**STATE OF NEW HAMPSHIRE**

**BEFORE THE**

**NEW HAMPSHIRE PUBLIC UTILITIES COMMISSION**

**DOCKET NO. DE 19-057**

**REQUEST FOR PERMANENT DELIVERY RATES**

# REBUTTAL TESTIMONY OF

# ANN E. BULKLEY

***Return on Equity***

**On behalf of Public Service Company of New Hampshire**

**d/b/a Eversource Energy**

**March 3, 2020**

# Table of Contents

**List of Attachments**

**STATE OF NEW HAMPSHIRE**

**BEFORE THE NEW HAMPSHIRE PUBLIC UTILITIES COMMISSION**

**REBUTTAL TESTIMONY OF ANN E. BULKLEY**

**PETITION OF PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
d/b/a EVERSOURCE ENERGY
REQUEST FOR PERMANENT RATES**

**March 3, 2020**

**Docket No. DE 19-057**

---

## I. INTRODUCTION

**Q. Please state your name and business address.**

A. My name is Ann E. Bulkley. My business address is 293 Boston Post Road West, Suite 500, Marlborough, Massachusetts 01752.

**Q. What is your position with Concentric Energy Advisors, Inc. ("Concentric")?**

A. I am employed by Concentric as a Senior Vice President.

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

A. I am submitting this rebuttal testimony before the New Hampshire Public Utilities Commission ("Commission") on behalf of Public Service Company of New Hampshire ("PSNH" or the "Company"), dba Eversource Energy ("Eversource").

**Q. Did you previously submit testimony in this proceeding?**

A. Yes. I submitted Direct Testimony regarding the appropriate Return on Equity ("ROE") and capital structure for PSNH in this proceeding.

**Q. What is the purpose of your Rebuttal Testimony?**

A. The purpose of my Rebuttal Testimony is to respond to the Direct Testimonies of Dr. J. Randall Woolridge on behalf of the Staff ("Staff") of the New Hampshire Public Utilities Commission, Dr. Pradip K. Chattopadhyay on behalf of the Office of Consumer Advocate ("OCA"), and Steve W. Chriss on behalf of Walmart, Inc. ("Walmart"), as those testimonies (collectively the "Opposing ROE Witnesses") relate to the just and reasonable return on equity ("ROE") and the appropriate capital structure for PSNH in New Hampshire.

**Q. Have you prepared any rebuttal exhibits?**

A. Yes, I am sponsoring Attachments AEB-Rebuttal-1 through AEB-Rebuttal-6, which have been prepared by me or under my direction.

**Q. How is the remainder of your Rebuttal Testimony organized?**

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

- In Section II, I provide a summary and overview of my Rebuttal Testimony and the important factors to be considered in establishing the ROE for PSNH.

- In Section III, I provide a comparison of the other ROE witnesses' recommendations in this proceeding to the comparable returns for electric utilities nationwide.
- In Section IV, I respond to Dr. Woolridge's cost of capital analyses and recommendations.
- In Section V, I respond to Dr. Chattopadhyay's cost of capital analyses and recommendations.
- In Section VI, I respond to Walmart witness Mr. Chriss' recommendations.
- Finally, in Section VII, I summarize my conclusions and recommendations.

## II. SUMMARY AND OVERVIEW

**Q. What factors should be considered by the Commission in evaluating the results of ROE models and establishing the authorized ROE?**

A. The primary factors that should be considered are: (i) the importance of investors' actual return requirements and the critical role of judgment in selecting the appropriate ROE; (ii) the importance of providing a return comparable to returns on alternative investments with commensurate risk; (iii) the need for a return that supports a utility's ability to attract needed capital at reasonable terms; and (iv) the effect of current and expected capital market conditions.

**Q. Please summarize the ROE recommendations of the other ROE witnesses in this proceeding.**

A. Figure 1 presents the results of the ROE analyses presented by the other witnesses in this proceeding and their final recommendations. Based primarily on the results of his DCF analyses, Dr. Woolridge recommends an ROE for PSNH of 8.25 percent.[1] Similarly, Dr. Chattopadhyay recommends an ROE for PSNH of 8.27 percent based primarily on the results of his DCF analysis.[2] Mr. Chriss does not perform his own ROE analysis and therefore, does not provide a specific recommendation. However, Mr. Chriss does conclude that the authorized ROE for PSNH should be no greater than 9.67 percent (i.e., PSNH's current authorized ROE) based on a review of recently authorized ROEs.[3]

**Figure 1: Summary of Other ROE Witnesses' Model Results[4]**

| | **Dr. Woolridge (Staff)** | **Dr. Chattopadhyay (OCA)** |
|---|---|---|
| Constant Growth DCF | 7.75%-8.25% | 8.09%- 8.48% |
| CAPM | 6.90%-7.20% | 7.74%- 9.00% |
| Risk Premium | N/A | N/A |
| Recommendation | 8.25% | 8.27% |

1 Direct Testimony of Dr. J. Randall Woolridge, at 61.
2 Direct Testimony of Dr. Pradip K. Chattopadhyay, at 40.
3 Direct Testimony of Steve W. Chriss, at 14-15.
4 Wal-Mart witness Chriss did not perform his own ROE analysis and did not provide specific ROE recommendations. Therefore, Mr. Chriss is not included in this summary table.

**Q. What are your key conclusions and recommendations in response to the ROE Witnesses' testimony and recommendations in this case?**

A. My key conclusions are as follows:

1) Although both Dr. Woolridge and Dr. Chattopadhyay claim to recognize the comparable return and capital attraction standards that are established by the United States Supreme Court in the *Hope* and *Bluefield* cases, they abandon these standards when establishing their ROE recommendations. These decisions determined that the authorized ROE must meet all three standards: financial integrity, capital attraction, and comparable returns. Dr. Woolridge's ROE recommendation of 8.25 percent and Dr. Chattopadhyay's recommendation of 8.27 percent do not provide a return on equity that is comparable to those available to investors in companies with commensurate risk and is not sufficient to allow PSNH to compete for capital with other similar risk firms.

2) Authorized ROEs from 2017 to 2019 demonstrate that the majority of the recently authorized returns for electric utilities are between 9.50 percent and 10.50 percent.[5] While there are authorized returns that fall below this level, none of those returns are within the range that has been proposed by the intervening witnesses in this proceeding.

[5] SNL Financial.

3) In setting the ROE in this proceeding it is important to recognize that the return will be observed by the market. This includes credit and equity market participants. Credit rating agencies continue to review the cash flow metrics and the regulatory environment in which utilities operate to determine the overall risk profile. To the extent that rating agencies have concerns about credit metrics, or the regulatory environment is perceived to be negative, it could result in downgrades to credit ratings that will increase costs for customers over the long-run.

4) The recommendations offered by the ROE witnesses in this proceeding do not consider investor expectations and recent market signals regarding the appropriate cost of equity and equity ratio for electric utilities. Rating agencies have actively downgraded the outlook and in some cases the ratings of utilities based on the outcomes or projected outcomes of rate proceedings that have resulted in authorized ROEs that are *higher* than those proposed by the witnesses in this proceeding. Based on recent market signals, adopting a return in the range that has been proposed by Dr. Woolridge and Dr. Chattopadhyay will result in negative response from credit and equity analysts and equity investors.

**Q. What are the areas of the ROE Witnesses' testimony and recommendations that have contributed to the low recommended ROEs?**

A. While there are many assumptions on which we differ, the primary driver of the results of their analyses is an over-reliance on the results of the DCF model in determining the appropriate ROE for PSNH. The following summarizes several key assumptions in each of the analyses presented by the intervenor witnesses that contribute to their low recommended ROEs:

1) Dr. Wooldridge and Dr. Chattopadhyay rely primarily on the results of the Constant Growth DCF model, even though I have demonstrated how the results of that model are being distorted by anomalous conditions in capital markets. Consideration of alternative ROE methodologies, as well as authorized returns for electric utilities in other jurisdictions, is appropriate and necessary because the DCF model is not producing reasonable and reliable results at this time.
2) Dr. Woolridge suggests that the equity cost range is between 6.90 percent and 8.25 percent. This range is 135 to 270 basis points below the average of recently authorized ROEs from electric utilities from 2018 to 2019. While Dr. Woolridge acknowledges that utility stock prices are near historic highs and that interest rates are near historic lows,[6] he does not consider how these extremes have affected the results of his DCF analyses nor does he address the sustainability of these market conditions.
3) In his CAPM analysis, Dr. Woolridge does rely on a "normalized" risk-free rate of 3.75 percent, rather than using interest rates that he has acknowledged are near historic lows; however, he does not consider how "normalized"

[6] Direct Testimony of J. Randall Woolridge, at 7-8.

market conditions would affect the results of his Constant Growth DCF analysis. As shown in Attachment AEB-Rebuttal-4, if Dr. Woolridge's Constant Growth DCF analysis is updated to reflect the dividend yields of electric utilities the last time U.S. Treasury bond yields were 3.75 percent, Dr. Woolridge's Constant Growth DCF results would be 9.46 percent. This result would be within the range of recently authorized ROEs.

4) Dr. Woolridge's DCF result, on which he places the greatest emphasis in his final recommendations, is based on a selected growth rate. As demonstrated in the remainder of my testimony, the selection of growth rates, rather than the use of investor expected growth rates, has been a long-standing practice of Dr. Woolridge's DCF analysis which has resulted in a controlled, narrow band of ROE estimates based on varied market conditions over the last eight years. Furthermore, Dr. Woolridge's recommendations over this same time period have consistently been well below the range of authorized ROEs and the return established by the commissions in each case where he has provided a recommendation.

5) Despite using a normalized risk-free rate, Dr. Woolridge's CAPM analysis results in return estimates of 6.90 percent for his electric proxy group and 7.20 percent for my proxy group. Again, Dr. Woolridge does not reconcile the results of his models with any market data and instead uses the 6.90 percent result to set the low end of his range, even though it is 270 basis points below the average of authorized ROEs for electric utilities from 2018-

2019 and is significantly below any return that has ever been authorized for an electric utility.

6) While Dr. Chattopadhyay prepares both a DCF and CAPM analysis, he relies entirely on the results of the DCF models in setting his recommended ROE. In his testimony, he notes that the market-to-book ratios for electric utilities are currently greater than 1 which implies that investors expect the price to earnings ratio for electric utilities to decrease over the long-run. However, Dr. Chattopadhyay does not acknowledge the effect of a decline in the price to earnings ratio on the results of the DCF model. If prices decline as Dr. Chattopadhyay notes, then the dividend yield for utilities will increase which will increase the results of the DCF model. Therefore, Dr. Chattopadhyay's recommended ROE of 8.27 percent which is based on the average of his three Constant Growth DCF models understates the ROE for PSNH.

7) As shown in Figure 2, the recommendations of Dr. Chattopadhyay and Dr. Woolridge are at the very low end of the range of recently authorized ROEs for electric utilities from 2009 through 2019. Moreover, Dr. Wooldridge's and Dr. Chattopadhyay's recommendations are 135 and 133 basis points, respectively, lower than the average return authorized for electric utilities from January 2018 through December 2019. This places Dr. Woolridge's and Dr. Chattopadhyay's recommendations well below the returns on comparable companies. Neither witness has not presented any analysis to

demonstrate that PSNH has significantly less risk than the companies that have recently been authorized ROEs to warrant such a low authorized ROE.

8) Dr Woolridge's and Dr. Chattopadhyay's strict reliance on the results of the Constant Growth DCF model demonstrates the importance of considering the effect of market conditions on the assumptions used to develop the model otherwise returns could deviate substantially from the returns that have been authorized returns for other comparable electric utilities. As a result, rather than dwelling on which methodology is more "correct" under current market conditions, the Commission should consider the results of the traditional methodologies with caution and rely on a more common-sense approach that sets the authorized return at a level that meets the "just and reasonable" standard of the *Hope* decision.

9) Dr, Woolridge is the only intervenor witness in this case to propose an adjustment to the Company's actual capital structure. Dr. Woolridge's recommended 50/50 imputed capital structure is inconsistent with the trend in equity ratios for utility operating companies and the proxy group companies. Finally, Dr. Woolridge's recommended equity ratio fails to consider the overall risk related to the Tax Cuts and Jobs Act ("TCJA") for utilities.

## III. COMPARABLE RETURN STANDARD

**Q. In your opinion, are the other ROE witnesses recommended ROEs consistent with the comparable return standard?**

A. No. As discussed in my Direct Testimony, the *Hope* and *Bluefield* decisions form the legal basis for determining whether a return is just and reasonable.[7] One of the standards established by the Court in those cases was that the return authorized be consistent with the returns of other companies with similar or comparable risk. The returns recommended by Dr. Wooldridge and Dr. Chattopadhyay of 8.25 percent and 8.27 percent respectively fail to meet the comparable return standard.

**Q. Please explain why you believe that these recommended ROEs fail the comparable return standard.**

A. Recently authorized ROEs are a primary indicator to investors of the returns that can be expected in the market on investment in electric utilities. As shown in Figure 2, recently authorized ROEs have been mostly in the range of 9.50 percent to 10.50 percent with an average authorized ROE of 9.60 percent from January 2018 through December 2019. Neither Dr. Woolridge nor Dr. Chattopadhyay provide any justification as to why the authorized ROE for PSNH should be 135 and 133 basis points, respectively, below the average authorized ROE.

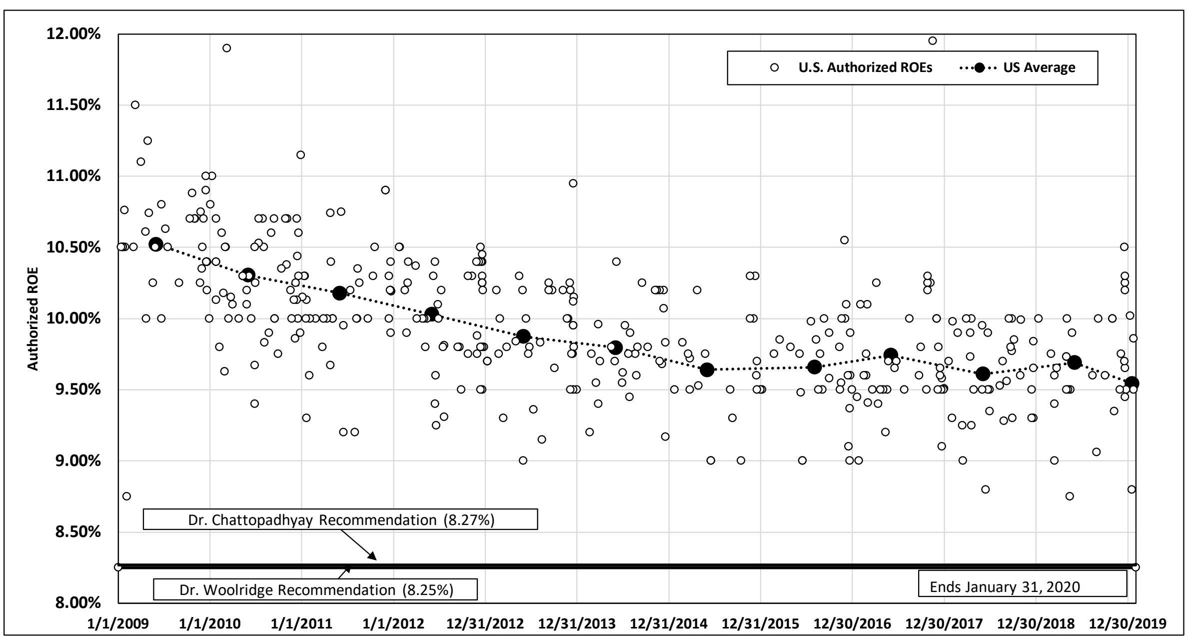
---

7 Bluefield Water Works Co. v. Publ. Serv. Comm'n., 262 U.S. 679 (1923); Federal Power Comm'n. v. Hope Natural Gas Co., 320 U.S. 591 (1944).

**Q. Have you developed a comparison of the other ROE witnesses' recommendations to the ROEs authorized by other Commission across the U.S.?**

A. Yes. Figure 2 below shows the authorized returns for electric utilities in other jurisdictions since January 2009, and the returns recommended by Dr. Wooldridge and Dr. Chattopadhyay for PSNH. As shown in Figure 2, Dr., Woolridge's recommended ROE of 8.25 percent and Dr. Chattopadhyay's recommended ROE of 8.27 percent are below any authorized ROE for an electric utility since 2009 and well below the average annual authorized ROE for electric utilities from 2009 through 2020. Thus, the recommendations of Dr. Wooldridge and Dr. Chattopadhyay do not meet the comparable return standard.

**Figure 2: U.S. Authorized Electric Returns: January 2009 – January 2020[8]**




---

[8] Source: SNL Financial. Rate case decisions from January 1, 2009 through January 31, 2020. The chart does not display the 12.88% ROE that was authorized for Alaska Electric Light and Power on

**Q. Are you aware of any utilities that have experienced a credit downgrade related to the financial effects of a rate case decision?**

A. Yes. Moody's Investors Service ("Moody's") recently downgraded ALLETE, Inc. from A3 to Baa1 for reasons that included the less than favorable outcome in Minnesota Power's last rate case in Minnesota. Moody's viewed Minnesota Power's recent rate case decision as credit negative for reasons that included: (1) the below-average authorized ROE of 9.25% which resulted in a reduction of approximately $20 million between the requested and approved revenue requirement; (2) the disallowance of certain expenses such as prepaid pension expenses; and (3) the decision to not adopt the annual rate review mechanism ("ARRM"), which, if adopted, would have mitigated the effect of industrial customers scaling back production in response to changes in economic conditions.[9] Furthermore, Moody's noted that the disallowance of expenses already incurred resulted in Minnesota Power cutting operating expenses in order to earn the company's authorized ROE.[10] For these reasons, Moody's concluded that while Minnesota Power has access to ratemaking mechanisms such as a forward test year and various riders, the ratemaking mechanisms are offset by the rate case outcome,

September 2, 2011. Additionally, the chart excludes the authorized returns in Illinois since they are established based on a formulaic approach that is directly linked to interest rates and therefore is affected by market conditions and monetary policy.

9 Moody's Investors Service, Credit Opinion: ALLETE, Inc. Update following downgrade, April 3, 2019, at 3.

10 *Ibid*.

which indicates a less than supportive regulatory relationship between Minnesota Power and the Minnesota Public Utilities Commission.[11]

In addition, FitchRatings recently downgraded CenterPoint Energy Houston Electric's ("CEHE") Long-Term Issuer Default rating from A- to BBB+ and revised the rating outlook from Stable to Negative following the approval of an unfavorable outcome in a recent rate case in Texas. FitchRatings indicated that the unfavorable outcome signals a more challenging environment in Texas for CEHE and that the authorized ROE and equity ratio, as well as the tax reform refunds will create pressure on credit metrics. FitchRatings also indicated that further negative rating action could be possible if the company's FFO leverage remains above 5x.[12]

**Q. Please summarize your conclusions regarding Dr. Woolridge's and Dr. Chattopadhyay's recommendations and the comparable return standard.**

A. One of the standards established by the Court in the *Hope* and *Bluefield* cases was that the return authorized for a utility be consistent with the returns of other companies with similar or comparable risk. As shown in Figure 2, the ROE recommendations of Dr. Woolridge and Dr. Chattopadhyay are well below the average authorized ROE for electric utilities across the U.S. from 2009 to 2020. Moody's downgrade of Minnesota Power demonstrates that credit rating agencies consider authorized ROEs, and that a below-average return contributed to the

---

[11] *Ibid*.

[12] FitchRatings, Fitch Downgrades CenterPoint Energy Houston Electric to BBB+; Affirms CNP; Outlooks Negative, February 19, 2020.

downgrade. Dr. Woolridge's and Dr. Chattopadhyay's recommendations are 100 and 98 basis points, respectively, below the 9.25 percent ROE authorized for Minnesota Power. As a result, it is clear that the recommendations of Dr. Woolridge and Dr. Chattopadhyay do not meet the comparable return standard outlined in the *Hope* and *Bluefield* decisions and would likely be viewed as credit negative by the credit rating agencies.

## IV. RESPONSE TO STAFF WITNESS DR. WOOLRIDGE

**Q. Please summarize Dr. Woolridge's testimony and recommendations.**

A. Dr. Woolridge develops a range of results from 6.90 percent to 8.25 percent and recommends an ROE for PSNH of 8.25 percent. His recommended ROE is based on a dividend yield of 3.15 percent and a growth rate of 5.00 percent using his electric proxy group. Dr. Woolridge indicates that his DCF results consider historical earnings growth rates, historical and projected dividend and book value growth rates, and retention growth rates, as well as projected earnings growth rates from Value Line, Yahoo, and Zack's, with a primary weight on the projected earnings growth rates.[13] Dr. Woolridge also presents a CAPM analysis, which produces an ROE range of 6.90 percent (Woolridge's electric proxy group) to 7.20 percent (my proxy group). Dr. Woolridge also recommends a hypothetical capital structure comprised of 50 percent common equity, 46.49 percent long-term debt and 3.51 percent short-term debt, rather than PSNH's proposed capital structure of

[13] Direct Testimony of Dr. J. Randall Woolridge, at 46.

consisting of 41.98 percent long-term debt, 3.17 percent short-term debt, and 54.85 percent common equity.[14]

**Q. Is Dr. Woolridge's 8.25 percent ROE recommendation fair and reasonable for PSNH?**

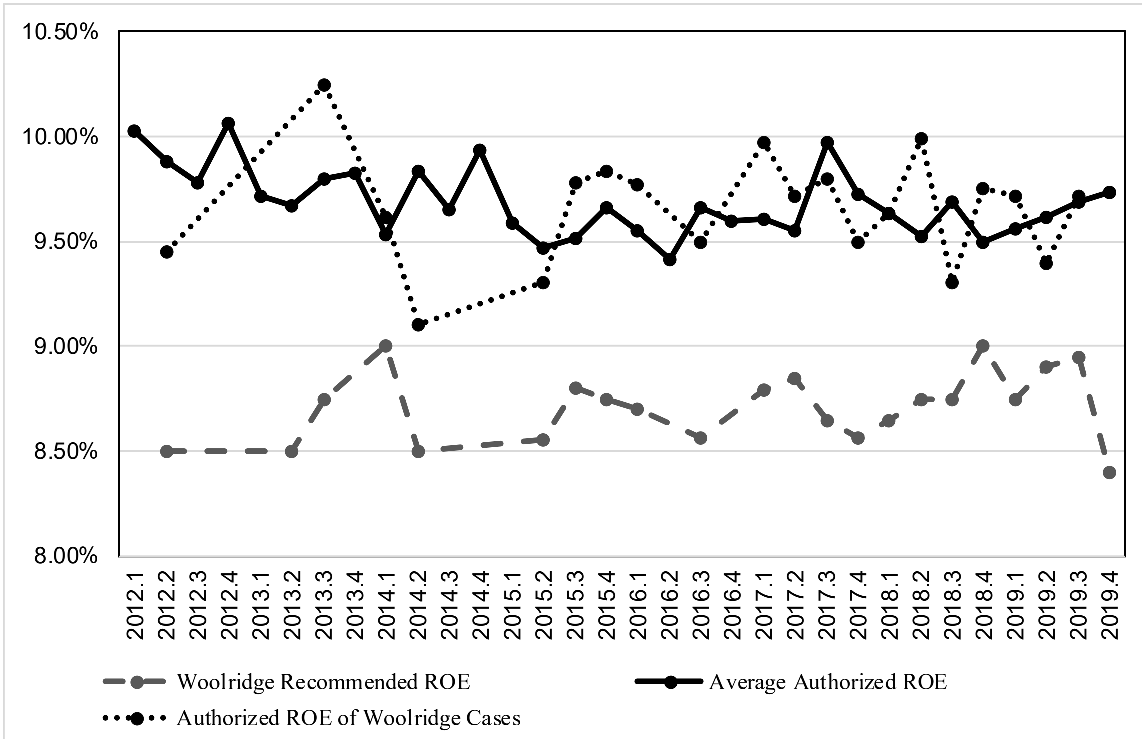
A. No. The rates set in this case, including the ROE and capital structure, will directly affect PSNH's cash flows in the period during which rates are in effect. The Company's cash flows, in turn, have a direct bearing on its credit quality and investors' perception of the riskiness of the enterprise. While Dr. Woolridge acknowledges several important recent market conditions, he does not appropriately reflect these conditions in his assessment of the results of his ROE models or in the development of his final recommended ROE. Dr. Woolridge has provided no justification for why it would be appropriate to reduce PSNH's authorized ROE 142 basis points from the Company's current authorized ROE of 9.67 percent. As demonstrated previously, rating agencies have reacted negatively to recently authorized ROEs that are more than 100 basis points higher than Dr. Woolridge's recommendation in this proceeding. Therefore, it is inconceivable that adopting Dr. Woolridge's recommended ROE of 8.25 would not result in a similar response from rating agencies and the market overall.

[14] *Id.*, at 7.

**Q. Do Dr. Woolridge's recommendations typically meet the comparable return standard?**

A. No. I have compiled Dr. Woolridge's recommendations in various cases from 2012 through the fourth quarter of 2019. As shown in Figure 3, Dr. Woolridge's ROE recommendations have been significantly lower than the return that is actually authorized by the state regulatory commissions, as well as lower than the average authorized return for electric and natural gas utilities at the same approximate time as his recommendation was made. Since the second quarter of 2012, Dr. Woolridge's ROE recommendation has been as much as 138 basis points below the average authorized return in the same quarter.

**Figure 3: Average Authorized ROEs vs. Dr. Woolridge's Recommendations 2012-2019**




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

A. As discussed in more detail below, there are several areas in which Dr. Woolridge and I disagree, including: 1) the composition of the proxy group developed by Dr. Woolridge; 2) the use of the mean DCF results without consideration of how current market conditions are affecting the DCF model; 3) the appropriate growth rates to be relied on in the Constant Growth DCF model; 4) the appropriateness of applying a 7 percent outlier screen to the results of the Constant Growth DCF; 5) the reasonableness of his CAPM assumptions and results; 6) the applicability of the Bond Yield Plus Risk Premium approach; 7) the relevance of market-to-book ratios; 8) the inclusion of flotation costs; and 9) the appropriate capital structure for PSNH.

### A. Composition of the Proxy Group

**Q. Please explain your disagreement with Dr. Wooldridge regarding the appropriate proxy group for PSNH.**

A. Dr. Woolridge and I have each developed proxy group(s) to estimate the cost of equity for PSNH. However, we have used somewhat different screening criteria to develop our respective proxy groups. Dr. Woolridge's proxy group of electric utilities consists of 30 companies. In addition, while he notes that the proxy group that I have relied on is small, he also calculates the results of his DCF and CAPM analysis using my proxy group.

**Q. Do you agree with the methodology that Dr. Woolridge relied on to select his proxy group?**

A. Not entirely. While many of Dr. Woolridge's screening criteria are similar to mine, there are several differences that affect the composition of our respective proxy groups. The following are the most important differences between our screening criteria:

1) Dr. Woolridge uses a revenue screen which can fluctuate from year to year and is not representative of a business segment's contribution to earnings.
2) Dr. Woolridge does not apply an owned generation screen to remove vertically integrated companies with a substantial amount of owned

generation from the proxy group. This results in the inclusion vertically integrated companies in the proxy group which as Dr. Woolridge has noted have greater businesses risk than transmission and distribution utilities like PSNH.[15]

**Q. Why do you believe that net operating income is an appropriate screening criterion?**

A. In establishing my proxy group, I relied on the percentage of net operating income derived from regulated operations instead of the percentage of total revenue derived from regulated operations because net operating income is more representative of the contribution of that business segment to earnings and the corporation's overall financial position. Specifically, a significant portion of gas and electric utility company revenue is derived from the costs of purchased gas, purchased fuel, and purchased power, which, in most cases, are recoverable through tracking mechanisms and do not, therefore, contribute to earnings. Furthermore, this portion of total revenue can fluctuate considerably based on the cost of gas and other inputs. Therefore, relying exclusively on a revenue screen does not provide a clear or necessarily consistent indicator of the contribution of the regulated utility operations to a company's earnings. Net operating income excludes the cost of purchased commodity and therefore more closely represents the contribution of the business segment to earnings.

---

15 *Id.*, at 17.

**Q. Please provide an example of a company that has been excluded from Dr. Woolridge's proxy group because total revenue was used instead of operating income as a screening criterion.**

A. Otter Tail Power Company ("Otter Tail") would have been included in Dr. Woolridge's electric proxy group if the percentage of total operating income derived from regulated electric operations were used as a screening criterion instead of the percentage of total revenue derived from regulated electric operations. Otter Tail has a Manufacturing segment which provides contract machining, metal parts stamping, fabrication and painting, and production of plastic thermoformed horticultural containers, life science and industrial packaging, and material handling components[16]and a Plastics segment which provides production of PVC pipe.[17] In 2018, the Manufacturing and Plastic segments had operating revenues of approximately $466 million. When compared to Otter Tail's total operating revenue of approximately $1.27 billion, it is clear that Otter Tail's percentage of revenue derived from regulated electric operations would not meet the revenue screening criterion. However, the Manufacturing and Plastic segments' 2018 operating revenue consisted of $354 million in production costs, which are passed through to customers at cost. Therefore, the Manufacturing and Plastic segments do not represent a large percentage of Otter Tail's net operating income.

---

16 Otter Tail Power Company 2018 Form 10-K, at 26.
17 *Id.,* at 27.

As discussed above, net operating income is the more appropriate screening criterion because it better approximates a business segment's contribution to earnings and the corporation's overall financial position. For example, Otter Tail operates a large electric segment with operations in Minnesota, North Dakota, and South Dakota and is generally regarded as a vertically integrated electric company. The Manufacturing and Plastic segments of Otter Tail represent a large percentage of the company's operating revenue but represents a small percentage of net operating income. Otter Tail's regulated operations contribute a larger portion to the company's earnings similar to PSNH and therefore should be included in Dr. Woolridge's electric proxy group.

**Q. Was Otter Tail included in your proxy group?**

A. No. At the time of the development of my Direct Testimony, Otter Tail did not meet my covered by more than one analyst screening criterion and was subsequently excluded from my proxy group. However, the ROE analyses contained in Dr. Woolridge's Direct Testimony are based on market data through December 2019. As of December 2019, Otter Tail was covered by more than one analyst[18]; therefore, I believe Otter Tail should be included in Dr. Woolridge's electric utility proxy group.

---

[18] Yahoo! Finance, December 31, 2019.

**Q. Do you have any other concerns with the screening criteria used by Dr. Woolridge to select his proxy group?**

A. Yes. Dr. Woolridge has inappropriately included vertically integrated electric utilities in his proxy group which own a substantial amount of generation. PSNH is a transmission and distribution utility and therefore does not own electric generation assets. Thus, the owned generation screening criterion is intended to remove companies that own substantial amounts of generation and may not be as comparable to the Company. According to Moody's, generation ownership causes vertically integrated electric utilities to have higher business risk than either electric transmission and distribution companies, or natural gas distribution or transportation companies. For example, Moody's states that:

> Generation utilities and vertically integrated utilities generally have a higher level of business risk because they are engaged in power generation, so we apply the Standard Grid. We view power generation as the highest-risk component of the electric utility business, as generation plants are typically the most expensive part of a utility's infrastructure (representing asset concentration risk) and are subject to the greatest risks in both construction and operation, including the risk that incurred costs will either not be recovered in rates or recovered with material delays.[19]

**Q. Is there additional evidence that vertically integrated electric utilities have different risk profiles than distribution-only utilities?**

A. Yes, there is. As an example, consider Southern Company ("Southern"), a vertically integrated electric utility included in Dr. Woolridge's proxy group but

---

19 Moody's Investors Service, Rating Methodology: Regulated Electric and Gas Utilities, June 23, 2017, at 21.

excluded from my proxy group. Value Line (i.e., the source that Dr. Woolridge relies on extensively in both his DCF and CAPM analyses) states the following when summarizing Southern's financial data:

> Southern Company has been one of the top-performing stocks in the electric utility industry in 2019. The company's Georgia Power subsidiary is building two units at the site of the Vogtle nuclear station. The project has had delays and cost overruns that have caused the company to take write-offs, but in 2019 there have been no such charges. Thus, Wall Street has become more comfortable with the project. The progress Georgia Power has made and the generous dividend yield of the stock have attracted investors. An estimated $2.9 billion of costs remain to complete construction. Units 3 and 4 are scheduled to come on line in November of 2021 and 2022, respectively.[20]

As discussed by Value Line, the risks Southern confronts as a vertically integrated electric utility are quite different from the risk factors of PSNH. Investors analyzing Southern's stock consider the risks associated with the company's extensive fleet of electricity generating resources, the effect of weather on the company's generation, and the company's ability to add renewable generation capacity. None of those are risks faced by the Company, which operates as a transmission and distribution company.

[20] Value Line Investment Survey, November 15, 2019.

**Q. Have you developed an analysis to determine which companies in Dr. Woolridge's proxy group own a substantial amount of generation?**

A. Yes. As shown in Attachment AEB-Rebuttal-1, 15 of the 30 companies in Dr. Woolridge's electric proxy group have owned generation comprising more than 60.00 percent of MWh sales to ultimate customers. This means that half of the Value Line electric companies included in Dr. Woolridge's electric proxy group own a substantial amount of generation and should not be included in the group of proxy companies used to develop the cost of equity for PSNH.

**Q. Do you agree with Dr. Woolridge that his electric proxy group will produce "more reliable results" than your proxy group due to the small size of your proxy group?[21]**

A. No, I do not. Comparability of the group is more important than the number of companies in the proxy group. While I recognize that my proxy group includes fewer companies, it contains a sufficient number of companies to estimate the cost of equity. In addition, my proxy group is superior to Dr. Woolridge's group because it more closely reflects PSNH's operations which do not include operation of generation assets.

Additionally, while Dr. Woolridge's electric proxy group for PSNH includes 30 companies, Dr. Woolridge has relied on proxy group with less than ten companies in prior cases. For example, in Docket No. DG 17-048, Dr. Woolridge relied on a natural gas proxy group of seven companies to develop his recommended ROE for

---

[21] Direct Testimony of Dr. J. Randall Woolridge, at 19.

EnergyNorth Natural Gas.[22] It appears that in that case, Dr. Woolridge recognized that increasing the size of the proxy group would result in the inclusion of utilities which would not be considered comparable to EnergyNorth Natural Gas and thus it was more appropriate to rely on a smaller group of more comparable natural gas utilities.

### B. Constant Growth DCF Analysis

**Q. Please summarize the results of Dr. Woolridge's Constant Growth DCF analysis.**

A. Dr. Woolridge performs a Constant Growth DCF analysis using both his electric proxy group and my proxy group which produced ROE results of 8.25 percent and 7.75 percent, respectively. For Dr. Woolridge's electric proxy group, the analysis is based on the mean dividend yield for the proxy companies of 3.15 percent and Dr. Woolridge's selected growth rate of 5.00 percent.[23] The analysis he performs using my proxy group is based on the mean dividend yield for the proxy companies of 3.20 percent and Dr. Woolridge's selected growth rate of 4.50 percent.[24] Dr. Woolridge did not provide an exhibit that develops the ROE estimates for each individual company in the proxy group.

---

22 Docket No. DE 17-048, Direct Testimony of Dr. J. Randall Woolridge, November 30, 2017, at 14.
23 Direct Testimony of Dr. J. Randall Woolridge, at 47.
24 *Ibid*.

**Q. What are the major differences in methodology and opinions that drive the differences in the results of your DCF analysis and the analysis prepared by Dr. Woolridge?**

A. The major methodological differences between the DCF analyses performed by the witnesses in this case are: 1) the development of the growth rate; 2) the application of the DCF to the proxy group; 3) the appropriateness of applying a 7 percent outlier screen to the results of the Constant Growth DCF; 4) the consideration of the effect of recent historical market conditions on the dividend yield; and 5) the weighting placed on the DCF result in the final recommendation.

### 1. Development of the Growth Rate

**Q. Please summarize Dr. Woolridge's criticism of the growth rate that you relied on.**

A. Dr. Woolridge criticizes my analysis for the exclusive use of "overly optimistic and upwardly biased EPS growth rate forecasts" and devotes many pages to the summary and discussion of several alternative of growth rates.[25]

**Q. Please summarize Dr. Woolridge's growth rate analysis.**

A. Dr. Woolridge's testimony summarizes several growth rate assumptions including historical and projected growth in EPS, historical and projected dividends per share ("DPS") and book value per share ("BVPS"), and the internal growth rate. While he states many concerns with the use of EPS growth rates and suggests that the use of EPS growth rates in my analysis is one of his primary concerns with the analysis

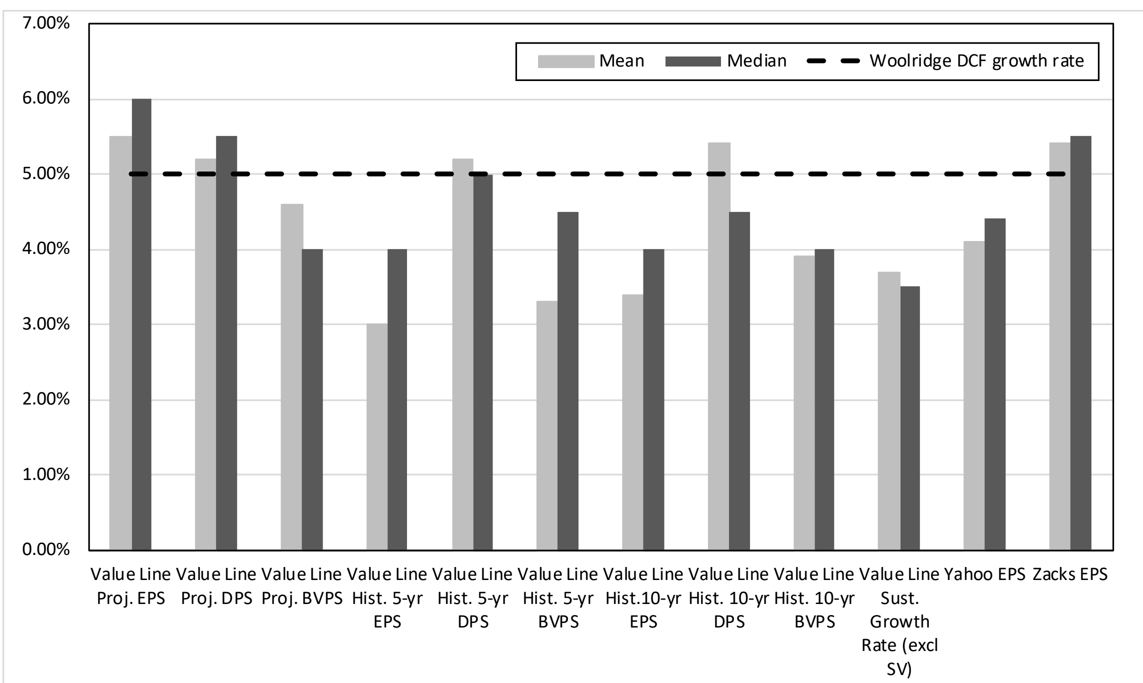
---

[25] *Id.,* at 9.

presented in my Direct Testimony, he gives "primary weight to analysts projected EPS growth rates".[26]

Figure 4 below depicts the 24 growth rates that Dr. Woolridge summarizes in his Direct Testimony for his electric proxy group. As shown in Figure 4, 16 of the 24 growth rates that Dr. Woolridge reviewed are below the 5.00 percent growth rate that underlie the result of his DCF analysis using the electric proxy group. In fact, Dr. Woolridge recognizes that "over the very long term, dividends and earnings will have to grow at a similar growth rate."[27]

**Figure 4: Growth Rates Considered by Dr. Woolridge**




---

[26] *Id.*, at 46.
[27] *Id.*, at 42.

**Q. How do you respond to Dr. Woolridge's assertion that you "exclusively used the overly optimistic and upwardly biased EPS growth rate forecasts of Wall Street analysts and Value Line"?[28]**

A. First, I did not rely exclusively on earnings growth rate to calculate my DCF model. As discussed in my Direct Testimony, the Commission has noted that it is not appropriate to rely solely on earnings growth rates in the DCF model.[29] Therefore, while I believe that earnings growth rates are the appropriate measure for long-term growth in the DCF model, I also considered a DCF analysis which relies on the retention growth rate.[30]

Second, I fail to understand Dr. Woolridge's definition of what is an "overly optimistic and upwardly biased EPS growth rate forecast". In the Docket No. 16-06-04 for The United Illuminating Company before the State of Connecticut Public Utilities Regulatory Authority, Dr. Woolridge provided this same criticism of my DCF analysis when the growth rate that I relied on was 5.13 percent. In fact, this is a routine criticism of the growth rates relied on by any ROE witness to whom Dr. Woolridge responds. Figure 5 below summarizes several recent cases where Dr. Woolridge has provided testimony, the growth rates that he has relied on in his DCF analysis and the "overly optimistic and upwardly biased" growth rates of the Company witnesses.

---

28 *Id.*, at 70.
29 Direct Testimony of Ann E. Bulkley, at 51.
30 *Ibid*.

**Figure 5: Growth Rates relied on by Dr. Woolridge**

| Date | Jurisdiction | Docket No. | Woolridge Growth rate | Company witness growth rate |
|---|---|---|---|---|
| 2016 | Connecticut | 16-06-04 | 5.00%[31] | 5.13%[32] |
| 2017 | Wisconsin | 4220-UR-123 (Elec.) | 5.00%[33] | 5.21%[34] |
| 2018 | Connecticut | 18-05-10 | 5.75%[35] | 6.21%[36] |
| 2018 | Massachusetts | 17-170 | 6.0%[37] | 6.31%[38] |
| 2019 | New Hampshire | 19-064 | 5.25%[39] | 5.42%[40] |
| 2019 | New Hampshire | 19-057 | 5.00%[41] | 5.52%[42] |

As shown in Figure 5 above, despite the criticism that all of the company witnesses in each of these cases have used overly optimistic EPS growth rates, Dr. Woolridge has relied primarily on EPS growth rates in each of these cases. Furthermore, the range of growth rates that he has relied on is similar to the range that has been relied on by the company witnesses.

It is important to note that while Dr. Woolridge does not deviate from this criticism in the current case, he has chosen to rely on a growth rate of 5.00 percent for the

31 Connecticut Public Utilities Regulatory Authority, Docket No. 16-06-04, Direct Testimony of J. Randall Woolridge, at 58.
32 Connecticut Public Utilities Regulatory Authority, Docket No. 16-06-04, Exhibit AEB-1.
33 Wisconsin Public Service Commission, Docket No. 4220-UR123, Direct Testimony of J. Randall Woolridge, at 24.
34 *Ibid*.
35 Connecticut Public Utilities Regulatory Authority, Docket No. 18-05-10, Direct Testimony of J. Randall Woolridge, at 40.
36 Connecticut Public Utilities Regulatory Authority, Docket No. 18-05-10, Exhibit AEB-4.
37 Massachusetts Department of Public Utilities, Docket No. 17-170, Direct Testimony of J. Randall Woolridge, at 42.
38 Massachusetts Department of Public Utilities, Docket No. 17-170, Exhibit NG-RBH-3.
39 New Hampshire Public Utilities Commission, Docket No. DE 19-064, page 1 of Attachment JRW-9.
40 New Hampshire Public Utilities Commission, Docket No. DE 19-064, Attachment JC-4.
41 Direct Testimony of Dr. J. Randall Woolridge, at 47.
42 Attachment AEB-4.

electric proxy group in this proceeding, which is 25 basis points lower than the growth rate used in the Granite State case in New Hampshire for an electric proxy group, filed only a few weeks prior to the analysis presented in this case. Dr. Woolridge's 5.25 percent growth rate in that case differs from the average earnings growth rate that I have relied on in this case by 27 basis points. Comparing the differences between the growth rates that Dr. Woolridge and I relied on in the United Illuminating case, the differences in growth rates was 13 basis points. Considering these facts, it appears that any growth rate relied on by a company witness that differs from what Dr. Woolridge has selected as a growth rate is defined as the use of "overly optimistic and upwardly biased EPS growth rate forecasts."

**Q. Why do you believe that EPS growth rates are the appropriate growth rates to use in the DCF model?**

A. As discussed in my Direct Testimony, earnings are the fundamental determinant of a company's ability to pay dividends.[43] Further, both dividends and book value per share may be directly affected by short run management decisions. As a result, dividend growth rates and book value growth rates may not accurately reflect a company's long-term growth. In contrast, earnings growth is not affected by short run cash management decisions. Despite his criticism of the use of EPS growth

[43] Direct Testimony of Ann E. Bulkley, at 50.

rates, it is Dr. Woolridge's view that "over the very long term, dividends and earnings will have to grow at a similar growth rate".[44]

In addition to the theoretical basis for the use of earnings growth rates, there is the practical consideration of the availability of market data. EPS growth rates are the only forward-looking growth rates available on a consensus basis. With the exception of his EPS growth rates, the source for all of Dr. Woolridge's growth rates is Value Line. Dr. Woolridge's reliance on Value Line's historical and forecasted DPS and BVPS growth rates, as well as Value Line's estimates of ROE and retention rates for his internal growth rate, unnecessarily introduces "sole source" bias into his calculations. By contrast, my Constant Growth DCF analysis using earnings growth rates is based on forecasted EPS growth rates from multiple sources, including Zack's and Thomson First Call, both of which provide consensus estimates from multiple analysts.

**Q. Do you share Dr. Woolridge's concern that "long-term EPS growth rate forecasts of Wall Street securities analysts are overly optimistic and upwardly biased"?[45]**

A. No, I do not. The 2003 Global Analysts Research Settlement (the "Global Settlement") served to significantly reduce the bias referred to by Dr. Woolridge. In fact, the Global Settlement required financial institutions to insulate investment banking from analysis, prohibited analysts from participating in "road shows," and

44 Direct Testimony of Dr. J. Randall Woolridge, at 42.
45 *Id.*, at 72.

required the settling financial institutions to fund independent third-party research. In addition, analysts covering the common stock of the proxy companies certify that their analyses and recommendations are not related, either directly or indirectly, to their compensation. Thus, it is unclear why investors would assume that the EPS growth rates for the proxy companies are susceptible to an ongoing upward bias.

A 2010 article in Financial Analysts Journal found that analyst forecast bias declined significantly or disappeared entirely since the Global Settlement:

> Introduced in 2002, the Global Settlement and related regulations had an even bigger impact than Reg FD on analyst behavior. After the Global Settlement, the mean forecast bias declined significantly, whereas the median forecast bias essentially disappeared. Although disentangling the impact of the Global Settlement from that or related rules and regulations aimed at mitigating analysts' conflicts of interest is impossible, forecast bias clearly declined around the time the Global Settlement was announced. These results suggest that the recent efforts of regulators have helped neutralize analysts' conflicts of interest.[46]

**Q. Have you reviewed the studies cited by Dr. Woolridge which examine the potential bias in analysts' growth projections?**

A. Yes. Dr. Woolridge references a number of articles and studies that he asserts prove the potential bias in analysts' EPS projections.[47] However, only one of the studies that Dr. Woolridge cites analyzes the period after the Global Settlement in October

---

[46] Armen Hovakimian and Ekkachai Saenyasiri, *Conflicts of Interest and Analyst Behavior: Evidence from Recent Changes in Regulation*, Financial Analysts Journal, Volume 66, Number 4, July/August 2010, at 195.

[47] Direct Testimony of Dr. J. Randall Woolridge, at 43.

31, 2003. The study by Goedhart, Raj and Saxena published in 2010, notes the following:

> Exceptions to the long pattern of excessively optimistic forecasts are rare, as a progression of consensus earnings estimates for the S&P 500 shows (Exhibit 1). Only in years such as 2003 to 2006, when strong economic growth generated actual earnings that caught up with earlier predictions, do forecasts actually hit the mark. This pattern confirms our earlier findings that analysts typically lag behind events in revising their forecasts to reflect new economic conditions. When economic growth accelerates, the size of the forecast error declines; when economic growth slows, it increases. So as economic growth cycles up and down, the actual earnings S&P 500 companies report occasionally coincide with the analysts' forecasts, as they did, for example, in 1988, from 1994 to 1997, and from 2003 to 2006.[48]

The earnings reported by S&P 500 companies met and exceeded the growth projected by analysts between 2003 and 2006.[49] The period analyzed in the study extends through 2008, and analysts' projections did exceed actual earnings growth in 2007 and 2008. However, this time period reflected the start of the Great Recession and does not indicate analyst bias, but rather shows that analysts were unable to predict the severity of the financial crisis. Furthermore, the study examines analysts' EPS forecasts for a given year at one, two and three years out. It does not review the 3 to 5-year earnings per share growth rates that I used in my Constant Growth DCF analysis, which are meant to represent average growth for a

48 Marc Goedhart, Rishi Raj, and Abhishek Saxena, "Equity analysts: Still too bullish" McKinsey and Company, April 2010.
49 *Ibid*.

company over a period of time. Therefore, Dr. Woolridge has provided no evidence that the growth rates for the companies in my DCF analysis are the result of consistent and pervasive analyst bias.

**Q. Do you agree with Dr. Woolridge that historical measures of growth are relevant to a forward-looking evaluation of the Company's ROE?**

A. Yes, I do, however these historical data points are likely considered by investors in developing forward-looking opinions. Therefore, specific consideration of historical growth rates is likely to overweight history in the analysis. The Constant Growth DCF model is a forward-looking model that evaluates investors' required returns based on future cash flows. As such, the appropriate measure of growth to incorporate for DCF analyses is investors' expectations, which may be informed by historical results. Dr. Woolridge himself observes that historical growth rates must be treated with caution because "[i]n some cases, past growth may not reflect future growth potential."[50] As discussed previously, Dr. Woolridge also primarily relies on long-term EPS estimates that are often not materially different from the estimates of company witnesses.

**Q. Why do you disagree with Dr. Woolridge's calculation of the retention growth rate?**

A. Dr. Woolridge's calculation of retention growth rates (also known as "internal growth rates" or "sustainable growth rates") considers only the product of earnings

[50] Direct Testimony of Dr. J. Randall Woolridge, at 40.

retention rates and earned returns on common equity, or what are commonly known as internally-generated funds. In the sustainable growth formula, this is commonly referred to as the product of “b X r”, where “b” is the retention ratio, or the portion of net income not paid in dividends, and “r” is the expected ROE on the portion of net income that is retained within the Company as a means for future growth.

Dr. Woolridge fails to consider that earnings growth also occurs as a result of new equity issuances, or what are commonly known as externally-generated funds. As discussed my Direct Testimony, in the sustainable growth formula, this is shown as the product of “s” x “v”, where “s” represents the growth in shares outstanding and “v” is that portion of the M/B ratio that exceeds unity.[51] This methodology is recognized as a common approach to calculating the sustainable growth rate.[52] By only considering the funds from internally-generated sources, Dr. Woolridge’s sustainable growth rate calculation understates the prospective growth rates for his proxy group companies. As shown in Attachment AEB-Rebuttal-2, had Dr. Woolridge included the “s” x “v” component in his computation, his mean sustainable growth rate for his electric proxy group would increase by approximately 86 basis points from 3.74 percent to 4.59 percent.

---

51 Direct Testimony of Ann E. Bulkley, at 52.
52 *See* Roger Morin, New Regulatory Finance, at 306.

**Q. Do you have other concerns with the reasonableness of Dr. Woolridge's sustainable growth rate calculation?**

A. Yes, I do. Since the "r" in the "b x r" approach refers to the ROE, Dr. Woolridge has effectively pre-supposed Value Line's ROE and payout ratio projections for his proxy group companies. By using this growth measure, Dr. Woolridge has assumed that Value Line's ROE projections are reasonable; yet, as shown on page 4 of Attachment JRW-9, the mean and median ROE projections for the companies in his electric proxy group are 10.50 percent and 10.50 percent, respectively, which is significantly higher than his recommended ROE for PSNH of 8.25 percent.

**Q. As a practical matter, does Dr. Woolridge rely on the alternative growth rates that he summarizes?**

A. No, it does not. Despite his criticism of my methodology, Dr. Woolridge has also relied primarily on projected EPS growth rates, recognizing that "over the very long term, dividends and earnings will have to grow at a similar growth rate."[53] Therefore, Dr. Woolridge's criticism of my analysis for the use of EPS growth rates is invalidated by his own views and his ultimate reliance on EPS growth rates.

**Q. Have you reviewed Dr. Woolridge's growth rate recommendations in other cases?**

A. Yes, I have. Figure 6 summarizes the dividend yields and growth rates that Dr. Woolridge relied on in the development of his constant growth DCF models for 54 cases in the last 8 years. As shown in Figure 6, as the dividend yields for his proxy

[53] Direct Testimony of Dr. J. Randall Woolridge, at 42.

groups have declined in response to capital market conditions, Dr. Woolridge simply selects a higher projected growth rate to be used in the Constant Growth DCF model.

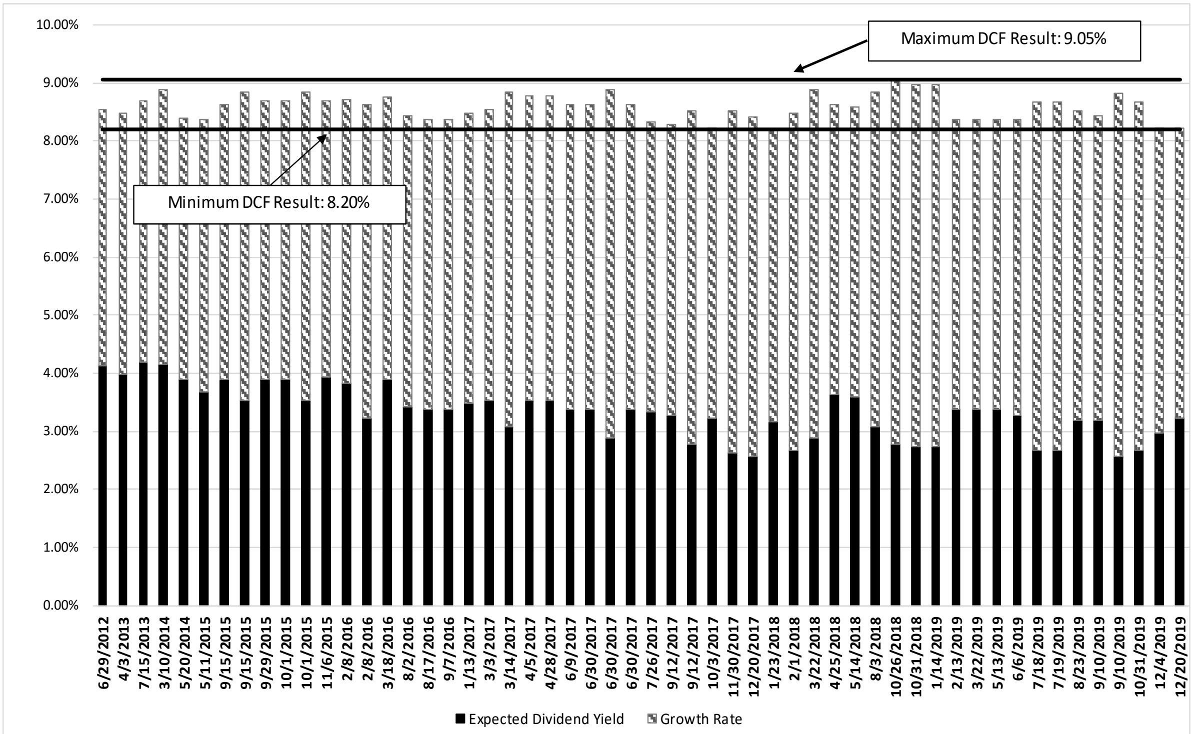
**Q. Have you conducted any analysis on the dividend yield and growth rate assumptions relied on in Dr. Woolridge's DCF analyses over this time- period?**

A. Yes, I calculated the correlation between these two assumptions over time in Dr. Woolridge's analysis. The correlation coefficient between the dividend yield used in Dr. Woolridge's DCF analysis and the growth rate using the 54 cases from the last 8 years is (0.91), which suggests a high degree of correlation between the dividend yield and growth rate used in Dr. Woolridge's DCF analysis. [54] Furthermore, the correlation coefficient is negative which implies that as the dividend yield increases (decreases), the growth rate decreases (increases). This supports my conclusion that Dr. Woolridge's selected growth rate used in his DCF analysis appears to be related to whether the dividend yield for his proxy group has increased or decreased.

---

[54] A correlation coefficient with an absolute value of 0.8 or higher indicates a very strong relationship.

**Figure 6: Woolridge Historical Dividend Yields and Growth Rates**




**Q. What do you conclude from this analysis?**

A. Despite changes in interest rates and the price of utility stocks over this period, all of which should have an effect on the results of the ROE estimation models, as shown in Figure 6, by selecting the growth rate used in the DCF model, Dr. Woolridge has maintained DCF results in a tight range, never exceeding 9.10 percent over the last 8 years.

**Q. Have you compared Dr. Woolridge's selected growth rates in this case analyses he has performed in other recent cases?**

A. Yes. Figure 7 compares the growth rates and yields relied on by Dr. Woolridge in this case to his analysis presented in the Granite State Electric case (Docket No. DE 19-064) where he filed testimony in December of this past year. As shown in Figure

7, Dr. Woolridge's selected growth rate was higher in Docket No. DE 19-064, offsetting the lower dividend yield, but maintaining an ROE estimate of 8.25 percent. Dr. Woolridge has provided no information in his testimony to suggest that market conditions for electric utilities have changed markedly in a couple of weeks to support a reduction in the long-term expected growth rate of 25 basis points for the electric utility benchmark group.

**Figure 7: Comparison of the Woolridge DCF assumptions**
**(Granite State Electric and PSNH Rate Cases)**

| Case | Dividend Yield | Growth Rate Selected | DCF Result |
|---|---|---|---|
| Granite State Electric (Docket No DE 19-064) | 2.90% | 5.25% | 8.25% |
| PSNH | 3.15% | 5.00% | 8.25% |

### 2. Application of the DCF model to the proxy group

**Q. Why is it important to consider the ROE results for each proxy company?**

A. As discussed previously, developing a return that reflects investor expectations should be of primary importance, not the model or methodology employed to develop that result. As such, it is important to consider whether the indicated returns for each individual company are reasonable before accepting the data for that company in the proxy group.

**Q. Do other witnesses develop ROE estimates for each proxy company?**

A. Yes. Dr. Woolridge's DCF analysis is the only DCF analysis in this case that does not evaluate each result from the ROE model for reasonableness. The analyses presented in both Dr. Chattopadhyay and my Direct testimonies, include ROE results for each proxy company using the Constant Growth DCF model. This allows for the opportunity to review the reasonableness of the DCF model results on a company-specific basis.

**Q. Does Dr. Chattopadhyay review the DCF results of each proxy group company for reasonableness?**

A. Yes. Dr. Chattopadhyay removes the individual DCF results for companies that do not meet his outlier and risk premium screens. Dr. Chattopadhyay identifies unreasonable results by (1) applying a statistical outlier screen excluding ROE estimates above or below the range of the mean plus/minus two standard deviations; and (2) excluding results that do not exceed the yield on Utility A preferred stocks plus 50 basis points.[55] In regard to the risk premium screen, Dr. Chattopadhyay acknowledges that common stocks are expected to have a return that sufficiently exceeds the yields on utility preferred stock.[56] Therefore, while we do not agree on the overall ROE recommendation, Dr. Chattopadhyay and I agree that it appropriate for an analyst to consider the reasonableness of the data to ensure the individual DCF results provide a return that is commensurate with the risk of equity.

---

[55] Direct Testimony of Dr. Pradip K. Chattopadhyay, at 31.
[56] *Id.,* at 32.

**Q. How does the growth rate that is selected by Dr. Woolridge affect his DCF analysis?**

A. Dr. Woolridge simply chooses the growth rate that he relies on from within the projections he has summarized. Therefore, because he is selecting a value, rather than relying directly on the consensus estimates from industry analysts, Dr. Woolridge's analysis is entirely subjective, and judgement based.

It is also important to recognize that Dr. Woolridge's DCF analysis is not performed at the individual company level, but rather is one growth rate, that he has selected, and the average dividend yield for the proxy companies. As noted in both our Direct Testimonies, the Constant Growth form of the DCF model is as follows:

$$P_0 = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \ldots + \frac{D_\infty}{(1+k)^\infty} \quad [1]$$

Where $P_0$ represents the current stock price, $D1 \ldots D\infty$ are all expected future dividends, and k is the discount rate, or required ROE. Equation [1] is a standard present value calculation that can be simplified and rearranged into the following form:

$$k = \frac{D_0(1+g)}{P_0} + g \quad [2]$$

In this form of the DCF model, the dividend yield is also affected by the growth rate to develop the next year cash flow. Therefore, Dr. Woolridge's imposition of his judgment in selecting the growth rate applies his judgment to both terms of the Constant Growth DCF model.

**Q. How does your application of the Constant Growth DCF model differ from Dr. Woolridge's approach?**

A. As discussed in my Direct Testimony, I have calculated two forms of the Constant Growth DCF model. The first relied on projected EPS growth rates reported by Value Line, as well EPS consensus estimates reported by Zacks and Yahoo Finance. Consistent with Commission precedent, the second relied on the projected EPS growth rates from Value Line, Zacks and Yahoo but also included a retention growth estimate using data from Value Line. For each model, I have considered the mean growth rates as well as the low and high of the reported growth rates to develop individual DCF results for each proxy group member. Therefore, my analysis relies directly on the estimates of growth for each proxy company.

**Q. Have you reviewed the ROE results for each of the companies in Dr. Woolridge's proxy group using the dividend yields and earnings growth rates assumed by Dr. Woolridge?**

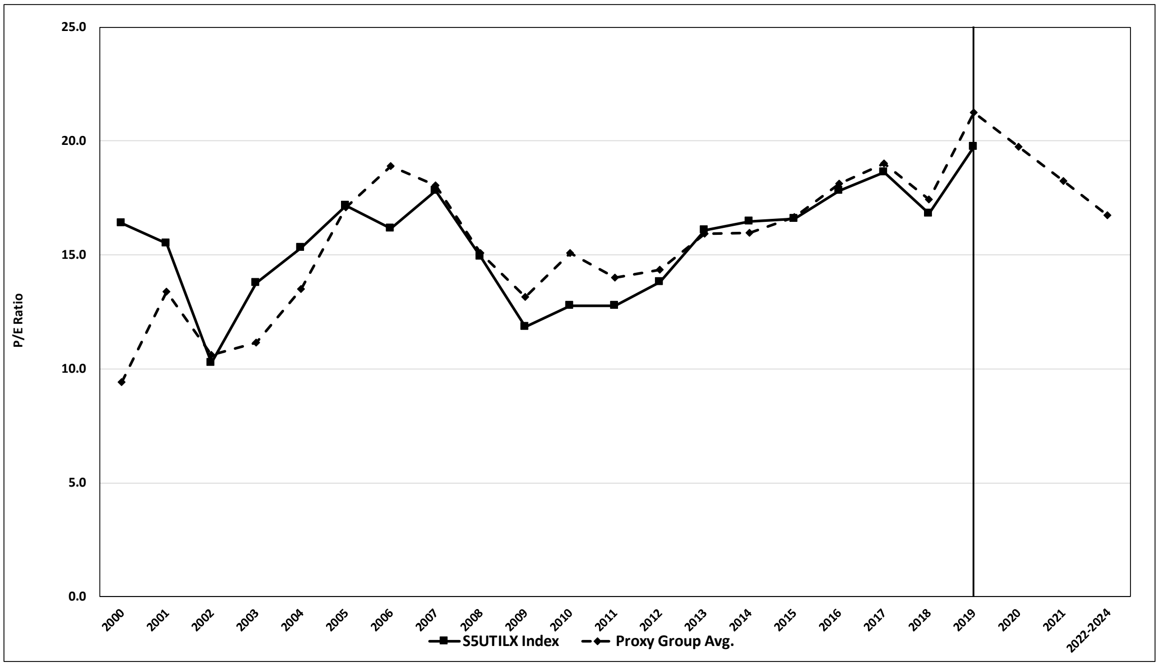
A. Yes, I have. Attachment AEB-Rebuttal-3 provides the DCF result for each of the companies in Dr. Woolridge's proxy group based on the dividend yields calculated by Dr. Woolridge and the earnings growth rates from Value Line, Yahoo and Zacks relied on by Dr. Woolridge. Relying on my risk premium screen which excludes individual proxy group results below 7 percent, the mean return for Dr. Woolridge's electric proxy group is 9.06 percent (30-day), 8.95 percent (90-day), and 9.04 percent (180-day).

### 3. Consideration of market conditions on the DCF

**Q. How have investors reacted to information in the market since the Great Recession of 2008/09?**

A. As discussed on pages 13 through 21 of my Direct Testimony, an overreaction to market information by investors had a large effect on utility prices following the Great Recession of 2008-2009. As the Federal Reserve pursued accommodative monetary policy, yields on short-term government bonds and then long-term government bonds decreased as investors moved along the risk spectrum searching for higher returns. This also increased the demand for dividend paying stocks such as utilities. However, investors bid up the prices of utility stocks to unsustainably high levels. As shown in Figure 8 below, the P/E ratios for the companies in the proxy group are higher than at any other time in the last nineteen years.

**Figure 8: Average Historical Proxy Group P/E Ratios[57]**




**Q. Have there been other examples of market overreactions recently?**

A. Yes. In the last week of February the overall market, as measured by the Dow Jones Industrial Average ("DJIA") declined 2,633 points, the VIX, which is a measure of the market's uncertainty; a "fear index" increased from below 20 in January of this year to over 40 by the end of February. On the first trading day of March, the DJIA rebounded approximately 1,294 points in a single day. These types of reactions in the market demonstrate the overall sense of uncertainty in the market for equities. If the analyses in this case were prepared as of the end of February, it would also be necessary to recognize that those market conditions would not likely be expected to persist into the future. This demonstrates the

---

57 Bloomberg Professional, Data through December 31, 2019, and Value Line Investment Survey, November 15, 2019, December 13, 2019, and January 24, 2020.

importance of considering projected market data to reflect investors' forward-looking return expectations.

**Q. How do these market reactions affect the ROE estimation process for a regulated utility?**

A. In general, investors use the DCF model to develop return estimates for a company as of a specific date factoring all the information available to them at the time of the estimation. However, for a regulated utility like PSNH, the ROE is being estimated for a future period when the utility's rates will be in effect. Therefore, investors' current valuations may be different than the valuations investors calculate during the period that PSNH's rates will be in effect. This is why it is important to review current and prospective market conditions and determine if current market conditions are expected to exist during the period that PSNH's rates will be in effect. If prospective market conditions are expected to be different than current market conditions, the ROE models based on current market data will not produce reasonable estimates of the cost of equity during the period that PSNH's rates will be in effect.

As discussed in my Direct Testimony, many analysts have cautioned investors regarding the current high valuations of utilities.[58] Since the filing of my Direct Testimony, Jeffrey Saut, chief investment strategist for Capital Wealth Planning, has indicated that after forty-nine years in investment management, he is not a "big

58 Direct Testimony of Ann E. Bulkley, at 19-20.

fan of utilities" in the current market because "utilities are as richly valued as I have ever seen them".[59]

Furthermore, as shown in Figure 8 above, Value Line is projecting the P/E ratio for the utilities contained in my proxy group to decline over the near-term. If the valuation of utilities decline, then the dividend yields of utilities will increase resulting in increases in the ROE estimate produced by the DCF model. Given that we are estimating the cost of equity for the period that PSNH's rates will be in effect, this is an important factor that must be considered when relying on the results produced by the ROE estimation models.

**Q. Has Dr. Woolridge considered the effect of market conditions on the ROE estimation models?**

A. While he has considered the need to normalize his risk-free rate, he has not considered how the market would respond to that normalized rate in investment decisions. Figure 2 in my Direct Testimony shows the historical relationship between the dividend yield and interest rates. As shown in that figure, the yield on the 30-year Treasury Bond was near Dr. Woolridge's "normalized" 3.75 percent in 2011 (i.e., 3.91 percent). The dividend yield for electric utilities was 4.35 percent in 2011 which results in a 120-basis point increase over the 3.15 percent dividend yield that Dr. Woolridge used in his Constant Growth DCF analysis. This

59 CNBC, "This is the no. 1 S&P 500 sector to avoid here," market bull Jeff Saut says, February 16, 2020.

demonstrates the trade-off that investors consider between risk and return. Since, Dr. Woolridge's analysis relies on a current dividend yield of 3.15 percent in the DCF and a "normalized" risk-free rate of 3.75 percent in the CAPM, the understated dividend yields result in DCF estimates that are lower than those that would have resulted in Dr. Woolridge's "normalized" market scenario.

**Q. Have you considered "normalized" market conditions as a scenario of Dr. Woolridge's Constant Growth DCF analysis?**

A. Yes, in Attachment AEB-Rebuttal-4, I recalculated the Constant Growth DCF model for the electric proxy group presented on page 1 of Attachment JRW-9. Since, a "normalized" risk-free rate would have an effect on lower risk investors' investment options, I considered a historical dividend yield that was experienced at a time when the yield on the 30-year Treasury bond was 3.75 percent. I updated the dividend yield in Dr. Woolridge's Constant Growth DCF analysis using the dividend yields for electric utilities shown in Figure 2 of my Direct Testimony.

As discussed above, the last time the yield on the 30-year Treasury Bond was at least 3.75 percent was in 2011. The dividend yields were 4.35 percent on average in 2011. Therefore, I developed a Constant Growth DCF analysis using the 2011 dividend yield for electric utilities and assuming Dr. Woolridge's growth rate estimate of 5.00 percent. This analysis reflects a reasonable estimate of a "normalized" dividend yield that would correspond to Dr. Woolridge's "normalized" risk free rate.

The ROE result from this analysis is 9.46 percent, demonstrating the relationship that has typically been well understood, as the yield on the 30-year Treasury Bond increases, the cost of equity increases. Furthermore, the calculated results show that Dr. Woolridge's 8.25 percent Constant Growth DCF result for his electric proxy group understates the cost of equity when you consider a "normalized" market.

### 4. Weighting of the DCF results in the final recommendation

**Q. Please explain how Dr. Woolridge establishes his ROE recommendation.**

A. Dr. Woolridge states that he is relying primarily on the DCF model and therefore selects the upper end of the range as the equity cost rate.[60] Thus, Dr. Woolridge's recommendation is set equal to the Constant Growth DCF result using his electric proxy group of 8.25 percent.

**Q. Do you agree with Dr. Woolridge's primary reliance on the result of this DCF model?**

A. No, I do not. As discussed in this section of my response to Dr. Woolridge, his DCF analysis is based entirely on his judgment. I have demonstrated, through a review of 54 cases where Dr. Woolridge has offered his recommendation, that Dr. Woolridge's selection of the EPS growth rate used in his DCF model is subjective and appears to be highly correlated with the then current dividend yield. The result in each of these 54 cases was a recommended ROE over the last 8 years that is held

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

below 9.10 percent. Finally, comparing his recommendation to authorized ROEs over time demonstrates that Dr. Woolridge's DCF results are well below the average authorized ROEs demonstrating that his judgment is not considering all the necessary risk factors for the subject companies.

### C. Projected DCF Analysis

**Q. Please discuss Dr. Woolridge's criticism of your use of a projected DCF analysis.**

A. Dr. Woolridge claims there are two "errors" with my projected DCF analysis.[61] The first error is that the projected DCF is a "totally" new approach while the second error is that it involves a "mismatch" of data.[62] According to Dr. Woolridge, the analysis incorrectly combines three-to-five year projected stock prices and dividends with projected earnings growth rates from 2019.

**Q. Do you agree with Dr. Woolridge's concern that the projected DCF analysis relies on a "mismatch" of data?**

A. No, I do not. Dr. Woolridge indicates that the use of the Constant Growth DCF model is appropriate for the utility industry because the industry is in the "maturity stage of the life cycle".[63] This, according to Dr. Woolridge, means that the earnings growth rate, payout ratio and ROE stabilize for the remainder of the company's life cycle.[64] In my projected DCF, I have relied on projected prices and dividends for

---

61 *Id.,* at 75.
62 *Ibid.*
63 *Id.,* at 36.
64 *Ibid.*

the period of 2021 through 2023; however, for the growth rate I utilize the five-year projected earnings growth rates from my Constant Growth DCF analysis. Thus, the projected DCF model assumes that the growth rate in the DCF analysis will remain stable over time. This assumption is consistent with the reasoning Dr. Woolridge uses for relying on the Constant Growth DCF model to estimate the ROE for PSNH. Therefore, it is unclear why Dr. Woolridge is concerned with my use of the five-year projected earnings growth rates from 2019 in my projected DCF analysis.

**Q. Do you have any other observations regarding the Projected DCF model?**

A. Yes. As discussed above and in my Direct Testimony, the valuations of utilities are currently at unsustainably high levels. Thus, if the valuations of utilities decline as expected, the dividend yields will increase which will result in increased estimates of the cost of equity using the DCF model. The projected stock prices developed by Value Line reflect this relationship. Consistent with market expectations, Value Line projects that the stock prices of the companies in my proxy group will decrease over the near-term. The purpose of the projected DCF analysis is to illustrate the effect that the decline in utility stock prices will have on the cost of equity during the period that PSNH's rates will be in effect. The use of the Projected DCF is consistent with Dr. Woolridge's use of a "normalized" interest rate in his CAPM analysis.

**Q. Does Dr. Wooldridge rely on Value Line Projections to calculate the results of his DCF analysis?**

A. Yes. While Dr. Woolridge criticizes my reliance on three- to five-year projections of stock prices and dividends, he also relies on Value Line projections in developing his Constant Growth DCF analysis. Specifically, Dr. Woolridge relies on Value Line's EPS, DPS, BVPS and retention growth rate projections over the same time-period as the growth rate estimate for his Constant Growth DCF analysis. As such, Dr. Woolridge relies on the very same Value Line projection period and data that he has concerns with when applied in my projected DCF analysis.

### D. CAPM Analysis

**Q. Please summarize Dr. Woolridge's CAPM results and explain how he uses that analysis.**

A. As shown in Table 3 of Dr. Woolridge's Direct Testimony, his CAPM results range from 6.90 percent using his electric proxy group to 7.20 percent using my proxy group. These results are based on a risk-free rate of 3.75 percent, a Beta coefficient of 0.55 for the electric proxy group and 0.60 for my proxy group, and an MRP of 5.75 percent. The results of Dr. Woolridge's CAPM analysis form the lower boundary of his range of results for PSNH. Dr. Woolridge testifies that he ultimately relies primarily on the results of his Constant Growth DCF model.[65] The

[65] *Id.*, at 61.

results of Dr. Woolridge's CAPM analysis are well below the authorized ROE for any U.S. electric utility in the past 30 years.[66]

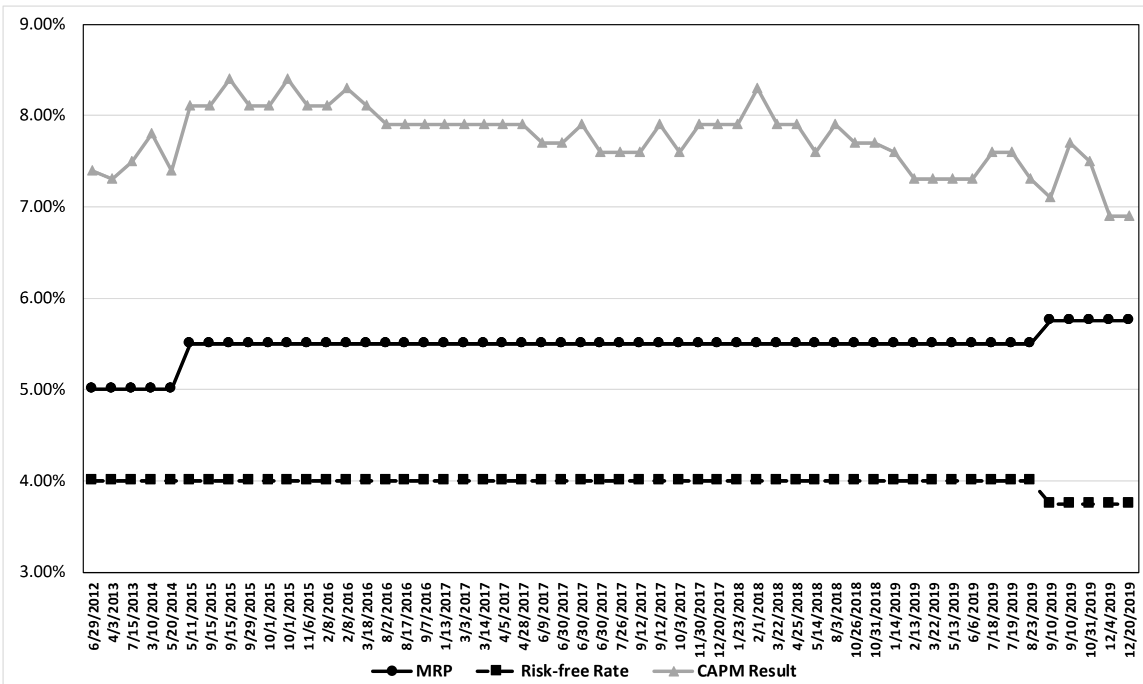
**Q. What are the areas of disagreement with Dr. Woolridge's CAPM analysis?**

A. I have three areas of concern with the inputs and assumptions that Dr. Woolridge has relied on to derive his CAPM results. First, in spite of the fact that Dr. Woolridge devotes many pages to a discussion of the low interest rate environment and why he believes interest rates will remain low, he uses a risk-free rate of 3.75 percent in his CAPM analysis.[67] Second, Dr. Woolridge relies on Value Line's Beta coefficients for the companies in his electric proxy group and my proxy group which, as discussed in my Direct Testimony, are currently understating the Beta coefficient of utilities due to the effect of the TCJA on investors views of utilities as compared to the broader market. Finally, I take issue with Dr. Woolridge's use of an MRP of 5.75 percent because it is based on the results of investor surveys and academic research rather than forward-looking market data and does not reflect the inverse relationship between interest rates and the equity risk premium. Finally, as shown in Figure 9, two of the three assumptions used in Dr. Woolridge's CAPM analysis have remained relatively constant since 2012, not recognizing any of the market fluctuations that have occurred over the last several years. Furthermore, it appears that Dr. Woolridge has not evaluated the results of his CAPM for

[66] Source: Regulatory Research Associates.
[67] Direct Testimony of Dr. J. Randall Woolridge, at 49-50.

reasonableness. Comparing the results in Figure 9 to recently authorized ROEs shown in Figure 2, it is clear that the returns that result from the CAPM, as specified by Dr. Woolridge are unreasonably below any return authorized by any regulatory commission over this time period.

**Figure 9: Risk-free Rate and MRP relied on by Dr. Woolridge**




**Q. What is your response to Dr. Woolridge's criticism of your use of projected interest rates?**

A. Dr. Woolridge's criticism of the use of projected interest rates in my analysis is essentially meaningless. As with other aspects of his Direct Testimony noted previously, Dr. Woolridge has offered this exact same criticism of many witnesses providing ROE testimony on behalf of companies over the last several years without consideration of the difference between those projected interest rates and his "normalized" interest rate.

**Figure 10: Summary of Risk-Free rates used in the CAPM**

| Date | State | Docket No. | Woolridge Normalized Rf rate | Bulkley Rf rates |
|---|---|---|---|---|
| 2016 | CT | 16-06-04 | 4.00%[68] | 3.15%-4.33%[69]<br>Mean: 3.74% |
| 2018 | CT | 18-05-10 | 4.00%[70] | 3.58%- 4.03%[71]<br>Mean: 3.81% |
| 2019 | NH | DE 19-057 | 3.75%[72] | 3.04%-3.90%[73]<br>Mean: 3.41% |

In the current case, Dr. Woolridge indicates that one of his issues with my CAPM analysis is the use of projected interest rates which he notes are "well in excess" of current interest rates.[74] As shown in Figure 10 above, my interest rate projections range from 71 basis points *lower* than his normalized interest rate to 15 basis points higher than his recommended normalized rate.

Furthermore, Dr. Woolridge suggested that my interest rate projections were a "major issue" in my CAPM analysis in both Docket No. 16-06-04 for The United Illuminating Company and Docket No. 18-05-10 for the Yankee Gas Company. However, as shown in Figure 10, the short-term projections that I relied on were 42

68 Docket No. 16-06-04, Direct Testimony of Dr. J. Randall Woolridge, at 61.
69 Docket No. 16-06-04, Exhibit AEB-5.
70 Docket No. 18-05-10, Direct Testimony of Dr. J. Randall Woolridge, at 43.
71 Docket No. 18-05-10, Exhibit AEB-6.
72 Direct Testimony of Dr. J. Randall Woolridge, at 49.
73 Attachment AEB-9.
74 Direct Testimony of Dr. J. Randall Woolridge, at 9-10.

to 85 basis points *lower* than his normalized risk-free rate and the long-term projections were only 3 to 33 basis points higher than his recommendation, resulting in mean projections that were *lower* than his "normalized" interest rate.

**Q. What concerns do you have about the risk-free rate relied on by Dr. Woolridge in his CAPM analysis?**

A. While I do not specifically dispute the value that Dr. Woolridge relies on for the risk-free rate, the methodology that he uses to support his selection is unclear at best and does not appear to reflect current or expected market conditions.

First, it is unclear what Dr. Woolridge believes that his normalized risk-free rate represents. Dr. Woolridge states that he has reviewed historical yields on the 30-year Treasury bond from 2013-2019 which range from 2.0 percent to 4.0 percent, referencing Attachment JRW-10 for this analysis. Reviewing Attachment JRW-10, demonstrates that the yield on the 30-year Treasury bond reached only 3.75 percent at the beginning of the time-period that Dr. Woolridge reviewed. The rationale he provides for selecting 3.75 percent is as follows: "Given the recent range of yields, I have chosen to use the top end of the range as my risk-free interest rate."[75] This suggests that he recognizes and is reflecting potentially higher interest rates when he selects the risk-free rate from within his historical data set. However,

---

75 *Id.*, at 49.

he then directly contradicts this rationale in the following statements in his direct testimony:

> Q. Does the 3.75% risk-free interest rates take into consideration of forecasts of higher interest rates?
>
> A. No, it does not. Forecasts of higher interest rates have been notoriously wrong for a decade. My 3.75% risk-free interest rate considers the range of interest rates in the past and effectively synchronizes the risk-free rate with the market risk premium. The risk-free rate and the market risk premium are interrelated in that the market risk premium is developed in relation to the risk-free rate. As discussed below, my market risk premium is based on the results of many studies and surveys that have been published over time. Therefore, my risk-free interest rate of 3.75% is effectively a normalized risk-free rate of interest.[76]

In addition to being inconsistent with his prior statement on the basis for the 3.75% risk-free rate, it is concerning that Dr. Woolridge suggests that the MRP and the risk-free rate that he has chosen are somehow synchronized. As is discussed in more detail later in my Rebuttal testimony, Dr. Woolridge selects his MRP from within a range that he develops from survey data that has been collected from 2010-2019.[77] There is no information provided as to how the selected "normalized" 3.75 percent risk free rate that Dr. Woolridge is "synchronized" with the selected MRP. Furthermore, the estimation of the cost of equity is forward looking, therefore synchronizing the risk-free rate to historical survey data is not reflective of the expected return over the rate period.

---

[76] *Id.*, at 50.
[77] *Id.*, at 59-60.

**Q. Please summarize the Beta Coefficients relied on by Dr. Woolridge.**

A. Dr. Woolridge relies on the average Value Line estimate of Beta coefficients for the companies in his electric proxy group and the companies in my proxy group. He does not consider Bloomberg's Beta coefficients, or any additional estimates from other sources, and Dr. Woolridge does not acknowledge the effect of the TCJA on utility companies relative to the broader market. Instead, Dr. Woolridge opposes my use of the Bloomberg Beta Coefficients calculated over a ten-year period citing that Beta coefficients have declined over the past decade because the investment risk of utilities has declined.[78]

**Q. Why is it reasonable to rely on Bloomberg's 10-year Beta coefficients?**

A. It is reasonable to consider several measures of market conditions in estimating the ROE. As noted in my Direct Testimony, the Bloomberg Beta coefficient is widely used, and because it is based on a ten-year period as compared to Value Line's five-year period, it mitigates the exogenous effect of the TCJA on utility Betas.[79] As illustrated by Figure 10 in my Direct Testimony, the performance of utility stocks deviated substantially from the performance of the broader market following the passage of the TCJA.

Value Line's Beta coefficients are calculated over a five-year period. As shown in Figure 11 below, in the last five years, the performance of the S&P Utilities Index

---

78 *Id.,* at 78.
79 Direct Testimony of Ann E. Bulkley, at 60-62.

has been significantly less correlated with the performance of the S&P 500 than the long-term historical correlation of the two indices. However, the relative volatility of the two indices is essentially unchanged. This indicates that the relative riskiness of utility stocks is essentially unchanged following the passage of the TCJA, even though utility stocks' Beta coefficients have declined. Thus, CAPM results derived solely from Value Line's Beta coefficients are likely to be understated because they are calculated using the last five years of financial data.

**Figure 11: Beta Input Analysis**

| | **Correlation (S&P Utilities Index Compared to S&P 500)** | **Relative Volatility (S&P Utilities Index Compared to S&P 500)** |
|---|---|---|
| Current Five-Year Value (January 2015 – January 2020) | 0.30 | 1.03 |
| Long-Term Historical Value (2000 – January 2020) | 0.55 | 1.03 |

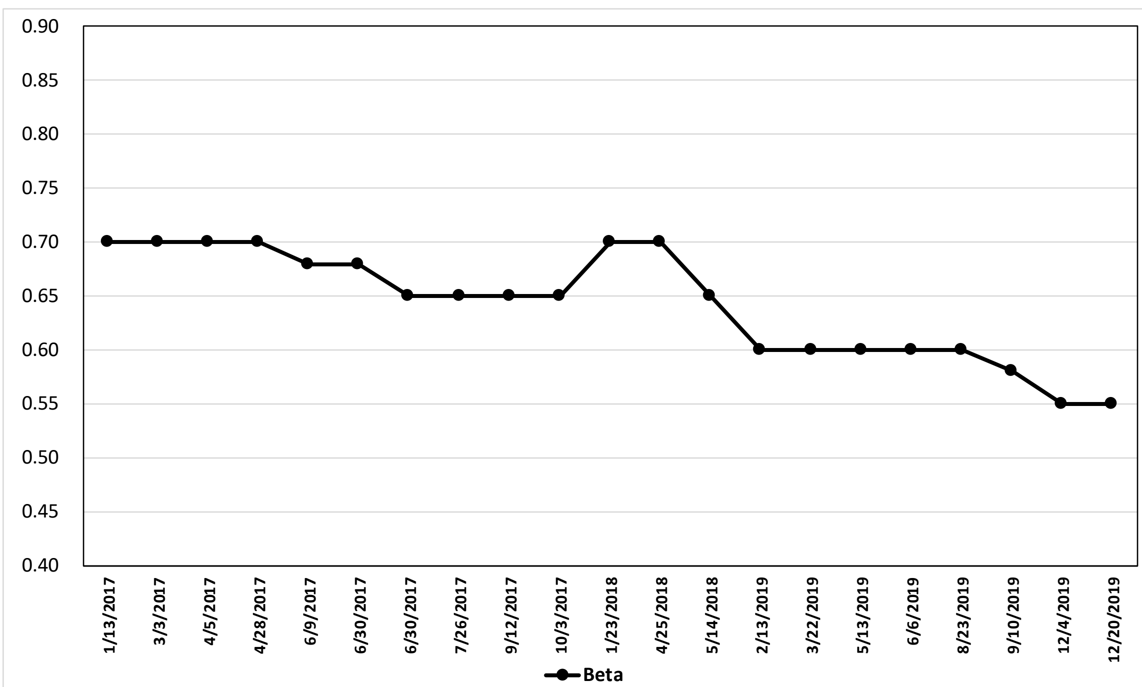
**Q. Has Dr. Woolridge acknowledged the effect of the TCJA on utility Beta coefficients?**

A. No. Dr. Woolridge concludes that the Beta coefficients for utilities have declined in recent years because the investment risk of utilities has declined over the last decade due to the increased use of ratemaking mechanisms such as revenue decoupling mechanisms and cost recovery riders.[80] However, Dr. Woolridge does not provide any supporting analyses to justify his conclusion. In contrast, I have provided in Figure 12 the Beta coefficients for Dr. Woolridge's electric proxy group

80 Direct Testimony of Dr. J. Randall Woolridge, at 78.

between 2017 and 2019. As shown in Figure 12, the Beta coefficient for Dr. Wooldridge's electric proxy group ranged from 0.65 to 0.70 in 2017 and 2018; however, the Beta coefficient declined to 0.55 by December 2019. The recent decline in the Beta coefficient for Dr. Woolridge's electric proxy group supports the conclusion that the TCJA has resulted in a short-term change in the market relationship between utilities and the broader market.

**Figure 12: Beta coefficient relied on by Dr. Woolridge**




**Q. Why is it reasonable to mitigate the effects of the TCJA on utility Beta coefficients?**

A. The TCJA resulted in a short-term market dislocation as investors considered the effects of the tax law change and factored those considerations into their investment decisions. Therefore, the TCJA did not result in a fundamental shift in the financial relationship between utilities and the broader market. Since, the effect of the TCJA is not representative of prospective market conditions, it is important to mitigate the effect of the event on the Beta coefficients and thus the estimate of the cost of capital produced by CAPM. As a result, I believe it is more appropriate to rely on Bloomberg Betas calculated using a ten-year period than the Value Line Betas calculated using a five-year period since the longer-time period better mitigates the effect of the TCJA.

**Q. What MRP does Dr. Woolridge use in his CAPM analysis?**

A. Dr. Woolridge estimates the MRP as being in the range of 4.00 percent to 6.00 percent. From within that range, he chooses an MRP of 5.75 percent.[81]

**Q. What is the basis for Dr. Woolridge's MRP of 5.75 percent?**

A. Dr. Woolridge presents much information that has been published about the MRP, however he does not provide any information about how he weighs this information when he selected an MRP of 5.75 percent. The information he summarizes includes historical estimates of the MRP that are as high as 7.0 percent but is somewhat dismissive of historical data because ex-post returns are not the same as ex-ante expectations, MRPs can change over time, and market conditions can change such that historical returns are poor estimates of future returns. [82]

[81] *Id.*, at 60.
[82] *Id.,* at 52.

Dr. Woolridge also summarizes investor surveys and the results of academic research.[83] Dr. Woolridge presents the results of several surveys that have been published since January 2010. The median MRP reported in those surveys is 5.24 percent.[84] In particular, Dr. Woolridge highlights a September 2019 survey conducted by CFO Magazine and Duke University in which the expected MRP was 4.62 percent,[85] the survey conducted by Pablo Fernandez which indicates that the median MRP was 5.6 percent,[86] the MRP calculated by Professor Aswath Damodaran which has primarily been in the range of 5 percent to 6 percent since 2010,[87] Duff & Phelps publication which recommended using a 5.50 percent MRP for the U.S,[88] KPMG's estimated MRP which was 5.75 percent as of the first quarter of 2019,[89] and the implied MRP calculated by market-risk-premia.com which as of July 31, 2019 was 4.10 percent.[90]

**Q. Why do you disagree with Dr. Woolridge's MRP estimate of 5.75 percent?**

A. Given the current low yields on Treasury bonds, and the inverse relationship between interest rates and the MRP that is shown in my Bond Yield Plus Risk Premium analysis, Dr. Woolridge's MRP estimate of 5.75 percent is understated. First, from a practical standpoint, the results of his CAPM analysis are significantly

---

83 *Id.*, at 53-55.
84 *Id.*, at 56.
85 *Id.*, at 57.
86 *Ibid*.
87 *Id.*, at 58.
88 *Id.*, at 59.
89 *Ibid*.
90 *Ibid*.

below any return that has been authorized by any regulatory jurisdiction. While the Beta coefficient relied on by Dr. Woolridge is understated as discussed above, the primary issue with the unreasonably low results from Dr. Woolridge's CAPM are the result of his selection of the MRP. Based on historical data from Duff and Phelps, the market risk premium from 1926-2018 is 6.90 percent.[91] The historical income only return on government bonds, used to calculate the historical MRP over the same time-period, has been approximately 5.00 percent. The 30-day average risk-free rate on long-term government bonds as of January 31, 2020 is 2.25 percent. Because interest rates on long-term government bonds are well below the historical average of 5.0 percent, the inverse relationship between interest rates and the MRP implies that the MRP should be well above the long-term historical average of 6.90 percent. However, the MRP used by Dr. Woolridge of 5.75 percent suggests that the expected market risk premium is currently 115 basis points lower than the historical average MRP of 6.90 percent.

**Q. What are your concerns with the surveys that Dr. Woolridge has relied upon to derive his MRP range of 4.00 percent to 6.00 percent?**

A. Dr. Woolridge has devoted many pages of his testimony to discussing his view that investors and central banks are no longer relying on interest rate forecasts from economic surveys. In spite of Dr. Woolridge's concern with the ability of

---

[91] The market risk premium from 1926-2018 is calculated as the average return on large company stocks from 1926-2018 minus the average income only return on long-term government bonds from 1926-2018 (i.e., 11.90 percent – 5.00 percent = 6.90 percent). Source: Duff &Phelps, Valuation Handbook: Guide to Cost of Capital, 2019, Exhibit 2.3.

economists to accurately forecast interest rates, he relies on surveys from Duke University/CFO Magazine and Pablo Fernandez to develop his estimate of the MRP. It is unclear why Dr. Woolridge believes the use of surveys is appropriate for purposes of deriving the MRP in his CAPM analysis, but not appropriate in an overall assessment of economic conditions and their effect on the models used to estimate the cost of equity.

Furthermore, the Duke University/CFO magazine survey does not ask participants to provide their expected MRP. Instead, the survey asks participants for expected returns on stocks and bonds without defining what is meant by "returns." To the extent that "return" does not include both income (dividend yield) and growth (capital appreciation), the survey results may understate the expected total return of survey respondents.

**Q. What MRP is suggested by the survey results summarized by Dr. Woolridge?**

A. The March 2019 survey by Pablo Fernandez reported a mean required MRP for the U.S. of 5.6 percent. However, it is important to note that Mr. Fernandez collected data from 1,175 respondent regarding the MRP for the U.S. which resulted in a wide range of MRPs from 2.2 percent to 17 percent. Given the wide dispersion of responses, investors' required returns can be substantially different. Thus, taking the average of a sample of investors' required returns may not be a reasonable assumption when calculating the required return of the market. In fact, Mr. Fernandez cautioned against using this approach:

> We can find out the REP [Required Equity Premium] and the EEP [Expected Equity Premium] of an investor by asking him, although for many investors the REP is not an explicit parameter but, rather, it is implicit in the price they are prepared to pay for the shares. However, it is not possible to determine the REP for the market as a whole, because it does not exist: even if we knew the REPs of all the investors in the market, it would be meaningless to talk of a REP for the market as a whole. There is a distribution of REPs and we can only say that some percentage of investors have REPs contained in a range. The average of that distribution cannot be interpreted as the REP of the market nor as the REP of a representative investor.[92]

Furthermore, the Global Business Outlook Survey conducted quarterly by Duke University and CFO magazine asks participants to predict the average annual return for the S&P 500 over the next ten years given the current yield on ten-year Treasury bonds. CFO magazine uses this information to estimate the MRP by subtracting the current yield on ten-year Treasury bonds from the expected return on the S&P 500. The Duke survey asks respondents for expectations regarding the "average annual S&P 500 return over the next ten years," but does not define return.[93] In the current survey, the median expected return on the S&P 500 reported in this survey is 6.16 percent. Dr. Woolridge suggests that a "normalized" return on the 30-year Treasury bond is 3.75 percent. If Dr. Woolridge is correct that this response is intended to reflect income and capital appreciation, then the CFOs who responded to this survey are projecting a MRP of 2.41 percent. Moreover, while the Duke

---

92 Pablo Fernandez, Vitaly Pershin, and Isabel Fernandez Acín, "Market Risk Premium and RiskFree Rate used for 59 countries in 2019: a survey," IESE Business School, (Apr. 2019), at 10.

93 *See* CFO Magazine Survey, Third Quarter 2019, at 61.

survey addresses return expectations (however defined), it does not ask whether the respondents would be willing to invest (i.e., meets their required return expectations) in equity at those return levels. To the extent that expected and required returns differ, the usefulness of survey responses for the purpose of establishing PSNH's required ROE becomes increasingly tenuous.

**Q. Do you have any concerns with the implied MRPs that Dr. Woolridge has cited to support his 5.75 percent MRP?**

A. Yes. As discussed above, Dr. Woolridge's cites to implied MRPs calculated by Professor Aswath Damodaran, Duff & Phelps, KPMG, and market-risk-premia.com as support for the 5.75 percent MRP that Dr. Woolridge has used in his CAPM analysis. However, as shown in Figure 13, the implied market return for the sources cited by Dr. Woolridge range from 6.12 percent to 9.00 percent. These returns while not only unreasonably low are inconsistent with the results produced by Dr. Woolridge's DCF analysis. As Dr. Wooldridge notes the Constant Growth DCF result for his electric utility proxy group was 8.25 percent. Since Dr. Woolridge has also acknowledged that his electric proxy group is less risky than the market by relying on a Beta coefficient of 0.55 in his CAPM analysis, it would stand to reason that the market returns that Dr. Woolridge has relied on to select his MRP would be significantly higher than his Constant Growth DCF results for a group of electric utilities. However, as shown in Figure 13, the market returns cited by Dr. Woolridge range from 213 basis points below his Constant Growth DCF result to 75 basis points above his Constant Growth DCF result. This highlights an important inconsistency that Commission should consider between the inputs used to calculate Dr. Woolridge's CAPM analysis and Dr. Woolridge's Constant Growth DCF analysis.

**Figure 13: Implied Market Returns cited by Dr. Woolridge**

| Source | Implied MRP | Risk-Free Rate | Implied Market Return |
|---|---|---|---|
| Professor Aswath Damodaran[94] | 5.96% | 2.68% | 8.64% |
| Duff and Phelps | 3.50% | 5.50% | 9.00% |
| KPMG[95] | 5.75% | 2.63% | 8.38% |
| market-risk-premia.com | 4.10% | 2.02% | 6.12% |

**Q. What is Dr. Woolridge's concern with the MRPs you have used in your CAPM analysis?**

A. Dr. Woolridge expresses concern that my forward-looking MRP is over-stated because it was developed using the expected return for the S&P 500 based on analysts' forecasted EPS growth rates. In particular, Dr. Woolridge testifies: "Simply stated, the expected EPS growth rates and the associated expected stock market return and resulting market risk premium are totally unrealistic and defy economic logic."[96]

---

94 Professor Aswath Damodaran's implied MRP and risk-free rate for 2018 were included in Figure 13.

95 KPMG does not specifically cite a risk-free rate used to develop the implied MRP; however, KPMG notes that the yields on long-term government bonds were reviewed to estimate the implied MRP. Therefore, the 30-day average of the U.S. 30-year Treasury Bond yield as of June 30, 2019 was used as the estimate of the risk-free rate to calculate the implied market return.

96 Direct Testimony of Dr. J. Randall Woolridge, at 80.

**Q. Does Dr. Woolridge agree that the MRP can be estimated based on expected returns for the S&P 500?**

A. Yes. According to Dr. Woolridge: "The market risk premium is the difference in the expected total return between investing in equities and investing in "safe" fixed-income assets, such as long-term government bonds."[97] Dr. Woolridge states that the MRP is equal to the expected return on the stock market (e.g., the expected return on the S&P 500) minus the risk-free rate.[98] This is consistent with the approach I have used to estimate the forward-looking MRP in my CAPM analysis.

**Q. What is your response to Dr. Woolridge's concern that the forward-looking MRP in your CAPM analysis is "excessive" since it relies on five-year EPS growth rates from Wall Street analysts for the S&P 500?**[99]

A. Dr. Woolridge supports this assertion by arguing that the EPS growth rate for the S&P 500 of 11.62 percent is significantly higher than long-term EPS growth for the S&P 500 and more recent trends in GDP growth, as well as projections of GDP growth.[100] However, the analysts' forecasted growth rates used in my CAPM analysis are market-based growth rates upon which current stock prices for the companies in the S&P 500 are based. In other words, 11.62 percent is not my estimate of the expected growth rate; it is based on forecasted earnings growth rates for the companies in the S&P 500 as reported by Bloomberg.

---

97 *Id.*, at 51.
98 *Ibid.*
99 *Id.*, at 81.
100 *Id.*, at 82.

Dr. Woolridge supports the use of the Constant Growth DCF model to estimate the cost of equity for PSNH and relies primarily on projected EPS growth rates. However, Dr. Woolridge dismisses the expected five-year EPS growth rates as overstated even though the model upon which he relies assumes that investors set stock prices based on expectations for future growth in dividends and share price. As discussed previously in my Rebuttal Testimony, recent academic research has found that analyst bias has been reduced or eliminated, if it ever existed, after the financial market reforms of the early 2000s.

**Q. Is there support for the use of a forward-looking market risk premium calculated using the methodology that you relied on in your Direct Testimony?**

A. Yes. As discussed in my Direct Testimony, the Staff in Maine has also endorsed the use of a forward-looking market risk premium.[101]

**Q. What methodology did Dr. Chattopadhyay use to estimate the market risk premium?**

A. Dr. Chattopadhyay calculated the expected market return using an approach that is similar to the approach I relied on in my Direct Testimony. Specifically, Dr. Chattopadhyay applied a Constant Growth DCF model to the companies in the S&P 500 to estimate the market return.[102] For the growth rate, Dr. Chattopadhyay relied on earnings, dividend and book value growth rate projections from Value Line calculating estimates of the market return which relied on all three estimates of

[101] Direct Testimony of Ann E. Bulkley, at 63-64.
[102] Direct Testimony of Dr. Pradip K. Chattopadhyay, at 36-37.

growth and earnings growth rates only. Therefore, Dr. Chattopadhyay relied on the same earnings growth rates which Dr. Woolridge noted were overstated and unrealistic. Additionally, it is important to note that Dr. Woolridge is the only ROE witness in this proceeding who calculated a CAPM analysis and did not rely on the Constant Growth DCF model to estimate the forward-looking market return.

**Q. Are there other estimates of the MRP that support the analysis presented in your Direct Testimony?**

A. Yes. Standard & Poor's ("S&P") also publishes a dividend yield and earnings growth projection for the S&P 500. Using the dividend yield of 1.88 percent and the projected earnings growth rate of 11.40 percent for the S&P 500 reported by S&P as of January 31, 2020, the estimated return for the S&P 500 is 13.38 percent.[103] This return supports the return that I calculated in my Direct Testimony using Bloomberg data. Furthermore, the resulting MRP using a 3.75 percent risk-free rate is 9.63 percent. In my Direct Testimony I relied on a MRP between 9.87 percent and 10.73 percent.[104]

**Q. What is your conclusion regarding the appropriate MRP in the context of current market data?**

A. It is reasonable to expect that the uncertainty in current market conditions would result in a MRP that is higher than the historical average MRP. Dr. Woolridge's estimated MRP of 5.75 percent is substantially lower than: (1) the historical MRP

103 S&P Dow Jones Indices, S&P 500 Earnings and Estimate Report, January 31, 2020.
104 *See* Attachment AEB-9.

using large company stocks (6.90 percent); (2) the forward-looking MRP in my CAPM analysis, which was derived using forecasted total returns for the S&P 500 less the risk-free rate (between 9.87 percent and 10.73 percent); and (3) the forward-looking MRP in Dr. Chattopadhyay's CAPM analysis, which was also derived using forecasted total returns for the S&P 500 less the risk-free rate (between 10.15 percent and 12.32 percent). Dr. Woolridge's MRP of 5.75 percent, when added to the 30-day average yield on the 30-year Treasury as of January 31, 2020 of 2.25 percent, suggests that market participants are expecting a total return for equities of 8.00 percent. By contrast, the long-term average total return for large company stocks since 1926, as reported by Duff and Phelps, has been 11.90 percent, or approximately 390 basis points higher than Dr. Woolridge's MRP estimate assumes. For these reasons, I continue to support the method I used to estimate the MRP.

### E. Bond Yield Plus Risk Premium Method

**Q. Please summarize Dr. Woolridge's concerns with your Risk Premium analysis.**

A. Dr. Woolridge has expressed several concerns with my Bond Yield Plus Risk Premium analysis, including: (1) that I have used historical authorized ROEs and Treasury yields and applied the resulting risk premium to projected Treasury yields; (2) that the analysis is a gauge of regulatory commission behavior, not investor behavior; (3) that my analysis includes returns from settled as well as litigated rate cases; and (4) that the analysis includes authorized ROEs for distribution-only and vertically integrated utilities.[105]

**Q. Is Dr. Woolridge's concern about the use of projected Treasury yields valid?**

A. No, it is not. As shown in Attachment AEB-10 to my Direct Testimony, my Risk Premium analysis determines the appropriate risk premium based on the relationship between historic authorized ROEs for electric utilities and bonds yields. I disagree with Dr. Woolridge that it is incorrect to apply the historical risk premium from this analysis to projected Treasury yields in order to estimate the ROE at specified interest rates. As shown in Attachment AEB-10, my analysis is supported by a regression equation that evaluates the relationship between bond yields and the equity risk premium over time. The regression equation has an R2 of 0.77, meaning that the regression can be used to predict the equity risk premium at different levels of interest rates. In summary, my Bond Yield Plus Risk Premium analysis is designed to use the historical relationship between bond yields and the MRP to predict how investors will react to changes in interest rates.

**Q. What is your response to Dr. Woolridge's concern that your Risk Premium analysis is a gauge of regulatory commission behavior rather than investor behavior?**

A. While my Risk Premium analysis is based on authorized ROEs and the corresponding Treasury yields at the time the regulatory decisions were issued, I

[105] Direct Testimony of Dr. J. Randall Woolridge, at 94-95.

believe that investors are informed by allowed ROEs from hundreds of rate case decisions to frame their return expectations. One of the fundamental principles in setting a just and reasonable return is that the return must be comparable to returns available to investors in companies with similar risk. In that regard, the returns that have been authorized to other electric utilities are a relevant consideration for investors. My Risk Premium analysis simply shows what those returns are in relation to the risk-free rate, so that it is possible to use historical returns to estimate future returns given investor expectations, as shown by current and projected Treasury yields.

**Q. Do you share Dr. Woolridge's concern that your Risk Premium analysis includes settled rate case decisions?**

A. No, I do not. In order to test Dr. Woolridge's premise that settled rate decisions are different than litigated rate decisions, I modified my Risk Premium analysis for electric utilities for the period from 1992 through February 2019 using only litigated cases. Based on that analysis, as shown in Attachment AEB-Rebuttal-5, the resulting ROE estimate ranges from 9.79 percent to 10.21 percent, with an average of 9.97 percent. As such, there is no basis for Dr. Woolridge's concern that the inclusion of settled rate case decisions affected my Risk Premium analysis.

**Q. Have other regulators considered the results of the Bond Yield Plus Risk Premium Analysis when determining the authorized ROE?**

A. Yes. In its most recent Orders for Minnesota Power (Docket No. E-015/GR-16-664), Otter Tail Power Company (Docket No. E-017/GR-15-1033) and Minnesota

Energy Resources Corporation (Docket No. G011/GR-17-563), the Minnesota Public Utilities Commission ("MPUC") relied on the results of the Risk Premium analysis in addition to the CAPM to check the reasonableness of the results of the DCF model.[106] In its Order for Minnesota Power, the MPUC concluded that:

> it is appropriate to establish an ROE toward the higher end of the DCF-supported results to adjust for the divergence between ROEs supported by the DCF models and the models the Commission has historically relied upon for confirmation of reasonableness—the CAPM and Bond Yield Plus Risk Premium models.[107]

In Docket No. E-015/GR-16-664 for Minnesota Power, the DCF results presented by the ROE witnesses tended to support an ROE towards the lower end of the range of ROE results, while the CAPM and Risk Premium models tended to support an ROE towards the higher end of the range.[108] The MPUC recognized the divergence between the ROE results produced by the DCF, CAPM and Risk Premium models and approved an ROE toward the higher end of the DCF-supported ROE results. In my view, the results of the Risk Premium analysis are an important data point for the Commission to consider in this proceeding.

[106] Docket No. E-015/GR-16-664, Findings of Fact, Conclusions, and Order, at 61; Docket No. E-017/GR-15-1033, Findings of Fact, Conclusions, and Order, at 54; Docket No. G011/GR-17-563, Findings of Fact, Conclusions and Order, at 27.

[107] Docket No. E-015/GR-16-664, Findings of Fact, Conclusions, and Order, at 61.

[108] *Id.*, at 60.

**Q. What is your conclusion regarding the Risk Premium analysis?**

A. I continue to support the use of the Risk Premium analysis to corroborate the reasonableness of my DCF and CAPM results.

### F. Relevance of Market-to-Book Ratios

**Q. Please summarize Dr. Woolridge's position regarding the relationship between the Market-to-Book ("M/B") ratio and authorized equity returns.**

A. Dr. Woolridge testifies that a M/B ratio above 1.0 indicates that a company is earning a return "above its cost of equity."[109] Dr. Woolridge further asserts that there is a strong positive relationship between the estimated ROE and M/B ratios for public utilities, based on a regression analysis he performed using Value Line data.[110] On that basis, Dr. Woolridge concludes: "This means that, for at least the last decade, returns on common equity for electric utilities have been greater than the cost of capital, and thus more than necessary to meet investors' required returns."[111]

**Q. What is the M/B ratio?**

A. The M/B ratio equals the market value (or stock price) per share divided by the total common equity (or the "book equity") per share. Book value per share is an accounting construct which reflects historical costs. In contrast, market value per share (i.e., the stock price) is forward-looking and is a function of many variables,

---

[109] Direct Testimony of Dr. J. Randall Woolridge, at 28-29.
[110] *Id.,* at 29-30.
[111] *Id.,* at 31.

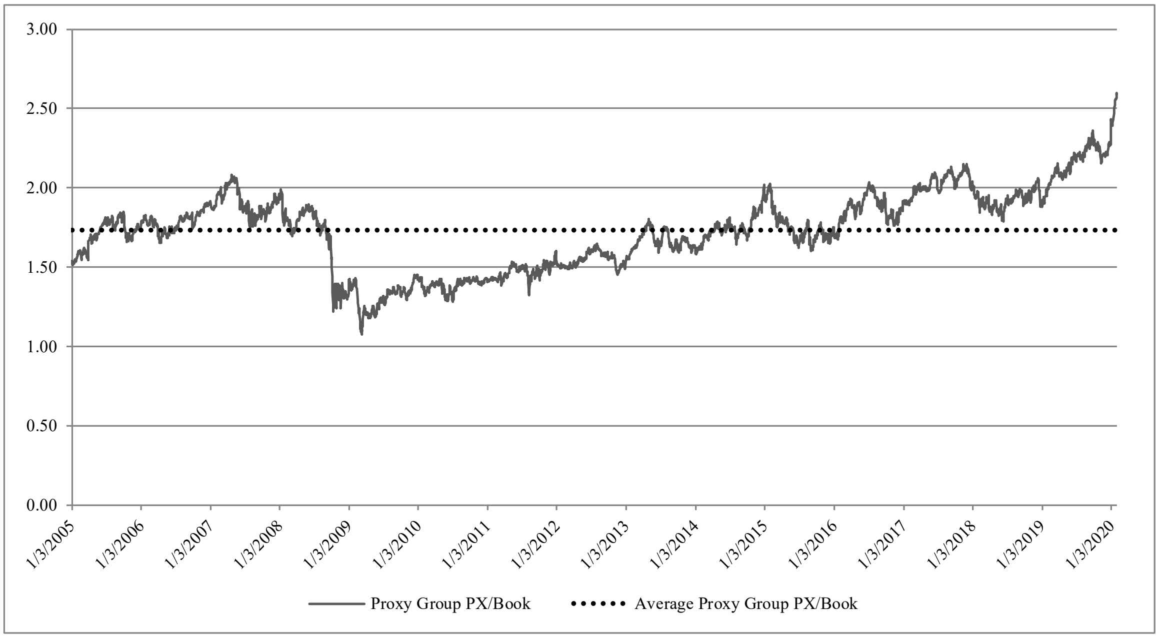
including (but not limited to) expected earnings and cash flow growth, expected payout ratios, measures of "earnings quality," the regulatory climate, the equity ratio, expected capital expenditures, and the expected return on book equity.[112] It follows, therefore, that the M/B ratio is also a function of numerous variables in addition to the historical or expected return on book equity.

**Q. Do you agree with Dr. Woolridge that utility companies with M/B ratios above 1.0 are earning returns above their Cost of Equity?**

A. No, I do not. I have several concerns with Dr. Woolridge's position. Figure 14 shows the M/B ratio for companies in Dr. Woolridge's proxy group for the period January 1, 2005 through January 31, 2020. Over that period, the proxy group average (represented by the dotted line) was 1.73.

[112] *See* Roger A. Morin, New Regulatory Finance, Public Utilities Reports, Inc., 2006, at 366.

**Figure 14: Proxy Group Average Market-to-Book Ratio[113]**




Even though the proxy group companies were subject to numerous ROE awards during that period, I am not aware of any state regulatory commission that has set the authorized ROE for a public utility based on a M/B ratio of 1.0. The only time during this period that the M/B ratio for Dr. Woolridge's electric proxy group approached 1.0 was during the Great Recession, clearly not an indicator of normal market conditions. Based on this evidence, it appears that state regulatory commissions do not share Dr. Woolridge's concern that such companies are earning returns in excess of their required returns, and that authorized returns should be set at levels that force the M/B ratio to unity.

113 Source: Bloomberg.

Further, the notion that book values should be set at unity by regulatory commissions has been refuted for many years. As noted by Stewart Meyers in 1972:

> In short, a straightforward application of the cost of capital to a book value rate base does not automatically imply that the market and book values will be equal. This is an obvious but important point. If straightforward approaches did imply equality of market and book values, then there would be no need to estimate the cost of capital. It would suffice to lower (raise) allowed earnings whenever markets were above (below) book.[114]

**Q. What would be the practical effect of setting an allowed ROE for utility stocks that reduced the M/B ratio to 1.0?**

A. As a practical matter, no rational investor would invest in utility stocks if they believed that utility commissions were going to set rates in an effort to move the M/B ratio to 1.0. If, for example, an investor purchased a utility stock at the long-term average M/B ratio of 1.73 (i.e., the proxy group average), that investor would incur a loss of approximately -42.29 percent once the M/B ratio reached unity (1.00 / (1.73 – 1) = -42.29 percent). Such a result would inhibit a utility's ability to attract the capital required to support its operations, in direct contravention of the *Hope* and *Bluefield* standards.

[114] Stewart C. Meyers, *The Application of Finance Theory to Public Utility Rate Cases*, The Bell Journal of Economics and Management Science, Vol. 2, No. 1 (Spring, 1972), at 76.

**Q. Are you aware of any contemporary text suggesting that M/B ratios for utilities should be expected to revert to 1.0?**

A. No. To the contrary, Dr. Roger Morin provides an extensive review of the issue of M/B reversion to unity and makes the following summation:

> In short, economic principles do not support the notion that the market value of utility shares should necessarily equal book value. A basic economic principle holds that, in the long run, market value should equal asset replacement cost in a given industry. In the presence of inflation and absent significant technological advances, replacement cost exceeds the original cost book value of assets. Consequently it is quite reasonable for the market value of utility shares to exceed their book value and there is no reason to conclude that market value should equal book value when one recognizes that regulation is intended to emulate competition.[115]

**Q. Please comment on the trend in the average earned ROE and the M/B ratio for electric utilities.**

A. As discussed above, according to Dr. Woolridge, a firm that has a return on equity that exceeds the cost of equity will have a market-to-book ratio that is greater than 1.0.[116] This relationship implies that if the return on equity increases (decreases) then the market-to-book ratio should also increase (decrease). Dr. Woolridge supports the positive correlation between the ROE and the market-to-book ratio by conducting a regression analysis, the results of which are presented in Attachment JRW-6. To examine this financial relationship since the Great Recession of 2008/09, I reviewed the average earned return on equity and market-to-book ratio data for electric utilities presented by Dr. Woolridge in a chart on page 3 of

---

115 *See*, New Regulatory Finance, Roger A. Morin Ph.D., Public Utility Reports, 2006, at 376 - 378.
116 Direct Testimony of Dr. J. Randall Woolridge, at 28-29.

Attachment JRW-7. Based on the data presented in the chart, it is clear that the average earned return on equity for electric utilities has declined slightly from 2010 to 2016 while remaining relatively constant between 2016 and 2018. However, over the same time-period, the market-to-book ratio has continued to increase reaching its highest point since 2001 in 2017. While the market-to-book ratio declined in slightly in 2018, it is still at a level that is substantially higher than it was in 2009. As a result, it appears that Dr. Woolridge's assumption about the relationship between equity returns and the market-to-book ratio is clearly not supported by actual market data.

**Q. What is your conclusion regarding the relevance of M/B ratios in setting the allowed ROE for PSNH in this proceeding?**

A. My conclusion is that investors do not expect allowed returns for utilities to be set at levels that would cause the M/B ratio to approximate 1.0. Such returns would provide unreasonably low equity risk premia and are inconsistent with prevailing levels of authorized ROEs for comparable risk electric utilities. Additionally, recent market data does not imply a strong relationship between the ROE and the market-to-book ratio. For all of these reasons, the Commission should not be concerned with setting the allowed ROE for PSNH in this proceeding at a level that would cause the M/B ratio to move toward 1.0.

### G. Flotation Cost Adjustment

**Q. Please summarize Dr. Woolridge's position on flotation costs.**

A. Dr. Woolridge contends that it is not appropriate to consider flotation costs when determining the authorized ROE for PSNH because the Company is referencing flotation costs for equity issuances that occurred in 2005 and 2009.[117] According to Dr. Woolridge, the costs associated with the 2005 and 2009 equity issuances have not been identified or paid in many years. In addition, Dr. Woolridge testifies that it is incorrect to argue that a flotation cost adjustment is necessary to prevent the dilution of the stock price for existing shareholders.[118]

**Q. Do you agree with Dr. Woolridge that the M/B ratio greater than 1.0 for electric utilities implies that the flotation cost should be reflected as a reduction to the ROE?**

A. No, I do not. As Dr. Morin notes:

> The flotation cost adjustment does not depend on any market-to-book input assumption and is still relevant even when utility companies have stock prices in excess of book value, as they have for over two decades. This is because the flotation cost adjustment applicable to all of the company's book equity is an average of the current allowances required for each past financing, that is, each source of equity. The flotation cost allowance is a buildup of historical floatation cost adjustments. Clearly, over such a long time period, equity issues were made, and will be made in the future, under varying market circumstances and capital market conditions. Some issues were consummated at market-to-book ratios in excess of one, others below one.

---

[117] *Id.,* at 95.
[118] *Id.*, at 96.

> The derivation of the conventional flotation cost adjustment formula does not depend on the assumption of a market-to-book ratio equal to 1.00. This can be seen as follows. A company's existing shareholders expect a given stream of dividends to be produced from the firm's existing asset base. Following a stock issue, new shareholders likewise expect the same dividend stream. But the only way the new shareholders can receive the same dividend stream without impairing the dividend stream of old investors is that the new funds from the stock issue be invested at a return sufficiently high to provide a dividend stream whose present value is equal to the net proceeds of the issue.[119]

**Q. What is your response to Dr. Woolridge's position on flotation costs?**

A. As discussed in my Direct Testimony, the great majority of a utility's flotation costs is incurred prior to the test year but remains part of the cost structure that exists during the test year and beyond.[120] As such, flotation costs should be recognized for ratemaking purposes. This cost is appropriate regardless of whether an issuance occurs during, or is planned for, the test year. To the extent PSNH is denied the opportunity to recover prudently incurred flotation costs, the Company's actual returns will fall short of expected (or required) returns, thereby diminishing PSNH's ability to attract adequate capital on reasonable terms.

**Q. What is your conclusion with regard to flotation costs?**

A. I continue to believe that it is appropriate to consider flotation costs when establishing the appropriate ROE for PSNH.

---

[119] *See* New Regulatory Finance, Roger A. Morin Ph.D., Public Utility Reports, 2006, at 336.
[120] Direct Testimony of Ann E. Bulkley, at 79-80.

### H. Proposal to Impute Capital Structure

**Q. Please summarize Dr. Woolridge's proposed adjustment to PSNH's capital structure.**

A. Dr. Woolridge proposes an imputed capital structure consisting of 50.0 percent common equity, 46.49 percent long-term debt and 3.51 percent short-term debt, as compared to the capital structure proposed by PSNH consisting of 54.85 percent common equity, 41.98 percent long-term debt and 3.17 percent short-term debt.[121] As support for his recommendation, Dr. Woolridge states that the median equity ratio as of the end of the 2018 was 45.5 percent for his electric proxy group and 49.0 percent for my proxy group.[122] On that basis, he concludes that a capital structure of 50 percent common equity, 46.49 percent long-term debt and 3.51 percent short-term debt is more appropriate.

**Q. Have you reviewed the analysis of proxy company capital structures that Dr. Woolridge relies on?**

A. Yes. As shown page 1 of Attachment JRW-4, the data relied upon by Dr. Woolridge for his analysis of the proxy company capital structures is reported at the holding company level. As such, Dr. Woolridge's analysis includes corporate-level debt that is not part of the regulated or financial capital structure of the operating utilities. The relevant capital structure for comparison purposes is at the operating company level, not the holding company. The Commission in this case will be setting the capital structure for PSNH, the operating company, which will

[121] Direct Testimony of Dr. J. Randall Woolridge, at Attachment JRW-5.
[122] *Id.*, at 21.

be used to finance investments in rate base that provides electric service to customers.

Attachment AEB-13 provides the capital structures for the electric proxy companies at the operating level. As shown, the average equity ratio for the electric proxy group companies is 53.41 percent, which is only slightly lower than the equity ratio proposed by the Company.

**Q. What effect does the TCJA have on the appropriate capital structure for PSNH?**

A. As discussed in my Direct Testimony, the TCJA places additional pressure on utility operating company cash flows and thus has been viewed negatively by credit rating agencies. All three rating agencies have commented on the potential negative implications for utilities from the loss of bonus depreciation and the reduction in taxes collected, both of which affect utility cash flows. As discussed in my Direct Testimony, in the first quarter of 2018, the credit rating agencies issued reports identifying this risk factor and suggesting mitigation approaches that included increasing the ROE or the equity ratio of utility operating subsidiaries.[123] Moody's has since downgraded the credit rating of several utilities with concerns about cash flow metrics.

[123] Direct Testimony of Ann E. Bulkley, at 28-34.

S&P noted that regulators must also recognize that tax reform is a strain on utility credit quality and expects companies to request stronger capital structures and other means to offset some of the negative impact.[124] At the time of the rating publication, S&P had already revised its outlook to negative on PNM Resources Inc. and its subsidiaries after a Public Service Co. of New Mexico rate case decision incorporated tax savings with no offsetting measures taken to alleviate the weaker cash flows.

Even though FitchRatings did not make any ratings actions, they highlighted the importance of utility management and regulators working to find solutions to address this credit concern. The heightened concern from rating agencies highlights the importance of considering the equity ratios of the utility operating subsidiaries as the appropriate benchmark to be used in determining the equity ratio for PSNH in this proceeding.

**Q. What are your conclusions with respect to the Company's proposed capital structure?**

A. The Company's proposed capital structure is consistent with the range of equity ratios at the operating company level for the electric companies in my proxy group, and consistent with the credit rating agency guidance for addressing the risks

[124] Standard and Poor's Global Ratings, "U.S. Tax Reform: For Utilities' Credit Quality, Challenges Abound," January 24, 2018.

related to the TCJA. For those reasons, I believe that the equity ratio proposed by PSNH over the rate period is reasonable.

## V. RESPONSE TO OCA WITNESS DR. CHATTOPADHYAY

**Q. Please summarize the ROE analyses and recommendation of Dr. Chattopadhyay.**

A. Dr. Chattopadhyay recommends an authorized ROE of 8.27 percent for PSNH, within a range from 8.15 percent to 8.35 percent.[125] Dr. Chattopadhyay's ROE recommendation is based primarily on the results of his Constant Growth DCF analysis. He also conducts a CAPM analysis to check the reasonableness of his DCF results. Dr. Chattopadhyay selects a proxy group of electric utilities (both vertically integrated and transmission and distribution only) that he considers have similar risk profiles as PSNH. Dr. Chattopadhyay devotes a significant portion of his testimony to discussing the high market-to-book ratios of the companies in his proxy group, which is consistent with my testimony regarding the high valuations and PE ratios of the electric utility industry at this time. However, we reach opposite conclusions regarding how these high valuations and low dividend yields are affecting the reliability of the results produced by the DCF model. He rejects an adjustment to the authorized ROE for flotation costs. Further, Dr. Chattopadhyay does not compare the business and regulatory risk of his proxy

[125] Direct Testimony of Pradip K. Chattopadhyay, at 7.

group companies to that of PSNH in order to select his recommendation from within his range of results.

**Q. At a high level, what is your response to Dr. Chattopadhyay's ROE analyses and recommendation?**

A. Although Dr. Chattopadhyay refers to the U.S. Supreme Court decisions in *Hope* and *Bluefield* as setting the standards for a fair return for regulated utilities, he fails to consider whether his ROE recommendation meets those standards. In particular, as shown in Figure 2 of my Rebuttal Testimony, Dr. Chattopadhyay's ROE recommendation for PSNH is not comparable to the returns that have been authorized to electric utilities in other jurisdictions across the country. Further, Dr. Chattopadhyay has not provided any evidence that PSNH has lower business or financial risk than those other electric utility companies. In addition, Dr. Chattopadhyay has not considered how economic or capital market conditions, including interest rates, economic growth, monetary policy, or other factors influence the cost of equity and the models that are used to estimate the cost of equity. Lastly, Dr. Chattopadhyay has not provided any evidence that would support a conclusion that PSNH's authorized ROE has declined from the current level of 9.67 percent, which was established by the Commission in June 2010, to his recommended level of 8.27 percent.

**Q. Please summarize the principal areas of disagreement between you and Dr. Chattopadhyay.**

A. As discussed in more detail below, Dr. Chattopadhyay and I disagree in the following areas: 1) the composition of the proxy group and the appropriate screening criteria to develop that comparator group; 2) the relevance of the Constant Growth DCF results given how current market conditions are affecting the DCF model, as demonstrated by both the high P/E ratios cited in my Direct Testimony and the high market-to-book ratios cited by Dr. Chattopadhyay; 3) the appropriate growth rates to be utilized in the Constant Growth DCF model; 4) the appropriate inputs to the CAPM model; 5) the outlier screen that should be applied to the results of the DCF and CAPM methods; 6) the applicability of the Bond Yield Plus Risk Premium approach; and 7) the inclusion of flotation costs.

### A. Proxy Group Composition

**Q. Please explain the differences between your proxy group and the one derived by Dr. Chattopadhyay.**

A. One important difference between our respective proxy groups is that I have screened based on the percentage of operating income from regulated operations, while Dr. Chattopadhyay has used the percentage of revenues and assets from regulated operations.

**Q. Why have you screened based on net operating income rather than revenue or assets?**

A. Dr. Chattopadhyay used his asset screen to ensure that the companies included in his proxy group have significant regulated operations and his revenue screen to ensure that the companies included in the proxy group have significant regulated electric operations. However, the use of a revenue screen to ensure companies have significant regulated electric operations is inappropriate because, as discussed in Section IV, a significant portion of electric utility company revenue is derived from the cost of purchased fuel, which, in most cases, is passed through directly to customers and do not affect earnings. This portion of total revenue can fluctuate considerably based on the commodity cost and other inputs. Relying on a revenue screen does not provide a clear or necessarily consistent indicator of the contribution of the regulated electric utility operations to a company's earnings. In contrast, net operating income excludes the cost of purchased commodity and therefore more closely represents the contribution of the business segment to earnings. As a result, I believe it is more appropriate to rely on the operating income screens that I apply in my Direct Testimony than the combination of the asset and revenue screen relied on by Dr. Chattopadhyay.

**Q. Are there any other important differences in your screening criteria?**

A. Yes. Dr. Chattopadhyay objects to my screen for percentage of company-owned generation because he believes there is no difference in the risk profile of integrated electric utilities and transmission and distribution ("T&D") only companies.

However, as discussed in greater detail in Section IV, since PSNH no longer owns regulated generation facilities, I included a screening criterion that excluded companies with a higher percentage of company-owned generation because such companies are viewed by credit rating agencies and investors as having greater risk. Dr. Chattopadhyay did not include a screen for generation ownership, so his proxy group includes electric utilities with substantial amounts of company-owned generation. These include: AEE, AEP, DUK, EVRG, ETR, IDA, OGE, PNW, PNM, SO, XEL. I excluded these companies from my proxy group due to the higher risk associated with company-owned generation.

**Q. Are the companies in the proxy group selected by Dr. Chattopadhyay comparable in risk to PSNH?**

A. Not entirely. Dr. Chattopadhyay's proxy group is comprised of 19 companies, and as discussed previously, many of these companies own a significant percentage of generation assets in rate base, making them riskier than PSNH. In addition, Dr. Chattopadhyay's revenue and asset screens result in the elimination of several companies in my proxy group (i.e., ALE, AGR and HE) that derive more than 70 percent of their operating income from regulated operations and more than 80 percent of their regulated operating income from electric utility service. If Dr. Chattopadhyay's objective is to choose companies with significant electric utility operations, it is not reasonable to exclude these companies from the proxy group for PSNH.

**Q. Is the composition of the proxy group a primary driver in the difference between your respective ROE analyses and recommendations?**

A. No. While I believe that my proxy group is more risk comparable to PSNH than the group selected by Dr. Chattopadhyay, the composition of the proxy group is not a primary contributor to the differences in the results of our respective ROE analyses. For that reason, I have limited my response on this issue.

### B. Relevance of Constant Growth DCF Results

**Q. Please comment on the relevance of the Constant Growth DCF results under current market conditions.**

A. As discussed in my Direct Testimony, economic and capital market conditions have affected the DCF model inputs, particularly the dividend yield component, such that the results of that model are not representative of the forward-looking, long-term cost of equity for regulated utilities such as PSNH. For example, the mean results of Dr. Chattopadhyay's Constant Growth DCF model range from 8.09 percent to 8.48 percent, depending on the selected growth rates. The average authorized ROE for electric utilities in 2018 and 2019 was 9.60 percent. This demonstrates that the Constant Growth DCF model is not currently producing results that are consistent with the comparable return standard of *Hope* and *Bluefield*.

**Q. Dr. Chattopadhyay asserts that the DCF model is superior to the CAPM because the DCF model uses inputs that are forward-looking while the CAPM relies on historical data.[126] Do you agree?**

A. No, I do not. The DCF model has two primary inputs: 1) the dividend yield; and 2) the growth rate in dividends per share. The dividend yield component is based on projected dividends for the next year and the recent historical share price for each company in the proxy group, while the growth rate is based on projected growth in earnings per share, or in the case of Dr. Chattopadhyay's ROE analysis, dividends and book value per share. The CAPM has three primary inputs: 1) the risk-free rate; 2) Beta; and 3) the market risk premium. In my CAPM analysis, both the risk-free rate and the market risk premium are based on projected market data, and the Beta coefficient is based on the historical relationship between the returns on the proxy group companies and a broad market index such as the NYSE Composite or the S&P 500. In summary, two of the three assumptions used in the CAPM are forward-looking, while one of the assumptions used in the DCF model is based on projected market data.

**Q. Dr. Chattopadhyay contends that the DCF results are overstated because the M/B ratio for utilities exceeds 1.0.[127] What is your response?**

A. While I agree with Dr. Chattopadhyay that utility valuations are currently well above their historical average level, and I present similar data regarding the elevated level of price-to-earnings ratios for the proxy group companies, I disagree with his

126 Direct Testimony of Dr. Pradip K. Chattopadhyay, at 19.
127 *Id.*, at 15-16.

conclusion that these high valuations indicate that the DCF results are overstated. On the contrary, as discussed in my Direct Testimony, the high current valuations for utility shares and investors' view that those valuations are not sustainable indicate that the forward-looking cost of equity for regulated utilities is most likely understated by the DCF model results.[128] This is because the dividend yield component, which is based on historical stock prices, is currently very low. If those share prices decline, as expected by equity analysts such as Value Line and Edward Jones, then the dividend yields for the proxy group companies will increase, along with the DCF results.

Dr. Chattopadhyay agrees that market-to-book ratios for utilities are unsustainable at current levels.[129] Given that fact, he must also agree that utility share prices should be expected to decline and that dividend yields will increase. However, as discussed in my response to Dr. Woolridge, if the Commission were to set the authorized return for PSNH at a level that causes the Company's market to book ratio to decline to 1.0, then PSNH would not be able to compete for capital with other regulated utilities which have market-to-book ratios well above this level.

[128] Direct Testimony of Ann E. Bulkley, at 15-16.
[129] Direct Testimony of Dr. Pradip K. Chattopadhyay, at 16-17.

**Q. Dr. Chattopadhyay argues that the growth rates in the DCF model should be tempered to offset the effect of high M/B ratios for regulated utilities.[130] Do you agree?**

A. No, I do not. Dr. Chattopadhyay has not provided any evidence that growth rates for regulated utilities are overstated, or that those growth rates are affected in any way by the M/B ratio. The only component of the DCF model that is affected by the utility's share price is the dividend yield. The growth rate is based on analysts' and investors' expectations for future growth in dividends. It is not affected by the valuation on the utility shares. I see no basis for Dr. Chattopadhyay's contention that the growth rates in the DCF model should be adjusted to offset the effect of high M/B ratios for the proxy group companies.

### C. Appropriate Growth Rates in DCF model

**Q. What growth rates does Dr. Chattopadhyay use in his Constant Growth DCF model?**

A. Dr. Chattopadhyay uses three sources of growth rates in his Constant Growth DCF analysis: 1) the average of projected earnings, dividends and book value per share from Value Line; 2) projected earnings growth rates from Zacks and SNL Financial; and 3) sustainable (or retention) growth rates calculated using Value Line data.

---

130 *Id.,* at 17-18.

**Q. Do you agree with the growth rates Dr. Chattopadhyay has used in his Constant Growth DCF analysis?**

A. While I agree with Dr. Chattopadhyay's use of projected earnings growth rates, I do not agree with his inclusion of dividends per share and book value per share growth rates. First, Value Line is the only source that I am aware of that provides DPS and BVPS growth rates, and the Value Line reports are based on the views of one analyst. By contrast, the EPS growth rates published by Zacks, First Call and SNL Financial are consensus forecasts that consider the views of multiple equity analysts. Dr. Chattopadhyay's reliance on Value Line DPS and BVPS growth rates introduces sole source bias. Furthermore, as Dr. Chattopadhyay acknowledges, the Constant Growth DCF model assumes that EPS, DPS and BVPS all grow at the same constant rate in perpetuity. As such, there is no reason to believe that growth in earnings, dividends, and book value per share would be substantially different over the long-term. Lastly, as discussed in my Direct Testimony, dividend growth is a function of EPS growth and depends on the short-term management decisions regarding payout ratio and funding for capital investments. For this reason, EPS growth is more representative of long-term growth than is DPS growth.

**Q. Do you agree with Dr. Chattopadhyay that your single-stage DCF analysis relies exclusively on EPS growth rates?[131]**

A. No, I do not. As explained in my Direct Testimony and as shown in Attachment AEB-6, I have developed a single-stage DCF analysis that includes sustainable

[131] *Id.,* at 26.

growth rates, which are averaged with the EPS growth rates for each of my proxy companies.

**Q. Dr. Chattopadhyay challenges the articles you have cited as support for investors' preference for EPS growth rates in the DCF model.[132] What is your response?**

A. Dr. Chattopadhyay argues that the articles that I cite in my Direct Testimony do not specifically evaluate the use of projected DPS growth rates and therefore, do not support the exclusive use of earnings growth rates as the estimate of growth in the DCF model. However, the fact that the articles did not evaluate projected DPS growth in stock price valuation does not affect the overall conclusion of the articles which is that earnings growth rates are extremely relevant and important in stock price valuation. Furthermore, the article authored by Malkawi, Rafferty and Pillai and referenced by Dr. Chattopadhyay as support for the use of projected DPS growth does not in fact evaluate the use of DPS growth rates in stock price valuation.[133] The referenced article examines the relevance of dividends in general in stock price valuation. The article discusses one theory called the dividend irrelevance hypothesis developed by Miller and Modigliani, which posited that in a perfect market, dividends do not affect the price or cost of capital of a firm. Therefore, the Malkawi, Rafferty and Pillai article is not focused on the selection of the growth rate to use for dividends in the DCF model but the relevance of

---

132 *Id.*, at 26-28.

133 "Dividend Policy: A Review of Theories and Empirical Evidence", Malkawi, Rafferty, and Pillai, International Bulletin of Business Administration, ISSN: 1451-243X Issue 9 (2010).

dividends at all in stock price valuation. Thus, Dr. Chattopadhyay has not provided any support for the inclusion of projected DPS growth rates in the DCF model.

Furthermore, in addition to the articles cited in my Direct Testimony, there is other academic research and investor surveys that have reached similar conclusions. For example, in a survey completed by 297 members of the Association for Investment Management and Research, the majority of respondents ranked earnings as the most important variable in valuing a security (more important than cash flow, dividends, or book value).[134] Additionally, a 2002 study in the *Journal of Accounting Research* examined "the valuation performance of a comprehensive list of value drivers" and found that "forward earnings explain stock prices remarkably well" and were generally superior to other value drivers analyzed.[135] A 2012 study from the journal *Contemporary Accounting Research* found that sell-side analysts with the most accurate stock price targets were those whom the researchers found to have more accurate earnings forecasts.[136]

134 Block, Stanley B., "A Study of Financial Analysts: Practice and Theory", Financial Analysts Journal (July/August 1999).

135 Liu, Jing, et al., "Equity Valuation Using Multiples," Journal of Accounting Research, Vol. 40 No. 1, March 2002.

136 Gleason, C.A., et al., "Valuation Model Use and the Price Target Performance of Sell-Side Equity Analysts," Contemporary Accounting Research.

**Q. Dr. Chattopadhyay testifies that another reason not to rely on EPS growth rates is due to the well-known issue of analyst bias.[137] Do you share this concern?**

A. No, I do not. Dr. Chattopadhyay has provided no evidence that the growth rates used in my DCF analysis are the result of a consistent and pervasive bias on the part of analysts. Moreover, the Global Settlement served to significantly reduce the bias referred to by Dr. Chattopadhyay. In fact, as referenced in Section IV above, a 2010 article in Financial Analysts Journal found that analyst forecast bias declined significantly or disappeared entirely since the Global Settlement.[138]

**Q. Dr. Chattopadhyay objects to your projected DCF analysis because he claims that it is not appropriate to rely on price projections and dividend yield projections that are well beyond a year.[139] What is your response?**

A. As explained in my Direct Testimony, the purpose of my projected DCF analysis is to demonstrate the extent to which the high current valuations for utility shares are distorting the dividend yield component of the DCF model. Based on Value Line's projections for the share prices of the companies in my proxy group, as shown in Attachment AEB-7, the projected dividend yield was on average approximately 50 to 60 basis points higher than the average proxy group dividend yield for my Constant Growth DCF analysis shown in Attachment AEB-4 . This analysis demonstrates what would happen to the forward-looking cost of equity for

137 Direct Testimony of Dr. Pradip K. Chattopadhyay, at 17-18.
138 Armen Hovakimian and Ekkachai Saenyasiri, *Conflicts of Interest and Analyst Behavior: Evidence from Recent Changes in Regulation*, Financial Analysts Journal, Volume 66, Number 4, July/August 2010, at 195.
139 Direct Testimony of Dr. Pradip K. Chattopadhyay, at 32.

the companies in my proxy group if the share prices of these companies were to trade at the midpoint of the target range set by Value Line. In fact, the analysis is consistent with Dr. Chattopadhyay's position that investors expect the price to earnings ratio for utilities to decrease over the long-run if the current market-to-book ratio is greater than 1.[140] As such, I do not share Dr. Chattopadhyay's concern regarding the use of projected dividends and target share prices in my projected DCF analysis.

### D. CAPM Analysis Results and Inputs

**Q. Please summarize Dr. Chattopadhyay's CAPM analysis and comment on the relevance of those results.**

A. Dr. Chattopadhyay develops a CAPM analysis as a check on the reasonableness of his DCF results. His CAPM analysis is based on the current average yield on 10-year Treasury bonds, Value Line Betas, and a forward-looking market risk premium that is based on Value Line data. Dr. Chattopadhyay's CAPM analysis produces mean results that range from 7.74 percent to 9.00 percent. As with his Constant Growth DCF model, two of the three results of Dr. Chattopadhyay's CAPM analysis are well below any authorized ROE that has been observed for an electric utility since at least 1980. As such, the results of Dr. Chattopadhyay's CAPM analysis do not meet the comparable return requirement of *Hope* and *Bluefield*, and should not be used to inform the authorized ROE for PSNH in this proceeding.

140 *Id.,* at 16-17.

**Q. Please summarize your areas of concern with the inputs Dr. Chattopadhyay has used in his CAPM analysis.**

A. I disagree with Dr. Chattopadhyay's sole reliance on the current yield on 10-year Treasury bonds as the risk free rate, and with his sole reliance on Value Line Beta coefficients, which are based on five years of historical return data and which currently understate the relative risk of the companies in the proxy group. While I agree with Dr. Chattopadhyay that the market risk premium should be calculated based on forward-looking data, I disagree with his inclusion of dividend and book value growth rates in that calculation.

**Q. Please explain why you disagree with the risk-free rate that Dr. Chattopadhyay uses in his CAPM analysis.**

A. Dr. Chattopadhyay uses the current average yield on the 10-year Treasury bond of 1.82 percent as the risk-free rate in the CAPM analysis. I disagree with the use of the 10-year Treasury bond as the risk-free rate because, as discussed in my Direct Testimony, the term of the risk-free interest rate should match the approximate useful life of the asset being financed.[141] Since utility plant assets typically have a useful life between 20 and 50 years, it is appropriate to select a longer duration bond, such as the 30-year Treasury bond, as the risk-free rate in the CAPM analysis.

---

141 Direct Testimony of Ann E. Bulkley, at 58-59.

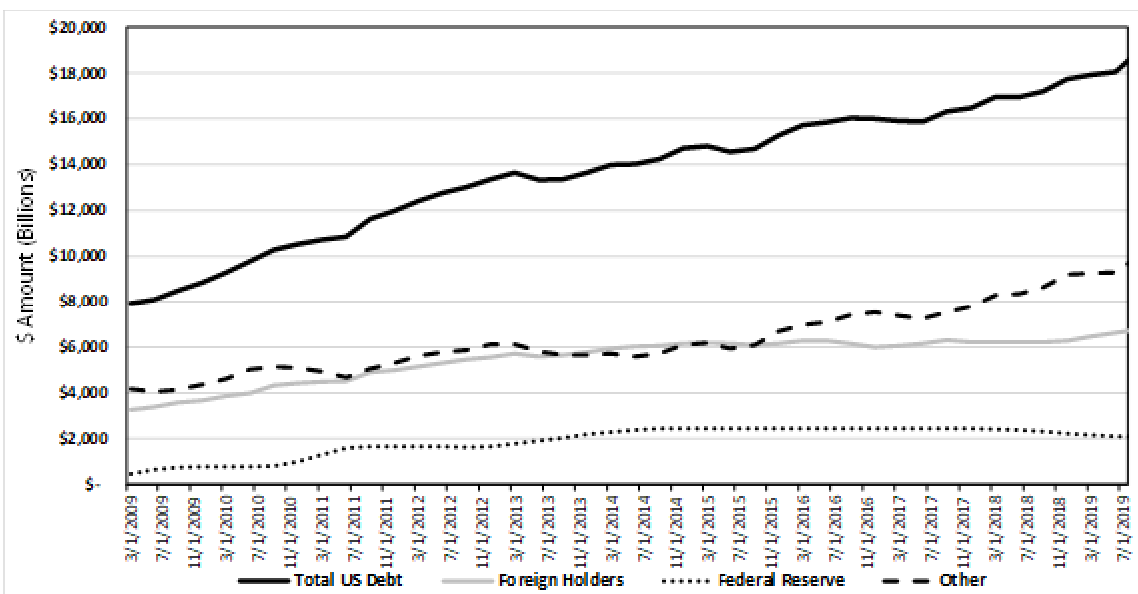
**Q. Do you have any other concerns with the risk-free rate that Dr. Chattopadhyay uses in CAPM analysis?**

A. Yes. I also disagree with Dr. Chattopadhyay's exclusive reliance on the current average Treasury bond yield as the risk-free rate. As show in Figure 15 below, the percentage of private sector investors who own the U.S. debt has been increasing since 2009. Private investors are more price sensitive and more likely to respond to changes in the market. This is exactly what has occurred over the last six months of 2019. As shown in Figure 16, investors have responded to both positive and negative developments regarding the trade dispute with China as well as policy announcements from the Federal Reserve. As a result, the yield on the 10-year Treasury Bond has fluctuated between 1.50 percent and 2.00 percent between July and December 2019. Furthermore, while the concerns over the trade dispute between the U.S. and China have subsided, there have been a number of other external events that have resulted in continued volatility in the markets. As Mohamed El-Erian, former CEO of PIMCO, recently noted the market has reacted to a number of recent external events, which have resulted in a short sell-off period followed by a period where investors look to buy the low point in the market.[142] The increased volatility in the market directly affects the 30-day historical average of Treasury Bond yields.

[142] El-Erian, Mohamed. "Markets Are Getting Used to Shocks But Mask Risks: The Reaction to the Coronavirus Follows a Pattern That Obscures Long-Term Challenges." Bloomberg.com, Bloomberg, 27 Jan. 2020, www.bloomberg.com/opinion/articles/2020-01-27/coronavirus-markets-are-getting-used-to-shocks-but-mask-risks?srnd=opinion.

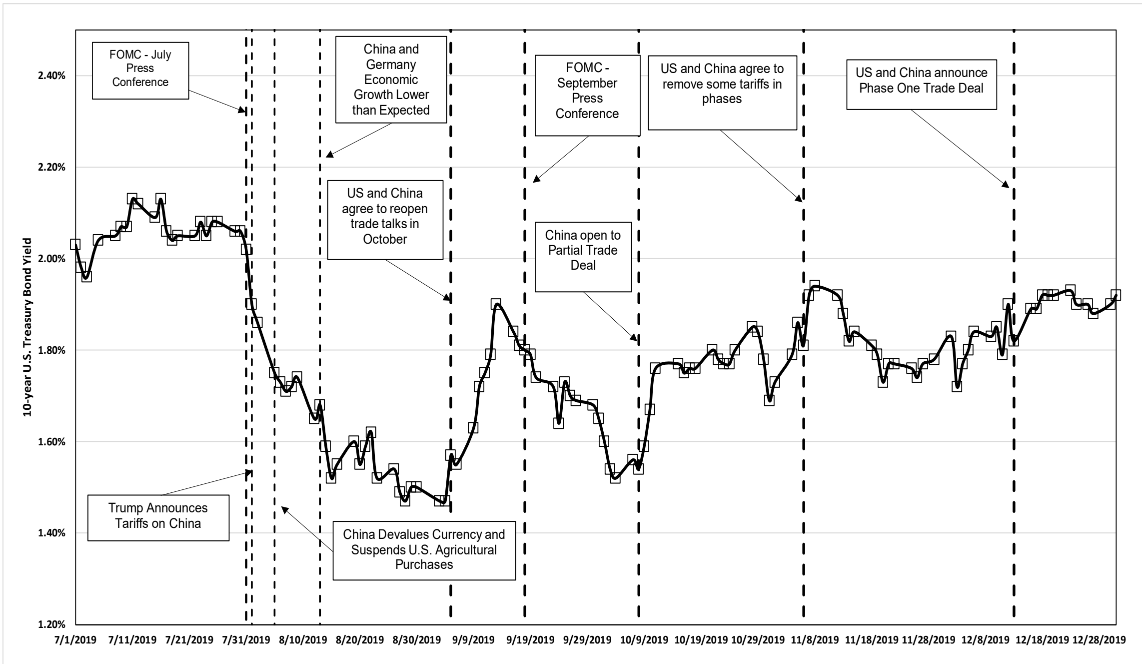
Moreover, as Dr. Chattopadhyay confirmed in his response to Eversource 1-013, the cost of equity is being estimated for the forward-looking period when PSNH's rates will be in effect. Therefore, it is equally important that the risk-free rate be reflective of the expected risk-free rate during PSNH's rate period. Given that the market volatility is largely related to short-term market events, it is unreasonable to assume that current market conditions will be reflective of the market conditions that will exist in the future. Therefore, I believe it is more appropriate to rely on forward-looking interest rates that are expected to prevail during the period that the Company's rates will be in effect.

**Figure 15: Ownership of U.S. Debt – 2009 - 2019[143]**




143 Bloomberg Professional, Data through December 31, 2019.

**Figure 16: 10-year Treasury Bond Yield**




**Q. Please explain why you disagree with Dr. Chattopadhyay's sole reliance on Value Line Betas.**

A. As explained in my response to Dr. Woolridge, I do not believe it is appropriate to rely exclusively on Betas from Value Line at this time because they are based on five years of historical returns. The five-year period used by Value Line has been disproportionately affected by the passage of the TCJA which caused a short-term dislocation in the relationship between utilities and the broader market. As discussed in my Direct Testimony, I also used Bloomberg Betas based on ten years of historical returns to mitigate the effect of the TCJA.[144] A longer time period such as ten years will reduce the effect of a short-term dislocation in the market like

[144] Direct Testimony of Ann E. Bulkley, at 60-62.

the TCJA. This adjustment is appropriate because the TCJA did not result in a fundamental shift in the financial relationship between utilities and the broader market and therefore is not reflective of the forward-looking investment risk for utilities.

**Q. How does Dr. Chattopadhyay calculate the market risk premium used in his CAPM?**

A. Dr. Chattopadhyay's calculation of the market risk premium is based on a market return estimated using a DCF analysis with projected growth rates for the S&P 500 companies from Value Line. Dr. Chattopadhyay calculates the CAPM result using three estimates of the forward-looking market return based on: 1) only data for the dividend paying stocks in the S&P 500 and earnings growth rates; 2) only data for dividend paying stocks and an average of earnings, dividends and book value growth projections; and 3) data for all stock in the S&P 500 and earnings growth rates. The range of projected market returns is between 12.01 percent and 14.39 percent.[145]

**Q. Please discuss your concern with Dr. Chattopadhyay's calculation of the market risk premium.**

A. In two of the three estimates of the forward-looking market return, Dr. Chattopadhyay has inappropriately excluded the data for non-dividend paying companies in the S&P 500. This assumption is not consistent with the information

145 Direct Testimony of Dr. Pradip K. Chattopadhyay, at 37.

considered by investors and is inconsistent with the overall return on the market. As discussed in my response to Dr. Woolridge, S&P reports a dividend yield and projected earnings growth rate for the S&P 500. The dividend yield and projected earnings growth rate published by S&P include the information of all companies in the S&P 500 index. Individual companies are not excluded because they do not pay a dividend. This is important because investors rely on this information when developing their return expectations for the market. Therefore, investors consider the data of both non-dividend and dividend paying companies in their estimates of the market return.

Furthermore, in one of his forward-looking market return estimates, Dr. Chattopadhyay has relied on the average of projected earnings, dividend and book value growth rates. I do not agree with the inclusion of projected dividend and book value per share growth rates from Value Line for the same reasons discussed in my response to the growth rates Dr. Chattopadhyay uses in his Constant Growth DCF analysis. Thus, I believe that the Commission should only consider Dr. Chattopadhyay's forward-looking market return of 14.39 percent which relies on earnings growth rates and includes the data for both dividend and non-dividend paying companies.

**Q. Have you adjusted Dr. Chattopadhyay's CAPM analysis?**

A. Yes. Specifically, I adjusted Dr. Chattopadhyay's CAPM analysis to reflect: (a) the average projected 30-year U.S. Treasury bond yield for 2020 Q1 through 2021 Q1 of 2.36 percent;[146] (b) Bloomberg Betas using ten-years of weekly returns; and (c) Dr. Chattopadhyay's market return including data for non-dividend paying companies and earnings growth rates. As shown in Attachment AEB-Rebuttal-6, by making the appropriate changes to Dr. Chattopadhyay's CAPM analysis, the mean ROE result is 9.96 percent which is an increase of 96 to 222 basis points over the CAPM range developed by Dr. Chattopadhyay of 7.74 to 9.00 percent.

**Q. Please summarize your conclusions regarding Dr. Chattopadhyay's CAPM analysis.**

A. The results of Dr. Chattopadhyay's CAPM analysis are substantially lower than recent authorized ROEs for electric utilities, primarily due to his sole reliance on historical yields on 10-year Treasury bonds as the risk-free rate and his reliance on Beta coefficients from Value Line, which do not take into consideration the long-term relationship between utility returns and the broader market. In addition, Dr. Chattopadhyay has produced estimates of the forward-looking market risk premium which exclude data for non-dividend paying companies and rely on DPS and BVPS growth rates for the S&P 500 companies. These assumptions tend to understate investors' expectations for the total market return. Finally, as shown in Attachment AEB-Rebuttal-6, making the appropriate changes to Dr. Chattopadhyay's CAPM analysis, results in an ROE estimate of 9.96 percent. For all of these reasons, Dr. Chattopadhyay's CAPM analysis cannot be used to

[146] Blue Chip Financial Forecasts, Vol. 38, No. 11, November 1, 2019, at 2.

establish the authorized ROE for PSNH or to check the reasonableness of his DCF results.

### E. Outlier Screen

**Q. Please describe the outlier screens that Dr. Chattopadhyay has developed to exclude high and low results from his ROE analysis.**

A. Dr. Chattopadhyay has developed two approaches to identify outliers. First, he excludes results that are more than plus or minus two times the standard deviation. Second, he excludes ROE estimates that are less than or equal to the recent yield on Utility A preferred stocks (i.e., 5.99 percent) plus 50 basis points.[147]

**Q. Dr. Chattopadhyay expresses concern that you have only included a low outlier screen and contends that OCA's approach to outliers is "better informed by current market realities". What is your response?**

A. It is important to note that while Dr. Chattopadhyay applied a statistical screen based on the mean and standard deviation of the proxy group results, no individual company results were excluded from the analysis using his statistical screen. The individual company DCF results that were excluded were removed as a result of Dr. Chattopadhyay's risk premium screen which similar to my low-end screen acknowledges that the return on common equity must provide a reasonable risk premium to compensate investors for the additional risk of an equity investment. As discussed in my Direct Testimony, my outlier screen is based on a risk premium above the Baa-rated utility bond yield, which is similar to his screen that is based

147 Direct Testimony of Dr. Pradip K. Chattopadhyay, at 31.

on 50 basis points above the yield on utility preferred shares. Both his approach and mine take into consideration recent yields on either utility debt or preferred shares in order to establish a minimum return that might be acceptable to investors in utility common shares.

### F. Bond Yield Plus Risk Premium Analysis

**Q. Did Dr. Chattopadhyay perform a Bond Yield Plus Risk Premium analysis?**

A. No, he did not. However, he did express several concerns with my Risk Premium analysis. In particular, Dr. Chattopadhyay contends that it is inappropriate to use historical data on allowed returns and Treasury yields to inform the cost of equity estimate. In addition, he argues that to the extent allowed returns have captured the price appreciation resulting from greater divergence between allowed returns and the true cost of equity, the risk premium method is susceptible to the same problem as the CAPM approach.[148]

**Q. Do you share these concerns with the Risk Premium method?**

A. No, I do not. As explained in my Direct Testimony, my Risk Premium analysis is based on a regression analysis of the historical spread between authorized ROEs for electric utilities and the corresponding yield on 30-year U.S. Treasury bonds in the same quarter as the ROE decision was issued. This analysis results in a regression equation that can be used to estimate the ROE at varying levels of

---

[148] *Id.*, at 15.

government bond yields. Therefore, I do not agree that the Risk Premium method that I have developed is backward-looking, as Dr. Chattopadhyay suggests.

The second concern that Dr. Chattopadhyay expresses with my Risk Premium analysis relates to the authorized ROEs for electric utilities being higher than the true cost of equity for these companies. As discussed in greater detail in my response to Dr. Chattopadhyay's Constant Growth DCF analysis, I do not believe that high market-to-book ratios have resulted in ROE results that exceed the true cost of equity.

### G. Flotation Costs

**Q. Please summarize Dr. Chattopadhyay's position on flotation costs.**

A. Dr. Chattopadhyay rejects my proposed adjustment for flotation costs primarily because of the fact that the M/B ratio for the proxy group companies is higher than 1.0. According to Dr. Chattopadhyay, these high valuations obviate the need for an explicit flotation cost adjustment.[149]

**Q. What is your response to Dr. Chattopadhyay's testimony on this issue?**

A. I do not agree with Dr. Chattopadhyay that the high valuations of the proxy group companies suggest that flotation costs should not be included in the authorized ROE for PSNH in this proceeding. As discussed in my response to Dr. Woolridge, the need to recover flotation costs does not depend on the market-to-book ratios for the

[149] *Id.*, at 33.

proxy group. Flotation costs are real costs that are incurred by the utility, and which should be recovered through rates by way of an adjustment to the authorized ROE. Disallowance of these costs results in PSNH not having a reasonable opportunity to earn its authorized ROE.

### H. Other Issues

**Q. Has Dr. Chattopadhyay presented a similar ROE analysis in other previous rate cases?**

A. Yes, Dr. Chattopadhyay's ROE analysis in this case is very similar to the testimony he filed on behalf of the Minnesota Office of the Attorney General in in a 2013 rate case involving CenterPoint Energy's gas distribution business in Minnesota.[150]

**Q. Was his testimony and recommendation in that 2013 case accepted by the Commission in Minnesota?**

A. No, it was not. In fact, the witness for the Department of Commerce (which is equivalent to Staff) rejected many of these same arguments put forth by Dr. Chattopadhyay in that CenterPoint case, and the Administrative Law Judge's recommended decision specifically rejected Dr. Chattopadhyay's testimony on many of these same issues, including high market-to-book ratios, the use of dividend per share and book value per share growth rates in the DCF model, the

---

150 See, CenterPoint Energy Resources Corp., Docket No. G008/GR-13-316, Direct Testimony and Exhibits of Pradip Chattopadhyay, November 26, 2013.

use of 10-year Treasury bonds in the CAPM, and his failure to make an adjustment for flotation costs.[151]

**Q. Has Dr. Chattopadhyay provided any testimony on capital market conditions in this proceeding?**

A. No. Dr. Chattopadhyay has not discussed capital market conditions such as the level of interest rates, as well as factors that are currently influencing those interest rates, such as the accommodative monetary policy of the Federal Reserve and global events including the trade dispute between the U.S. and China, the ongoing tensions with Iran and North Korea and the Coronavirus in China. In addition, Dr. Chattopadhyay has not provided any evidence to support his view that long-term interest rates are being set by the supply and demand of market participants rather than heavily influenced by Federal Reserve purchases of long-term government bonds. These are important omissions. Absent the context of capital market conditions, Dr. Chattopadhyay's comments regarding the high market-to-book ratios for electric utilities provide no meaningful information to the Commission.

**Q. Please comment on Dr. Chattopadhyay's assertion that economic growth in New Hampshire is stronger than the national average and stronger than the growth rate in the states served by the companies in his proxy group.[152]**

A. Dr. Chattopadhyay's statement is based on the economic growth rate of 3.5 percent in New Hampshire for the 12-months ending August 2019 as compared to 2.85

---

[151] See, CenterPoint Energy Resources Corp., Docket No. G008/GR-13-316, Direct Testimony and Exhibits of Eilon Amil, December 23, 2013; CenterPoint Energy Resources Corp., Docket No. G008/GR-13-316, Administrative Law Judge's Recommended Decision, April 9, 2014.

[152] Direct Testimony of Dr. Pradip K. Chattopadhyay, at 25-26.

percent for the U.S. over the same period. He also analyzes economic growth data from the Federal Reserve of Philadelphia in the 39 states covered by the companies in his proxy group. However, Dr. Chattopadhyay's analysis is not specific to the service territory for each operating utility. As such, it is possible that economic conditions may not be uniform across an entire state, with some regions growing more slowly than average while others are expanding at a faster rate. Dr. Chattopadhyay has not provided sufficient evidence to demonstrate that economic conditions in New Hampshire are substantially stronger than the rest of the country or than the service territories of the operating utilities in his proxy group, and, even if that there found to be true, his analysis is based on historical economic growth rather than projected growth over the period during which the rates for PSNH will be in effect.

**Q. Did Dr. Chattopadhyay present any evidence or analysis regarding the relative risk of PSNH and the companies in his proxy group?**

A. No, Dr. Chattopadhyay did not present an assessment of the business, regulatory or financial risk of PSNH as compared to his proxy group companies. Rather, he simply chooses the average results of his three DCF models as his recommended ROE for PSNH without regard to whether PSNH has greater risk than the proxy group companies.

**Q. Did Dr. Chattopadhyay present any evidence or analysis that would support a reduction in the authorized ROE for PSNH from 9.67 percent to 8.27 percent?**

A. No, Dr. Chattopadhyay has not explained why the long-term cost of equity for PSNH would have declined by 140 basis points since the Commission approved the Company's current authorized ROE of 9.67 percent. In addition, he has not offered any testimony or evidence to demonstrate that PSNH's risk has declined in any meaningful way since the previous rate case. Therefore, his conclusion that an authorized ROE of 8.27 percent is just and reasonable for PSNH is not supported by any evidence in this proceeding other than the mean results of his DCF model, which is being distorted by current market conditions that are not expected to be sustained over the period during which the rates set in this proceeding will be in effect.

## VI. RESPONSE TO WAL-MART WITNESS MR. CHRISS

**Q. Please summarize the ROE testimony of Mr. Chriss.**

A. Mr. Chriss does not conduct an ROE analysis and does not provide a specific ROE recommendation for PSNH in this proceeding. Rather, Mr. Chriss urges the Commission to consider the effect on the Company's revenue requirement and customer rates of the proposed ROE. By way of evidence, Mr. Chriss provides data from Regulatory Research Associates on authorized returns for electric utilities in other jurisdictions from 2016-2019. Specifically, Mr. Chriss provides average returns in each year for all electric utilities and for T&D only utility companies. The comparable return data provided by Mr. Chriss is consistent with data I used to create Figure 2 in my Rebuttal Testimony. Mr. Chriss notes that the proposed ROE of 10.40 percent for PSNH, which is within the range of results presented in my Direct Testimony, exceeds the ROEs awarded by this Commission in 2016 through 2019, and recently authorized ROEs across the country

**Q. What is your response to Mr. Chriss' testimony?**

A. With respect to Mr. Chriss' observation that the recommended ROE for PSNH is higher than returns authorized by this Commission and other regulatory jurisdictions across the nation, while I agree with Mr. Chriss that recently authorized ROEs are a useful benchmark that investors use to develop their return requirements, I also believe that current and expected economic and capital market conditions need to be considered to understand investors' required return on a forward-looking basis. As shown in Figure 8, the average P/E ratio for the companies in the proxy group has reached historically high levels, indicating that the current valuations may not be sustainable. For example, Value Line is projecting that the P/E ratios for the companies in the proxy group will decline from current levels over the period from 2022 through 2024. This projected decline in utility share prices results in a corresponding increase in the dividend yields of these utility companies and thus ROE estimates from models such as the DCF also increase. Therefore, it is reasonable to expect that ROE awards and investors' return requirements will be increasing from current levels. Further, if the Commission finds recently authorized ROEs to be a useful benchmark in this proceeding, my ROE recommendation of 10.40 percent is within the range of authorized ROEs shown in Figure 2.

**Q. Mr. Chriss also contends that PSNH's proposed DRAM, if approved by the Commission, serves to lower the Company's risk profile and regulatory lag. What is your response?**

A. While I agree that the Distribution Rate Adjustment Mechanism ("DRAM"), if approved, would reduce PSNH's regulatory lag, the Company's current Reliability Enhancement Program ("REP") was scheduled to expire on July 1, 2019. Further, as discussed in my Direct Testimony and as shown on Attachment AEB-11, 28 percent of the operating companies held by my proxy group have some form of capital cost recovery mechanism in place. If the DRAM is approved, PSNH's capital cost recovery risk would be similar to the proxy group companies. Absent the DRAM and assuming the REP expired, PSNH's regulatory risk would be higher than the proxy group companies. In addition, as discussed in my Direct Testimony, PSNH uses a historical test year adjusted for known and measurable changes, while 72 percent of the operating companies held by the proxy group provide service in jurisdictions that allow a partially or fully forecasted test year.[153]

[153] Direct Testimony of Ann E. Bulkley, at 73.

## VII. CONCLUSIONS AND RECOMMENDATIONS

**Q. Please summarize your conclusions and recommendations.**

A. I continue to support the analyses and recommendation contained in my Direct Testimony. Specifically, the range of reasonable ROE results for the proxy group companies is between 10.00 percent and 10.75 percent, and within that range, a return of 10.40 percent for PSNH balances the interests of customers and shareholders and preserves the Company's financial metrics which have clearly been a focus of the rating agencies for regulated utilities since the implementation of the TCJA. Nothing in the other ROE witnesses' testimony has caused me to change my view regarding the appropriate ROE or capital structure for PSNH. My testimony demonstrates that recent market conditions have been viewed by many market participants and regulators as unsustainable. Based on that and consistent with the recent conclusions of other regulators, my recommendation takes into consideration both the results of the DCF model and risk premium methodologies, specifically the forward-looking CAPM and Bond Yield Plus Risk Premium analyses. In addition, my recommendation considers other factors in determining the appropriate ROE, including company-specific risk factors, and the capital attraction standard. Further, the Company's proposed capital structure of 54.85 percent common equity, 41.98 percent long-term debt and 3.17 percent short-term debt is reasonable relative to the operating utility companies held by the proxy group companies and taking in consideration the effect of the TCJA on the cash flows of utilities and therefore should be adopted.

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

A. Yes, it does.