COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES

D.P.U. 14-150

DIRECT TESTIMONY OF ROBERT B. HEVERT

EXHIBIT NSTAR-RBH-1

RETURN ON EQUITY

IN SUPPORT OF
NSTAR GAS COMPANY

REQUEST FOR BASE REVENUE ADJUSTMENT

December 17, 2014

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I. INTRODUCTION

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

A. My name is Robert B. Hevert. I am Managing Partner of Sussex Economic Advisors, LLC ("Sussex"). My business address is 161 Worcester Road, Suite 503, Framingham, Massachusetts 01701.

Q. On whose behalf are you submitting this testimony?

A. I am submitting this direct testimony ("Direct Testimony") before the Massachusetts Department of Public Utilities (the "Department") on behalf of NSTAR Gas Company ("NSTAR Gas" or the "Company").

Q. Please describe your educational background.

A. I hold a Bachelor's degree in Business and Economics from the University of Delaware, and an MBA with a concentration in Finance from the University of Massachusetts. I also hold the Chartered Financial Analyst designation.

Q. Please describe your experience in the energy and utility industries.

A. I have worked in regulated industries for over twenty-five years, having served as an executive and manager with consulting firms, a financial officer of a publicly-traded natural gas utility (at the time, Bay State Gas Company), and an analyst at a telecommunications utility. In my role as a consultant, I have advised numerous energy

and utility clients on a wide range of financial and economic issues including corporate and asset-based transactions, asset and enterprise valuation, transaction due diligence, and strategic matters. As an expert witness, I have provided testimony in more than 100 proceedings regarding various financial and regulatory matters before numerous state utility regulatory agencies, including the Department, and the Federal Energy Regulatory Commission. A summary of my professional and educational background, including a list of my testimony in prior proceedings, is included in Exhibit NSTAR-RBH-2 to my Direct Testimony.

II. PURPOSE OF TESTIMONY

Q. What is the purpose of your testimony?

A. The purpose of my Direct Testimony is to present evidence and provide the Department with a recommendation regarding the Company's Return on Equity ("ROE"),[1] and to provide an assessment of the capital structure used for ratemaking purposes. My analyses and conclusions are supported by the data presented in Exhibit NSTAR-RBH-3 through Exhibit NSTAR-RBH-13, which have been prepared by me or under my direction.

Q. What are your conclusions regarding the appropriate Cost of Equity and capital structure?

A. My analyses indicate that the Company's Cost of Equity currently is in the range of 10.00 percent to 10.50 percent. Based on the quantitative and qualitative analyses discussed throughout my Direct Testimony and the Company's risk profile, I conclude that an ROE

[1] Throughout my testimony, I interchangeably use the terms "ROE" and "Cost of Equity".

of 10.25 percent is reasonable and appropriate. In addition, I conclude that a capital structure including 52.94 percent common equity and 47.06 percent long-term debt is appropriate.

Because all financial models are subject to various assumptions and constraints, equity analysts and investors tend to use multiple methods to develop their return requirements. I therefore relied on three widely-accepted approaches to develop my ROE recommendation: (1) the Discounted Cash Flow ("DCF") model, including the Constant Growth, and Multi-Stage forms; (2) the Capital Asset Pricing Model ("CAPM"); and (3) the Bond Yield Plus Risk Premium approach.

In addition to the methodologies noted above, my recommendation also takes into consideration: (1) the Company's proposed Revenue Decoupling Adjustment Clause ("RDAC"); (2) flotation costs associated with equity issuances; and (3) the effect of my ROE recommendation on the Company's financial integrity. Although I did not make any explicit adjustments to my ROE estimates for those factors, I did take these factors into consideration when determining where the Company's Cost of Equity should be established within the range of results.

Q. How is the remainder of your Direct Testimony organized?

A. The remainder of my Direct Testimony is organized as follows:

- Section III – Provides a summary of my conclusions and recommendations as related to the Cost of Equity;

- Section IV – Discusses the regulatory guidelines and financial considerations pertinent to the development of the cost of capital;

- Section V – Explains my selection of the proxy group of natural gas utilities used to develop my analytical results;

- Section VI – Explains my analyses and the analytical bases for my ROE recommendation;

- Section VII – Provides a discussion of specific business risks that have a direct bearing on the Company's Cost of Equity;

- Section VIII – Briefly discusses the current capital market conditions and the effect of those conditions on the Company's Cost of Equity;

- Section IX – Addresses the reasonableness of the Company's capital structure; and

- Section X – Summarizes my conclusions and recommendations.

III. SUMMARY OF CONCLUSIONS

Q. What are the key factors considered in your analyses and upon which you base your recommended ROE?

A. My analyses and recommendations considered the following:

- The *Hope* and *Bluefield* decisions[2] that established the standards for determining a fair and reasonable allowed Return on Equity, including: consistency of the allowed return with other businesses having similar risk; adequacy of the return to provide access to capital and support credit quality; and that the end result must lead to just and reasonable rates.

- The effect of the current capital market conditions on investors' Return on Equity requirements, and in particular, the Company's ability to access the capital markets.

- The Company's business risks relative to the proxy group of comparable companies and the implications of those risks in arriving at the appropriate ROE.

Q. What are the results of your analyses?

A. The results of my analyses are summarized in Table 1 (below).

[2] *Bluefield Waterworks & Improvement Co., v. Public Service Commission of West Virginia*, 262 U.S. 679 (1923); *Federal Power Commission v. Hope Natural Gas Co.*, 320 U.S. 591 (1944).

Table 1: Summary of Analytical Results

Discounted Cash Flow	***Mean Low***	***Mean***	***Mean High***
30-Day Constant Growth DCF	7.96%	9.26%	10.85%
90-Day Constant Growth DCF	7.94%	9.24%	10.84%
180-Day Constant Growth DCF	7.99%	9.29%	10.88%
30-Day Multi-Stage DCF	9.33%	9.65%	10.07%
90-Day Multi-Stage DCF	9.32%	9.63%	10.05%
180-Day Multi-Stage DCF	9.35%	9.67%	10.10%
Supporting Methodologies			
CAPM Results		***Bloomberg Derived Market Risk Premium***	***Value Line Derived Market Risk Premium***
Average Bloomberg Beta Coefficient			
Current 30-Year Treasury (3.09%)		11.18%	10.67%
Near-Term Projected 30-Year Treasury (3.88%)		11.98%	11.47%
Average Value Line Beta Coefficient			
Current 30-Year Treasury (3.09%)		11.21%	10.69%
Near Term Projected 30-Year Treasury (3.88%)		12.00%	11.49%
	Low	***Mid***	***High***
Bond Yield Risk Premium	10.03%	10.17%	10.76%
Flotation Costs		0.12%	

Based on the analytical results presented in Table 1, and in light of the considerations discussed throughout the balance of my Direct Testimony regarding the Company's business risks relative to the proxy group, it is my view that a reasonable range of estimates is from 10.00 percent to 10.50 percent, and within that range, an ROE of 10.25 percent is reasonable and appropriate based on my consideration of the Company's risk profile.

IV. REGULATORY GUIDELINES AND FINANCIAL CONSIDERATIONS

Q. Please provide a brief summary of the guidelines established by the U.S. Supreme Court (the "Court") for the purpose of determining the Return on Equity.

A. The Court established the guiding principles for establishing a fair return for capital in two cases: (1) *Bluefield Water Works and Improvement Co. v. Public Service Comm'n.* ("*Bluefield*");[3] and (2) *Federal Power Comm'n v. Hope Natural Gas Co.* ("*Hope*").[4] In *Bluefield*, the Court stated:

> A public utility is entitled to such rates as will permit it to earn a return on the value of the property which it employs for the convenience of the public equal to that generally being made at the same time and in the same general part of the country on investments in other business undertakings which are attended by corresponding, risks and uncertainties; but it has no constitutional right to profits such as are realized or anticipated in highly profitable enterprises or speculative ventures. The return should be reasonably sufficient to assure confidence in the financial soundness of the utility and should be adequate, under efficient and economical

[3] *Bluefield Waterworks & Improvement Co., v. Public Service Commission of West Virginia*, 262 U.S. 679, 692-93 (1923).

[4] *Federal Power Commission v. Hope Natural Gas Co.*, 320 U.S. 591, 603 (1944).

> management, to maintain and support its credit and enable it to raise the money necessary for the proper discharge of its public duties.[5]

The Court therefore recognized that: (1) a regulated company cannot remain financially sound unless the return it is allowed to earn on its invested capital is at least equal to the cost of capital (the principle relating to the demand for capital); and (2) a regulated company will not be able to attract capital if it does not offer investors an opportunity to earn a return on their investment equal to the return they expect to earn on other investments of the same risk (the principle relating to the supply of capital).

In *Hope*, the Court reiterated the financial integrity and capital attraction principles of the *Bluefield* case:

> From the investor or company point of view it is important that there be enough revenue not only for operating expenses but also for the capital costs of the business. These include service on the debt and dividends on the stock... By that standard the return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital.[6]

In summary, the Court clearly has recognized that the fair Rate of Return on Equity should be: (1) comparable to returns investors expect to earn on other investments of similar risk; (2) sufficient to assure confidence in the company's financial integrity; and (3) adequate to maintain and support the company's credit and to attract capital.

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[5] *Bluefield Waterworks & Improvement Co., v. Public Service Commission of West Virginia*, 262 U.S. 679, 692-93 (1923).

[6] *Federal Power Commission v. Hope Natural Gas Co.*, 320 U.S. 591, 603 (1944).

Q. Does Massachusetts precedent provide similar guidance?

A. Yes. The Department has consistently stated:

> The standard for determining the allowed ROE is set forth in Bluefield at 692-693 and Hope at 603. Specifically, the allowed ROE should preserve a company's financial integrity, allow a company to attract capital on reasonable terms, and be comparable to returns on investments of similar risk. See Bluefield at 692-693; Hope at 603, 605. It should be determined "having regard to all relevant facts." Bluefield at 692.[7]

Q. Aside from the standards established by the Courts, is it important for a utility to be allowed the opportunity to earn a return that is adequate to attract equity capital at reasonable terms?

A. A return that is adequate to attract capital at reasonable terms, under varying market conditions, will enable the subject utility to provide safe, reliable natural gas distribution service while maintaining its financial integrity. Although the "capital attraction" and "financial integrity" standards are important principles in normal economic conditions, the practical implications of those standards are even more pronounced when, as discussed in more detail in Section VIII, continued equity market volatility, together with sustained increases in the incremental spread on utility debt (*i.e.*, the difference in debt yields of utilities varying credit ratings) have intensified the importance of maintaining a strong financial profile.

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[7] Massachusetts Department of Public Utilities, Docket No. D.P.U. 13-90, *Petition of Fitchburg Gas and Electric Light Company (Electric Division) d/b/a Unitil to the Department of Public Utilities for approval of the rates and charges set forth in Tariffs M.D.P.U. Nos. 229 through 238, and approval of an increase in base distribution rates for electric service pursuant to G.L. c. 164, § 94 and 220 C.M.R. § 5.00 et seq.*, May 30, 2014, at 231. *See also*: Massachusetts Department of Public Utilities, Docket No. D.P.U. 13-75, *Petition of Bay State Gas Company d/b/a Columbia Gas of Massachusetts, pursuant to General Laws Chapter 164, § 94, and 220 C.M.R. §§ 5.00 et seq*., February 28, 2014, at 327; Massachusetts Department of Public Utilities, Docket No. D.P.U. 11-01, *Petition of Fitchburg Gas and Electric Light Company, d/b/a Unitil, pursuant to G.L. c. 164, § 94 and 220 C.M.R. §§ 5.00 et seq., for Approval of a General Increase in Electric Distribution Rates, a Capital Cost Adjustment Mechanism, and a Revenue Decoupling Mechanism*, August 1, 2011, at 420.

V. PROXY GROUP SELECTION

Q. As a preliminary matter, why is it necessary to select a group of proxy companies to determine the Cost of Equity for NSTAR Gas?

A. The Cost of Equity for a given enterprise depends on the risks attendant to the business in which the company is engaged. According to financial theory, the value of a given company is equal to the aggregate market value of its constituent business units. The value of the individual business units reflects the risks and opportunities inherent in the business sectors in which those units operate. In this proceeding, we are focused on estimating the Cost of Equity for the NSTAR Gas. Because the ROE is a market-based concept and the Company is not a publicly traded entity, it is necessary to establish a group of companies that are both publicly traded and comparable to the Company in certain fundamental respects to serve as its "proxy" in the ROE estimation process.

Even if the Company were a publicly traded entity, it is possible that short-term events could bias its market value in one way or another during a given period of time. A significant benefit of using a proxy group, therefore, is that it serves to moderate the effects of anomalous, temporary events that may be associated with any one company.

Q. Does the selection of a proxy group suggest that analytical results will be tightly clustered around average (*i.e.*, mean) results?

A. Not necessarily. The DCF approach is based on the theory that a stock's current price represents the present value of its future expected cash flows. The DCF model is defined as the sum of the expected dividend yield and projected long-term growth. Notwithstanding the care taken to ensure risk comparability, market expectations with

respect to future risks and growth opportunities will vary from company to company. Therefore, even within a group of similarly situated companies, it is common for analytical results to reflect a seemingly wide range. At issue, then, is how to select an ROE estimate from within that range. That determination necessarily must be based on the informed judgment and experience of the analyst.

Q. Please provide a summary profile of the Company.

A. NSTAR Gas provides natural gas distribution service to approximately 400,000 residential, commercial, and industrial customers in Massachusetts.[8] NSTAR Gas' current long-term issuer credit ratings are as follows: (1) Standard and Poor's ("S&P") A- (Outlook: Positive); and (2) Fitch Ratings ("Fitch") A- (Outlook: Stable).[9]

Q. How did you select the companies included in your proxy group?

A. I began with the group of 11 companies that Value Line classifies as Natural Gas Utilities: AGL Resources, Atmos Energy, Laclede Group, New Jersey Resources, NiSource Inc., Northwest Natural Gas, Piedmont Natural Gas, South Jersey Industries, Southwest Gas, UGI Corp., and WGL Holdings. I then applied the following screening criteria:

- Because certain of the models used in my analyses assumes that earnings and dividends grow over time, I excluded companies that do not consistently pay quarterly cash dividends;

[8] Northeast Utilities, SEC Form 10-K for the fiscal year ended December 31, 2013, at 2, 12.

[9] Source: SNL Financial.

- In order to ensure that the growth rates used in my analyses are not biased by a single analyst, all of the companies in my proxy group have been covered by at least two utility industry equity analysts;
- All of the companies in my proxy group have investment grade senior unsecured bond and/or corporate credit ratings from S&P;
- To incorporate companies that are primarily regulated gas distribution utilities, I have only included companies with at least 60.00 percent of operating income derived from regulated natural gas utility operations; and
- I eliminated companies that are currently known to be party to a merger, or other significant transaction.

Q. What companies met those screening criteria?

A. The criteria discussed above produce the following group of eight proxy companies:

Table 2: Proxy Group

Company	Ticker
AGL Resources Inc.	GAS
Atmos Energy Corporation	ATO
New Jersey Resources Corporation	NJR
Northwest Natural Gas Company	NWN
Piedmont Natural Gas Company, Inc.	PNY
South Jersey Industries, Inc.	SJI
Southwest Gas Corporation	SWX
WGL Holdings, Inc.	WGL

Q. Do you believe your proxy group appropriately represents NSTAR Gas' risk profile?

A. Yes, I do. By applying the screening criteria discussed above, I ensured that the proxy group excludes companies with regulated electric operations, or significant unregulated activities. Consequently, the proxy group contained in Table 2 contains only companies that, like NSTAR Gas, are focused on the regulated distribution of natural gas. Because all eight proxy companies are primarily natural gas distribution utilities they are reasonable proxies for NSTAR Gas.

Q. Do you believe that eight companies constitute a sufficiently large proxy group for the purpose of determining the Cost of Equity for a utility?

A. Yes, I do. The analyses performed in estimating the ROE are more likely to be representative of the subject utility's Cost of Equity to the extent that the chosen proxy companies are fundamentally comparable to the subject utility. Because all analysts use some form of screening process to arrive at a proxy group, the group, by definition, is not randomly drawn from a larger population. Consequently, there is no reason to place more reliance on the quantitative results of a larger proxy group simply by virtue of the resulting larger number of observations. Moreover, because I am using market-based data, my analytical results will not necessarily be tightly clustered around a central point. Results that may be somewhat dispersed, however, do not suggest that the screening approach is inappropriate or the results less meaningful. Further, including companies whose fundamental comparability is tenuous at best, simply for the purpose of expanding the number of observations, does not add relevant information to the analysis.

VI. COST OF EQUITY ESTIMATION

Q. Please briefly discuss the ROE in the context of the regulated rate of return.

A. Regulated utilities primarily use common stock and long-term debt to finance their permanent property, plant, and equipment. The overall Rate of Return ("ROR") for a regulated utility is based on its weighted average cost of capital, in which the cost rates of the individual sources of capital are weighted by their respective book values. While the costs of debt and preferred stock can be directly observed, the Cost of Equity is market-based and, therefore, must be estimated based on observable market information.

Q. How is the required ROE determined?

A. The required ROE is estimated by using one or more analytical techniques that rely on market-based data to quantify investor expectations regarding required equity returns, adjusted for certain incremental costs and risks. By their very nature, quantitative models produce a range of results from which the market required ROE must be selected. As discussed throughout my Direct Testimony, that selection must be based on a comprehensive review of relevant data and information, and does not necessarily lend itself to a strict mathematical solution. Consequently, the key consideration in determining the Cost of Equity is to ensure that the methodologies employed reasonably reflect investors' view of the financial markets in general, and the subject company (in the context of the proxy group) in particular.

Although we cannot directly observe the Cost of Equity, we can observe the methods frequently used by analysts to arrive at their return requirements and expectations. While

investors and analysts tend to use multiple approaches in developing their estimate of return requirements, each methodology requires certain judgment with respect to the reasonableness of assumptions and the validity of proxies in its application. In essence, analysts and academics understand that ROE models are tools to be used in the ROE estimation process and that strict adherence to any single approach, or the specific results of any single approach, can lead to flawed and irrelevant conclusions. That position is consistent with the *Hope* and *Bluefield* finding that it is the analytical result, as opposed to the methodology, that is controlling in arriving at ROE determinations. A reasonable ROE estimate therefore considers alternative methodologies, observable market data, and the reasonableness of their individual and collective results.

In my view, therefore, it is both prudent and appropriate to use multiple methodologies in order to mitigate the effects of assumptions and inputs associated with relying exclusively on any single approach. Such use, however, must be tempered with due caution as to the results generated by each individual approach. As such, I have considered the results of the Constant Growth and Multi-Stage forms of the DCF model, the Capital Asset Pricing Model, and the Risk Premium approach.

A. Constant Growth DCF Model

Q. Are DCF models widely used in regulatory proceedings?

A. Yes, in my experience the Constant Growth DCF model is widely recognized in regulatory proceedings. Nonetheless, neither the DCF nor any other model should be

applied without considerable judgment in the selection of data and the interpretation of results.

Q. Please describe the DCF approach.

A. The DCF approach is based on the theory that a stock's current price represents the present value of all expected future cash flows. In its simplest form, the DCF model expresses the Cost of Equity as the sum of the expected dividend yield and long-term growth rate, and is expressed as follows:

$$P = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \cdots + \frac{D_\infty}{(1+k)^\infty} \quad [1]$$

where P represents the current stock price, $D_1 \ldots D_\infty$ represent expected future dividends, and k is the discount rate, or required ROE. Equation [1] is a standard present value calculation that can be simplified and rearranged into the familiar form:

$$k = \frac{D_0\,(1+g)}{P} + g \quad [2]$$

Equation [2] often is referred to as the "Constant Growth DCF" model, in which the first term is the expected dividend yield and the second term is the expected long-term growth rate.

Q. What assumptions are required for the Constant Growth DCF model?

A. The Constant Growth DCF model requires the following assumptions: (1) a constant average growth rate for earnings and dividends; (2) a stable dividend payout ratio; (3) a constant price-to-earnings ("P/E") multiple; and (4) a discount rate greater than the

expected growth rate. The Department has recognized the limiting nature of those assumptions, pointing out that "[t]his model has a number of very strict assumptions…" and that those assumptions "…affect the estimates of cost of equity."[10] In that regard, the Department's observations are consistent with the position noted earlier: considerable judgment should be applied in developing the Constant Growth DCF analysis, and in interpreting the model's results.

Q. What market data did you use to calculate the dividend yield component of your DCF model?

A. The dividend yield is based on the proxy companies' current annualized dividend, and average closing stock prices over the 30-, 90-, and 180-trading days as of October 31, 2014.

Q. Why did you use three averaging periods to calculate the average stock price?

A. I did so to ensure that the model's results are not skewed by anomalous events that may affect stock prices on any given trading day. At the same time, the averaging period should be reasonably representative of expected capital market conditions over the long term. In my view, the use of the 30-, 90- and 180-day averaging periods reasonably balances those concerns.

[10] Massachusetts Department of Public Utilities, Docket No. D.P.U. 13-90, *Petition of Fitchburg Gas and Electric Light Company (Electric Division) d/b/a Unitil to the Department of Public Utilities for approval of the rates and charges set forth in Tariffs M.D.P.U. Nos. 229 through 238, and approval of an increase in base distribution rates for electric service pursuant to G.L. c. 164, § 94 and 220 C.M.R. § 5.00 et seq.*, May 30, 2014, at 217.

Q. Did you make any adjustments to the dividend yield to account for periodic growth in dividends?

A. Yes, I did. Because utility companies tend to increase their quarterly dividends at different times throughout the year, it is reasonable to assume that dividend increases will be evenly distributed over calendar quarters. Given that assumption, it is appropriate to calculate the expected dividend yield by applying one-half of the long-term growth rate to the current dividend yield.[11] That adjustment ensures that the expected dividend yield is, on average, representative of the coming twelve-month period, and does not overstate the dividends to be paid during that time.

Q. Is it important to select appropriate measures of long-term growth in applying the DCF model?

A. Yes. In its Constant Growth form, the DCF model (*i.e.*, as presented in Equation [2] above) assumes a single growth estimate in perpetuity. In order to reduce the long-term growth rate to a single measure, one must assume a constant payout ratio, and that earnings per share, dividends per share, and book value per share all grow at the same constant rate. Over the long term, however, dividend growth can only be sustained by earnings growth. Consequently, it is important to incorporate a variety of measures of long-term earnings growth into the Constant Growth DCF model.

[11] *See*, Exhibit NSTAR-RBH-3.

Q. Please summarize the findings of academic research on the appropriate measure for estimating equity returns using the DCF model.

A. The relationship between various growth rates and stock valuation metrics has been the subject of much academic research.[12] As noted over 40 years ago by Charles Phillips in The Economics of Regulation:

> For many years, it was thought that investors bought utility stocks largely on the basis of dividends. More recently, however, studies indicate that the market is valuing utility stocks with reference to total per share earnings, so that the earnings-price ratio has assumed increased emphasis in rate cases.[13]

Philips' conclusion continues to hold true. Subsequent academic research has clearly and consistently indicated that measures of earnings and cash flow are strongly related to returns, and that analysts' forecasts of growth are superior to other measures of growth in predicting stock prices.[14] For example, Vander Weide and Carleton state that, "[our] results…are consistent with the hypothesis that investors use analysts' forecasts, rather than historically oriented growth calculations, in making stock buy-and-sell decisions."[15] Other research specifically notes the importance of analysts' growth estimates in determining the Cost of Equity, and in the valuation of equity securities. Dr. Robert

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[12] *See*, for example, Harris, Robert, *Using Analysts' Growth Forecasts to Estimate Shareholder Required Rate of Return*, Financial Management, Spring 1986.

[13] Charles F. Phillips, Jr., The Economics of Regulation, Revised Edition, 1969, Richard D. Irwin, Inc., at 285.

[14] *See*, for example, Christofi, Christofi, Lori and Moliver, *Evaluating Common Stocks Using Value Line's Projected Cash Flows and Implied Growth Rate*, Journal of Investing (Spring 1999); Harris and Marston, *Estimating Shareholder Risk Premia Using Analysts Growth Forecasts*, Financial Management, 21 (Summer 1992); and Vander Weide and Carleton, *Investor Growth Expectations: Analysts vs. History*, The Journal of Portfolio Management, Spring 1988.

[15] Vander Weide and Carleton, *Investor Growth Expectations: Analysts vs. History*, The Journal of Portfolio Management, Spring 1988.

Harris noted that "a growing body of knowledge shows that analysts' earnings forecast are indeed reflected in stock prices." Citing Cragg and Malkiel, Dr. Harris notes that those authors "found that the evaluations of companies that analysts make are the sorts of ones on which market valuation is based."[16] Similarly, Brigham, Shome and Vinson noted that "evidence in the current literature indicates that (i) analysts' forecasts are superior to forecasts based solely on time series data; and (ii) investors do rely on analysts' forecasts."[17]

To that point, the research of Carleton and Vander Weide demonstrates that earnings growth projections have a statistically significant relationship to stock valuation levels, while dividend growth projections do not. Those findings suggest that investors form their investment decisions based on expectations of growth in earnings, not dividends. Consequently, earnings growth not dividend growth is the appropriate estimate for the purpose of the Constant Growth DCF model.

Q. Please summarize your inputs to the Constant Growth DCF model.

A. I applied the DCF model to the proxy group of natural gas utility companies using the following inputs for the price and dividend terms:

- The average daily closing prices for the 30-trading days, 90-trading days, and 180-trading days ended October 31, 2014 for the term P_0; and

[16] Robert S. Harris, *Using Analysts' Growth Forecasts to Estimate Shareholder Required Rate of Return*, Financial Management, Spring 1986.

[17] Eugene F. Brigham, Dilip K. Shome, and Steve R. Vinson, *The Risk Premium Approach to Measuring a Utility's Cost of Equity*, Financial Management, Spring 1985.

- The annualized dividend per share as of October 31, 2014 for the term D_0.

I then calculated the DCF results using each of the following growth terms:

- The Zacks consensus long-term earnings growth estimates;
- The First Call consensus long-term earnings growth estimates;
- The Value Line long-term earnings growth estimates; and
- An estimate of Retention Growth.

Q Please describe the Retention Growth model.

A. The Retention Growth model, which is a generally recognized and widely taught method of estimating long-term growth, is an alternative approach to the use of analysts' earnings growth estimates. In essence, the model is premised on the proposition that a firm's growth is a function of its expected earnings, and the extent to which it retains earnings to invest in the enterprise. In its simplest form, the model represents long-term growth as the product of the retention ratio (*i.e.,* the percentage of earnings not paid out as dividends, referred to below as ("b") and the expected return on book equity (referred to below as "r")). Thus, the simple "b x r" form of the model projects growth as a function of internally generated funds. That form of the model is limiting, however, in that it does not provide for growth funded from external equity.

The "br + sv" form of the Retention Growth estimate used in my DCF analysis is meant to reflect growth from both internally generated funds *(i.e.,* the "br" term) and from issuances of equity *(i.e.,* the "sv" term). The first term, which is the product of the

retention ratio *(i.e.,* "b", or the portion of net income not paid in dividends) and the expected Return on Equity *(i.e.,* "r") represents the portion of net income that is "plowed back" into the Company as a means of funding growth. The "sv" term is represented as:

$$\left(\frac{m}{b} - 1\right) x \text{ Growth rate in Common Shares} \qquad [3]$$

where $\frac{m}{b}$ is the Market-to-Book ratio.

In this form, the "sv" term reflects an element of growth as the product of (a) the growth in shares outstanding, and (b) that portion of the market-to-book ratio that exceeds unity. As shown in Exhibit NSTAR-RBH-4, all of the components of the Retention Growth Model can be derived from data provided by Value Line.

Q. How did you calculate the high and low DCF results?

A. I calculated the proxy group mean high DCF result using the maximum Earnings Per Share ("EPS") growth rate as reported by Value Line, Zack's, First Call, and Retention Growth for each proxy group company in combination with the dividend yield for each of the proxy group companies. The average mean high result then reflects the average maximum DCF result for the proxy group as a whole. I used a similar approach to calculate the proxy group mean low results, using instead the minimum growth rate as reported by Value Line, Zack's, First Call, and Retention Growth for each proxy group company.

Q. What are the results of your DCF analysis?

A. My Constant Growth DCF results are summarized in Table 3 (below; *see also*, Exhibit NSTAR-RBH-3).

Table 3: Constant Growth DCF Results

	Mean Low	***Mean***	***Mean High***
30-Day Average	7.96%	9.26%	10.85%
90-Day Average	7.94%	9.24%	10.84%
180-Day Average	7.99%	9.29%	10.88%

Q. How did you reflect the Constant Growth DCF results in your ROE range and recommendation?

A. I recognize that in Docket No. 13-90 the Department noted that the model's assumptions are "responsible for DCF cost of equity anomalies" and that because of those limitations "it is appropriate to consider all of the DCF estimates when evaluating the [c]ompany's ROE."[18] My recommendation does, therefore, consider those results, along with the range of results from the additional analyses discussed below.

B. Multi-Stage DCF Model

Q. What other forms of the DCF model have you used?

A. In order to address certain limiting assumptions underlying the Constant Growth form of the DCF model (such as those noted by the Department), I also considered the results of

[18] Massachusetts Department of Public Utilities, Docket No. D.P.U. 13-90, *Petition of Fitchburg Gas and Electric Light Company (Electric Division) d/b/a Unitil to the Department of Public Utilities for approval of the rates and charges set forth in Tariffs M.D.P.U. Nos. 229 through 238, and approval of an increase in base distribution rates for electric service pursuant to G.L. c. 164, § 94 and 220 C.M.R. § 5.00 et seq.*, May 30, 2014, at 219. [clarification added]

the Multi-Stage (three-stage) Discounted Cash Flow Model. The Multi-Stage model, which is an extension of the Constant Growth form, enables the analyst to specify growth rates over three distinct stages. As with the Constant Growth form of the DCF model, the Multi-Stage form defines the Cost of Equity as the discount rate that sets the current price equal to the discounted value of future cash flows. Unlike the Constant Growth form, however, the Multi-Stage model must be solved in an iterative fashion.

Q. Please now summarize why you have included the Multi-Stage DCF method in your Cost of Equity estimation.

A. First, as noted earlier, it is both prudent and appropriate to use multiple methodologies in order to mitigate the effects of assumptions and inputs associated with any single approach. Second, the Constant Growth DCF model assumes that earnings, dividends and book value will grow at the same, constant rate in perpetuity; that the payout ratio will remain constant in perpetuity; and that the Price/Earnings ratio will remain constant. In addition, the model assumes that the return required today will be the same return required every year in the future. However, those assumptions are not likely to hold. In particular, it is likely that over time, payout ratios will increase from their current levels. In addition, to the extent that long-term interest rates increase over the next few years, it is likely that the Cost of Equity also will increase. In my view, the Multi-Stage DCF model enables analysts to consider those issues, and to address the limiting, and likely unrealistic assumptions underlying the Constant Growth form of the model.

Q. Please generally describe the structure of your Multi-Stage model.

A. As noted above, the model sets the subject company's stock price equal to the present value of future cash flows received over three "stages". In the first two stages, "cash flows" are defined as projected dividends. In the third stage, "cash flows" equal both dividends and the expected price at which the stock will be sold at the end of the period (*i.e.,* the "terminal price"). I calculated the terminal price based on the Gordon model, which defines the price as the expected dividend divided by the difference between the Cost of Equity (*i.e.*, the discount rate) and the long-term expected growth rate. In essence, the terminal price is defined by the present value of the remaining "cash flows" in perpetuity. In each of the three stages, the dividend is the product of the projected earnings per share and the expected dividend payout ratio. A summary description of the model is provided in Table 4 (below).

Table 4: Multi-Stage DCF Structure

Stage	0	1	2	3
Cash Flow Component	Initial Stock Price	Expected Dividend	Expected Dividend	Expected Dividend + Terminal Value
Inputs	Stock Price; EPS; Dividends Per Share ("DPS")	Expected EPS; Expected DPS	Expected EPS; Expected DPS	Expected EPS; Expected DPS; Terminal Value
Assumptions	30-, 90-, and 180-day average stock price	EPS Growth Rate; Payout Ratio	Growth Rate Change; Payout Ratio Change	Long-term Growth Rate; Long-term Payout Ratio

Q. What are the analytical benefits of your three-stage model?

A. The primary benefits relate to the flexibility provided by the model's formulation. Because the model provides the ability to specify near, intermediate, and long-term growth rates, for example, it avoids the sometimes limiting assumption that the subject company will grow at the same, constant rate in perpetuity. In addition, by calculating the dividend as the product of earnings and the payout ratio, the model enables analysts to reflect assumptions regarding the timing and extent of changes in the payout ratio to reflect, for example, increases or decreases in expected capital spending, or transition from current payout levels to long-term expected levels. In that regard, because the model relies on multiple sources of earnings growth rate assumptions, it is not limited to a single source, such as Value Line, for all inputs, and mitigates the potential bias associated with relying on a single source of growth estimates.[19]

The model also enables the analyst to assess the reasonableness of the inputs and results by reference to certain market-based metrics. For example, the stock price estimate can be divided by the expected earnings per share in the final year to calculate an average P/E ratio. Similarly, the terminal P/E ratio can be divided by the terminal growth rate to develop a Price to Earnings Growth ("PEG") ratio. To the extent that either the projected P/E or PEG ratios are inconsistent with either historical or expected levels, it may indicate incorrect or inconsistent assumptions within the balance of the model.

[19] *See*, for example, Harris and Marston, *Estimating Shareholder Risk Premia Using Analysts' Growth Forecasts*, Financial Management, 21 (Summer 1992).

Q. Please summarize your inputs to the Multi-Stage DCF model.

A. I applied the Multi-Stage model to the proxy group described earlier in my Direct Testimony. My assumptions with respect to the various model inputs are described in Table 5 (below).

Table 5: Multi-Stage DCF Model Assumptions

Stage	Initial	First	Transition	Terminal
Stock Price	30-, 90-, and 180-day average stock price as of October 31, 2014			
Earnings Growth	2013 actual EPS escalated by Period 1 growth rate	EPS growth as average of: (1) Value Line; (2) Zacks; (3) First Call; (4) Retention Growth	Transition to Long-term GDP growth	Long-term GDP growth
Payout Ratio		Value Line company-specific	Transition to long-term industry payout ratio	Long-term expected payout ratio
Terminal Value				Expected dividend in final year divided by solved Cost of Equity less long-term growth rate

Q. How did you calculate the long-term GDP growth rate?

A. The long-term growth rate of 5.64 percent is based on the real Gross Domestic Product ("GDP") growth rate of 3.27 percent from 1929 through 2013,[20] and an inflation rate of 2.29 percent. The GDP growth rate is calculated as the compound growth rate in the chain-weighted GDP for the period from 1929 through 2013. The rate of inflation of 2.29 percent is a compound annual forward rate starting in ten years (*i.e.,* 2024, which is the beginning of the terminal period) and is based on the 30-day average projected inflation based on the spread between yields on long-term nominal Treasury Securities and long-term Treasury Inflation Protected Securities, known as the "TIPS spread."

Q. What were your specific assumptions with respect to the payout ratio?

A. As noted in Table 5, for the first two periods I relied on the first year and long-term projected payout ratios reported by Value Line[21] for each of the proxy group companies. I then assumed that by the end of the second period (*i.e*., the end of year 10), the payout ratio will converge to the long-term industry average of 68.74 percent.[22]

Q. Please summarize the results of your Multi-Stage DCF analyses.

A. Table 6 (below; *see also*, Exhibit NSTAR-RBH-5), presents the results of the Multi-Stage DCF analyses.

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[20] Bureau of Economic Analysis, October 17, 2014 update.

[21] As reported in the Value Line Investment Survey as "All Div'ds to Net Prof."

[22] Source: Bloomberg Professional.

Table 6: Multi-Stage DCF Results

	Low	***Mean***	***High***
30-Day Average	9.33%	9.65%	10.07%
90-Day Average	9.32%	9.63%	10.05%
180-Day Average	9.35%	9.67%	10.10%

Q. Did you undertake any additional analyses to support your DCF model results?

A. Yes. While the Department accepts the DCF model in its analysis, it may also rely upon the results of other approaches to determine the appropriate rate of return. As such, I also applied the CAPM, and Bond Yield Plus Risk Premium approaches.

C. CAPM Analysis

Q. Please briefly describe the general form of the CAPM analysis.

A. The CAPM analysis is a risk premium approach that estimates the Cost of Equity for a given security as a function of a risk-free return plus a risk premium (to compensate investors for the non-diversifiable or "systematic" risk of that security). As shown in Equation [4], the CAPM is defined by four components, each of which theoretically must be a forward-looking estimate:

$$k = r_f + \beta(r_m - r_f) \quad [4]$$

where:

k = the required market ROE;
β = Beta coefficient of an individual security;
r_f = the risk-free rate of return; and
r_m = the required return on the market as a whole.

In Equation [4], the term ($r_m - r_f$) represents the Market Risk Premium. According to the theory underlying the CAPM (and as discussed in Section VIII), since unsystematic risk can be diversified away by adding securities to their investment portfolio, investors should be concerned only with systematic or non-diversifiable risk. Non-diversifiable risk is measured by the Beta coefficient, which is defined as:

$$\beta_j = \frac{\sigma_j}{\sigma_m} \, x \, \rho_{j,m} \qquad [5]$$

where σ_j is the standard deviation of returns for company "*j*"; σ_m is the standard deviation of returns for the broad market (as measured, for example, by the S&P 500 Index), and $\rho_{j,m}$ is the correlation of returns in between company *j* and the broad market. Thus, the Beta coefficient represents both relative volatility (*i.e.,* the standard deviation) of returns, and the correlation in returns between the subject company and the overall market.

Q. What assumptions regarding the risk-free rate did you include in your CAPM analysis?

A. Because utility assets represent long-term investments, I used three different estimates of the risk-free rate: (1) the current 30-day average yield on 30-year Treasury bonds (*i.e.*, 3.09 percent); and (2) the near-term (that is, through the first calendar quarter of 2016) projected 30-year Treasury yield (*i.e.*, 3.88 percent).[23]

[23] *See*, Blue Chip Financial Forecasts, Vol. 33, No. 10, October 1, 2014, at 2.

Q. Please describe your ex-ante approach to estimating the Market Risk Premium.

A. The approach is based on the market required return, less the current 30-year Treasury bond yield. To do so, I relied on data from two sources: (1) Bloomberg; and (2) Value Line. For both Bloomberg and Value Line, I calculated the market capitalization weighted expected dividend yield (using the same one-half growth rate assumption described earlier), and combined that amount with the market capitalization weighted projected earnings growth rate to arrive at the market capitalization weighted average DCF result. I then subtracted the current 30-year Treasury yield from that amount to arrive at the market DCF-derived *ex-ante* Market Risk Premium estimate. The results of those calculations are provided in Exhibit NSTAR-RBH-6.

Q. How did you apply your expected Market Risk Premium and risk-free rate estimates?

A. I relied on each of the *ex-ante* Market Risk Premia discussed above, together with the current and projected 30-year Treasury bond yields as inputs to my CAPM analyses.

Q. What Beta coefficients did you use in your CAPM analysis?

A. As shown in Exhibit NSTAR-RBH-7, I considered the Beta coefficients reported by two sources: Bloomberg and Value Line. For each source, I employed the average of the reported Beta coefficient for each proxy group company. While both of those services adjust their calculated (or "raw") Beta coefficients to reflect the tendency of the Beta coefficient to regress to the market mean of 1.00, Value Line calculates the Beta

coefficient over a five-year period, while Bloomberg's calculation is based on two years of data.

Q. What are the results of your CAPM analyses?

A. The results of my CAPM analysis are summarized in Table 7 (below; *see also*, Exhibit NSTAR-RBH-8).

Table 7: Summary of CAPM Results

	Bloomberg Derived Market Risk Premium	***Value Line Derived Market Risk Premium***
Average Bloomberg Beta Coefficient		
Current 30-Year Treasury (3.09%)	11.18%	10.67%
Near-Term Projected 30-Year Treasury (3.88%)	11.98%	11.47%
Average Value Line Beta Coefficient		
Current 30-Year Treasury (3.09%)	11.21%	10.69%
Near Term Projected 30-Year Treasury (3.88%)	12.00%	11.49%

D. Bond Yield Plus Risk Premium Approach

Q. Please generally describe the Bond Yield Plus Risk Premium approach.

A. This approach is based on the financial tenet that, because equity investors bear the residual risk of ownership, their returns are subject to more risk than are the returns to bondholders. As such, equity holders require a premium over the returns available to debt holders. Risk premium approaches, therefore, estimate the Cost of Equity as the

sum of an Equity Risk Premium[24] and a bond yield. The Equity Risk Premium is the difference between the historical Cost of Equity and long-term Treasury yields. Because we are calculating the risk premium for natural gas utilities, a reasonable approach is to use actual authorized returns for natural gas utilities as the historical measure of the Cost of Equity.

Q. Please now explain how you performed your Bond Yield Plus Risk Premium analysis.

A. As discussed above, I first defined the Risk Premium as the difference between authorized ROEs and the then-prevailing level of long-term (*i.e.*, 30-year) Treasury yield. I then gathered data from 1,007 natural gas utility rate proceedings between January 1, 1980 and October 31, 2014.[25] In addition to the authorized ROE, I also calculated the average period between the filing of the case and the date of the final order (the lag period). In order to reflect the prevailing level of interest rates during the pendency of the proceedings, I calculated the average 30-year Treasury yield over the average lag period (approximately 188 days).

Because the data covers a number of economic cycles,[26] the analysis also may be used to assess the stability of the Equity Risk Premium. As noted above, the Equity Risk Premium is not constant over time; prior research has shown that it is directly related to

[24] The Equity Risk Premium is defined as the incremental return that an equity investment provides over a risk-free rate.

[25] Source: Regulatory Research Associates.

[26] *See*, National Bureau of Economic Research, U.S. Business Cycle Expansion and Contractions.

expected market volatility, and inversely related to the level of interest rates.[27] That finding is particularly relevant given the historically low level of current Treasury yields.

Q. How did you model the relationship between interest rates and the Equity Risk Premium?

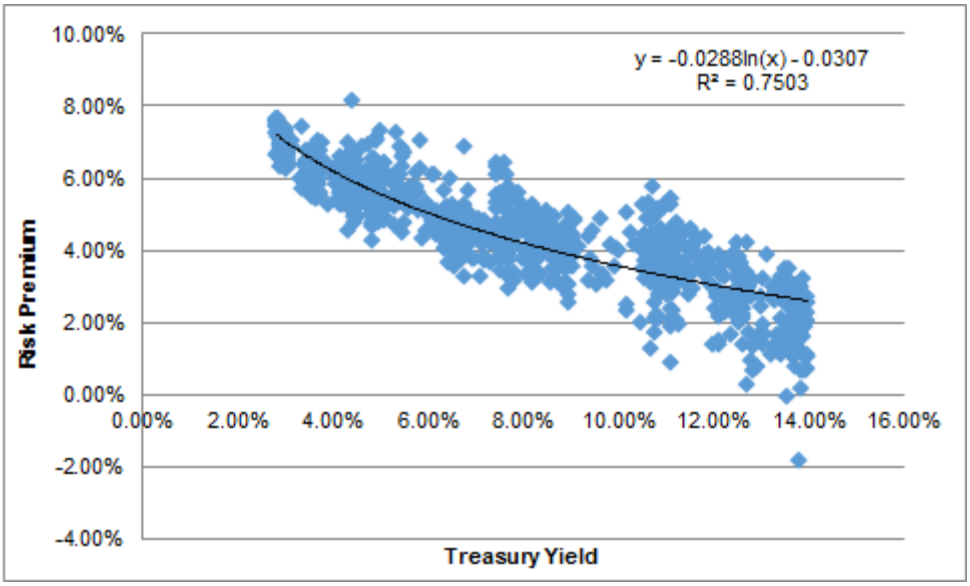
A. The basic method used was regression analysis, in which the observed Equity Risk Premium is the dependent variable, and the average 30-year Treasury yield is the independent variable. Relative to the long-term historical average, the analytical period includes interest rates and authorized ROEs that are quite high during one period (*i.e.*, the 1980s) and that are quite low during another (*i.e.*, the post-Lehman bankruptcy period). To account for that variability, I used the semi-log regression, in which the Equity Risk Premium is expressed as a function of the natural log of the 30-year Treasury yield:

$$RP = \alpha + \beta(\mathrm{LN}(T_{30})) \quad [6]$$

As shown on Chart 1 (below), the semi-log form is useful when measuring an absolute change in the dependent variable (in this case, the Risk Premium) relative to a proportional change in the independent variable (the 30-year Treasury yield).

[27] *See*, *e.g.*, Robert S. Harris and Felicia C. Marston, *The Market Risk Premium: Expectational Estimates Using Analysts' Forecasts*, Journal of Applied Finance, Vol. 11, No. 1, 2001, at 11-12; Eugene F. Brigham, Dilip K. Shome, and Steve R. Vinson, *The Risk Premium Approach to Measuring a Utility's Cost of Equity*, Financial Management, Spring 1985, at 33-45; and Farris M. Maddox, Donna T. Pippert, and Rodney N. Sullivan, *An Empirical Study of Ex Ante Risk Premiums for the Electric Utility Industry*, Financial Management, Autumn 1995, at 89-95.

Chart 1: Equity Risk Premium[28]



As Chart 1 demonstrates, over time there has been a statistically significant, negative relationship between the 30-year Treasury yield and the Equity Risk Premium. Consequently, applying the simple long-term average Equity Risk Premium of 4.47 percent (*see* Exhibit NSTAR-RBH-9) would significantly under-state the Cost of Equity and produce results well below any reasonable estimate. Based on the regression coefficients in Chart 1, however, the implied ROE is between 10.03 percent and 10.76 percent (*see* Exhibit NSTAR-RBH-9). In any event, the analysis demonstrates that there has been a significant inverse relationship between the 30-year Treasury yield and the Equity Risk Premium.

[28] *See also*, Exhibit NSTAR-RBH-9.

VII. BUSINESS RISKS AND OTHER CONSIDERATIONS

Q. What additional information did you consider in assessing the analytical results noted above?

A. Because the analytical methods discussed above provide a range of estimates, there are several additional factors that should be taken into consideration when establishing a reasonable range for the Company's Cost of Equity. In particular, those factors include the Company's proposed decoupling mechanism, flotation costs, and the effect of my ROE recommendation on the Company's financial integrity.

A. Proposed Decoupling Mechanism

Q. Please briefly describe the Company's proposed decoupling mechanism.

A. As described by Charles R. Goodwin, the Company's RDAC proposal sets an annual revenue per customer benchmark for the winter season and the summer season based on the distribution revenue level approved by the Commission in this proceeding. The revenue per customer calculation will be made for each of the twelve calendar months consistent with approved rates and billing determinants. At the conclusion of each year, the Company will reconcile actual revenue per customer to the approved revenue per customer targets, among three separate customer groups. Consistent with other Department-approved decoupling mechanisms, NSTAR Gas plans to exclude revenues associated with new customer additions occurring after the end of the test year.

Q. How common are decoupling mechanisms such as the Company's decoupling proposal?

A. There is little question that decoupling mechanisms are increasingly common. The

increased interest in such mechanisms has generally resulted from the growing cost of maintaining system reliability, coupled with the flat or declining volume brought on by energy efficiency and relatively slow economic growth. A December 2013 report published by Regulatory Research Associates ("RRA") indicated that some form of revenue decoupling has been implemented by gas utilities in 35 jurisdictions.[29] Consequently, the implementation of alternative regulation mechanisms has become an increasingly visible issue to investors.

Q. Are decoupling mechanisms common among the proxy companies?

A. Yes, they are. Exhibit NSTAR-RBH-10 provides a summary of decoupling mechanisms currently in effect at each gas utility subsidiary of the proxy group companies. As Exhibit NSTAR-RBH-10 demonstrates, each of the proxy group companies has a form of decoupling in place in most, if not all, of its gas utility subsidiaries.

Q. Would the Company's proposed revenue decoupling structure reduce NSTAR Gas' Cost of Equity?

A. No, it would not. The principal analytical issue is whether the Company would be so less risky than its peers as a direct result of the proposed decoupling structure that investors would specifically and measurably reduce their return requirements. The fact that the proposed decoupling structure may stabilize the Company's revenues would not affect its Cost of Equity unless it can be demonstrated that (1) the Company would be materially less risky than the proxy group by virtue of the decoupling mechanism; and (2) investors

[29] RRA *Decoupling Mechanisms/Straight-Fixed-Variable Rate Design – A State-By-State Overview*, December 26, 2013. Includes weather normalization clauses.

are likely to react to the incremental effect of the mechanism. Because revenue stabilization and cost recovery mechanisms are common among the proxy companies, there is no reason to assume that NSTAR Gas would be materially less risky, and that its Cost of Equity would be lower than its peers' as a result of the proposed decoupling mechanism.

Q. Have regulatory commissions recognized the prevalence of decoupling mechanisms?

A. Yes, for example, in its most recent order regarding Baltimore Gas and Electric, for example, the Public Service Commission of Maryland, stated that:

> We will not further reduce that return as a result of BGE's decoupling mechanism. No party argued that the Company should have a reduced ROE for its natural gas operations because of decoupling. Instead, as the parties testified, decoupling provisions are common among natural gas distribution companies.[30]

Similarly, in its most recent order regarding Southwest Gas, the Public Utilities Commission of Nevada also noted that decoupling mechanisms have become common:

> The Commission further finds that an adjustment for SWG's revenue decoupling mechanism is unnecessary as all of the companies in the Proxy Group have some form of a rate stabilization mechanism in place.[31]

Q. What is your conclusion regarding the effect of the Company's proposed decoupling structure on its Cost of Equity?

A. I appreciate that in prior orders, the Department has observed the number of revenue stabilization mechanisms in place throughout the industry; as noted above, decoupling

[30] Baltimore Gas & Electric, Public Service Commission of Maryland, Case No. 9299, Order No. 85374, February 22, 2013, at 78.

[31] Southwest Gas Corporation, Public Utilities Commission of Nevada, Docket No. 12-04005, Modified Final Order, December 14, 2012, at 28.

mechanisms have become increasingly common for gas utility companies. I also recognize that the Department has drawn distinctions among the types of decoupling mechanisms that are in place, and has noted that investors may refer to SEC Form 10-Q and 10-K filings to understand the nature of decoupling mechanisms. As shown in Exhibit NSTAR-RBH-10, I have reviewed the most recent SEC Form 10-K filings for the proxy companies and on that basis, do not see the Company's proposal as so different than its peers' that investors would assume a lower level of risk and require a lower return. Moreover, there is little question that regulatory commissions continue to recognize that revenue stabilization and cost recovery mechanisms are increasingly common and, therefore, already are reflected in current market valuations. On balance, I do not believe that it would be proper to reduce the Company's ROE in connection with its proposed decoupling structure.

B. Flotation Costs

Q. What are flotation costs?

A. Flotation costs are the costs associated with the sale of new issues of common stock. These include out-of-pocket expenditures for preparation, filing, underwriting, and other costs of issuance.

Q. Are flotation costs part of the utility's invested costs or part of the utility's expenses?

A. Flotation costs are part of capital costs, which are properly reflected on the balance sheet under "paid in capital" rather than current expenses on the income statement. Flotation

costs are incurred over time, just as investments in rate base or debt issuance costs. As a result, the great majority of flotation costs are incurred prior to the test year, but remain part of the cost structure during the test year and beyond.

Q. How did you calculate the flotation cost recovery adjustment?

A. I modified the DCF calculation to provide a dividend yield that would reimburse investors for issuance costs. My flotation cost adjustment recognizes the costs of issuing equity that were incurred by the Company and the proxy group companies in their most recent two issuances. As shown in Exhibit NSTAR-RBH-11, an adjustment of 0.12 percent (*i.e.*, 12 basis points) reasonably represents flotation costs for the Company.

Q. Are you proposing to adjust your recommended ROE by 12 basis points to reflect the effect of flotation costs on the Company's ROE?

A. No, I am not. Rather, I have considered the effect of flotation costs, in addition to the Company's other business risks, in determining where the Company's ROE falls within the range of results.

C. Financial Integrity

Q. Have you also considered how your recommended ROE, if adopted, would affect the Company's credit metrics?

A. Yes, I considered pro forma credit metrics that correspond to a measure disclosed by companies in their SEC Form 10-K filings, *i.e.,* the ratio of earnings to fixed charges.[32] That ratio (sometimes referred to as the ratio of EBIT/Interest), which measures the

[32] *See*, for example, Exhibit 12 to Northeast Utilities' SEC Form 10-K for the Year Ended December 31, 2013.

surplus of (1) the sum of pre-tax earnings and fixed charges over; and (2) fixed charges, is meant to be a measure of long-term solvency.[33]

Q. How did you use those measures in assessing the reasonableness of the recommended ROE?

A. I calculated the pro forma ratio based on my recommended ROE and the Company's capital structure recommendations, together with certain elements of the Company's filing. Exhibit NSTAR-RBH-12 summarizes the results of those calculations. To put those results in context, I compared the pro forma EBIT coverage ratios to those of each of my proxy group companies, as reported by SNL Financial. The intent of that analysis was to understand whether my recommended ROE would support financial metrics that would allow the company to maintain its credit profile.

Q. What did that analysis reveal?

A. The Company's pro forma EBIT/Interest ratio of 4.52 is generally consistent with the proxy group median of 4.43. Therefore, the Company's pro forma EBIT/Interest ratio, based on a recommended ROE of 10.25 percent, would support the Company's financial integrity relative to its peers.

[33] "EBIT" refers to Earnings Before Interest and Taxes. Although fixed charges may include other items, it is primarily a measure of interest on long-term debt.

Q. What are the implications of these findings in relation to the Company's debt rating?

A. Because regulatory actions are important to credit ratings, the Department's decision in this proceeding will affect the Company's ability to maintain access to capital at favorable rates.

VIII. CAPITAL MARKET ENVIRONMENT

Q. Do economic conditions influence the required cost of capital and required return on common equity?

A. Yes. As discussed in Section VI, the models used to estimate the Cost of Equity are meant to reflect, and therefore are influenced by, current and expected capital market conditions. Therefore, it is important to assess the reasonableness of any financial model's results in the context of observable market data. To the extent that certain ROE estimates are incompatible with such data or inconsistent with basic financial principles, it is appropriate to consider whether alternative estimation techniques are likely to provide more meaningful and reliable results.

Q. Do you have any general observations regarding the relationship between current capital market conditions and the Company's Cost of Equity?

A. Yes, I do. Much has been reported about the Federal Reserve's Quantitative Easing policy, and its effect on interest rates. The issue as to how those policies, and the continuing level of interest rates, affects utility stock prices is less clear. As discussed below, for example, while Federal Reserve policy has affected interest rates, it also correlates to lower levels of market volatility. Generally speaking, when volatility is low

investors are willing to take on more risk, and allocate capital to less defensive stocks. In essence, they are more willing to take on additional risk in expectation of realizing higher returns. Recently, however, the market appears to be providing conflicting signals: low volatility and low interest rates have resulted in defensive stocks somewhat outperforming other sectors.

A relevant question, then, is how investors will react when the Federal Reserve completes its market intervention. A viable outcome is that investors will perceive greater chances for economic growth, which will increase the growth rates included in the Constant Growth DCF model. At the same time, higher growth and the absence of Federal market intervention could provide the opportunity for interest rates to increase, thereby increasing the dividend yield portion of the DCF model. In that case, both terms of the Constant Growth DCF model would increase, producing increased ROE estimates.

At this time, however, market data is somewhat disjointed. As a consequence, it is difficult to rely on a single model to estimate the Company's Cost of Equity. A more reasoned approach is to understand the relationships among Federal Reserve policies, interest rates and risk, and assess how those factors may affect different models. For the reasons discussed below, the current market is one in which it is very important to consider a broad range of data and models when determining the Cost of Equity.

Q. Please summarize the effect of recent Federal Reserve policies on interest rates and the cost of capital.

A. Beginning in 2008, the Federal Reserve proceeded on a steady path of initiatives intended

to lower long-term Treasury yields.[34] The Federal Reserve policy actions "were designed to put downward pressure on longer-term interest rates by having the Federal Reserve take onto its balance sheet some of the duration and prepayment risks that would otherwise have been borne by private investors."[35] Under that policy, "Securities Held Outright" on the Federal Reserve's balance sheet increased from approximately $489 billion at the beginning of October 2008 to $4.22 trillion by October 31, 2014.[36] To put that increase in context, the securities held by the Federal Reserve represented approximately 3.29 percent of GDP at the end of September 2008, and increased to approximately 24.09 percent in October 2014.[37]

Q. Is the Federal Reserve expected to maintain these policies?

A. The Federal Reserve began "tapering" its asset purchases in December 2013, and although the future pace of such reductions was not on a "preset course," it was completed in October 2014.[38] On September 17, 2014, the Federal Reserve issued a statement regarding "Policy Normalization Principles and Plans," in which it discussed the conditions under which, and methods by which it may reduce its holdings of securities and increase certain short term interest rates.[39] Although the Federal Reserve

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[34] *See* Federal Reserve Press Release (Jun. 19, 2013).

[35] Federal Reserve Bank of New York, *Domestic Open Market Operations During 2012*, April 2013, at 29.

[36] Federal Reserve Schedule H.4.1, "Securities held outright" include U.S. Treasury securities, Federal agency debt securities, and mortgage-backed securities.

[37] Federal Reserve Schedule H.4.1; Bureau of Economic Analysis, GDP data as of the third calendar quarter of 2014.

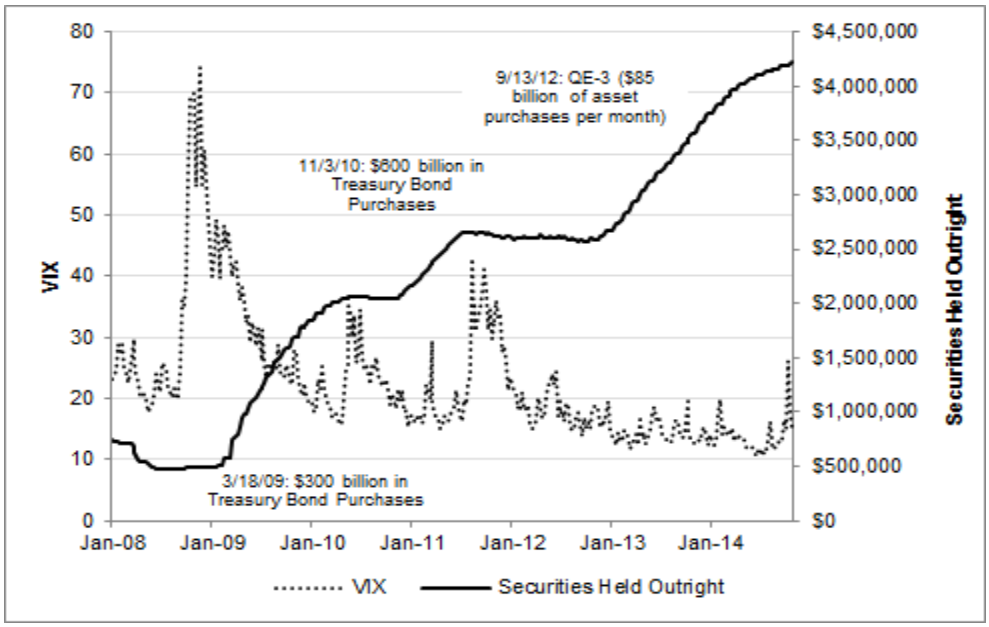
[38] Federal Reserve Board of Governors Press Release (Oct. 29, 2014).

[39] Federal Reserve Press Release, *Policy Normalization Principles and Plans,* (Sep. 17, 2014).

discussed its policy goals, no specific timelines were identified. As such, uncertainties remain in the market today and going forward. The uncertainty surrounding the timing of the Federal Reserve's future policy decisions, including the unwinding of stimulus programs, represents a risk to investors that, in my view, should be reflected in the Company's authorized ROE.

Just as market intervention by the Federal Reserve has reduced interest rates, it also has had the effect of reducing market volatility. As shown in Chart 2 (below), each time the Federal Reserve began to purchase bonds (as evidenced by the increase in "Securities Held Outright" on its balance sheet), volatility subsequently declined. In fact, in September 2012, when the Federal Reserve began to purchase long-term securities at a pace of $85 billion per month, volatility (as measured by the CBOE Volatility Index, known as the "VIX") fell, and through October 2014 remained in a relatively narrow range. The reason is quite straight-forward: Investors became confident that the Federal Reserve would intervene if markets were to become unstable.

Chart 2: VIX and Federal Reserve Asset Purchases[40]



The important analytical issue is whether we can infer that risk aversion among investors is at a historically low level, implying a Cost of Equity that is well below recently authorized returns. Given the negative correlation between the expansion of the Federal Reserve's balance sheet and the VIX, it is difficult to conclude that fundamental risk aversion and investor return requirements have fallen. If it were the case that investors believe that volatility will remain at low levels (that is, that market risk and uncertainty will remain low), it is not clear why they would decrease their return requirements for defensive sectors such as utilities. In that respect, it appears that the Constant Growth DCF results are at odds with market conditions. As such (and as discussed earlier in my testimony), I believe that it is currently appropriate to consider multiple methods.

[40] Source: Federal Reserve Economic Data (FRED), Federal Reserve Bank of St. Louis; Federal Reserve Statistical Release H.4.1, Factors Affecting Reserve Balances.

Q. What conclusions do you draw from your analyses of capital market conditions?

A. From an analytical perspective, it is important that the inputs and assumptions used to arrive at an ROE recommendation, including assessments of capital market conditions, are consistent with the recommendation itself. While I appreciate that all analyses require an element of judgment, there must be an application of that judgment in the context of the quantitative and qualitative information available to the analyst and the capital market environment in which the analyses were undertaken. Because the application of financial models and interpretation of their results often is the subject of differences among analysts in regulatory proceedings, I believe that it is important to review and consider a variety of data points; doing so enables us to put in context both quantitative analyses and the associated recommendations.

IX. CAPITAL STRUCTURE

Q. What is the Company's proposed capital structure?

A. The Company has proposed a capital structure comprised of 52.94 percent common equity, and 47.06 percent long-term debt.

Q. Is there a generally accepted approach to developing the appropriate capital structure for a regulated natural gas utility?

A. Yes, there are a number of generally accepted approaches to developing the appropriate capital structure. The reasonableness of the approach depends on the nature and circumstances of the subject company. In cases where the subject company does not issue its own securities, it may be reasonable to look to the parent's capital structure or to

develop a "hypothetical" capital structure based on the proxy group companies or other industry data. Regardless of the approach taken, however, it is important to consider the resulting capital structure in light of industry norms and investor requirements. That is, the capital structure should enable the subject company to maintain its financial integrity, thereby enabling access to capital at competitive rates under a variety of economic and financial market conditions.

Q. How does the capital structure affect the Cost of Equity?

A. The capital structure relates to a company's financial risk, which represents the risk that a company may not have adequate cash flows to meet its financial obligations, and is a function of the percentage of debt (or financial leverage) in its capital structure. In that regard, as the percentage of debt in the capital structure increases, so do the fixed obligations for the repayment of that debt. Consequently, as the degree of financial leverage increases, the risk of financial distress (*i.e.*, financial risk) also increases. Because the capital structure can affect the subject company's overall level of risk, it is an important consideration in establishing a just and reasonable rate of return.

Q. Please discuss your analysis of the capital structures of the proxy group companies.

A. I calculated the average capital structure for each of the proxy group companies over the last eight quarters. Measuring the capital components at a particular point in time can skew the capital structure by the specific circumstances of a particular period. Therefore, it is more appropriate to normalize the relative relationship between the capital components over a period of time. As shown in Exhibit NSTAR-RBH-13, the median of

the proxy group actual capital structures is 52.98 percent common equity and 47.02 percent long-term debt. The average common equity ratios range from 48.94 percent to 67.79 percent. Further, the Company's proposed 52.94 percent equity ratio is generally consistent with Bay State Gas Company's 53.68 percent equity ratio authorized by the Department in February 2014.[41] Based on that review, it is apparent that the Company's proposed capital structure is generally consistent with the capital structures of the proxy group companies and similarly situated companies.

Q. What is your conclusion regarding an appropriate capital structure for the Company?

A. Considering the median actual equity ratio of 52.98 percent for the proxy group companies, I have concluded that the Company's proposed common equity ratio of 52.94 percent is appropriate, as it is consistent with the proxy group companies.

X. SUMMARY AND CONCLUSIONS

Q. What is your conclusion regarding the Company's Cost of Equity?

A. A return on common equity in the range of 10.00 percent to 10.50 percent represents the range of equity investors' required return for investment in natural gas utilities similar to the Company in today's capital markets. Within that range, I believe that an ROE of 10.25 percent is reasonable and appropriate. My recommended ROE, considers the Company's risk profile relative to the proxy group analytical results with respect to: (1) the Company's proposed RDAC; (2) flotation costs associated with equity issuances; and

[41] Massachusetts Department of Public Utilities, Docket No. D.P.U. 13-75, *Petition of Bay State Gas Company d/b/a Columbia Gas of Massachusetts, pursuant to General Laws Chapter 164, § 94, and 220 C.M.R. §§ 5.00 et seq*., February 28, 2014, at 276.

(3) the effect of my ROE recommendation on the Company's financial integrity. As such, a return on common equity of 10.25 percent reasonably represents the return required to invest in a company with a risk profile comparable to the Company. Table 8 summarizes my analytical results.

Table 8: Summary of Analytical Results

Discounted Cash Flow	***Mean Low***	***Mean***	***Mean High***
30-Day Constant Growth DCF	7.96%	9.26%	10.85%
90-Day Constant Growth DCF	7.94%	9.24%	10.84%
180-Day Constant Growth DCF	7.99%	9.29%	10.88%
30-Day Multi-Stage DCF	9.33%	9.65%	10.07%
90-Day Multi-Stage DCF	9.32%	9.63%	10.05%
180-Day Multi-Stage DCF	9.35%	9.67%	10.10%
Supporting Methodologies			
CAPM Results		***Bloomberg Derived Market Risk Premium***	***Value Line Derived Market Risk Premium***
Average Bloomberg Beta Coefficient			
Current 30-Year Treasury (3.09%)		11.18%	10.67%
Near-Term Projected 30-Year Treasury (3.88%)		11.98%	11.47%
Average Value Line Beta Coefficient			
Current 30-Year Treasury (3.09%)		11.21%	10.69%
Near Term Projected 30-Year Treasury (3.88%)		12.00%	11.49%
	Low	***Mid***	***High***
Bond Yield Risk Premium	10.03%	10.17%	10.76%
Flotation Costs		0.12%	

Q. What is your conclusion regarding the Company's capital structure?

A. I conclude that a capital structure that consists of 52.94 percent common equity, and 47.06 percent long-term debt is reasonable and appropriate.

Q. Does this conclude your Direct Testimony?

A. Yes, it does.