



**STATE OF NEW HAMPSHIRE
BEFORE THE
PUBLIC UTILITIES COMMISSION**

Docket No. DE 16-383

Liberty Utilities (Granite State Electric) Corp. d/b/a Liberty Utilities
Distribution Service Rate Case

REBUTTAL TESTIMONY

OF

ROBERT B. HEVERT

February 3, 2017

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1 **I. INTRODUCTION**

2 **Q. Please state your name, affiliation, and business address.**

3 A. My name is Robert B. Hevert. I am Managing Partner of Sussex Economic Advisors,
4 LLC (“Sussex”). My business address is 1900 West Park Drive, Suite 250,
5 Westborough, Massachusetts 01581.

6 **Q. On whose behalf are you submitting this testimony?**

7 A. I am submitting this testimony before the New Hampshire Public Utilities Commission
8 (“Commission”) on behalf of Liberty Utilities (Granite State Electric) Corp. d/b/a Liberty
9 Utilities (“Granite State” or the “Company”).

10 **Q. Have you previously submitted testimony in this proceeding?**

11 A. Yes. I submitted prefiled testimony as part of the Company’s April 29, 2016, filing for
12 an increase in distribution rates. My professional background and qualifications are
13 contained in the prior testimony.

14 **II. PURPOSE AND OVERVIEW OF TESTIMONY**

15 **Q. What is the purpose of your testimony?**

16 A. The purpose of my Rebuttal Testimony is to respond to the direct testimony of Dr. Pradip
17 K. Chattopadhyay on behalf of the New Hampshire Office of Consumer Advocate
18 (“OCA”) and the direct testimony of Dr. J. Randall Woolridge on behalf of the
19 Commission Staff (“Staff”), as their testimonies relate to the Company’s Return on
20 Equity (“ROE” or “Cost of Equity”). My rebuttal testimony also updates many of the

1 analyses contained in my Direct Testimony,¹ and provides several additional analyses
2 developed in response to Dr. Chattopadhyay's and Dr. Woolridge's testimony.

3 **Q. Please provide a summary overview of the recommendations contained in your**
4 **Rebuttal Testimony.**

5 A. In my Direct Testimony, I concluded that an ROE of 10.30 percent represents the Cost of
6 Equity for Granite State, within a range of 10.00 percent to 10.60 percent. As my Direct
7 Testimony discussed, my ROE recommendation considers a variety of factors, including
8 capital market conditions in general and certain risks faced by Granite State. Because the
9 application of financial models and the interpretation of their results are often sources of
10 disagreement among analysts in regulatory proceedings, I believe it is important to
11 review and consider a variety of data points; doing so enables us to put in context both
12 quantitative analyses and the associated recommendations. As such, I have updated
13 many of the analyses contained in my Direct Testimony, and I have provided several new
14 analyses in response to issues raised by Dr. Woolridge and Dr. Chattopadhyay
15 (collectively, the "Opposing ROE Witnesses"). As discussed throughout the balance of
16 my Rebuttal Testimony, those analyses continue to support my ROE range and
17 recommendation.

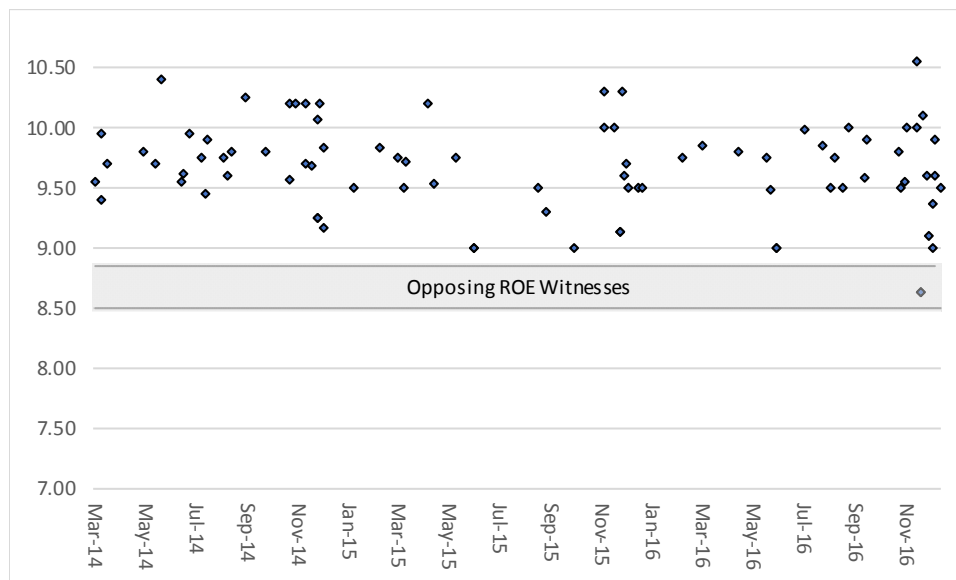
18 Lastly, I continue to find the Company's capital structure consisting of 55.00 percent
19 common equity and 45.00 percent long-term debt is consistent with Order No. 25,638 at
20 16 (Mar. 17, 2014) and reasonable relative to its peers.

¹ See, Attachment-RBH-R-1 to Attachment-RBH-R-7.

Q. Please now provide an overview of your response to the ROE recommendations made by the Opposing ROE Witnesses.

A. In this proceeding, the Opposing ROE Witnesses' Discounted Cash Flow ("DCF") method produces ROE estimates that are significantly below the returns authorized for other electric utilities. See Chart 1, below.

Chart 1: Authorized Electric ROEs and Opposing ROE Witnesses' Range²



For example, Dr. Chattopadhyay presents DCF results that range from 7.38 percent to 8.69 percent, with an average of 8.18 percent.³ Dr. Woolridge's DCF results range from 8.55 percent to 8.85 percent.⁴ Because the Opposing ROE Witnesses primarily rely on their DCF results, their recommendations rely on ROE estimates that are near or below the lowest ROE ever authorized for an electric utility, and in the case of certain of Dr.

² Source: Regulatory Research Associates. See Attachment RBH-R-9.
³ See Direct Testimony of Dr. Pradip K. Chattopadhyay, at 95, Schedule PKC-8.
⁴ See Direct Testimony of Dr. J. Randall Woolridge, Exhibit JRW-10.

1 Chattopadhyay's estimates, over 100 basis points below the lowest authorized return for
2 an electric utility.⁵ Putting aside the methodological concerns with their DCF analyses,
3 the Opposing ROE Witnesses' emphasis on that model is a case-in-point as to why it is
4 important to fully consider multiple methods and to assess the reliability of individual
5 model results in the context of current market conditions when estimating the Cost of
6 Equity.

7 In light of the emphasis that the Opposing ROE Witnesses place on their DCF results, it
8 is not surprising that their recommendations fall far below the returns authorized for
9 electric utilities in other jurisdictions. Other regulatory authorities have been reluctant to
10 give undue weight to models and methods that produce unreasonably low results.

11 Nevertheless, the Opposing ROE Witnesses are of the opinion that because Market-to-
12 Book ("M/B") ratios have exceeded unity, regulatory commissions have consistently
13 authorized returns in excess of the Cost of Equity. Regardless of how they develop their
14 models, DCF estimates as low as 7.38 percent fail to meet the *Federal Power Comm'n v.*
15 *Hope Natural Gas Co.*, 320 U.S. 591 (1944) ("*Hope*") and *Bluefield Water Works and*
16 *Improvement Co. v. Public Service Comm'n.* ("*Bluefield*") "end result" standard, and
17 should be given no weight in determining Granite State's ROE.⁶

18 Dr. Chattopadhyay notes that his 8.20 percent to 8.60 percent recommended range falls
19 below recently authorized returns. In fact, the high end of Dr. Chattopadhyay's
20 recommended range of 8.60 percent, falls below all ROEs authorized for electric utilities

⁵ See Schedule PKC-8.

⁶ Dr. Chattopadhyay's low DCF estimate is 7.38 percent. See Direct Testimony of Pradip K. Chattopadhyay, at 95, Schedule PKC-8. See also, *Hope*, 320 U.S. at 603.

1 since January 1980. From a somewhat different perspective, Dr. Chattopadhyay's (high-
2 end) 8.60 percent recommendation is 106 basis points below the average authorized
3 return since 2014.⁷ In fact, there have only been five authorized ROEs as low as 8.85
4 percent (the high end of Dr. Woolridge's range) for an electric utility.⁸

5 Dr. Woolridge suggests that the Cost of Equity has fallen since the Company was
6 authorized its current return of 9.55 percent in 2014.⁹ Observable data, however, does
7 not support that position. As Chart 1 (above) demonstrates, since March 2014, there has
8 been essentially no trend up or down in authorized returns for electric utilities. That is,
9 the slope of the trend line essentially is zero.

10 It is important to keep in mind that no one financial model is more reliable than others at
11 all times and under all market conditions. As discussed above, at times some model
12 results simply do not make sense. Determining the Cost of Equity is not always a strict
13 mathematical exercise; it requires the application of reasoned judgment in vetting the
14 models and assumptions used by various analysts, and in assessing the reasonableness of
15 their recommendations. As discussed throughout the balance of my Rebuttal Testimony,
16 the Opposing ROE Witnesses' recommendations cannot be supported by the reasonable
17 application of financial models, nor can they be justified by current or expected market
18 conditions. Rather, their unduly low recommendations would only serve to increase

⁷ Excluding limited issue rate riders.

⁸ Source: Regulatory Research Associates. Four of those five were the outcome of Illinois formula rate plans.

⁹ Direct Testimony of J. Randall Woolridge, at 8.

1 Granite State's regulatory and financial risk, and diminish its ability to compete for
2 capital.

3 **Q. Please now summarize the updated analyses contained in your Rebuttal Testimony.**

4 A. I have updated the Constant Growth and Multi-Stage forms of the DCF model, CAPM,
5 and Bond Yield Risk Premium analyses based on data through December 30, 2016, and
6 applied those analyses to my updated proxy group, consisting of the proxy group
7 contained in my Direct Testimony, but excluding Great Plains Energy, Inc. (GXP) and
8 Westar Energy Inc. (WR), and including Black Hills Corporation (BKH) and WEC
9 Energy Group (WEC). On May 31, 2016 (subsequent to the analytical period presented
10 in my Direct Testimony) GXP announced its proposed acquisition of WR.¹⁰ Because
11 GXP and WR no longer meet the screening criterion that excludes companies involved in
12 mergers or other significant transactions as discussed in my Direct Testimony, I have
13 removed GXP and WR from the proxy group used in my updated analyses. In addition,
14 BKH and WEC were removed from the proxy group in my Direct Testimony because of
15 their significant acquisitions of SourceGas Holdings LLC and Integrys Energy Group,
16 Inc., respectively.¹¹ Because enough time has passed to ensure that the analytical results
17 are not affected by those acquisitions, I have included BKH and WEC in my updated
18 proxy group.

¹⁰ Great Plains Energy, Inc., SEC Form 8-K, May 31, 2016.

¹¹ Black Hills Corporation, SEC Form 8-K, February 12, 2016. Wisconsin Energy Corporation, *Wisconsin Energy completes acquisition of Integrys to form WEC Energy Group*, Press Release, June 29, 2015. The combined company is now called WEC Energy Group, Inc. (WEC).

1 **Q. How is the remainder of your rebuttal testimony organized?**

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

- 3 • Section III – Contains my response to issues common to the Opposing ROE
- 4 Witnesses;
- 5 • Section IV – Contains my response to Dr. Woolridge;
- 6 • Section V – Contains my response to Dr. Chattopadhyay; and
- 7 • Section VI – Summarizes my updated analyses,¹² conclusions, and
- 8 recommendations.

9 **III. ISSUES COMMON TO THE OPPOSING WITNESSES**

10 **Q. Before addressing witness-specific issues, are there issues that are common to Drs.**
11 **Woolridge and Chattopadhyay that you would like to address?**

12 A. Yes. Because it underlies so many of the analyses involved in estimating the Cost of
13 Equity, I will address current and expected capital market conditions as a common issue.
14 In addition, because Drs. Woolridge and Chattopadhyay believe that Market-to-Book
15 ratios are important measures of investor return requirements, I will address their
16 arguments, also as a common issue.

¹² See Attachment RBH-R-1 through RBH-R-7.

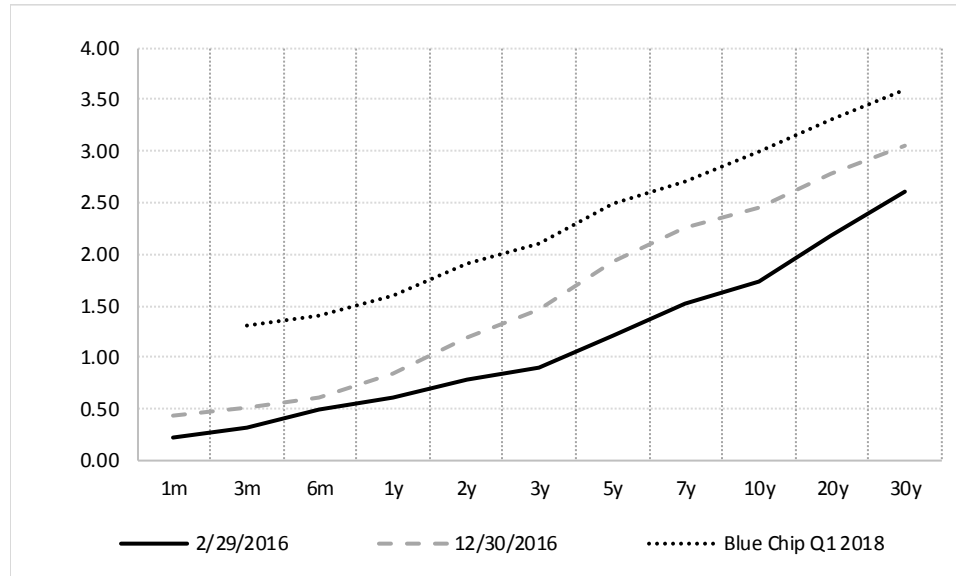
1 **A. Current Capital Market Environment**

2 **Q. Are there capital market measures that are helpful to observe in assessing ROE**
3 **recommendations?**

4 A. Yes, there are. For example, recent and expected changes in interest rates in response to
5 Federal Reserve monetary policy normalization is particularly important in the current
6 market environment. With the Federal Reserve increasing the target range of the Federal
7 Funds rate by 25 basis points (from 0.25 percent - 0.50 percent to 0.50 percent - 0.75
8 percent) on December 14, 2016, short-term rates have increased by a corresponding
9 amount since February 29, 2016 (the date of the analysis used in my Direct Testimony).¹³
10 Long-term yields, however, have increased by wider margins, with the ten year and 30-
11 year Treasury yields increasing by 71 basis points and 45 basis points, respectively. See
12 Chart 2 below.

¹³ Source: Federal Reserve Board Schedule H.15. 6-month and 1-year Treasury yields increased by 13 and 23 basis points, respectively.

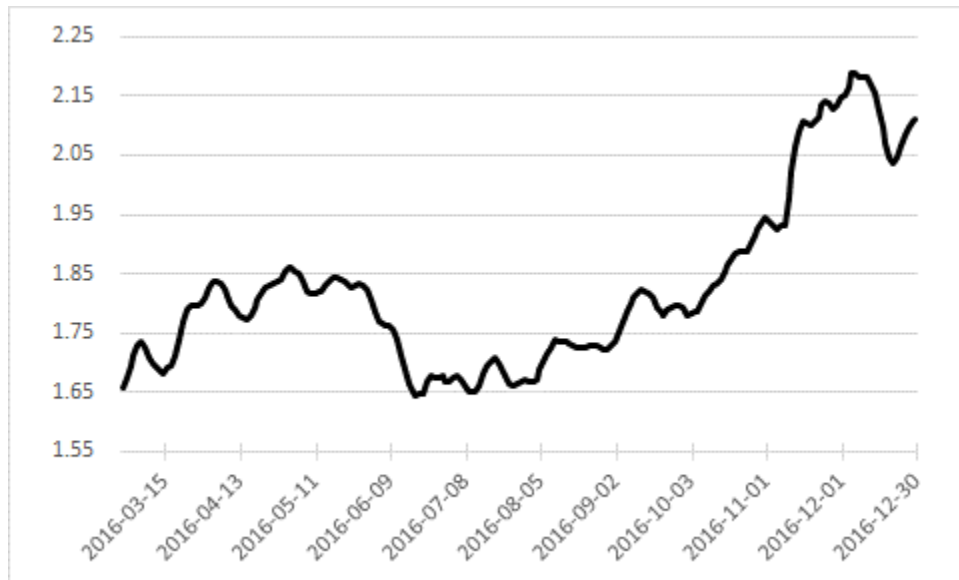
Chart 2: Treasury Yield Curve: 2/29/2016, 12/30/2016 and Projected Q1 2018¹⁴



The increases in Treasury yields correspond to increases in expected inflation, measured by the difference between nominal Treasury yields and Treasury Inflation Protected Securities, which difference often is referred to as the “TIPS spread.” See Chart 3, below.

¹⁴ Sources: Federal Reserve Board Schedule H.15.; Blue Chip Financial Forecasts, Vol. 36, No.1, January 1, 2017, at 2.

Chart 3: Forward Inflation Estimates 2/29/2016 – 12/30/2016¹⁵



The increase in both long-term interest rates and inflation, particularly considering the magnitude of the changes in an abbreviated period, suggest higher investor return requirements.

Q. How have long-term Treasury yields changed since the beginning of 2016?

A. Treasury yields have been volatile, with long-term rates declining through the first half of 2016, but increasing by 92 basis points since July 1, 2016. As shown in Chart 4, by the end of November 2016 the 30-year Treasury yield had surpassed the levels seen at the beginning of 2016. As of the end of 2016, 30-year Treasury yields were approximately equal to their five-year averages.

¹⁵ Forward inflation estimates calculated as the difference between implied nominal and inflation protected 20-year Treasury yields in ten years.

Chart 4: 30-Year Treasury Yield January - December 2016¹⁶



Q. Do market-based data indicate that investors see a probability of increasing interest rates?

A. Yes. Looking to long-term interest rates, consensus projections gathered by *Blue Chip Financial Forecasts* suggest a 30-year Treasury yield of 3.60 percent by the first quarter of 2018 (a 54 basis point increase over the 3.06 percent yield as of end of December).¹⁷ Similarly, and as discussed earlier, market expectations for increased long-term Treasury yields are apparent in the market prices to buy or sell at-the-money options in long-term Government bond funds. That is, the value of the option to sell the TLT (an exchange-traded fund of long-term Government bonds) in January 2019 at today's price is approximately one and a half times more than the value of the option to buy that fund.¹⁸

¹⁶ Source: Bloomberg Professional.
¹⁷ Blue Chip Financial Forecasts, Vol. 36, No. 1, January 1, 2016, at 2.
¹⁸ <http://www.nasdaq.com/symbol/tlt/option-chain?dateindex=8>

Because bond prices fall as interest rates increase, investors see a greater likelihood of increases in long-term interest rates than decreases.

Looking to short-term interest rates, data compiled by CME Group indicates that investors see a 92.90 percent likelihood of further Federal Funds rate increases, even after the December 14, 2016 increase. As shown in Table 1 below, the market is now anticipating at least one additional rate hike (92.90 percent probability) and possibly two or three (68.20 percent and 34.50 percent probability, respectively) by December 2017. Importantly, the potential for rising rates represents risk for utility investors.

Table 1: Probability of Federal Funds Rate Increase¹⁹

Target Rate (bps)	Federal Reserve Meeting Date							
	2/1/17	3/15/17	5/3/17	6/14/17	7/26/17	9/20/17	11/1/17	12/13/17
50-75	96.0%	79.0%	65.5%	32.2%	26.6%	17.9%	14.7%	7.1%
75-100	4.0%	20.3%	30.3%	48.2%	45.4%	39.3%	35.4%	24.7%
100-125		0.7%	4.1%	17.4%	22.7%	30.2%	31.8%	33.7%
125-150			0.1%	2.1%	4.8%	10.7%	14.2%	23.3%
150-175				0.1%	0.4%	1.8%	3.4%	9.0%
175-200						0.1%	0.5%	2.0%
200-225								0.2%

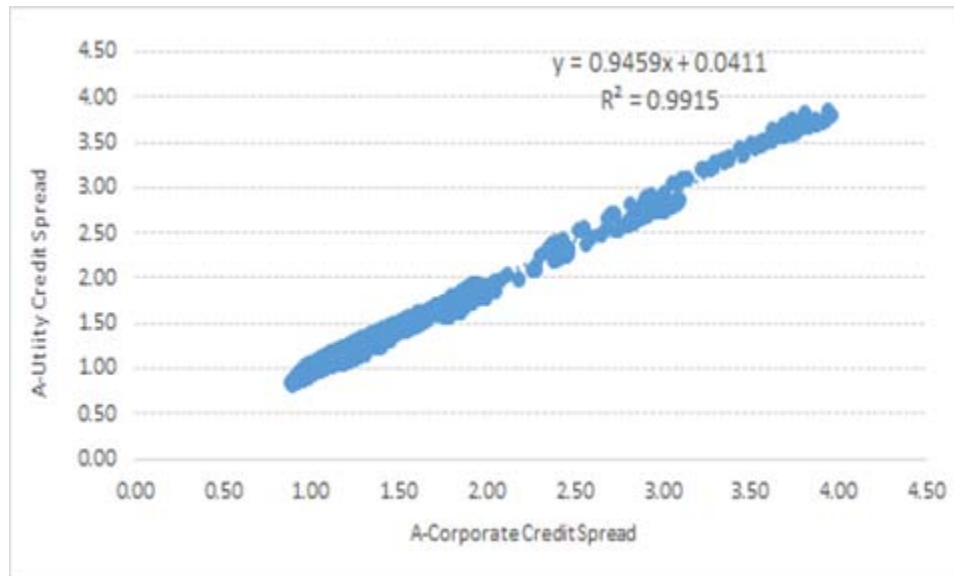
In fact, investors see only about a 7.00 percent chance of no increases in 2017; the probability of a 100-basis point increase is higher than the probability of no increase.

¹⁹ Source: <http://www.cmegroup.com/trading/interest-rates/countdown-to-fomc.html>, accessed January 18, 2017.

1 **Q. Have you also reviewed the relationship between credit spreads for A-rated utility**
2 **debt relative to A-rated corporate debt?**

3 **A.** Yes, I have. Given the historical volatility in the spread between corporate and utility A-
4 rated debt, there is no reason to conclude that utility yields are different than those of
5 their corporate counterparts. That conclusion is consistent with the finding that over
6 time, there has been a nearly one-to-one relationship between credit spreads on A-rated
7 corporate and utility bonds. In fact, a regression analysis in which corporate credit
8 spreads are the explanatory variable and utility credit spreads are the dependent variable
9 shows that slope is approximately 1.00 and highly significant. See Chart 5, below.
10 Because the intercept term is statistically insignificant, we can conclude that there has
11 been no material difference between the two, and there certainly is no meaningful
12 difference in the current market.

Chart 5: Corporate and Utility Credit Spreads (A-Rated)²⁰



Q. Have you considered other data points in your assessment of general economic conditions?

A. Yes. Although a single observation, I note that the Bureau of Economic Analysis recently announced that third quarter Gross Domestic Product rose by 3.50 percent.²¹ At the same time, expected inflation (as measured by the 30-year TIPS spread) was in the range of 2.05 percent to 2.15 percent,²² suggesting nominal GDP growth in the range of 5.60 percent to 5.70 percent.

Q. What do you conclude from those analyses?

A. First, it is clear that interest rates have increased from the low levels experienced in 2015 and 2016. It also is clear that investor expectations, as measured by forward Treasury

²⁰ Source: Bloomberg Professional. Please note that for a univariate regression, the correlation coefficient equals the square root of the R-square. In this case, the square root of 0.9915 is approximately 0.996 (99.60 percent).

²¹ Bureau of Economic Analysis, News Release dated December 22, 2016.

²² Federal Reserve Schedule H.15, dated January 13, 2017.

1 yields and the implied probability of Federal Funds rate increases, suggest rising capital
2 costs in the near term. Those higher Treasury yields again indicate expectations for
3 increased capital costs. The observation that interest rates and GDP growth have
4 increased indicate that the financial community sees the strong prospect of increased
5 growth throughout the economy. As that occurs, and as interest rates continue to rise, it
6 would be reasonable to expect higher dividend yields and higher growth rates. In the
7 context of the Discounted Cash Flow model, those variables would combine to indicate
8 increases in the Cost of Equity.

9 Although the market data discussed above indicate increasing costs of capital, it is
10 important to keep in mind that estimating the Cost of Equity is an empirical, but not an
11 entirely mathematical, exercise; that the methods used, or the weight given to any one
12 method, may change from case to case; and that the returns authorized in other
13 jurisdictions provide a relevant, observable, and verifiable benchmark for assessing the
14 reasonableness of analytical assumptions, results, and conclusions. With those points in
15 mind, I continue to believe that a reasonable range of ROE estimates is from 10.00
16 percent to 10.60 percent.

17 **Q. Have there been other recent periods when utility valuation levels were high relative**
18 **to both their long-term average and the market?**

19 A. Yes. In early 2015, the utility sector (as measured by the S&P Electric Utility Index)
20 traded at a Price/Earnings ratio of approximately 18.00.²³ During the same period, the
21 overall market (as measured by the S&P 500) traded at a P/E of approximately 18.00. In

²³ “S&P” refers to Standard & Poor’s.

1 late January 2015, the utility sector began to lose value, and by June 2015 it had lost
2 approximately 15.50 percent of its value. Similarly, the P/E ratio of the S&P Electric
3 Utility Index was only slightly below that of the S&P 500 in early July 2016. Since then,
4 the S&P Electric Utility Index lost approximately 9.00 percent of its value, while the
5 S&P 500 increased approximately 6.60 percent. The point simply is that as investors see
6 an increasing likelihood of higher interest rates, they will move out of sectors that
7 provided higher yields relative to the overall market. As they do, valuations and P/E
8 ratios fall.

9 **Q. What conclusions do you draw from those analyses?**

10 A. In my view, we cannot conclude that the recent levels of utility valuations are due to a
11 fundamental change in the risk perceptions of utility investors. Rather, it is my view that
12 the valuation levels are related to the “reach for yield” that sometimes occurs during
13 periods of low Treasury yields.²⁴ That position is consistent with the observation that 22
14 of 24 authorized electric utility ROEs in the second half of 2016 were above the highest
15 of the opposing witnesses ROE recommendations (8.85 percent).²⁵ As Chart 1 above
16 demonstrates, the recommendations of Staff Witness Woolridge and OCA Witness
17 Chattopadhyay diverge so far from the range of recently authorized ROEs that they
18 should be considered outliers.²⁶

²⁴ See, for example, Value Line’s Electric Utility (Central) Industry report, June 17, 2016.

²⁵ Source: Regulatory Research Associates, excluding limited-issue riders and excluding formula rates in Illinois. I also note a number of authorized returns were 10.00% or above: Wisconsin Power and Light Co. in WI (10.00%), Florida Power & Light Co. in FL (10.55%), Liberty Utilities CalPeco Electric in CA (10.00%), and Duke Energy Progress LLC in SC (10.10%).

²⁶ At page 82 of his Direct Testimony, Dr. Chattopadhyay uses a two-standard deviation outlier approach to assess his DCF estimates. Dr. Woolridge and Dr. Chattopadhyay’s ROE recommendations are more than two standard deviations below the average authorized return since 2014. See Attachment RBH-R-9.

1 **B. Market to Book Ratios**

2 **Q. Please summarize the Opposing Witnesses' position regarding the Market/Book**
3 **ratio for utilities, and its implications for estimating the Cost of Equity.**

4 A. Dr. Woolridge and Dr. Chattopadhyay suggest that Market/Book ("M/B") ratios in excess
5 of unity indicate that the earned Return on Equity exceeds the investor-required Cost of
6 Equity.²⁷ Beyond the general observation that M/B ratios for electric utilities have been
7 greater than 100.00 percent, neither Dr. Woolridge nor Dr. Chattopadhyay provide any
8 support for their positions. For the reasons discussed below, I disagree with the
9 conclusion that utility commissions consistently authorize returns in excess of the Cost of
10 Equity.

11 Dr. Woolridge provides a series of three regression analyses reflecting the relationship
12 between the Return on Equity and M/B ratios for electric, natural gas, and water utilities,
13 respectively, and concludes that there is a "strong positive relationship" between M/B
14 ratios and the ROE for utilities.²⁸ Although the earned Return on Equity may be one
15 factor explaining M/B ratios, it is not the only factor. If it were, the regression equations
16 presented in Dr. Woolridge's Exhibit JRW-6 would produce reasonable ROE estimates
17 when the M/B ratio equals unity. Based on Dr. Woolridge's Exhibit JRW-6, an M/B
18 ratio of 1.00 is associated with an ROE of just 4.44 percent.²⁹

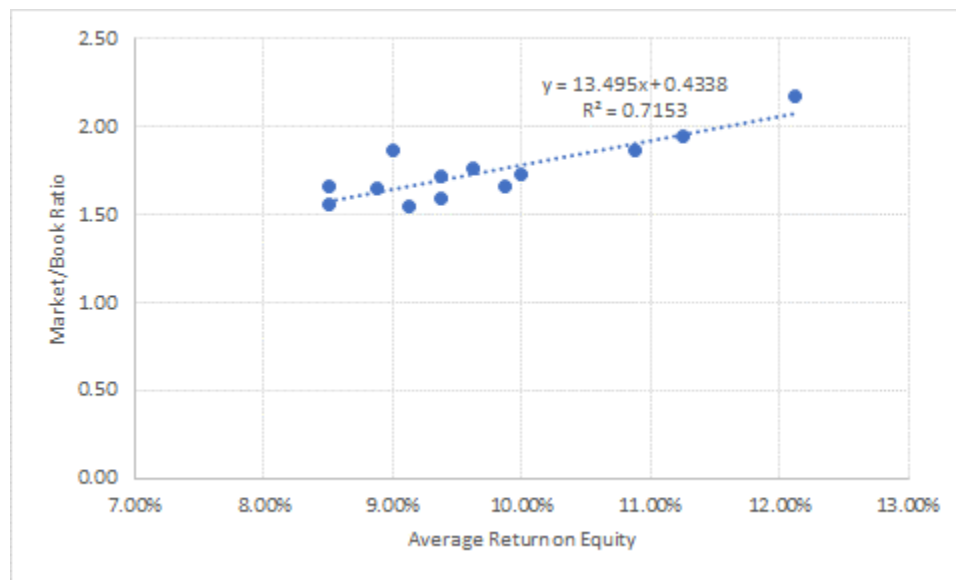
²⁷ See Direct Testimony of Pradip K. Chattopadhyay, at 57-68; Direct Testimony of J. Randall Woolridge, at 13, 40.

²⁸ *Ibid.*, at 38-39 and Exhibit JRW-6. Please note that there were only nine observations for the water group and twelve for the gas company group.

²⁹ I have updated the chart contained in Exhibit JRW-6 including the regression coefficients, using recent data from Value Line as of December 30, 2016. The resulting regression equation is: $1.00 = 0.393 + (4.442\% \times 0.137)$.

I performed a similar analysis using Dr. Chattopadhyay's exhibits. If we take at face value the proposition that M/B ratios will equal 1.00 when ROE equals the Cost of Equity, we can use the data provided in Dr. Chattopadhyay's Schedules to estimate the relationship between ROE and M/B ratios. The data provided Schedules PKC-6 and PKC-7 produce the equation provided in Chart 6, below.

Chart 6: Market/Book Ratio as a Function of ROE



That regression equation, which explains about 71.50 percent of the variation in the Market/Book ratios included in Dr. Chattopadhyay's exhibits, suggests that the Market/Book ratio would equal 1.00 when the ROE (and under Dr. Chattopadhyay's construct, the Cost of Equity) equals 4.20 percent.³⁰

Both Dr. Woolridge and Dr. Chattopadhyay's data result in Cost of Equity estimations that are as much as 168 basis points below the Company's *cost of debt* (i.e., 5.88

³⁰ $1.00 = .4338 + (4.20\% \times 13.495)$

1 percent). In other words, for the M/B ratio to equal 1.00, the Cost of Equity would be
2 well below the cost of debt, a condition that is highly improbable and would be
3 financially threatening to a utility if it existed. There is no reason to conclude that equity
4 investors would accept a return that is within a handful of basis points of the return they
5 would receive from investing in utility debt.³¹ Consequently, neither Dr. Woolridge's,
6 nor Dr. Chattopadhyay's data support their theory that ROEs in excess of unity indicate
7 that the subject company's return exceeds investors' required returns.

8 Turning to Dr. Chattopadhyay specifically, he believes there are three reasons why it is
9 important to "investigate" M/B ratios. First, he argues that any divergence between the
10 market value of equity (that is, the market price of a share of stock) and the book value
11 (the account-based value of common equity) "is very telling" regarding any divergence
12 between the expected return on equity, and the opportunity cost-based cost of equity. He
13 argues that M/B ratios greater than 1.00 indicate that expected returns exceed required
14 returns. Dr. Chattopadhyay then states that M/B ratios greater than 1.00 have certain
15 implications for the Constant Growth DCF model. Lastly, he notes that one of his
16 applications of the DCF approach relies on M/B ratios as an input.³²

17 Although I will respond to all three issues, the first – that M/B ratios greater than 1.00 are
18 indicative of expected returns exceeding the "true cost of equity"³³ – is a fundamental
19 concern.

³¹ As of December 30, 2016, the 30-day average Moody's Utility Baa Index yield was 4.79 percent. Source: Bloomberg Professional.

³² Direct Testimony of Dr. Pradip K. Chattopadhyay, at 57.

³³ Direct Testimony of Dr. Pradip K. Chattopadhyay, at 83.

1 **Q. Do M/B ratios above 1.00 necessarily suggest that authorized ROEs have been too**
2 **high?**

3 A. No, they do not. Given that Staff and the OCA view M/B ratios as an observable
4 benchmark for assessing the Cost of Equity, it is important to review the ratio itself, and
5 to bear in mind what it does, and does not, indicate. In very general terms, the M/B ratio
6 equals the market value (or stock price) per share, divided by the total common equity (or
7 the book equity) per share. Book value is an accounting construct, which reflects
8 historical costs. In contrast, market value per share, *i.e.*, the stock price, is forward-
9 looking and is a function of many variables, including (but not limited to) expected
10 earnings and cash flow growth, expected payout ratios, measures of “earnings quality”,
11 the regulatory climate, the equity ratio, expected capital expenditures, and the expected
12 return on book equity.³⁴ It follows, therefore, that the P/B ratio likewise is a function of
13 numerous variables in addition to the historical or expected Return on Common Equity.

14 Here, Dr. Chattopadhyay discusses the M/B ratio in the context of the Constant Growth
15 DCF model. As Dr. Chattopadhyay notes, under certain restrictive assumptions, that
16 model can be rewritten to express the M/B ratio as follows³⁵

17 A.
$$\frac{P}{B} = \frac{ROE - g}{k - g} \quad \text{Equation [1]}$$

³⁴ See for example, Roger A. Morin, New Regulatory Finance, Public Utility Reports, Inc., 2006, at 366. Dr. Morin cites several academic articles that address the various factors that affect the Market-to-Book ratio for utilities

³⁵ B. Branch, A. Sharma, C. Chawla, and F. Tu, *An Updated Model of Price-to-Book*, Journal of Applied Finance, No. 1 (2014). See, also, Dr. Chattopadhyay’s Direct Testimony at 79, Equation (1).

1 where ROE is the return on book equity, k is the risk-adjusted discount rate, and g is the
2 long-term growth rate in dividends per share. Rearranging Equation [1] produces the
3 familiar Gordon Growth model:

$$4 \quad P = \frac{D}{k - g} \quad \text{Equation [2]}$$

5
6 and the Constant Growth DCF model:

$$7 \quad k = \frac{D}{P} + g \quad \text{Equation [3]}$$

8 That is, Dr. Chattopadhyay's assumed relationship between the accounting Return on
9 Equity and the Cost of Equity simply falls from the Constant Growth DCF model itself;
10 one cannot be assumed without the other. As such, any inferences drawn from
11 relationships among M/B, ROE, and k from Equation [1] rely on the explicit acceptance
12 of all assumptions underlying the Constant Growth DCF model, including a constant
13 dividend growth rate in perpetuity, and the constancy of the DCF result. Equally
14 important, Equation [1] only can be solved from the Constant Growth DCF model if we
15 assume: (1) a constant dividend payout ratio in perpetuity; (2) no stock issuances or
16 repurchases; and (3) that the firm is in a steady state, in which the book equity growth
17 rate equals the dividend growth rate, in perpetuity. Taken together, those assumptions are
18 quite restrictive, and call into question the definitive linkage between M/B, ROE, and k
19 that Dr. Chattopadhyay assumes.

1 **Q. Are you aware of any published research that addresses the issue of M/B ratios in**
2 **the context of the Constant Growth DCF model?**

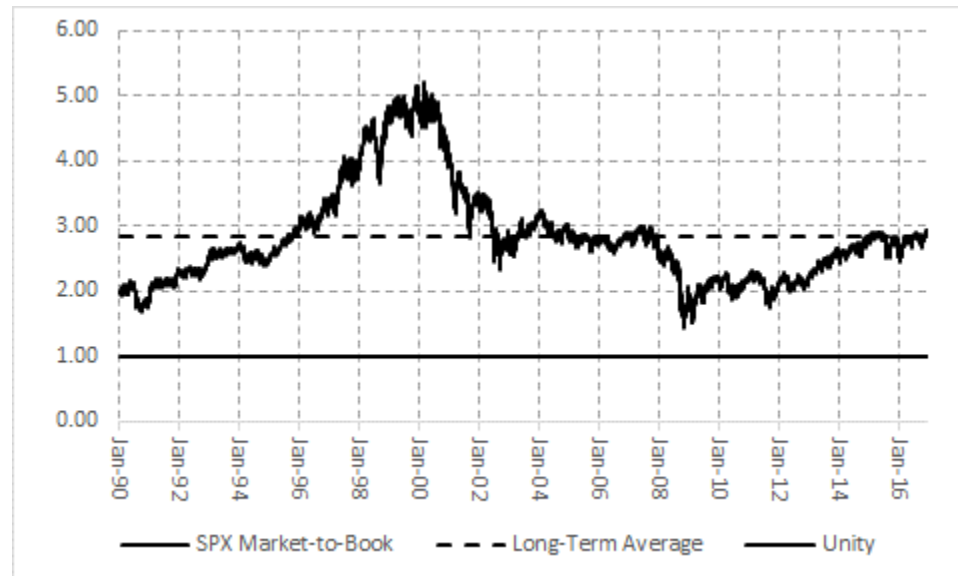
3 A. Yes. As noted above, if we accept all the assumptions that underlie the Constant Growth
4 DCF model, Equation [1] suggests that if M/B exceeds unity, then ROE exceeds k .
5 Branch *et al.* point out that M/B is generally greater than or equal to one because the
6 value of the firm as a going concern (price per share) generally exceeds the liquidation
7 value (book value per share), and because “firms having going concern values greater
8 than their liquidation values (most firms) and firms having finite prices (all firms) should
9 have $ROE > R > G$.”³⁶ Taken from that perspective M/B ratios in excess of unity should
10 not be surprising; if the liquidation value exceeds the market value, the company would
11 be liquidated.

12 **Q. Have Market/Book values generally exceeded 1.00 for the broad equity market?**

13 A. Yes, they have. As Chart 7 below demonstrates, since 1990 the average Market/Book
14 ratio for the S&P 500 Index has been 2.85; it has never reached unity.

³⁶ Branch et al. (2014), at 78. [clarification added] Here, R = the Cost of Equity, and G = growth.

Chart 7: S&P 500 Market/Book Ratio Over Time³⁷



If investors, over many years and across many companies, felt that the returns they expected had so significantly exceeded the returns they required, they would adjust their requirements. In Dr. Chattopadhyay's construct, the disequilibrium between expected and required returns would dissipate, and take with it the disequilibrium between market and book values. But that has not occurred.

That finding also is consistent with the position that M/B ratios greater than 1.00 simply mean that firms are worth more as a going concern than the book value of their assets. This is consistent with U.S. Generally Accepted Accounting Principles ("GAAP") and International Financial Reporting Standards, which require firms to carry the value of assets on their books at the historical cost of those assets. Only under specific

³⁷

Source: Bloomberg Professional.

1 circumstances may the value of certain financial investments be carried at market value.³⁸

2 As a result:

3 ...given market efficiency, the [M/B] ratio is intrinsically an
4 accounting phenomenon; that is, on first order, [M/B] is determined by
5 how accountants measure book value... If all assets and liabilities
6 were accounted for using unbiased mark-to-market or “fair value”
7 accounting, [M/B] would be equal to unity for all levels of risk....A
8 good example is a pure investment fund where “net asset value”
9 typically equals market value, since accountants apply mark-to-market
10 accounting to these funds....For most other firms, accountants do not
11 mark the net assets involved with operations to market. The
12 application of historical cost accounting, exacerbated by the
13 application of conservative accounting, introduces a difference
14 between price and book value.³⁹

15 **Q. Are you aware of research that has focused on the Market/Book ratios of regulated**
16 **utilities?**

17 A. Yes I am. Although Dr. Chattopadhyay and Dr. Woolridge suggest that utility
18 commissions have contributed to the divergence between market and book values,
19 research focusing on utilities has long concluded that regulation may not necessarily
20 result in M/B ratios approaching unity. As noted by Phillips in 1993:

21 Many question the assumption that market price should equal book
22 value, believing that “the earnings of utilities should be sufficiently
23 high to achieve market-to-book ratios which are consistent with those
24 prevailing for stocks of unregulated companies.”⁴⁰

25 In 1988 Bonbright stated:

26 In the first place, commissions cannot forecast, except within wide
27 limits, the effect their rate orders will have on the market prices of the

³⁸ Financial Accounting Standards Board Rule 157.

³⁹ S. H. Penman, S.A. Richardson, and I. Tuna, “*The Book-to-Price Effect in Stock Returns: Accounting for Leverage*”, *Journal of Accounting Research*, 45:2, May 2007. The authors use the reciprocal of the M/B and different notation. In the quote above, I have replaced B/P (where P denotes price per share) with M/B for ease of exposition.

⁴⁰ Charles F. Phillips, *The Regulation of Public Utilities – Theory and Practice* (Public Utility Reports, Inc., 1993) at 395.

1 stocks of the companies they regulate. In the second place, whatever
2 the initial market prices may be, they are sure to change not only with
3 the changing prospects for earnings, but with the changing outlook of
4 an inherently volatile stock market. In short, market prices are beyond
5 the control, though not beyond the influence, of rate regulation.
6 Moreover, even if a commission did possess the power of control, any
7 attempt to exercise it ... would result in harmful, uneconomic shifts in
8 public utility rate levels.⁴¹

9 As noted by Stewart Myers in 1972:

10 In short, a straightforward application of the cost of capital to a book
11 value rate base does not automatically imply that market and book
12 values will be equal. This is an obvious but important point. *If*
13 *straightforward approaches did imply equality of market and book*
14 *values, then there would be no need to estimate the cost of capital.* It
15 would suffice to lower (raise) allowed earnings whenever markets
16 were above (below) book [emphasis added].⁴²

17 Finally, as Dr. Morin states, it is rarely the case in cost of service-based regulation that

18 M/B ratios equal 1.00:

19 The third and perhaps most important reason for caution and
20 skepticism is that application of the DCF model produces estimates of
21 common equity cost that are consistent with investors' expected return
22 only when stock price and book value are reasonably similar, that is,
23 when the M/B is close to unity. As shown below, application of the
24 standard DCF model to utility stocks understates the investor's
25 expected return when the market-to-book (M/B) ratio of a given stock
26 exceeds unity. This was particularly relevant in the capital market
27 environment of the 1990s and 2000s whose utility stocks are trading at
28 M/B ratios well above unity and have been for nearly two decades.
29 The converse is also true, that is, the DCF model overstates the
30 investor's return when the stock's M/B ratio is less than unity. The
31 reason for the distortion is that the DCF market return is applied to a
32 book value rate base by the regulator, that is, a utility's earnings are
33 limited to earnings on a book value rate base.⁴³

⁴¹ James C. Bonbright, Albert L. Danielsen and David R. Kamerschen, Principles of Public Utility Rates (Public Utilities Reports, Inc., 1988), at 334.

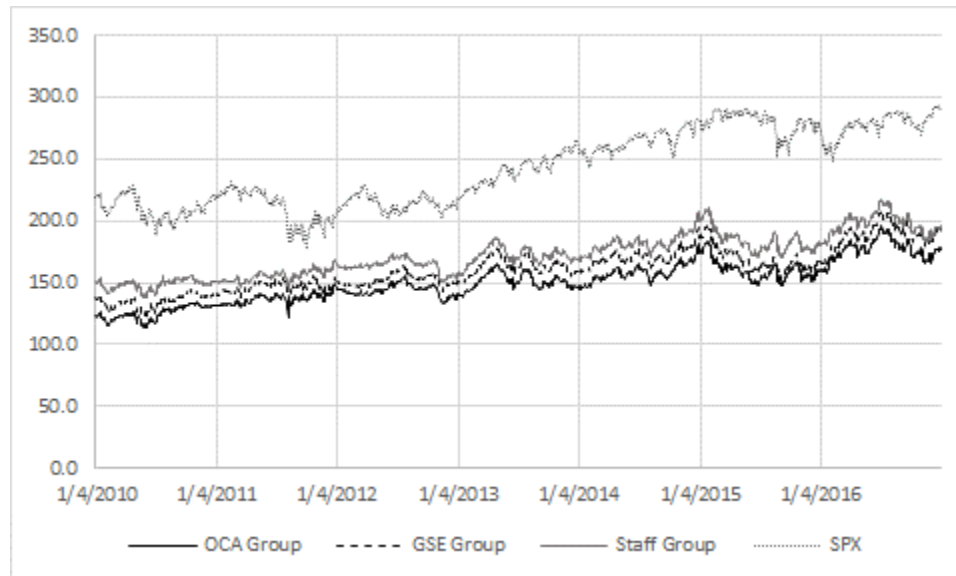
⁴² See, Roger A. Morin, New Regulatory Finance, Public Utilities Reports, Inc., 2006, at 366, citing Stewart C. Myers, *The Application of Finance Theory to Public Utility Rate Cases*, The Bell Journal of Economics and Management Science, Vol. 3, No. 1 (Spring 1972), at 76.

⁴³ Roger A. Morin, New Regulatory Finance, Public Utilities Reports, Inc., 2006, at 434 (emphasis added).

1 Because the Constant Growth DCF model traditionally used in rate regulation assumes a
2 M/B of unity, it would understate investors' required return rate when market value
3 exceeds book value. It would do so because investors evaluate and receive their returns
4 on the market value of a utility's equity, whereas regulators authorize returns on book
5 common equity. Consequently, the market-based DCF model will result in a total annual
6 dollar return on book common equity equal to the total annual dollar return expected by
7 investors only when market and book values are equal, a rare and unlikely situation.

8 Just as M/B ratios for the S&P 500 have remained above 1.00, so have those of the
9 Opposing ROE Witnesses' and my comparison companies. Chart 8 below demonstrates
10 that since 2010 (generally the time frame used by Dr. Chattopadhyay), all three proxy
11 groups' M/B ratios have exceeded unity, and have generally moved in parallel with the
12 S&P 500 M/B ratio. Although the broad market represents a cross section of risk and
13 return profiles, of which the utility sector is just one, the observed variation in market-
14 level M/B ratios speaks to the time-varying influence of general macroeconomic factors.

Chart 8: Comparison Groups, S&P 500 Market Book Ratios (2010 – 2016)⁴⁴



An interesting observation is that approximately 67.00 percent to 78.00 percent of the change in the comparison company groups' M/B ratios are explained by changes in the S&P 500 M/B ratio. That is, macroeconomic factors affect utilities as well as non-regulated entities.

Q. What would be the result if regulatory commissions did force M/B ratios toward unity?

A. Looking at Dr. Chattopadhyay's comparison group, the average capital loss for equity investors would be about 40.00 percent. From a slightly different perspective, the total loss in market value across the comparison group would be in the range of \$53 billion to \$62 billion, which is more than the market capitalization of the largest electric utility reported by Value Line.⁴⁵ Therefore, if investors believed that the extent to which M/B

⁴⁴ Source: Bloomberg Professional.

⁴⁵ As of December 1, 2016, Value Line reports NextEra Energy's market capitalization as \$53.4 billion.

1 ratios exceed 1.00 is a measure of the difference between their expected and required
2 returns, and that regulatory commissions would authorize returns that would set the
3 market value equal to the book value of utility stocks, there would be a significant loss of
4 value.

5 That loss would not just affect investors, it also would substantially diminish the ability
6 of utilities to attract external capital. Moreover, such a significant departure from
7 regulatory practice would introduce a degree of regulatory risk that would put pressure on
8 credit ratings, which pressure would be exacerbated by the diluted cash flow resulting
9 from the significantly lower authorized equity returns. Because utilities are so dependent
10 on external capital to fund the long-term investments needed to provide safe and reliable
11 service, the diminished access and increased cost would be to the detriment of customers,
12 as well as investors. To summarize, if regulatory commissions were to set rates with an
13 eye toward moving the M/B ratio toward unity, that practice may well impede the ability
14 to attract the capital required to support its operations, especially in markets during which
15 the M/B ratio for the overall market is significantly in excess of 100.00 percent.

16 **Q. Have you analyzed whether the actual earned Return on Equity explains the M/B**
17 **ratios for proxy group companies?**

18 A. Yes, I have. Based on data for the combined proxy group companies from SNL
19 Financial, I performed a regression analysis in which the M/B ratio was the dependent
20 variable, and the most recent twelve-month Return on Average Common Equity
21 (“ROACE”) was the explanatory variable. As shown in Attachment RBH-R-8, the R-
22 squared was approximately 34.00 percent (the coefficients and equation were statistically

1 significant). Thus, other factors explain up to 66.00 percent of M/B ratios for the
2 companies in the three proxy groups.⁴⁶ Those results support the position that although
3 the earned return on equity is a factor that explains M/B ratios, it is not the only factor.
4 In any case, the regression equation indicates that a M/B ratio of 1.00 is associated with a
5 Return on Common Equity of 0.79 percent, and an M/B ratio of 1.10 relates to an
6 ROACE of 1.94 percent. Because those estimates are far below the Company's 5.88
7 percent cost of debt, I do not agree that M/B ratios in excess of unity demonstrate
8 earnings in excess of investors' requirements.

9 **Q. Do you have any other observations regarding this issue?**

10 A. Yes. It is important to keep in mind that in practice, the M/B ratio is used as a measure of
11 relative, not absolute valuation. That is, it typically is used by investors to assess the
12 value of an asset or enterprise relative to the prevailing M/B ratios of comparable assets
13 or enterprises. That it is used in that manner simply reflects the practical understanding
14 that no one model, including the Constant Growth DCF model, should be relied on as the
15 sole measure of value. In that important sense, investors have been more likely to assess
16 the market value of an electric utility relative to the M/B ratios of comparable firms than
17 to assume that the market value should equal book value.

⁴⁶ $0.66 = (1 - 0.34).$

1 **IV. RESPONSE TO TESTIMONY OF DR. WOOLRIDGE**

2 **Q. Please provide a brief summary of Dr. Woolridge's testimony and ROE**
3 **recommendation.**

4 A. Dr. Woolridge recommends an ROE of 8.85%, which is the top end of his DCF and
5 CAPM results. Dr. Woolridge makes clear, however, that his recommendation relies
6 primarily on his Constant Growth DCF model results.⁴⁷

7 **Q. What are the principal areas of disagreement between you and Dr. Woolridge?**

8 A. There are several areas in which I disagree with Dr. Woolridge. In general, those areas
9 include: (1) The reasonableness of an ROE recommendation far below recently
10 authorized ROEs; (2) the composition and selection of the proxy group companies; (3)
11 the growth rates applied in the Constant Growth DCF model; (4) the growth rate applied
12 in the Multi-Stage DCF model; (5) the application of the CAPM; (6) the reasonableness
13 of the Bond Yield Plus Risk Premium analysis; (7) the business risk of Granite State
14 relative to the proxy group; and (8) the appropriateness of the Company's proposed
15 capital structure. In addition, I disagree with Dr. Woolridge's presentation and
16 interpretation of certain data relating to capital market conditions.

⁴⁷ Direct Testimony of Dr. J. Randall Woolridge, at 68-69. I note that Staff Witness Amanda Noonan recommends a 50-basis point reduction to account for Granite State's customer service issues. While I do not comment on the nature of the Company's performance, I strongly disagree that a Return on Equity of 8.35 percent is at all "reasonable" as Ms. Noonan suggests. See Direct Testimony of Amanda O. Noonan, at 11.

1 **A. Recommended ROE**

2 **Q. Is Dr. Woolridge's 8.85% consistent with recently authorized returns for electric**
3 **utilities?**

4 A. No. As shown in Attachment RBH-R-9, an ROE of 8.85% is far below the returns
5 currently authorized for electric utilities. In fact, as noted by Dr. Woolridge, an 8.85%
6 ROE would be approximately 81 basis points below the average returns for electric
7 utilities.⁴⁸

8 **Q. What is your conclusion regarding the reasonableness of Dr. Woolridge's**
9 **recommended ROE?**

10 A. Regardless of how Dr. Woolridge arrived at his recommendation, it is very difficult to
11 reconcile an ROE of 8.85% with past, current, and expected market environments. The
12 implications of Dr. Woolridge not reconciling his ROE recommendation with authorized
13 returns are particularly acute since, as described below, his conclusion is based
14 principally on his application of a single model for which his inputs are quite subjective,
15 his results cannot be replicated, and whose underlying assumptions are incompatible with
16 prevailing market conditions.

17 **B. Proxy Group Selection**

18 **Q. Please describe the screening criteria by which Dr. Woolridge developed his Proxy**
19 **Group.**

20 A. Dr. Woolridge relied on six screening criteria to develop his sample of 30 companies:

⁴⁸ At page 8 of his Direct Testimony, Dr. Woolridge refers to authorized returns for electric utilities.

- 1 1. Proxy companies must derive at least 50.00% of revenues from regulated electric
2 operations;
- 3 2. Each company selected must be listed as an Electric Utility by Value Line and as
4 an Electric Utility or Combination Electric and Gas company by AUS Utilities
5 Reports;
- 6 3. Selected companies must have an investment grade bond rating;
- 7 4. Companies must have a consistent dividend record with no cuts or omissions for
8 the past six months;
- 9 5. Each company must not be involved in an acquisition, or be the target of an
10 acquisition in the past six months; and
- 11 6. Proxy companies must have long-term Earnings Per Share (“EPS”) growth
12 forecasts available from Yahoo!, Reuters, or Zacks.⁴⁹

13 **Q. Do you agree with Dr. Woolridge’s screening criteria?**

14 A. Not entirely. Although we do have certain criteria in common (for example, we both
15 exclude companies that are party to a significant corporate transaction or that do not
16 consistently pay dividends), as explained below, I do not believe that Dr. Woolridge’s
17 screens render a group of companies that is sufficiently comparable to Granite State.

18 **Q. Do any of Dr. Woolridge’s proxy companies fail his proxy group screening criteria?**

19 A. I believe so. Dr. Woolridge included in his proxy group Dominion Resources
20 (“Dominion”), Duke Energy Corporation (“Duke”), and Southern Company

⁴⁹ Direct Testimony of Dr. J. Randall Woolridge, at 31.

1 (“Southern”), which have all recently been party to significant acquisitions. As such,
2 those companies should be removed from the proxy group.

3 **Q. What is your concern with Dr. Woolridge’s use of revenue, rather than income, as a**
4 **screening criterion?**

5 A. As discussed in my response to Dr. Chattopadhyay, measures of income are far more
6 likely to be considered by the financial community in making credit assessments and
7 investment decisions than are measures of revenue.

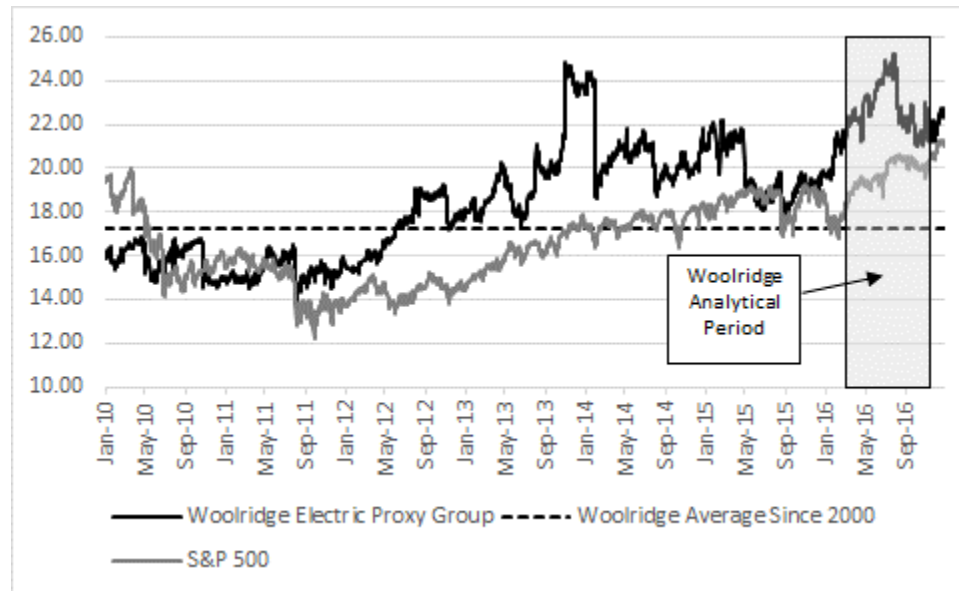
8 **C. Application of the Constant Growth DCF Approach**

9 **Q. Please summarize your concerns with the Constant Growth DCF model and Dr.**
10 **Woolridge’s application of that method.**

11 A. There are several aspects of Dr. Woolridge’s DCF analyses and conclusions that are
12 incompatible with market conditions, and inconsistent with the practical interpretation of
13 the models’ results. For example, the market data used in Dr. Woolridge’s DCF analyses
14 conflict with the models’ underlying assumptions. In particular, the market prices used to
15 calculate the dividend yield were taken from a period during which utilities in general,
16 and the proxy companies in particular, traded at unusually high, and likely unsustainable,
17 levels. In fact, as shown in Chart 9 below, during Dr. Woolridge’s study period, utility
18 P/E ratios exceeded their long-term average, and were higher than the market P/E ratio
19 (as measured by the S&P 500).⁵⁰

⁵⁰ Source: SNL Financial, Bloomberg Professional. The dividend yields in Dr. Woolridge’s DCF study (see Exhibit JRW-10) are calculated on the 30-, 90-, and 180-trading day periods ending November 17, 2016.

Chart 9: P/E Ratios Over Time



The elevated P/E ratios are an important factor simply because the Constant Growth DCF model assumes constant P/E ratios in perpetuity. Consequently, the basis of Dr. Woolridge’s recommendation – the Constant Growth DCF model – assumes data that are inconsistent with the model’s fundamental assumptions.

Lastly, Dr. Woolridge’s application of the Constant Growth DCF model includes a degree of subjectivity that prevents us from replicating the fundamental inputs that drive his results. It is entirely possible that analysts looking at the same data would come to different conclusions. For example, based on his review of historical and projected dividend, book value, earnings, and “sustainable” growth rates, Dr. Woolridge assumes a growth rate of 5.00 percent for the companies in his proxy group, although it is unclear how he calculates that estimate.⁵¹ Moreover, Dr. Woolridge’s judgment is to give

⁵¹ Direct Testimony of Dr. J. Randall Woolridge, at 56-57.

1 “primary weight”⁵² to growth rate projections produced by equity analysts, despite his
2 position that those analysts knowingly and persistently produce biased forecasts.

3 **Q. What growth rates did Dr. Woolridge review in his Constant Growth DCF analysis?**

4 A. Dr. Woolridge reviewed a number of growth rates, including historical and projected
5 dividends per share (“DPS”), book value per share (“BVPS”), and EPS growth rates as
6 reported by Value Line; analysts’ consensus EPS growth rate projections from Yahoo!,
7 Reuters, and Zacks; and an estimate of “Sustainable Growth” derived from data provided
8 by Value Line. Dr. Woolridge states that in arriving at his 8.85% DCF estimate, he gave
9 more weight to projected EPS growth rates.⁵³

⁵² *Ibid.*

⁵³ *Ibid.*

Table 2: Summary of Dr. Woolridge's Growth Rate Estimates⁵⁴

	Dr. Woolridge's Electric Proxy Group
Value Line Historical Growth Rates (DPS, BVPS, EPS)	4.20%
Value Line Projected Growth Rates (DPS, BVPS, EPS)	4.90%
Sustainable Growth	3.70%
Analyst Projected EPS Growth Rates (excl. Value Line) – Mean/Median	4.40%/5.30%
Dr. Woolridge's Assumed DCF Growth Rate	5.00%

Q. Do you agree with Dr. Woolridge's Sustainable Growth rate estimate?

A. No, I do not. The Sustainable Growth model assumes that growth is a function of expected earnings, and the extent to which those earnings are retained (that is, not paid out in dividends). Dr. Woolridge relies on the simplest form of the Sustainable Growth model, the "br" approach (where "b" is the earnings retention rate, and "r" is the expected Return on Common Equity). As Attachment RBH-R-10 demonstrates, the "br" method is essentially equal to Value Line's "Retained to Common Equity" rate (differences are due to rounding).

If Dr. Woolridge is going to consider a form of Sustainable Growth, he should use the "br + sv" form of the model, which reflects growth from both internally generated funds (*i.e.*, the "br" term) and from issuances of equity (*i.e.*, the "sv" term). As noted above, the first term is the product of the retention ratio (*i.e.*, "b", or the portion of net income not paid in

⁵⁴ *Ibid.* and Exhibit JRW-10, at 6.

dividends) and the expected return on equity (i.e., “r”). The “sv” term can be represented as:

$$\left(\frac{m}{b} - 1\right) \times \text{Growth Rate in Common Shares}$$

Where:

$$\frac{m}{b} = \text{The Market to Book Ratio}$$

In this form, the “sv” term reflects an element of growth as the product of (1) the growth in shares outstanding, and (2) that portion of the market-to-book ratio that exceeds unity.

In addition, it is important to realize that for the purpose of setting utility rates, Sustainable Growth requires an estimate of the expected earned Return on Common Equity. Since the “r” in the “br” approach refers to the equity return, Dr. Woolridge effectively has pre-supposed the Return on Common Equity projected by Value Line for his proxy group companies. Notwithstanding that Dr. Woolridge has assumed the reasonableness of Value Line’s projections for the purpose of his Sustainable Growth calculation, as demonstrated in Attachment RBH-R-10, his recommended Cost of Equity of 8.85% is 175 basis points below the mean Return on Common Equity estimate for his proxy group of 10.60%.

Q. Are there reasons to doubt the results of a DCF analysis that uses the Sustainable Growth rate for electric utilities in particular?

A. Yes. As noted below, the projected realized Return on Common Equity for many of the proxy companies is significantly diluted by recent or projected additions to net plant.

1 **Q. Have you conducted any analyses to demonstrate how the proxy companies’ earned**
2 **ROE projections are diluted by ongoing capital expenditures?**

3 **A.** Yes, I have. I analyzed Value Line’s earned ROE projections using the “DuPont”
4 formula, which decomposes the Return on Common Equity into three components: (1)
5 the Profit Margin (net income/revenues); (2) Asset Turnover (revenues/net plant); and (3)
6 the Equity Multiplier (net plant/equity).⁵⁵

7 As Attachment RBH-R-12 demonstrates, the Asset Turnover rate declined from 2003
8 through 2015 and is expected to remain at its current level through Value Line’s 2019 to
9 2021 projection period. Over that same period the proxy company average Net Plant
10 experienced a cumulative increase of approximately 133.06%. Because the utility
11 industry is going through a period of increased capital investment, the lag between the
12 addition of net plant and revenue generated by those investments dilute the Asset
13 Turnover ratio, at least in the near term. Consequently, the projected Return on Common
14 Equity also is diminished, such that its usefulness as a measure of investors’ expectations
15 of long-term (*i.e.*, in perpetuity) growth is limited.

16 As shown in Attachment RBH-R-12, there is a statistically significant negative
17 relationship between the annual change in the Asset Turnover rate and the annual change
18 in Net Plant, such that as annual net plant increases, the Asset Turnover ratio decreases.
19 Again, that analysis calls into question the reasonableness of the “Sustainable Growth”
20 method as a measure of long-term growth.

⁵⁵ See Attachment RBH-R-11. As shown in Attachment RBH-R-11, the ROE calculated using the DuPont formula is equal (but for rounding) to Value Line’s reported Return on Common Equity.

1 **Q. Do Dr. Woolridge’s analyses account for abnormally elevated P/E ratios?**

2 A. Not on a consistent basis. As discussed throughout my Rebuttal Testimony, DCF-based
3 methods, such as the Constant Growth model on which Dr. Woolridge relies, depend on
4 recent stock prices as a principal input, and in the case of the Constant Growth model
5 assume that Price/Earnings ratios, and resulting Cost of Equity, will remain constant in
6 perpetuity. As noted above, an important analytical issue is that utility sector P/E ratios
7 recently have been well above their historical levels.⁵⁶

8 To support his Capital Asset Pricing Model analysis, Dr. Woolridge refers to “Building
9 Block” approaches as part of the studies that he uses to estimate the Market Risk
10 Premium. See Exhibit JRW-11, pages 5 and 6. Among the “Building Block” studies
11 included in that review are those produced by Ibbotson and Chen. The Duff & Phelps
12 2016 SBBI Yearbook also discusses the “Building Block” model,⁵⁷ and in discussing the
13 effect of increasing P/E ratios on the market return concludes that “reported earnings are
14 affected not only by the long-term productivity, but also by ‘one-time’ items that do not
15 necessarily have the same consistent impact year after year.”⁵⁸ Duff & Phelps therefore
16 uses three-year average P/E ratios to develop its Supply-Side market return estimate.

17 In summary, Dr. Woolridge recognized and adjusted his analyses to reflect the abnormal
18 expansion in P/E ratios in his Building Blocks calculation, but did not acknowledge the

⁵⁶ Since the beginning of 2000, the long-term average P/E ratio for Dr. Woolridge’s proxy group was 17.20. The 30-day average P/E ratio for the period ending December 30, 2016 was 22.06 for Dr. Woolridge’s proxy group. Source: SNL Financial. Looking forward, indicators suggest that the industry’s current valuation levels may not persist. Value Line, for example, expects a decline in the P/E ratio for all but three of the companies in Dr. Woolridge’s proxy group over the coming three to five years. See Attachment RBH-R-13.

⁵⁷ Duff & Phelps refers to the method as the “Supply Side” approach.

⁵⁸ Duff & Phelps, 2016 SBBI Yearbook Stocks, Bonds, Bills and Inflation, at 10-28.

1 same principle in his DCF analysis. That is, Dr. Woolridge relies on an analysis that
2 adjusts abnormally high P/E ratios in a manner that reduces his CAPM estimate (the
3 Building Blocks approach to developing the Equity Risk Premium),⁵⁹ and at the same
4 time relies on DCF estimates that do not recognize or adjust for the abnormal expansion
5 in P/E ratios for his proxy companies. If Dr. Woolridge were to adjust his DCF results
6 for abnormal P/E ratios, stock prices would decrease, which would increase his dividend
7 yields and DCF results.

8 **Q. Please summarize Dr. Woolridge's reference to a March 2015 report by Moody's**
9 **regarding the effect of ROEs on utilities' near-term credit profiles.**

10 A. Dr. Woolridge points to the March 2015 Moody's report and concludes (among other
11 things) that lower authorized ROEs are not impairing utilities' credit profiles, and are not
12 "detering them from raising record amounts of capital."⁶⁰ Dr. Woolridge further states
13 that the Moody's article "supports the prevailing/emerging belief that lower authorized
14 ROEs are unlikely to hurt the financial integrity of utilities or their ability to attract
15 capital."⁶¹

16 **Q. What is your response to Dr. Woolridge in that regard?**

17 A. The Moody's article makes clear that utilities' cash flow have benefited from increased
18 deferred taxes, which themselves are due to bonus depreciation. As Moody's noted, the

⁵⁹ See Direct Testimony of Dr. J. Randall Woolridge, Exhibit JRW-11, at 5-6 and Duff & Phelps, 2016 SBBI Yearbook Stocks, Bonds, Bills and Inflation, at 10-28.

⁶⁰ Direct Testimony of Dr. J. Randall Woolridge, at 71.

⁶¹ *Ibid.*

1 rise in deferred taxes eventually will reverse.⁶² That may be one reason that the Moody's
2 study refers to "near-term credit profiles." In the longer-term, utilities will not have the
3 benefits of bonus depreciation to offset lower authorized returns.

4 Lastly, Moody's observed that although interest rates remain at relatively low levels, they
5 "will go up, eventually." When they do, Moody's warns, "this could spell trouble for
6 utilities." Moody's concludes, "[f]or now, utilities can enjoy their (historically) high
7 equity valuations in terms of dividend yield and price-earnings ratios."⁶³ That is, in
8 March 2015, Moody's observed that the then-current valuations were unusual, and that
9 some degree of reversion toward long-term means was likely. For the electric utility
10 sector, that was the case, as the S&P Electric Utility Index P/E ratio fell from 18.03 on
11 January 30, 2015 to 15.57 on July 1, 2015.⁶⁴ That observation is consistent with a point
12 made earlier in my Rebuttal Testimony: unusually high P/E ratios are unlikely to persist
13 and, therefore, Dr. Woolridge's approach of giving primary weight to his Constant
14 Growth DCF estimates should be viewed with considerable caution.

15 **Q. Do you have any concerns with Dr. Woolridge's belief that analysts' projections are**
16 **consistently biased?**

17 **A.** Yes, I do. Dr. Woolridge asserts that there is an upward bias in analysts' growth
18 estimates and, as such, the "DCF growth rate produces an overstated equity cost rate."⁶⁵
19 His position, however, is based on observations with respect to the broad market; Dr.

⁶² Moody's Investors Service, *Lower Authorized Returns Will Not Hurt Near-Term Credit Profiles*, March 10, 2015, at 4.

⁶³ *Ibid*, at 5.

⁶⁴ Source: Bloomberg Professional. Represents 30-day moving average.

⁶⁵ Direct Testimony of Dr. J. Randall Woolridge, at 76.

1 Woolridge has provided no evidence that any of the growth rates used in my (or for that
2 matter, his) DCF analyses are the result of a consistent and pervasive bias on the part of
3 the analysts providing those projections. Despite his view that they are biased, Dr.
4 Woolridge states that it was by “giving primary weight to the projected EPS growth rate
5 of Wall Street analysts” that he arrived at his assumed growth rates.⁶⁶

6 **Q. What is your response to Dr. Woolridge in that regard?**

7 A. There is no reason to believe that the analyst growth rates used in our respective DCF
8 analyses are biased. As a practical matter, the October 2003 Global Research Analyst
9 Settlement required financial institutions to insulate investment banking from analysis,
10 prohibited analysts from participating in “road shows,” and required the settling financial
11 institutions to fund independent third-party research.⁶⁷ I have reviewed the Letters of
12 Acceptance, Waiver and Consent signed by financial institutions that were party to the
13 Global Settlement, and found no reference to misconduct by analysts following the utility
14 sector.

15 Moreover, pursuant to Regulation AC, which became effective in April 2003, analysts
16 must certify that “the views expressed in the report accurately reflect his or her personal
17 views, and disclose whether or not the analyst received compensation or other payments
18 in connection with his or her specific recommendations or views.”⁶⁸ I further understand

⁶⁶ *Ibid.*, at 56-57.

⁶⁷ The 2002 Global Financial Settlement resolved an investigation by the U.S. Securities and Exchange Commission and the New York Attorney General’s Office of a number of investment banks related to concerns about conflicts of interest that might influence the independence of investment research provided by equity analysts.

⁶⁸ Securities and Exchange Commission, 17 CFR PART 242 [Release Nos. 33-8193; 34-47384; File No. S7-30-02], RIN 3235-A160 Regulation Analyst Certification.

1 that industry practice is to avoid conflicts of interest by ensuring that compensation is not
2 directly or indirectly linked to the opinions contained in those reports. Dr. Woolridge has
3 not explained why any of the analysts covering our respective proxy companies would
4 bias their projections in light of those certification requirements.

5 **Q. Is the use of analysts' earnings growth projections in the DCF model supported by**
6 **financial literature?**

7 A. Yes, it is. A number of published articles support the use of analysts' earnings growth
8 projections in the DCF model. Dr. Robert Harris, for example, demonstrated that
9 financial analysts' earnings forecasts (referred to in the article as "FAF") in the Constant
10 Growth DCF formula are an appropriate method of calculating the expected MRP.⁶⁹ In
11 that regard, Dr. Harris noted that:

12 ... a growing body of knowledge shows that analysts' earnings forecasts are
13 indeed reflected in stock prices. Such studies typically employ a consensus
14 measure of FAF calculated as a simple average of forecasts by individual
15 analysts.⁷⁰

16 Dr. Harris further noted that:

17 Given the demonstrated relationship of FAF to equity prices and the direct
18 theoretical appeal of expectational data, it is no surprise that FAF have been
19 used in conjunction with DCF models to estimate equity return
20 requirements.⁷¹

21 Similarly, in *Estimating Shareholder Risk Premia Using Analysts Growth Forecasts*,
22 Harris and Marston presented "estimates of shareholder required rates of return and risk

⁶⁹ See Robert S. Harris, *Using Analysts' Growth Forecasts to Estimate Shareholder Required Rates of Return*, *Financial Management*, 1986, at 66.

⁷⁰ *Ibid.*, at 59. Emphasis added. As noted in my direct testimony, Zacks and First Call, the sources of earnings growth projections that I use in addition to Value Line, are consensus forecasts.

⁷¹ *Ibid.*, at 60.

1 premia which are derived using forward-looking analysts' growth forecasts.”⁷² Harris

2 and Marston reported that:

3 ... in addition to fitting the theoretical requirement of being forward-
4 looking, the utilization of analysts' forecasts in estimating return
5 requirements provides reasonable empirical results that can be useful in
6 practical applications.⁷³

7 Here again, the finding was clear: analysts' earnings forecasts are highly related to stock
8 price valuations and are appropriate inputs to stock valuation and ROE estimation
9 models.⁷⁴ It appears that academic research supports Dr. Woolridge's acknowledgement
10 that analysts' growth rate projections are “better” than other measures of growth.

11 **Q. Do you agree with Dr. Woolridge's assertion that applying analyst growth rates as**
12 **the “DCF growth rate will provide an overstated equity cost rate”?⁷⁵**

13 A. No, I do not. First, if current stock prices (and therefore the dividend yield) already
14 reflect analysts' bias, it is unclear why it is necessary to adjust the growth rate. In
15 addition, although Dr. Woolridge asserts that “long-term EPS growth rate forecasts of
16 Wall Street securities analysts are overly optimistic and upwardly biased”⁷⁶ in general, he
17 has not demonstrated that to be true for the electric companies in our proxy groups, in
18 particular. To that point, I reviewed quarterly earnings presentations for several of the
19 companies in Dr. Woolridge's proxy group and found that the analysts' growth rate

⁷² Robert S. Harris, Felicia C. Marston, *Estimating Shareholder Risk Premia Using Analysts' Growth Forecasts*, Financial Management, Summer 1992.

⁷³ *Ibid.*, at 63.

⁷⁴ In *The Risk Premium Approach to Measuring a Utility's Cost of Equity*, published in Financial Management, Spring 1985, 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.”

⁷⁵ Direct Testimony of Dr. J. Randall Woolridge, at 76.

⁷⁶ *Ibid.*, at 53-54.

projections were consistent with the long-term growth rate ranges provided by the companies' management teams. See Table 3, below. I therefore disagree that the earnings projections included in our respective analyses are likely to be systemically biased.

Table 3: Analysts' Earnings Growth Projections Relative to Management Presentations⁷⁷

Company	Ticker	Zacks Earnings Growth	First Call Earnings Growth	Value Line Earnings Growth	Investor Presentation Earnings Growth
Alliant Energy Corporation	LNT	5.50%	6.00%	6.00%	5.00% - 7.00%
Ameren Corporation	AEE	6.50%	5.65%	6.00%	5.00% - 8.00%
American Electric Power Company, Inc.	AEP	5.40%	1.89%	5.00%	5.00% - 7.00%
Avista Corporation	AVA	5.30%	5.65%	5.00%	4.00% - 5.00%
CMS Energy Corporation	CMS	6.00%	7.27%	6.00%	6.00% - 8.00%
Eversource Energy	ES	6.30%	5.82%	6.00%	5.00% - 7.00%
PNM Resources, Inc.	PNM	6.80%	6.85%	9.00%	7.00% - 8.00%
SCANA Corporation	SCG	5.50%	6.03%	4.50%	4.00% - 6.00%
Xcel Energy Inc.	XEL	5.40%	5.65%	5.50%	4.00% - 6.00%

Q. Do you agree with Dr. Woolridge that dividend and book value growth rates are appropriate measures of expected growth for the Constant Growth DCF model?⁷⁸

A. No, I do not. Attachment RBH-R-14 illustrates that, under the strict assumptions of the Constant Growth DCF model, earnings, dividends, book value, and stock prices all grow at the same, constant rate in perpetuity. In addition, Value Line is the only service on which Dr. Woolridge relies that provides DPS, BVPS, or Sustainable Growth projections.

⁷⁷ Source: Zacks, Yahoo Finance, Value Line, and individual company third quarter 2016 earnings presentations and investor presentations.

⁷⁸ Direct Testimony of Dr. J. Randall Woolridge, at 54-55.

1 To the extent that the earnings projections services such as Zacks and First Call represent
2 consensus estimates, the results are less likely to be skewed in one direction or another as
3 a result of an individual analyst.

4 In any event, academic research clearly has indicated that measures of earnings are
5 strongly related to stock valuation.⁷⁹ As discussed below, that conclusion holds true for
6 the Value Line universe of electric utilities. Consequently, dividend and book value
7 growth should not be used in the application of the Constant Growth DCF model.
8 Rather, projected earnings growth rates are the appropriate measure of long-term growth.

9 **Q. Do you agree with Dr. Woolridge that historical growth rates are appropriate**
10 **measures of expected growth for the Constant Growth DCF model?**⁸⁰

11 **A.** No, I do not believe that historical growth rates are appropriate for the Constant Growth
12 DCF model.

⁷⁹ In *The Risk Premium Approach to Measuring a Utility's Cost of Equity*, published in Financial Management, Spring 1985, Brigham, Shome and Vinson noted that "evidence in the current literature indicates that (1) analysts' forecasts are superior to forecasts based solely on time series data; and (2) investors do rely on analysts' forecasts." Similarly, in a review of literature regarding the extent to which analyst forecasts are reflected in stock prices (Using Analyst's Growth Forecasts to Estimate Shareholder Required Rates of Return, Financial Management, Spring 1986), Harris noted: "VanderWeide and Carleton recently compare consensus [financial analyst forecasts] of earnings growth to 41 different historical growth measures. They conclude that 'there is overwhelming evidence that the consensus analysts' forecast of future growth is superior to historically-oriented growth measures in predicting the firm's stock price...consistent with the hypothesis that investors use analysts' forecasts, rather than historically-oriented growth calculations, in making stock buy and sell decisions.'" The VanderWeide and Carleton study was updated in 2004 under the direction of Dr. VanderWeide. The results of the updated study were consistent with the original study's conclusions.

⁸⁰ See Direct Testimony of Dr. J. Randall Woolridge, at 54-55.

1 **Q. Have you conducted any analyses to determine which measures of growth are**
2 **statistically related to the proxy companies' stock valuation levels?**

3 A. Yes, I have. I performed a series of regression analyses in which the historical and
4 projected growth rates were included as explanatory variables, with the P/E ratio as the
5 dependent variable. The intent of those analyses was to determine whether or not
6 historical and projected earnings, retention, and dividend growth rates are statistically
7 related to the companies' valuation levels.

8 **Q. What did those analyses reveal?**

9 A. As shown in Attachment RBH-R-15, the results indicate that the only positive
10 statistically significant variable was the projected EPS growth rate. That is, none of the
11 historical EPS, historical or projected DPS and BVPS growth rates, or historical or
12 projected retention growth rates have a positive statistically significant relationship to
13 valuation levels. Since the DCF model defines stock prices as a function of growth rates,
14 only those growth rates that have a strong theoretical and empirical relationship to
15 valuation levels should be used in the analysis. Consequently, projected EPS growth
16 rates are the appropriate measure of growth for the purpose of the DCF models.

17 **Q. Is it possible to replicate Dr. Woolridge's DCF analysis?**

18 A. No, it is not possible to do so. Although Dr. Woolridge reviews historical and projected
19 measures of growth for each of his proxy companies, his growth rate estimates rely on his
20 judgment as to what may or may not be representative of sustainable long-term growth.
21 As such, Dr. Woolridge's analyses cannot be replicated. Whereas utility analysts often
22 research the factors that fundamentally influence a given company's long-term growth,

1 Dr. Woolridge instead selects his long-term growth estimate based on a summary review
2 of earnings, dividend, and retention growth estimates. In effect, Dr. Woolridge has
3 substituted his judgment for those of utility analysts, who based their growth rate
4 projections on detailed, fundamental analyses.

5 **Q. Do you have any examples of that point?**

6 A. Yes, I do. One of the companies in Dr. Woolridge's proxy group is AEP. On January
7 28, 2016, AEP held a conference call to review its fourth quarter earnings.⁸¹ Analysts
8 from several firms attended that call, including:

- 9 • Barclays Capital
- 10 • Evercore
- 11 • Jeffries & Co.
- 12 • JPMorgan
- 13 • Glenrock Associates
- 14 • KeyBanc
- 15 • UBS

16 During the course of that call, the analysts asked and were given answers to a number of
17 issues that bear directly on the factors that determine the Return on Common Equity,
18 including:

- 19 • Increasing leverage on certain subsidiaries;
- 20 • Growth in sales forecasts for shale plays;
- 21 • EPS and cash flow guidance for 2016;

⁸¹ See American Electric Power Co., Inc., Q4 2015 Earnings Call Transcript, January 28, 2016.

- Incremental earnings and legal issues associated with AEP's PPA;
- Capital Expenditure plans;
- Expectations for future tax amounts;
- Breakdown of load growth by customer class;
- Estimated ROE for the Transmission segment in 2016; and
- Sale completion date of the Merchant business⁸²

In the first quarter 2016 call (which took place on April 28, 2016), analysts were provided with updated and additional information. During the course of the call, the company's management reiterated its earnings growth targets, and the various regulatory environments in which it operates. After the company's presentation, the analysts asked questions along several lines, including:

- Potential re-regulation of PPA assets;
- Political developments in Ohio and the upcoming federal election;
- Effect of the PPA on growth targets;
- Tax issues in the state of Louisiana;
- Potential degradation of returns of various operating subsidiaries;
- Guidance for O&M growth going forward; and
- Comments surrounding the recent Senate energy bill.⁸³

In its earnings conference call to review second quarter 2016 earnings, the company's management reiterated its long-term earnings growth target. After the company's

⁸² See American Electric Power Co., Inc., Q4 2015 Earnings Call Transcript, January 28, 2016.

⁸³ See American Electric Power Co., Inc., Q1 2016 Earnings Call Transcript, April 28, 2016.

1 presentation, analysts asked questions along several lines, all of which are relevant to Dr.
2 Woolridge's construct. Examples of such topics include:

- 3 • Industrial customer sales trends;
- 4 • AEP's plan for meeting sales growth targets;
- 5 • Maintaining credit metrics such as FFO-to-debt and debt-to-EBITDA;
- 6 • Expectations for renewable generation projects within the Generation and
7 Marketing segment;
- 8 • Regulatory preference for investment in generation or PPAs;
- 9 • AEP's recent tax audit and potential implication for future taxes; and
- 10 • Transmission investment plans.⁸⁴

11 In the case of just one of his proxy companies, therefore, the level of fundamental
12 research performed by analysts on issues that directly bear on long-term growth far
13 exceed Dr. Woolridge's review of growth estimates. In my view, by estimating growth
14 by selectively reviewing a range of long-term growth estimates when observable analyst
15 growth rate forecasts are readily available, Dr. Woolridge has introduced a level of
16 measurement error that is not necessary.

17 **Q. Do you have any concerns with the projected analysts' EPS growth rates relied on**
18 **by Dr. Woolridge?**

19 A. Yes. In determining his projected analysts' EPS growth rate, Dr. Woolridge includes
20 negative growth estimates. In doing so, Dr. Woolridge has implicitly assumed that
21 investors would consider committing capital to a company that is expected to have

⁸⁴ See American Electric Power Co., Inc., Q2 2016 Earnings Call Transcript, July 28, 2016.

1 negative growth, in perpetuity. As Attachment RBH-R-16 demonstrates, eliminating
2 negative growth rates from Dr. Woolridge's DCF analysis increases the mean projected
3 EPS growth rate by 70 basis points. However, given that Dr. Woolridge's 5.00% growth
4 rate is based on his judgment, it is difficult to say how removing negative growth rates
5 would affect his analyses and recommendation.

6 **D. Application of Multi-Stage DCF Approach**

7 **Q. Please briefly summarize Dr. Woolridge's observations regarding your Multi-Stage**
8 **DCF analysis.**

9 A. First, Dr. Woolridge does not appear to disagree with the structure of the model itself.
10 For example, in his Exhibit JRW-9, page 1 of 2, Dr. Woolridge describes the "dividend
11 discount model", which takes the same structure as my Multi-Stage DCF model. At page
12 45 of his Testimony, Dr. Woolridge explains that in the second, or "Transition" stage, the
13 dividend payout ratio increases because there are fewer investment opportunities. The
14 assumption of increasing payout ratios as capital investment requirements decline also is
15 consistent with my Multi-Stage analysis.

16 Although the dividend discount model is consistent in structure with my model, Dr.
17 Woolridge argues that the terminal growth rate (that is, the long-term growth rate in the
18 third, or "terminal period") applied in my model is overstated.⁸⁵ Dr. Woolridge also
19 objects to the use of the long-term average rate of real Gross Domestic Product ("GDP")
20 growth in my Multi-Stage DCF analysis.⁸⁶

⁸⁵ See, Direct Testimony of J. Randall Woolridge, at 78-79.
⁸⁶ *Ibid.*

1 **Q. Before responding to those two points, please describe the Multi-Stage DCF model,**
2 **and explain how the terminal growth rate is derived and applied.**

3 A. As discussed in my Direct Testimony, the Multi-Stage DCF model enables the analyst to
4 model growth in three stages, rather than a single growth rate in perpetuity (as the
5 Constant Growth DCF model assumes).⁸⁷ The terminal, or third stage growth rate,
6 represents investors' expectations for long-term (that is, perpetual) growth beginning in
7 the third stage. Because the model assumes five-year periods for the first and second
8 stage, the terminal stage (and, therefore, the terminal growth rate) begins in the eleventh
9 year. The Multi-Stage DCF model assumes that in the long-run, growth will converge to
10 the rate of growth in the overall economy. That is, the model assumes that terminal
11 growth rate equals the expected nominal GDP growth rate.

12 As also discussed in my Direct Testimony, the terminal growth rate is calculated as the
13 combination of (1) long-term historical real GDP growth, and (2) expected inflation
14 (calculated as the average of the difference in the "TIPS spread" and Blue Chip Financial
15 Forecast's projected CPI in 2022-2026). In that regard, the calculation specifically relies
16 on market-based data (via the TIPS spread) to arrive at the market-expected rate of
17 growth.

⁸⁷ See, Direct Testimony of Robert B. Hevert, at 21.

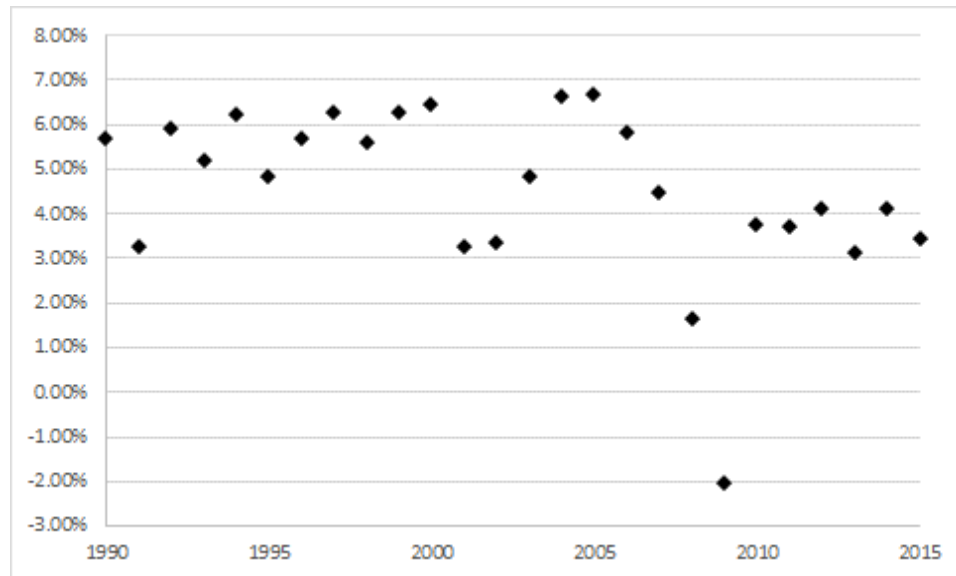
1 **Q. What is the basis of Dr. Woolridge’s concern with your assumed long-term growth**
2 **rate?**

3 A. Dr. Woolridge states that “nominal GDP growth in recent decades has slowed and that a
4 figure in the range of 4.0% to 5.0% is more appropriate today for the U.S. economy.”⁸⁸
5 To support his position, Dr. Woolridge reviews average nominal GDP growth over
6 periods of ten to 50 years, and concludes, “economic growth in the U.S. has slowed
7 considerably in recent decades.”⁸⁹ As shown on Chart 10 below, however, since 1990
8 (*i.e.*, in “recent decades”) the annual nominal growth rate in GDP has remained relatively
9 stable, but for the period 2008 to 2012, which included the recent recession. Over that
10 time, annual nominal GDP growth rates greater than 5.00 percent (the high end of Dr.
11 Woolridge’s suggested range) occurred in twelve of 26 years; growth rates of at least
12 5.30 percent (*i.e.*, the projected GDP growth rate I used in my Direct Testimony)
13 occurred in eleven of 26 years.

⁸⁸ Direct Testimony of J. Randall Woolridge, at 79.

⁸⁹ *Ibid.*, at 78.

Chart 10: Annual Nominal GDP Growth Rates⁹⁰



Moreover, historical nominal GDP growth rates since 1960 reflect periods of differing inflation rates. For example, the real GDP growth rates in 1980 and 2008 were nearly identical at negative 0.24 percent and negative 0.29 percent, respectively. On a nominal basis, however, the growth rates were vastly different, at 8.75 percent and 1.66 percent. Knowing that inflation was significantly higher in the 1970s and early 1980s than it was in 2008, it is not surprising that nominal GDP rates are lower when viewed within the context of shorter term averages (*i.e.*, over the last ten or twenty years as Dr. Woolridge has done).

In addition, as shown in Table 4 below, the recent economic downturn has had a significant effect on the real GDP growth rate calculated over shorter periods.

⁹⁰ Source: Bureau of Economic Analysis December 22, 2016 update.

Table 4: Average Real GDP Growth Rates⁹¹

Average Length	As Of 2015	As Of 2007
10-Year Average	1.41%	3.04%
20-Year Average	2.41%	3.07%
30-Year Average	2.60%	3.12%
40-Year Average	2.83%	3.14%
50-Year Average	2.89%	3.38%

As Table 4 demonstrates, prior to the recent recession the difference between the average GDP growth rates measured over varying time periods was minimal. Subsequent to the 2008-2009 recession the differences have been quite large. Because I apply the long-term growth rate beginning ten years in the future, it would be inappropriate to give undue weight to short-term trends in the time series, as Dr. Woolridge suggests.

As to the inflation portion of the expected nominal growth rate, Dr. Woolridge does not seem to disagree with my expected inflation rate of 2.00 percent, as he noted that the current inflation is “in the 2% to 3% range.”⁹² I also note that in Exhibit JRW-14, page 1, Dr. Woolridge provides the average growth rates since 1960 for nominal GDP, the S&P 500 Index, the S&P 500 earnings per share, and the S&P 500 dividends per share. The average of those measures is 6.42 percent, which is 112 basis points above the 5.30 percent long-term GDP growth rate estimate included in my Direct Testimony. The 6.42 percent average growth rate noted above also is 22 basis points greater than the 6.20

⁹¹ Source: Bureau of Economic Analysis, December 22, 2016 update.
⁹² Direct Testimony of J. Randall Woolridge, at 79.

1 percent long-term nominal GDP growth rate reported by the Bureau of Economic
2 Analysis. I therefore disagree with Dr. Woolridge's view that my assumed terminal
3 growth rate is excessive.

4 **Q. Are there examples in financial literature that support your calculation of the long-**
5 **term growth rate based on GDP?**

6 A. Yes. The use of expected long-term GDP growth in the terminal period is consistent with
7 practice and financial literature.⁹³ Morningstar, a source on which Dr. Woolridge relies
8 for Market Risk Premium estimates, describes an approach for calculating the long-term
9 growth estimate that is similar to that which is included in my model.⁹⁴ As with my
10 approach, Morningstar's method combines the historical average real GDP growth rate
11 with a measure of inflation calculated using the TIPS spread.⁹⁵

12 **Q. Does Dr. Woolridge provide any other data that supports your terminal growth rate**
13 **assumption?**

14 A. Yes, Dr. Woolridge cites research to support his view that analysts' earnings estimates
15 are "overly optimistic and upwardly biased."⁹⁶ One of the reports cited is a 2010 report
16 by McKinsey & Company ("McKinsey").⁹⁷ The McKinsey report observes that "long-
17 term earnings growth for the market as a whole is unlikely to differ significantly from

⁹³ Dr. Roger Morin, for example, writes "[i]t is useful to remember that eventually all company growth rates, especially utility services growth rates, converge to a level consistent with the growth rate of the aggregate economy." See, Roger A. Morin, New Regulatory Finance, Public Utilities Report, Inc., 2006, at 308.

⁹⁴ See, Ibbotson SBBI 2013 Valuation Yearbook, Morningstar, Inc., at 50-52.

⁹⁵ Implied Expected Nominal GDP = $((1 + \text{Historical Real GDP Growth}) \times (1 + \text{Implied Forward Inflation})) - 1$, or 5.23 percent = $((1 + 3.25 \text{ percent}) \times (1 + 1.92 \text{ percent})) - 1$.

⁹⁶ Direct Testimony of J. Randall Woolridge, at 53.

⁹⁷ *Equity Analysts: Still too bullish*, McKinsey & Company, McKinsey on Finance, Number 35, Spring 2010.

1 growth in GDP, as prior McKinsey research has shown.”⁹⁸ In a footnote to that sentence,
2 McKinsey further states that “[r]eal GDP has averaged 3 to 4 percent over past (*sic*)
3 seven or eight decades, which would indeed be consistent with nominal growth of 5 to 7
4 percent given current inflation of 2 to 3 percent.”⁹⁹ The McKinsey report therefore
5 supports the terminal growth rate used in my Multi-Stage DCF model; it represents the
6 combination of historical real GDP growth and expected inflation, and is toward the
7 lower end of the 5.00 percent to 7.00 percent range noted by McKinsey.¹⁰⁰

8 **Q. What is your response to Dr. Woolridge’s reference to GDP forecasts provided by**
9 **the *Survey of Professional Forecasters*, the Energy Information Administration**
10 **(“EIA”), and the Congressional Budget Office (“CBO”)?¹⁰¹**

11 A. As a preliminary matter, as noted above, the approach I use is supported by sources relied
12 upon by investors (*e.g.*, Morningstar). Dr. Woolridge, however, has not demonstrated
13 that investors rely on the surveys cited in his testimony. Further, in the case of the *Survey*
14 *of Professional Forecasters*, as Dr. Woolridge points out, the forecast relates to the 2016
15 to 2026 period. That is, that forecast does not apply to the terminal period, which begins
16 in 2026. As to the CBO and EIA forecast, those projections cover only fifteen to 25
17 years of a perpetual period, and are not consensus forecasts. Additionally, the EIA’s
18 GDP growth forecast is an input to its annual energy projections; the assumptions and

⁹⁸ *Ibid.*, at 16-17.

⁹⁹ *Ibid.*, at 17.

¹⁰⁰ Please also note that consistent with the McKinsey approach, the terminal growth rate used in my Multi-Stage DCF model is the product of real GDP growth (3.24 percent) and expected inflation (2.00 percent).

¹⁰¹ See, Direct Testimony of J. Randall Woolridge, at 80-81.

1 methodologies underlying its GDP forecast are for that specific purpose. As such, I do
2 not agree that those sources invalidate the growth rate used in my analysis.

3 In addition, the CBO provides annual updates regarding its forecasting record. In that
4 context, the CBO discusses comparisons to other forecasts, and notes that “[d]espite their
5 value, comparisons of forecasting errors can be misleading when forecasts are made for
6 different purposes.”¹⁰² In essence, the CBO notes that comparisons to other forecasts are
7 not always apt, at least in part because they may be based on different assumptions and
8 used for different purposes. Moreover, the CBO states that it is required to assume that
9 future fiscal policy will reflect current law, so that it may “provide a benchmark” against
10 which proposed changes in law may be assessed.¹⁰³ Given that purpose and structure, I
11 disagree that the CBO’s forecast invalidates the growth rate used in my Multi-Stage DCF
12 analysis.

13 The CBO notes that among its two-year forecasts since the early 1980’s, the forecast
14 error for “real output growth” and inflation (measured by the Consumer Price Index) has
15 been 1.40 percentage points, and 0.80 percentage points, respectively.¹⁰⁴ That range of
16 error, if applied to the 4.10 percent long-term CBO forecast noted by Dr. Woolridge,

¹⁰² CBO’s *Economic Forecasting Record: 2015 Update*, February 2015, at 4 – 5.

¹⁰³ “In particular, forecasters in the private sector attempt to predict the future stance of federal fiscal policy, and the Administration’s forecasts assume the adoption of the fiscal policy reflected in the President’s proposed budget. CBO, however, is required to assume that fiscal policy in the future will generally reflect the provisions in current law, an approach that derives from the agency’s responsibility to provide a benchmark for lawmakers as they consider proposed changes in law. Forecasting errors may be driven by those different assumptions, particularly when policymakers are considering major changes in the fiscal policy embedded in current law.”

¹⁰⁴ CBO’s *Economic Forecasting Record: 2015 Update*, February 2015, at 1.

1 suggests that the 5.30 percent rate applied in my Direct Testimony is within the range of
2 the CBO's projections.

3 Regarding the accuracy of the EIA's GDP forecast, the agency reviews its projections in
4 its *Annual Energy Outlook ("AEO") Retrospective Review*. In the *AEO Retrospective*
5 *Review*, the EIA notes: "[t]he projections in the AEO are not statements of what will
6 happen but of what might happen, given assumptions and methodologies."¹⁰⁵ The EIA
7 states in its AEO that "[t]he AEO2016 Reference case projection is a business-as-usual
8 trend estimate, given known technology and technological and demographic trends."¹⁰⁶
9 The result is that the agency's projections generally are based on the economic
10 environment at the time of the forecast. As shown in Table 2 of the *AEO Retrospective*
11 *Review*, the EIA compares its past GDP growth projections to actual GDP growth. In its
12 1993 forecast of GDP growth – a time during which the U.S. was coming out of a
13 recession – the agency generally underestimated GDP growth. During the stronger
14 economic times of the 2000s, the agency generally overestimated GDP growth into the
15 future.¹⁰⁷ The agency's 2016 to 2040 reference case is based on the current economic
16 environment of below average GDP growth, inflation, and interest rates.¹⁰⁸

¹⁰⁵ U.S. Energy Information Administration, *Annual Energy Outlook Retrospective Review: Evaluation of 2014 and Prior Reference Case Projections*, March 2015, at 1. Clarification added.

¹⁰⁶ U.S. Energy Information Administration, *Annual Energy Outlook 2016 with Projections to 2040*, August 2016, at iii.

¹⁰⁷ U.S. Energy Information Administration, *Annual Energy Outlook Retrospective Review: Evaluation of 2014 and Prior Reference Case Projections*, March 2015, Table 2, at 6-7.

¹⁰⁸ U.S. Energy Information Administration, *Assumptions to the Annual Energy Outlook 2016* January 2017, at 10-11.

1 **Q. Do you have any other observations regarding Dr. Woolridge's position that you do**
2 **not rely on economists' forecasts of real GDP growth?**

3 A. Yes, I do. Dr. Woolridge is quite critical of economists' projections of interest rates,
4 noting that, in hindsight, they often are incorrect.¹⁰⁹ At the same time, he is critical of the
5 fact that I do not rely on economists' real GDP growth rate projections, such as those
6 produced by the Philadelphia Federal Reserve *Survey of Professional Forecasters*.¹¹⁰
7 Putting aside the fact that the Multi-Stage DCF model requires forecasts beginning ten
8 years from now, not as of the present, Dr. Woolridge does not explain why economists'
9 near-term interest rate projections are improper, but their long-term real GDP growth rate
10 projections are sound.

11 **E. Application of the CAPM**

12 **Q. Please briefly describe Dr. Woolridge's CAPM analysis and results.**

13 A. Dr. Woolridge's CAPM analysis produces an estimated Cost of Equity of 7.90 percent.¹¹¹
14 Although Dr. Woolridge relies primarily on his DCF analysis, he also considers his
15 CAPM results in determining what he considers an appropriate range of the Company's
16 Cost of Equity.¹¹² As with Dr. Woolridge's DCF results, I strongly disagree that a
17 CAPM result of 7.90 percent is a reasonable estimate of the Company's ROE. As
18 discussed below, Dr. Woolridge's unduly low CAPM estimate primarily is the result of
19 his estimated Market Risk Premium.

¹⁰⁹ See, Direct Testimony of J. Randall Woolridge, at 20-21.

¹¹⁰ The Philadelphia Federal Reserve publishes the list of economists that provide forecasts with attribution. See <http://www.frbsf.org/economic-research/publications>.

¹¹¹ Direct Testimony of Dr. J. Randall Woolridge, Exhibit JRW-11, at 1.

¹¹² See *Ibid.*, at 68-69.

1 **Q. Please describe how Dr. Woolridge calculates his Market Risk Premium estimate.**

2 A. Dr. Woolridge reviews a series of studies that calculate the MRP using different
3 methodologies; he also considers the results of his “Building Blocks” approach. Based
4 on those reviews, Dr. Woolridge concludes that the MRP ranges from 4.00 percent to
5 6.00 percent and, within that range, 5.50 percent is reasonable.¹¹³

6 **Q. Do any of the authors cited in Woolridge’s Equity Risk Premium survey provide**
7 **support for your approach to estimating the current MRP?**

8 A. Yes. A study by Pablo Fernandez titled “Market Risk Premium used in 71 countries in
9 2016: a survey with 6,932 answers” discusses how the required Equity Risk Premium is
10 commonly calculated using a Constant Growth DCF approach.¹¹⁴ That study states:

11 [t]he [implied equity premium] is the implicit [required equity premium]
12 used in the valuation of a stock (or market index) that matches the
13 current market price. The most widely used model to calculate the
14 [implied equity premium] is the dividend discount model: the current
15 price (P0) is the present value of expected dividends discounted at the
16 required rate of return (Ke). If d1 is the dividend per share expected to
17 be received in year 1, and g the expected long term growth rate in
18 dividends per share:

19 $P_0 = d_1 / (K_e - g)$, which implies:

20 $[\text{implied equity premium}] = d_1/P_0 + g - R_f$ ¹¹⁵

¹¹³ *Ibid.*, at 66; Exhibit JRW-11, at 1, 5-6.

¹¹⁴ Dr. Woolridge cites Pablo Fernandez’s research; see Direct Testimony of Dr. J. Randall Woolridge, Exhibit JRW-11, at 5.

¹¹⁵ Pablo Fernandez, Alberto Ortiz, and Isabel Fernandez Acín, *Market Risk Premium used in 71 countries in 2016: a survey with 6,932 answers*, IESE Business School, at 10.

1 As discussed in my Direct Testimony, I calculated the *ex-ante* MRP in a similar manner
2 using a market capitalization weighted Constant Growth DCF calculation on the
3 individual companies in the S&P 500 Index.

4 **Q. Do you have any other observations regarding Dr. Woolridge's Equity Risk**
5 **Premium estimates?**

6 A. Yes. Many of Dr. Woolridge's Equity Risk Premium estimates assume market returns
7 equal to or below the Company's required return and, as such, do not make either
8 theoretical or practical sense. For example, Exhibit JRW-11, page 6 of 6, indicates that
9 the average estimated Equity Risk Premium over the studies from 2010 to 2016 is 4.88
10 percent. Combining that estimate with Dr. Woolridge's 4.00 percent estimated Risk-Free
11 Rate (Exhibit JRW-11, page 1 of 6) produces an estimated market return of 8.88 percent,
12 which is only 3 basis points above Dr. Woolridge's 8.85 percent recommendation.

13 Dr. Woolridge observes that "a regulated public utility is less risky than the market," and
14 should have a Beta coefficient less than 1.0.¹¹⁶ Because his implied 8.88 percent market
15 return is essentially equal to his 8.85 percent ROE recommendation, its relevance to
16 investors' actual required returns is questionable. Even focusing on all of the studies in
17 his survey (Exhibit JRW-X, page 5 of 6), the expected market return would be
18 approximately 8.64 percent, which is only 21 basis points below Dr. Woolridge's 8.85
19 percent recommendation for Granite State. Because such important elements of his
20 CAPM analyses contradict each other, Dr. Woolridge's CAPM results are not reliable.

¹¹⁶ Direct Testimony of Dr. J. Randall Woolridge, at 61.

1 **F. Bond Yield Plus Risk Premium Analysis**

2 **Q. Please summarize Dr. Woolridge’s response to your Bond Yield Plus Risk Premium**
3 **analysis.**

4 A. Dr. Woolridge believes that the Risk Premium derived from the analysis is “inflated” and
5 “is a gauge of *commission* behavior and not *investor* behavior.”¹¹⁷ Dr. Woolridge further
6 observes that my Risk Premium approach and results “reflect other factors used by utility
7 commissions in authorizing ROEs in addition to capital costs.”¹¹⁸ In particular, Dr.
8 Woolridge points to a potential discrepancy between settled and litigated cases.¹¹⁹ In
9 addition, Dr. Woolridge reasons that the analysis overstates the actual ROE, because the
10 estimated risk premium is based on historical Treasury yields, whereas the model is
11 applied to current and expected yields.¹²⁰

12 **Q. What is your response to Dr. Woolridge’s position that the Risk Premium analysis is**
13 **a study of utility commissions’ behavior, rather than investor behavior?**

14 A. Those cases, and their associated decisions, reflect the same type of market-based
15 analyses at issue in this proceeding. Moreover, given that authorized returns are publicly
16 available, it is difficult to imagine that such data is not reflected, at least to some degree,
17 in investors’ return expectations and requirements (American Electric Power, one of Dr.
18 Woolridge’s proxy companies, discloses authorized returns, by jurisdiction, in its 2015

¹¹⁷ Direct Testimony of J. Randall Woolridge, at 89. [emphasis included]

¹¹⁸ *Ibid.*, at 13.

¹¹⁹ *Ibid.*

¹²⁰ *Ibid.*

1 SEC Form 10-K). Consequently, it is reasonable to assume that authorized returns are a
2 reasonable (although not the only) measure of investor-required returns.

3 **Q. What is your response to Dr. Woolridge's statement that your analysis applies an**
4 **historical risk premium to projected rates and as such, overstates the Cost of**
5 **Equity?**¹²¹

6 A. I applied both historical and projected interest rates to the regression coefficients
7 developed in my Risk Premium analysis, not to an average historical risk premium. As
8 discussed in my Direct Testimony, the regression coefficients specifically recognize that
9 as interest rates increase the Equity Risk Premium decreases.¹²² A consequence of that
10 relationship is that interest rates and the Cost of Equity generally move in the same
11 direction, although not on a one-to-one basis. As projected interest rates increase, the
12 Cost of Equity also will increase, but not to the same degree. Dr. Woolridge's concern
13 that I have applied projected interest rates to an historical risk premium is misplaced in
14 that (1) my analysis does not rely on an historical risk premium, and (2) because the
15 estimated risk premium does not increase in lock step with interest rates, the resulting
16 ROE estimate does not overstate the Cost of Equity.

¹²¹ *Ibid.*

¹²² See Direct Testimony of Robert B. Hevert, at 37.

1 **Q. What is your response to Dr. Woolridge's position that your Risk Premium analysis**
2 **must take into consideration the specific aspects of this proceeding relative to all**
3 **others?**¹²³

4 A. First, every case has its unique set of issues and circumstances; there is no disagreement
5 on that point. Looking at approximately 1,500 cases over many economic cycles, and
6 using that data to develop the relationship between the Equity Risk Premium and interest
7 rates mitigates that concern. I do agree, however, that the Risk Premium model results
8 should be considered an industry average ROE estimate. To the extent Granite State
9 equity investors face incremental risks, its ROE should be adjusted.

10 **Q. Do you believe that it is a concern, as Dr. Woolridge states, to include both fully**
11 **litigated and settled rate cases in your Risk Premium analysis?**¹²⁴

12 A. No, I do not. Of the rate cases in my Risk Premium analysis, 384 were settled and 1,115
13 were fully litigated. More recently (from 2012 through December 2016), 88 cases were
14 litigated and 96 were settled. The difference in average authorized returns between the
15 two, however, was only ten basis points (9.84% and 9.74% for settled and litigated
16 electric cases, respectively).¹²⁵

17 Equally importantly, the same inverse relationship between interest rates and the Equity
18 Risk Premium is present whether the analysis includes fully litigated rate cases, settled

¹²³ Direct Testimony of J. Randall Woolridge, at 89-90.

¹²⁴ *Ibid.*

¹²⁵ Averages exclude Illinois formula rates.

1 rate cases, or both. I therefore disagree with Dr. Woolridge's concern that the distinction
2 between settled and litigated cases is meaningful.

3 **Q. Are authorized returns in other jurisdictions a relevant benchmark in assessing the**
4 **reasonableness of ROE estimates and recommendations?**

5 A. Yes, they are. It is important to recognize that in establishing their return requirements,
6 investors consider a broad range of data, including returns authorized in other
7 jurisdictions. Equity investors have many options available to them, and allocate their
8 capital based on the expected risks and returns associated with those alternatives. Given
9 that investors consider such data in framing their investment decisions, return
10 recommendations that materially depart from observed industry norms – such as such as
11 Dr. Woolridge's 8.85 percent recommendation – should be supported by clear and
12 unambiguous reasons.

13 I also disagree with Dr. Woolridge's position that authorized returns are not meaningful
14 because they are measures of "commission behavior" as opposed to measures of
15 investors' return expectations.¹²⁶ There is no reason to believe that other regulatory
16 commissions do not consider the same type of market-related factors at issue in this
17 proceeding. Nor is there reason to assume that investors dismiss authorized returns in
18 establishing their return expectations. Rather, the fact that companies such as American
19 Electric Power – one of Dr. Woolridge's proxy companies – report authorized returns in

¹²⁶

Ibid.

1 their annual Securities Exchange Commission Form 10-K indicates that they are quite
2 relevant to investors.

3 **G. Relative Risk**

4 **Q. Do you believe that credit ratings are an appropriate measure to determine the**
5 **equity risk of Granite State relative to the proxy group?**

6 A. Although I agree that, in general, credit spreads are directionally related to the Cost of
7 Equity,¹²⁷ I do not agree that changes in one is a direct measure of changes in the other.
8 Debt and equity are entirely different securities with different risk/return characteristics,
9 different lives, and different investors. Debt investors have a contractual, priority claim
10 on cash flows not available to equity investors and, as such, equity investors bear the
11 residual risk of ownership. Moreover, because the life of debt is finite, debt investors'
12 exposure to business and financial risk likewise is finite. Equity, on the other hand is
13 perpetual and thus equity investors are exposed to residual risk in perpetuity. Because
14 debt and equity are distinct securities with different risk and return profiles, debt and
15 equity investors themselves have different risk and return requirements. As such, any
16 inferences drawn from changes in credit spreads for the Companies' Cost of Equity
17 should be drawn with caution.

18 A visible measure of the distinction of the risks to which debt and equity investors are
19 exposed is the difference in their respective Beta coefficients. Although I disagree with

¹²⁷ As noted by Robert S. Harris and Felicia C. Marston, *Estimating Shareholder Risk Premia Using Analysts' Growth Forecasts*, Financial Management, Summer 1992, at 68, "equity risk premia... increased with the increases in the spread between corporate and government bond yields".

1 his conclusions, Dr. Woolridge recommends an average Beta coefficient of 0.70 for both
2 our respective proxy groups.¹²⁸ Duff & Phelps notes that as of December 2015, Beta
3 coefficients for A-rated debt was negative 0.07.¹²⁹ That is, the Beta coefficients of A-
4 rated debt are well below those of the equity Beta coefficients assumed by Dr.
5 Woolridge. In fact, the debt Beta coefficients in the range of 0.45 to 0.55 are associated
6 with Ba and B rated debt, both of which are considered to be below investment grade.¹³⁰
7 Those differences are a clear indication that the risks assumed by debt investors are far
8 different than those assumed by equity investors.

9 **Q. Did you perform any analyses to determine whether Dr. Woolridge's data supports**
10 **the assumption that there is a quantifiable difference in the Cost of Equity for**
11 **companies with different bond credit ratings?**

12 A. Yes, I did. I first produced Constant Growth DCF results for each of the comparison
13 companies using the growth rates and dividend yields reported by Dr. Woolridge. I then
14 applied "credit scores" to Dr. Woolridge's comparison companies by converting the S&P
15 bond ratings reported in his Direct Testimony to a numerical value. If there is a
16 quantifiable relationship between the proxy companies' credit ratings and Cost of Equity,
17 there should be a positive, statistically significant relationship between the credit score
18 and the DCF results. That is, as credit quality deteriorates (resulting in a higher score),
19 the Cost of Equity should increase. I therefore performed a regression analysis, in which
20 the dependent variable was the DCF result, and the explanatory variable was the credit

¹²⁸ Exhibit JRW-11, at 3.

¹²⁹ Duff & Phelps 2016 Valuation Handbook, John Wiley & Sons, Inc., 2016, at Appendix 3b.

¹³⁰ Duff & Phelps 2016 Valuation Handbook, John Wiley & Sons, Inc., 2016, at Appendix 3b. Debt Beta coefficients for BBB-rated companies were 0.08.

1 score. As shown in Attachment RBH-R-17, the regression analysis showed no
2 statistically significant statistical relationship between the two. In fact, the R-squared of
3 the regression was only 0.04, which indicates that credit ratings accounted for only 4.00
4 percent of the change in the DCF-estimated Cost of Equity.

5 **H. Capital Structure**

6 **Q. Please summarize Dr. Woolridge's position on the Company's capital structure.**

7 A. Dr. Woolridge recommends a capital structure consisting of 50.00 percent long-term debt
8 and 50.00 percent common equity. To support his conclusion, Dr. Woolridge compares
9 the Company's capital structure to the capital structures in place at the holding company
10 level.¹³¹ As discussed in my Direct Testimony, I analyzed the actual capital structures in
11 place at the operating companies held within my proxy group. Based on that review, it is
12 apparent that the Company's capital structure is generally consistent with the capital
13 structures of the proxy companies.

14 Lastly, as shown in Attachment RBH-R-7, my updated capital structure analysis
15 continues to support the reasonableness of the Company's current capital structure.

16 **V. RESPONSE TO THE DIRECT TESTIMONY OF DR. CHATTOPADHYAY**

17 **Q. Please briefly summarize Dr. Chattopadhyay's recommendation regarding the**
18 **Company's Cost of Equity.**

19 A. Dr. Chattopadhyay recommends an ROE of 8.50 percent, within a recommended range of
20 8.20 percent to 8.60 percent.¹³² While he does undertake a CAPM analysis, Dr.

¹³¹ Direct Testimony of Dr. J. Randall Woolridge, at 34, and Exhibit JRW-4.

¹³² See Direct Testimony of Dr. Pradip K. Chattopadhyay, at 56.

1 Chattopadhyay instead uses his CAPM estimate as a check on reasonableness and
2 recommends relying on the DCF approach, which (under his assumptions) produces three
3 estimates ranging from 7.38 percent to 8.69 percent, with an average of 8.18 percent.

4 Aside from discussing methodological issues, much of Dr. Chattopadhyay's testimony
5 speaks to his position that Market-to-Book ratios in excess of unity indicate that expected
6 returns exceed required returns, which position affects several aspects of his analyses and
7 recommendations. Dr. Chattopadhyay further suggests that his 8.50 percent ROE
8 recommendation is reasonable because the proxy companies' equity values have been,
9 and continue to be, in excess of book value. As discussed above in more detail, Dr.
10 Chattopadhyay's position regarding the implications of market values in excess of book
11 values is misplaced, and cannot be used to support an ROE recommendation that is so far
12 removed from prevailing levels.

13 **Q. What are the principal areas of disagreement between you and Dr. Chattopadhyay?**

14 A. There are several areas in which I disagree with Dr. Chattopadhyay's approach and
15 conclusions, including: (1) the composition of our respective proxy groups; (2) the
16 growth rates applied in the Constant Growth DCF model; (3) the relevance and
17 application of Multi-Stage DCF models; (4) the application of the CAPM; (5) the
18 reasonableness of the Bond Yield Plus Risk Premium approach; (6) the relevance and
19 application of the size premium; and (7) the relevance of flotation costs in determining
20 the Company's Cost of Equity. I discuss each of those issues in turn, below.

1 **A. Proxy Group Composition**

2 **Q. Please briefly describe the method by which Dr. Chattopadhyay developed his proxy**
3 **group.**

4 A. Dr. Chattopadhyay began with the same universe of companies from which I developed
5 my proxy group, and applied similar screening criteria. The difference between our
6 approaches is that Dr. Chattopadhyay focused on revenue rather than income as a
7 screening criterion. Specifically, he required at least 70.00 percent of the proxy
8 company's 2015 total revenues to be attributable to regulated electric operations. He also
9 required at least 80.00 percent of the subject company's assets to be associated with
10 regulated operations.¹³³ His screening criteria resulted in a proxy group of thirteen
11 companies, shown below in Table 5:

¹³³ Direct Testimony of Dr. Pradip K. Chattopadhyay, at 72.

Table 5: Dr. Chattopadhyay's Proxy Group¹³⁴

Company	Ticker
Alliant Energy Corporation	LNT
Ameren Corporation	AEE
American Electric Power, Inc.	AEP
Avista Corporation	AVA
Consolidated Edison	ED
Eversource Energy	ES
IDACORP, Inc.	IDA
Northwestern Corporation	NWE
OGE Energy Corporation	OGE
Pinnacle West Capital Corporation	PNW
PNM Resources, Inc.	PNM
Portland General Electric Company	POR
Xcel Energy Inc.	XEL

Q. Does Dr. Chattopadhyay follow his screening criteria?

A. No, he does not. First, Dr. Chattopadhyay includes a screening criterion requiring at least 70.00 percent of 2015 revenues to be attributable to the regulated electric operations. Avista Corporation fails this screening criterion at 67.76 percent of 2015 total operating revenue attributable to regulated electric operations.¹³⁵

Q. What is your concern with Dr. Chattopadhyay's use of revenue, rather than income, as a screening criterion?

A. Measures of income are far more likely to be considered by the financial community in making credit assessments and investment decisions than are measures of revenue. From

¹³⁴ *Ibid.*, at 74.

¹³⁵ See OCA 3-4 Attachment 1.

1 the perspective of credit markets, measures of financial strength and liquidity are focused
2 on cash from operations, which is directly derivative of earnings, as opposed to revenue.
3 As part of its rating methodology, for example, Moody's assigns a 40.00 percent weight
4 to measures of financial strength and liquidity, of which 22.50 percent specifically relates
5 to the ability to cover debt obligations with cash from operations.¹³⁶

6 Just as rating agencies focus on measures of cash from operations, equity analysts rely on
7 measures of income in assessing equity valuation levels; common measures of relative
8 value include the Price/Earnings ("P/E") ratio, and the ratio of Enterprise Value/EBITDA
9 (Earnings Before Interest, Taxes, Depreciation, and Amortization). Revenue, however,
10 may be several steps removed from the earnings and cash flows that form the basis of
11 equity valuations. Energy trading and marketing units, for example, often represent high
12 revenue but low margin operations. Those operations may generate a comparatively
13 large proportion of the combined entity's revenue, but only a small percentage of
14 operating income and cash flow. Focusing on revenue, therefore, may mislead the
15 analyst into assuming that a given operating unit is the primary driver of expected
16 growth, when the majority of earnings and cash flows are derived from other business
17 segments. Here, we are considering whether the underlying utility is the principal source
18 of long-term growth and thus focusing on revenue may obscure important elements of the
19 analysis.

¹³⁶ See *Rating Methodology, Regulated Electric and Gas Utilities*, Moody's Global Infrastructure Finance, August 2009, at 13.

Q. Do you have a similar concern with Dr. Chattopadhyay's use of assets as a screening criterion?

A. To some extent, yes. Similar to revenue, certain business segments may require a relatively small amount of fixed assets to produce a large proportion of consolidated revenue. Taking Consolidated Edison ("ED", one of Dr. Chattopadhyay's proxy companies) as an example, Table 6 below demonstrates that the company's competitive energy businesses produced relatively high revenues per dollar of assets, but low income per dollar of revenue.¹³⁷

Table 6: Consolidated Edison 2015 Segment Information¹³⁸

	Regulated Distribution	Competitive Energy Businesses
Total Operating Revenues/Total Assets	26.01%	82.32%
Net Income/Total Operating Revenues	10.17%	4.27%
Net Income /Assets	2.69%	3.51%

The point simply is that if screening criteria include measures of revenue and assets, the interplay among those metrics also is an important consideration.

Q. Those concerns aside, do your proxy companies meet Dr. Chattopadhyay's screening criteria?

A. Yes, I believe they do. First, I have excluded two companies due to merger activity or significant transactions that occurred since I filed my Direct Testimony: Great Plains

¹³⁷ Consolidated Edison meets my screening criteria of 60.00 percent of regulated operating income attributable to electric operations.

¹³⁸ See Consolidated Edison SEC Form 10-K For the Fiscal Year Ended December 31, 2015, at 44.

1 Energy, Inc. and Westar Energy, Inc. Furthermore, all my proxy group companies are
2 within two standard deviations of Dr. Chattopadhyay's thresholds for 2015 revenue and
3 assets.¹³⁹ Consequently, none is an outlier.

4 **Q. What are your conclusions regarding the composition of your respective proxy**
5 **groups?**

6 A. But for the two companies that are party to significant transactions since the analysis
7 presented in my Direct Testimony, I find no reason to exclude the remaining companies
8 from the proxy group. My proxy group companies derive most of their consolidated
9 income from regulated electric operations and are within two standard deviations of Dr.
10 Chattopadhyay's screening criteria thresholds. As such, with the exception of the two
11 companies I excluded due to merger activity, I have maintained the proxy group included
12 in Direct Testimony.

13 **B. Application of the Constant Growth Discounted Cash Flow Model**

14 **Q. Please briefly summarize Dr. Chattopadhyay's DCF analysis and results.**

15 A. In terms of its structure, Dr. Chattopadhyay and I generally rely on the same form of the
16 DCF model, which calculates the expected ROE as the sum of (1) the expected dividend
17 yield, and (2) the expected growth rate.¹⁴⁰ Rather than calculating an expected dividend
18 yield based on current prices and annualized dividends, Dr. Chattopadhyay relies on
19 recent prices and Value Line's projected dividend for 2017.¹⁴¹ While I do not entirely

¹³⁹ Dr. Chattopadhyay uses a similar methodology to determine whether his DCF-based ROE estimates are outliers. See Direct Testimony of Pradip K. Chattopadhyay at 82.

¹⁴⁰ See also, Direct Testimony of Robert B. Hevert, at 14.

¹⁴¹ See Schedule PKC-4.

1 disagree with that approach, as noted below, Dr. Chattopadhyay's DCF analysis is
2 heavily dependent on Value Line as the principal source of data. In my view, relying on
3 actual dividends and expected growth rates from consensus estimates serves the dual
4 benefit of reflecting market expectations and reducing the risk of biased results that could
5 arise from relying so heavily on a single source of data and growth rate assumptions. In
6 any case, the difference in our expected dividend yield estimate does not explain the
7 difference in our results or recommendation.

8 **Q. What growth rates did Dr. Chattopadhyay review in his Constant Growth DCF**
9 **analysis?**

10 A. Dr. Chattopadhyay reviewed a number of growth rates, including projected DPS, BVPS,
11 and EPS growth rates as reported by Value Line, consensus EPS growth rate projections
12 from Yahoo! and Zacks, and an estimate of "sustainable growth" derived from data
13 provided by Value Line.¹⁴² Dr. Chattopadhyay is of the view that it is improper to rely
14 solely on measures of earnings growth, preferring instead to include Value Line's
15 projections of growth in BVPS, and DPS in calculating his DCF results.

16 **Q. Do you agree with Dr. Chattopadhyay's position that dividend and book value**
17 **growth rates are appropriate measures of expected growth for the Constant Growth**
18 **DCF model?**

19 A. No, I do not. As discussed in my response to Dr. Woolridge, the only growth rate that
20 has a positive statistically significant relationship to valuation was the projected EPS
21 growth rate. That is, none of the historical or projected DPS and BVPS growth rates, the

¹⁴² See Schedule PKC-5 and Schedule PKC-6.

1 historical EPS growth rate, or historical or projected retention growth rates have a
2 positive statistically significant relationship to valuation levels.

3 As Dr. Chattopadhyay recognizes, Value Line is the only service that provides DPS,
4 BVPS, or sustainable growth projections.¹⁴³ The fact that services such as Zacks and
5 First Call choose to provide earnings, but not dividend or book value growth estimates,
6 indicates that they see little investor demand for such data. As Dr. Roger Morin notes:

7 Casual inspection of the Zacks Investment Research, First Call
8 Thompson, and Multex Web sites reveals that earnings per share
9 forecasts dominate the information provided. There are few, if any,
10 dividend growth forecasts. Only Value Line provides comprehensive
11 long-term dividend growth forecasts. The wide availability of
12 earnings forecast is not surprising. There is an abundance of evidence
13 attesting to the importance of earnings in assessing investors'
14 expectations. The sheer volume of earnings forecasts available from
15 the investment community relative to the scarcity of dividend forecasts
16 attests to their importance. The fact that these investment information
17 providers focus on growth in earnings rather than growth in dividend
18 indicates that the investment community regards earnings growth as a
19 superior indicator of future long-term growth.¹⁴⁴

20 I also note that services such as Zacks and First Call are freely available consensus
21 estimates that reflect the assessments of multiple analysts. Value Line estimates, in
22 contrast, are available via a subscription service and are attributable to a single analyst.
23 Consequently, consensus projections are less likely to be biased in one direction or
24 another as a result of an individual analyst. That is why one of my screening criteria
25 requires that subject company to be followed by two or more firms.

¹⁴³ See Direct Testimony of Pradip K. Chattopadhyay, at 80.

¹⁴⁴ Roger A. Morin, PhD, New Regulatory Finance, Public Utilities Reports, Inc., 2006, at 302 – 303.

1 **Q. Did Dr. Chattopadhyay comment on the research that you provided in discovery**
2 **regarding investors' views regarding the relevance of dividend and earnings**
3 **growth?**

4 A. Yes, he did. In summary, Dr. Chattopadhyay concludes that those articles do not support
5 my position that earnings growth is the appropriate measure for the purpose of the DCF
6 model.¹⁴⁵ Dr. Chattopadhyay suggests that the proper frame of reference is expected
7 dividend and earnings growth whereas the articles focused on historical growth, or
8 forecasts of cash flow measures aside from dividends.¹⁴⁶ While I disagree with his
9 conclusions, I understand that Dr. Chattopadhyay's analyses place considerable weight
10 on Value Line which, as noted above, is the only service that provides DPS and BVPS
11 growth rates.

12 **Q. What are your conclusions regarding the appropriateness of DPS and BVPS growth**
13 **rates?**

14 A. My analyses demonstrate that even if we were to rely solely on data from Value Line,
15 projected EPS growth is the only expected growth metric with a statistically significant
16 ability to explain utility price valuations. Those results confirm Dr. Chattopadhyay's
17 observation that earnings growth would be positively related to price changes.¹⁴⁷

¹⁴⁵ See Direct Testimony of Pradip K. Chattopadhyay, at 77-78.

¹⁴⁶ See Direct Testimony of Pradip K. Chattopadhyay, at 77-78.

¹⁴⁷ Direct Testimony of Pradip K. Chattopadhyay, at 66.

1 **C. Application of the Multi-Stage DCF Model**

2 **Q. Please briefly describe the structure and intent of the Multi-Stage DCF model**
3 **included in your Direct Testimony.**

4 A. As discussed in my response to Dr. Woolridge, the Multi-Stage DCF model enables the
5 analyst to model growth in three stages, rather than a single growth rate in perpetuity (as
6 the Constant Growth DCF model assumes).¹⁴⁸ The terminal growth rate, which begins in
7 the eleventh year and assumes that in the long-run growth will converge to the rate of
8 growth in the overall economy, specifically relies on market-based data (via the TIPS
9 spread) to arrive at the market-expected rate of growth.

10 The use of expected long-term GDP growth in the terminal period is consistent with
11 practice and financial literature. For example, Dr. Roger Morin writes “[i]t is useful to
12 remember that eventually all company growth rates, especially utility services growth
13 rates, converge to a level consistent with the growth rate of the aggregate economy.”¹⁴⁹

14 In a similar vein, Morningstar describes a three-stage DCF approach (generally consistent
15 with the model included in my Direct Testimony) in which the final stage assumes that
16 long-run growth moves toward that of the overall economy. Morningstar describes an
17 approach to calculating the long-term growth estimate that is similar to that which is

¹⁴⁸ See Direct Testimony of Robert B. Hevert, at 21-22.

¹⁴⁹ Roger A. Morin, New Regulatory Finance, Public Utilities Report, Inc., 2006, at 308.

1 included in my model in that Morningstar's method also combines historical average real
2 GDP growth rate with a measure of inflation calculated using the TIPS spread.¹⁵⁰

3 **Q. Does Dr. Chattopadhyay agree with your application of the Multi-Stage DCF**
4 **model?**

5 A. No, Dr. Chattopadhyay suggests that there is an element of judgment that goes along with
6 the model, and that electric utilities operate in a sufficiently stable environment that no
7 such model is needed.¹⁵¹

8 **Q. Do you agree with Dr. Chattopadhyay's assessment?**

9 A. No, I do not. In large measure, Dr. Chattopadhyay's recognition that dividends and
10 earnings are not expected to grow at the same rate over the coming three to five years
11 supports the use of the Multi-Stage approach.¹⁵² If, as Dr. Chattopadhyay suggests, the
12 industry is sufficiently stable that the Multi-Stage model does not add information to the
13 Cost of Equity estimation process, the fundamental assumptions underlying the Constant
14 Growth form of the DCF model would hold. That is, earnings, dividends, and book value
15 all would grow at the same, constant rate, in perpetuity. As Dr. Chattopadhyay
16 acknowledges, however, that is not the case.

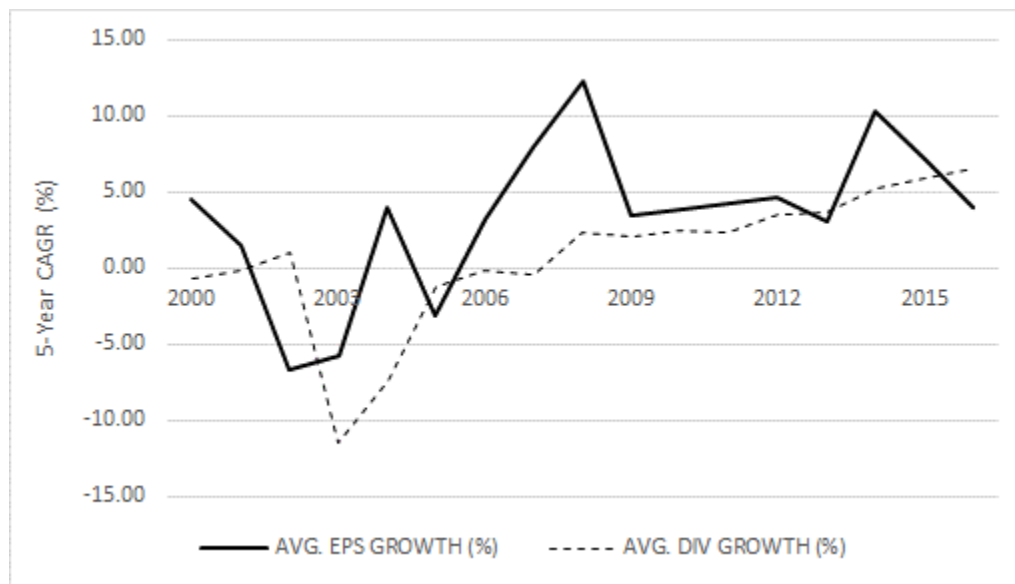
¹⁵⁰ Morningstar, Ibbotson SBBI 2013 Valuation Yearbook, at 52. I note that the long-term growth rate in my Multi-Stage DCF model equals 5.30 percent. $\text{Implied Expected Nominal GDP} = ((1 + \text{Historical Real GDP Growth}) \times (1 + \text{Implied Forward Inflation})) - 1$, or 5.70 percent $= ((1 + 3.24 \text{ percent}) \times (1 + 2.00 \text{ percent})) - 1$.

¹⁵¹ See Direct Testimony of Pradip K. Chattopadhyay, at 83.

¹⁵² *Ibid.*, at 31.

Taking a longer-term perspective, historically, Earnings and Dividend average growth rates for the companies within Mr. Chattopadhyay's proxy group typically have not been consistent, often diverging. See Chart 11, below.

Chart 11: Five-Year EPS and Dividend Growth Rates
(OCA Proxy Group)¹⁵³



It is quite clear that the fundamental assumptions underlying the Constant Growth DCF model do not hold, and have not held for some time. Therefore, I disagree with Dr. Chattopadhyay's conclusion and continue to believe that the Multi-Stage DCF model provides relevant information and produces meaningful estimates of the Company's Cost of Equity.

¹⁵³ Source: SNL Financial. 2016 data is through Q3 2016. Five-year Compound Annual Growth Rate of EPS after extraordinary items and dividends declared.

1 **D. Application of the Capital Asset Pricing Model**

2 **Q. As a preliminary matter, please provide a brief summary of the CAPM and its**
3 **components.**

4 A. As discussed in my Direct Testimony, the CAPM is a risk premium-based model defined
5 by four components: $k = r_f + \beta(r_m - r_f)$ [3]
6 where:

7 r_f is the risk-free rate of return;

8 β is the Beta coefficient, which reflects the subject security's risk relative to the
9 overall market¹⁵⁴;

10 r_m is the expected return on the market, taken as a whole; and

11 $(r_m - r_f)$ is the "Market Risk Premium", or the incremental return required to
12 invest in the equity market over the risk-free rate of return (*i.e.*, the premium
13 required to take on "market risk").

14 In essence, the model estimates the Cost of Equity as the sum of the risk-free rate of
15 return, and the risk-adjusted Market Risk Premium ("MRP").

16 **Q. With that background in mind, what are the principal areas in which you disagree**
17 **with Dr. Chattopadhyay's application of the CAPM?**

18 A. Our disagreements lie in three areas: (1) the calculation of the expected MRP; (2) the
19 tenor of the risk-free rate; and (3) the use of projected interest rates. In addition to those

¹⁵⁴ As noted in my Direct Testimony at page 31 (Equation [5]), risk is defined as the volatility of returns.

1 methodological differences, Dr. Chattopadhyay and I disagree regarding the extent to
2 which CAPM results should figure in determining the Company's ROE.

3 **Q. What is the nature of Dr. Chattopadhyay's concern with the methods by which you**
4 **estimated the MRP?**

5 A. Dr. Chattopadhyay is primarily concerned that (1) my market return estimates rely on
6 "biased" earnings growth estimates, and (2) it is inappropriate to "mix" sources of data
7 (that is, applying a Value Line Beta coefficient to Bloomberg market return estimates,
8 and vice versa). While Dr. Chattopadhyay adopts one of the two approaches included in
9 my Direct Testimony (that is, the use of Bloomberg-derived expected returns), his Value
10 Line approach is calculated in an entirely different manner.

11 **Q. Please describe how Dr. Chattopadhyay calculates his Value Line MRP.**

12 A. First, although he finds my Bloomberg MRP approach "reasonable",¹⁵⁵ he believes it is
13 necessary to also use Value Line's projected DPS and BVPS growth rates to calculate a
14 Value Line-based MRP. Dr. Chattopadhyay then eliminates companies for which
15 projected growth rates are not fully available, leaving 409 of the 500 companies.
16 Finally, he adjusts his MRP by the market-capitalization weighted mean Beta coefficient
17 from Value Line for the remaining 409 companies in his market sample.¹⁵⁶

¹⁵⁵ Direct Testimony of Pradip K. Chattopadhyay at 90.

¹⁵⁶ Dr. Chattopadhyay derives the conclusion that the MRP equals $(k_e - r_f)/B$ on page 38 of his testimony; I will not repeat that derivation here.

1 **Q. What is your response to Dr. Chattopadhyay’s Value Line MRP approach?**

2 A. First, if relying solely on earnings growth projections is reasonable in my Bloomberg
3 approach, it is unclear why it is unreasonable for my Value Line approach. For the
4 reasons discussed above, I believe that earnings growth projections are more appropriate
5 than dividend or book value growth rates. Therefore, I disagree with Dr.
6 Chattopadhyay’s inclusion of those growth rates in his market return calculation.

7 Further, I note that Dr. Chattopadhyay uses data from different time periods for his MRP
8 calculation. For his Bloomberg-based approach, he used the Company’s response to
9 OCA 3-6 which included data as of October 14, 2016. For his Value Line approach, he
10 used Value Line data downloaded on November 1, 2016, for the same companies
11 provided in OCA 3-6 (that is, the S&P 500 companies as of October 14, 2016). This
12 inconsistency is important because the companies included in the S&P 500 can and do
13 change from one time period to another, and could potentially affect the calculation of the
14 market-capitalization weights.

15 **Q. Do you agree with Dr. Chattopadhyay that it is inappropriate to “mix” the data**
16 **sources of the Market Risk Premium and Beta coefficients applied in the calculation**
17 **of your CAPM estimates?**

18 A. No, I do not. Dr. Chattopadhyay has not provided any evidence to conclude that the
19 differences in how Bloomberg and Value Line calculate their respective Beta coefficients
20 materially affect the CAPM estimates.

1 **Q. Turning now to the risk-free rate component, what is the basis of your disagreement**
2 **with Dr. Chattopadhyay?**

3 A. Whereas I rely on the 30-year Treasury yield, Dr. Chattopadhyay believes that the ten-
4 year Treasury yield is the better measure. Dr. Chattopadhyay suggests that because
5 interest rate risk increases as maturities lengthen, short-term Treasury Bills best capture
6 the risk-free rate. Nonetheless, Dr. Chattopadhyay prefers the ten year Treasury yield
7 because, in his view, it balances the incremental interest rate risk associated with longer-
8 term maturities with the “consideration that regulated utility rates are usually set for
9 longer terms than just a few months.”¹⁵⁷

10 **Q. Do you agree that either Treasury Bills or the frequency of rate filings should be**
11 **used as a frame of reference for tenor of the appropriate risk-free rate?**

12 A. No, I do not. The term of the Treasury security used to establish the risk-free rate should
13 match the duration of the underlying investment, not the frequency of rate filings. To
14 that point, Morningstar has observed that: “The time horizon of the chosen Treasury
15 security[...] should match the time horizon of whatever is being valued.”¹⁵⁸ Because
16 utility companies represent long-duration investments, it is appropriate to use yields on
17 long-term Treasury Bonds as the risk-free rate component of the CAPM.

¹⁵⁷ Direct Testimony of Pradip K. Chattopadhyay, at 84.

¹⁵⁸ Morningstar, Inc., 2013 Ibbotson Stocks, Bonds, Bills and Inflation Valuation Yearbook, at 44.

1 **Q. Please briefly explain the term “duration” and explain why it is important in this**
2 **context.**

3 A. In finance, “duration” (whether for bonds or equity) typically refers to the present value
4 weighted time to receive the security’s cash flows. In terms of its practical application,
5 duration is a measure of the percentage change in the market price of a given stock in
6 response to a change in the implied long-term return of that stock. A common portfolio
7 strategy is to match the duration of investments with the term of the underlying asset in
8 which the funds are being invested, or the term of a liability being funded. Since the term
9 of the risk-free rate should match the horizon of the underlying investment, it is
10 appropriate to consider the duration of equity investments (often referred to as “Equity
11 Duration”) of the subject company when selecting the Treasury yield used as the risk-free
12 rate in the CAPM. If the average Equity Duration of the proxy group is closer to 30 years
13 than to the frequency of rate requests, it would be appropriate to use the longer-term
14 security as the measure of the risk-free rate.

15 **Q. Have you calculated the Equity Duration for Dr. Chattopadhyay’s proxy group?**

16 A. Yes, I have. Using the stock price, dividend, and growth rate data contained in Schedules
17 PKC 4 – 7, I calculated the average Equity Duration for each of Dr. Chattopadhyay’s
18 proxy companies. Those results, which are provided in Attachment RBH-R-18, indicate
19 that the average Equity Duration is approximately 29.50 years. Consequently, the 30-
20 year Treasury yield is the appropriate measure of the Risk Free rate.

1 **Q. Putting aside the issue of Equity Duration, does Dr. Chattopadhyay’s DCF model**
2 **recognize the perpetual nature of equity?**

3 **A.** Yes, it does. The Gordon model, described in Equation [2] above, assumes that
4 dividends are received in perpetuity. If the model’s underlying assumptions hold, there is
5 no difference between holding the stock and collecting dividends in perpetuity, or selling
6 the stock at the end of a given holding period. In the latter instance, the price at which
7 the stock is sold (that is, the terminal value) also is defined by Equation [2].

8 The critical point is that the terminal value represents the perpetual claim on cash flows at
9 that time. If the holding period is five years, the only way the DCF result can remain
10 constant (or reasonable) is if the stock is sold at the prevailing market price, as defined by
11 the Gordon Model. In other words, even if an investor were to hold a share of stock for
12 20 years, they only would earn their required return if the stock is sold to an investor that
13 values the shares assuming cash flows in perpetuity. The same is true if the initial
14 holding period is seven years, ten years, 32 years, 87 years, or any other horizon. If
15 equity were not perpetual, the shares would hold no value at the end of the holding period
16 and the ROE estimates would be implausibly low. It is, therefore, the perpetual nature of
17 equity, not the frequency of rate filings, which defines the duration of the equity
18 investment and, therefore, the appropriate tenor of the risk-free rate.

1 **Q. Do you agree with Dr. Chattopadhyay's concern regarding projected yields?**

2 A. No, I do not. As discussed in my direct testimony, the Cost of Equity is forward-
3 looking.¹⁵⁹ As to the CAPM specifically, each of the components theoretically should be
4 forward-looking,¹⁶⁰ with which Dr. Chattopadhyay agrees.¹⁶¹ His objection to applying
5 projected Treasury yields in the CAPM, therefore, contradicts arguments elsewhere in his
6 testimony.

7 **E. Bond Yield Plus Risk Premium Approach**

8 **Q. Please briefly summarize Dr. Chattopadhyay's concern with the Bond Yield Plus**
9 **Risk Premium approach.**

10 A. Dr. Chattopadhyay suggests that because the analysis is based on historical data, it is not
11 an appropriate method. He further reasons that the method may capture the effect of
12 price appreciation resulting from authorized returns that exceed the "true" Cost of Equity.
13 Lastly, Dr. Chattopadhyay suggests that because investors "understand" that equities will
14 not trade in excess of book value over the long run, the DCF method should be the
15 preferred approach.¹⁶²

16 **Q. What is your response to Dr. Chattopadhyay on those points?**

17 A. As to the Bond Yield Plus Risk Premium method in general, for the reasons discussed in
18 my response to Dr. Woolridge, I continue to believe it is a useful approach. Although
19 historical data is used to determine the relationship between interest rates and the Equity

¹⁵⁹ See Direct Testimony of Robert B. Hevert, at 52.

¹⁶⁰ See Direct Testimony of Robert B. Hevert, at 33. Dr. Chattopadhyay notes that the Beta coefficient is historical looking; to my knowledge, there is no data source that forecasts the Beta coefficient.

¹⁶¹ See Direct Testimony of Pradip K. Chattopadhyay, at 64.

¹⁶² See Direct Testimony of Pradip K. Chattopadhyay, at 65.

1 Risk Premium, forward-looking data (i.e., projected 30-Year Treasury yields) is applied
2 to the regression coefficients to calculate forward-looking Cost of Equity estimates. In
3 terms of the implications of market values exceeding book value, for the reasons
4 discussed in Section III, I disagree with Dr. Chattopadhyay.

5 **F. Size Premium**

6 **Q. Please briefly summarize Dr. Chattopadhyay's position regarding the size effect.**

7 A. Dr. Chattopadhyay recognizes that I do not make a specific adjustment for the
8 Company's relatively small size, but points to certain factors which, he believes, suggest
9 that the effect does not apply in this instance. In that regard, Dr. Chattopadhyay suggests
10 that the size effect is dependent on the time period chosen for review, and that it may not
11 apply to utilities.

12 **Q. As a preliminary matter, is there support in the financial community for the use of a**
13 **small size premium?**

14 A. Yes, there have been several studies conducted that demonstrate the size premium. One
15 of the earliest works in this area found that over a period of 40 years "the common stock
16 of small firms had, on average, higher risk-adjusted returns than the common stock of
17 large firms."¹⁶³ The author, who referred to that finding as the "size effect," suggested
18 that the CAPM was mis-specified in that on average, smaller firms had significantly
19 larger risk-adjusted returns than larger firms. The author also concluded that the size
20 effect was "most pronounced for the smallest firms in the sample."¹⁶⁴ Since then,

¹⁶³ R. W. Banz, *The Relationship Between Return and Market Value of Common Stocks*, Journal of Financial Economics, 9, 1981.

¹⁶⁴ *Ibid.*

1 additional empirical research has focused on explaining the size effect as a function of
2 lower trading volume and other factors, but the proposition that Beta fails to reflect the
3 risks of smaller firms persists.¹⁶⁵

4 In any event, while the research discussed above supports my position that the size effect
5 is a reasonable consideration in determining the Company's Cost of Equity, Dr.
6 Chattopadhyay is correct in observing that I have not made a specific adjustment to my
7 recommended ROE due to Granite State's relatively small size.

8 **Q. Are there other observable factors that support the consideration of a small size**
9 **premium?**

10 A. Yes, there are. First, Granite State's market capitalization is far below the smallest of
11 both my proxy group and Dr. Chattopadhyay's comparison group. It therefore is not
12 surprising that (as discussed below) the trading volume of Algonquin Power & Utilities
13 Corp. ("Algonquin", the Company's ultimate parent company) is well below its peers.
14 Algonquin's comparatively low trading volume of its common stock along with its
15 somewhat low degree of institutional ownership indicate that investors require a
16 "liquidity premium." Those issues, and their implications for the Company's Cost of
17 Equity, are discussed in more detail below.

¹⁶⁵ See, for example, Mario Levis, *The record on small companies: A review of the evidence*, Journal of Asset Management, March, 2002.

1 **Q. How does relatively low trading volume affect the returns required by equity**
2 **investors?**

3 A. Smaller companies such as Algonquin typically have fewer shares outstanding, and fewer
4 shares traded than their larger counterparts. Both factors are important to institutional
5 investors, who typically hold larger numbers of shares in each of their investments as a
6 matter of management efficiency. That is, institutional investors tend to have minimum
7 dollar amounts for individual investments, which lead to positions involving larger
8 numbers of shares. If an institutional investor holds a relatively large portion of the
9 shares of a company, its ability to sell its position without adversely affecting the market
10 price of shares may be limited by the volume of shares traded each day. That uncertainty,
11 which often is referred to as “liquidity risk,” requires a higher expected return (that is, the
12 “liquidity premium” noted earlier). As noted by Amihud and Mendelson:

13 ...investors prefer to commit capital to liquid investments, which can
14 be traded quickly and at low cost whenever the need arises.
15 Investments with less liquidity must offer higher expected returns to
16 attract investors.¹⁶⁶

17 **Q. How does Algonquin’s trading volume compare to your proxy group, and to Dr.**
18 **Chattopadhyay’s comparison group?**

19 A. Algonquin’s trading volume is below both groups. As Table 7 below indicates,
20 Algonquin’s average daily volume has been only about 75.00 percent of the average daily
21 volume of both comparison groups on average. Even when we look at the average daily
22 float (the percentage of outstanding shares traded on an average day), it is approximately

¹⁶⁶ Yakov Amihud, Haim Mendelson, *Liquidity, Asset Prices and Financial Policy*, Financial Analysts Journal, Vol. 47, No. 6 (Nov-Dec 1991), at 56.

60.00 percent of its peers. That lower trading volume and float is a direct measure of relatively low liquidity, which is a factor underlying the size premium.

Table 7: Market Capitalization and Trading Volume

	Market Capitalization (\$millions)		Average Daily Volume		Average Daily Float	
Algonquin Power & Utilities	\$3,064		1,027,805		0.38%	
Hevert Proxy Group (Average)	\$10,478	29.24%	1,471,585	69.84%	0.66%	57.58%
OCA Comparison Group (Average)	\$11,076	27.66%	1,303,594	78.84%	0.63%	60.24%

Q. Turning now to “institutional ownership”, please explain that term how it is related to the Cost of Equity.

A. Institutional ownership refers to the extent to which a given company’s common stock is owned by large financial institutions, mutual funds, insurance companies, and endowments.¹⁶⁷ Because they tend to have more resources than retail investors, institutional investors are able to perform more in-depth research, and tend to take larger positions in a given company’s stock. A significant benefit of institutional investors to capital-intensive companies such as Algonquin is that they tend to be an efficient source of equity capital. In addition, because they buy and sell large stock positions based on their individual research and portfolio objectives, institutional investors provide a significant source of liquidity. As discussed below, a more liquid market means that an investor can sell stocks without the risk of losing value.

¹⁶⁷ As opposed to institutional ownership, “retail” ownership refers to ownership by individual investors.

1 There is little question that institutional ownership is important to equity investors. Value
2 Line, for example provides institutional buy and sell decisions (by quarter) as well as
3 total institutional ownership. Similarly, Yahoo! Finance (a source on which Dr.
4 Chattopadhyay relies) reports institutional ownership as a percentage of float and shares
5 held. Because their access to this efficient source of equity capital and market liquidity is
6 diminished, companies with lower levels of institutional ownership are at a competitive
7 disadvantage, and their investors face greater liquidity risk. Those companies therefore
8 must provide higher returns to compensate investors for that disadvantaged position and
9 incremental risk.

10 **Q. How does Granite State's degree of institutional ownership compare to your proxy**
11 **group, and to Dr. Chattopadhyay's comparison group?**

12 A. Granite State's institutional ownership is below all of the companies used in either of our
13 proxy groups. Whereas the average percentage of institutional ownership across our
14 groups is approximately 75.00 percent, only approximately 26.00 percent of Algonquin's
15 shares are owned by institutional investors. As with its comparatively low trading
16 volumes and float, Algonquin's relatively low degree of institutional ownership also
17 suggests that a liquidity premium (again, owing to its small size) is appropriate.

18 **Q. What do you conclude from that data?**

19 A. There is little question that Granite State has a lower percentage of institutional
20 ownership and low daily trading volumes relative to its peers. As a consequence, equity
21 investors face greater liquidity risk for which they would require a liquidity premium.
22 Because Dr. Chattopadhyay and I both estimated Cost of Equity based on proxy groups

1 of companies with greater degrees of institutional ownership and higher daily trading
2 volumes, the liquidity premium required to invest in Granite State's shares is not
3 reflected in our analytical results. Although it is difficult to estimate the required
4 liquidity premium, Algonquin's relatively illiquid shares provide further support for my
5 recommended ROE.

6 **G. Flotation Costs**

7 **Q. Please summarize Dr. Chattopadhyay's view regarding the recovery of flotation**
8 **costs.**

9 A. Dr. Chattopadhyay suggests that because M/B ratios are greater than 1.00, his DCF
10 estimates already reflect flotation costs. If, however, a given company's M/B ratio is
11 "actually close to one" and there is a risk of dilution associated with the issuance of new
12 shares, a premium to the ROE may be in order, although that premium may be needed to
13 account for more "fundamental" issues.¹⁶⁸

14 **Q. What is your response to Dr. Chattopadhyay in that regard?**

15 A. Dr. Chattopadhyay does not appear to disagree that flotation costs are legitimately
16 incurred, necessary costs. Rather, he suggests that the recovery of those costs, if at all,
17 should be conditioned on the M/B ratio. That position, however, is misplaced. As Dr.
18 Morin notes, "[t]he flotation cost adjustment does not depend on any market-to-book
19 input assumption and is still relevant even when utility companies have stock prices in
20 excess of book value, as they have for over two decades."¹⁶⁹ Dr. Morin goes on to note

¹⁶⁸ Direct Testimony of Pradip K. Chattopadhyay, at 84.

¹⁶⁹ Roger A. Morin, PhD, New Regulatory Finance, Public Utilities Reports, Inc., 2006, at 336.

1 that “[t]he derivation of the conventional flotation cost formula does not depend on the
2 assumption of a market-to-book ratio equal to 1.00.”¹⁷⁰ Consequently, I disagree with
3 Dr. Chattopadhyay’s conclusions regarding the flotation cost adjustment.

4 **VI. SUMMARY AND CONCLUSION**

5 **Q. Please summarize the analytical updates contained in your Rebuttal Testimony.**

6 A. Table 8 below summarizes my updated analytical results. *See also* Attachment RBH-R-1
7 through Attachment RBH-R-7. As discussed in my Direct Testimony, all of the models
8 used to estimate the Cost of Equity are subject to limiting assumptions or other
9 methodological constraints.¹⁷¹ As also noted in my Direct Testimony, adherence to any
10 single approach, or the results of any one approach, can result in misleading conclusions.
11 A reasonable ROE estimate therefore weighs the individual and collective results of
12 multiple methodologies.¹⁷² Because the capital markets have become increasingly
13 unsettled, with several measures indicating capital costs have increased, it is especially
14 important to consider the breadth of quantitative and qualitative information contained in
15 my Rebuttal Testimony.

¹⁷⁰ *Ibid.*

¹⁷¹ *See* Direct Testimony of Robert B. Hevert, at 12.

¹⁷² *Ibid.*, 12-13

1

Table 8: Summary of Results¹⁷³

Discounted Cash Flow	Mean Low	Mean	Mean High
30-Day Constant Growth DCF	8.17%	8.89%	9.54%
90-Day Constant Growth DCF	8.19%	8.91%	9.56%
180-Day Constant Growth DCF	8.17%	8.89%	9.53%
30-Day Multi-Stage DCF	10.01%	10.45%	10.85%
90-Day Multi-Stage DCF	10.07%	10.51%	10.91%
180-Day Multi-Stage DCF	10.00%	10.45%	10.84%
Supporting Methodologies			
CAPM Results		Bloomberg Derived Market Risk Premium	Value Line Derived Market Risk Premium
<i>Average Bloomberg Beta Coefficient</i>			
Current 30-Year Treasury (3.08%)		8.64%	9.36%
Near-Term Projected 30-Year Treasury (3.40%)		8.96%	9.68%
<i>Average Value Line Beta Coefficient</i>			
Current 30-Year Treasury (3.08%)		9.85%	10.73%
Near-Term Projected 30-Year Treasury (3.40%)		10.17%	11.05%
	Low	Mid	High
Bond Yield Risk Premium	10.01%	10.06%	10.33%

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Developing and establishing a Cost of Equity recommendation requires an element of judgment. That judgment, however, should consider the reasonableness of model results and the economic environment in which the analyses were undertaken. As discussed in my Direct Testimony, no model should be applied without considerable judgment in the

¹⁷³ See also Attachment RBH-R-1 through Attachment RBH-R-7.

1 interpretation of results.¹⁷⁴ The recent trends in the Constant Growth DCF results are
2 difficult to reconcile with observable, prevailing market conditions.

3 My recommendations therefore take into consideration the results of my Cost of Equity
4 analyses in the context of current and expected capital market conditions and the need for
5 utilities such as Granite State to maintain a level of financial integrity that enables access
6 to capital, at reasonable costs, under a variety of economic and financial market
7 conditions. With such considerations in mind, the analyses and data discussed
8 throughout my Rebuttal Testimony continue to support my recommended Cost of Equity
9 of 10.30 percent, within a range of 10.00 percent to 10.60 percent.

10 **Q. Does this conclude your Rebuttal Testimony?**

11 **A.** Yes, it does.

¹⁷⁴ See Direct Testimony of Robert B. Hevert, at 14.

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