that EnergyNorth has proposed full decoupling, without carefully comparing the specifics of EnergyNorth's decoupling mechanism with the proxy group's companies' decoupling approaches, it is premature to conclude that EnergyNorth's proposed decoupling mechanism does not justify adjusting the cost of equity downwards, ceteris paribus, to reflect lower risks.

Q. Did the OCA investigate the nature of decoupling mechanisms in place with respect to the OCA's proxy group's constituent companies?

A. Yes. I utilized the latest Regulatory Research Focus (RRA) report on Adjustment Clauses to examine the decoupling profile of the companies included in the OCA's proxy group (See Schedule PKC-12).[39] Of the 18 companies listed in the study, only two have full-decoupling, four have no decoupling at all, and the rest have partial decoupling.[40] While it would be beneficial to analyze the in-depth nature of the decoupling mechanisms individually for all of the companies listed in Schedule PKC-12 more carefully, the OCA has not performed such an analysis in this instant. Given the information in Schedule PKC-12 though, it is evident that if EnergyNorth is accorded

[38] Lazar, J. and Weston, F. (et al.). Regulatory Assistance Project. *Revenue Regulation and Decoupling: A Guide to Theory and Application* (June 2011). Page 11-13. (Describing the differences between partial, limited, and full decoupling). Available at: https://www.raponline.org/wp-content/uploads/2016/05/rap-revenueregulationanddecoupling-2011-04.pdf

[39] Regulatory Research Associates, Adjustment Clauses: A State-by-State Overview, September 12, 2017.

[40] No parent company of any utility within the proxy group is composed entirely of fully decoupled regulated entities. For Companies that have partial decoupling, the adjustments are limited to usage variations attributable to specific factors, such as weather or energy efficiency programs.

full decoupling, a downward adjustment may well be justified. In recommending the point estimate of allowed return on equity for EnergyNorth, as discussed below, the OCA, has weighed that and other considerations reasonably in determining where EnergyNorth's allowed return on equity should lie within the range of results obtained using the DCF estimates.

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 3: Summary of Cost of Equity Estimates	
DCF (traditional: EPS, BVPS & DPS average)	8.14
DCF (traditional: EPS)	8.57
DCF ($g=br+sv$ Method)	10.62
DCF (All Methods)	8.48
CAPM	9.22

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

A. The table above summarizes estimates of cost of equity that the OCA's analysis produced. The OCA recommends using solely the DCF approach in estimating the cost of equity, for reasons that were discussed in sections II and IIIA. As stated earlier, the CAPM based cost of equity was estimated mainly as a check. The average of all of the eighteen company-wise DCF estimates, subject to the statistical outlier determination approach, is 8.48 percent, as reported in Table 3. The OCA considers it appropriate to look at a range of 8.14 percent to 8.48 percent to inform its point estimate of the allowed return on equity. If the OCA's recommended full decoupling approach is accepted by

the Commission, the OCA recommends a point estimate of allowed return on equity of 8.40 percent. With respect to what constitutes a reasonable range of allowed return on equity, the OCA recommends a range of 8.20 to 8.50 percent.

Q. Do you have any additional concluding thoughts?

A. Yes. First, to the extent additional testimony or discovery opportunities in this docket inform the specific decoupling mechanism that the Commission approves, any information that provides concrete support for a specific downward ROE adjustment (if any) in view of the approved decoupling mechanism, should be given due consideration. Second, it is useful to bring to the Commission's attention that a direct reduction in the allowed return on equity is not the only way to internalize such a risk reduction. Due to shareholders' sensitivity to return on equity, regulators could instead accommodate a more leveraged capital structure to recognize the lower earnings volatility.[41]

Based on the information that OCA has analyzed at the time of writing this testimony and focusing on EnergyNorth's gas distribution business and its comparability to the OCA's proxy group, however, the OCA asserts that an allowed return on equity of 8.40 percent is reasonable.

Q. Does this conclude your testimony?

A. Yes, it does.

[41] Migden-Ostrander, J., and Sedano, R. (2016). *Decoupling Design: Customizing Revenue Regulation to Your State's Priorities.* Montpelier, VT: Regulatory Assistance Project. Available at: http://www.raponline.org/knowledge-center/decouplingdesign-customizing-revenue-regulation-state-priorities