

August 9, 2019

VIA ELECTRONIC FILING AND OVERNIGHT DELIVERY

Ms. M. Lynn Jarvis
Chief Clerk
North Carolina Utilities Commission
430 N. Salisbury Street, Dobbs Building
Raleigh, North Carolina 27603

Re: Docket No. G-9, Sub 743

Dear Ms. Jarvis:

Piedmont hereby submits the following documents for filing in the above-captioned docket:

- 1) Rebuttal Testimony and Exhibit of Robert B. Hevert as to Attorney General Witness Woolridge
- 2) Rebuttal Testimony of Bruce P. Barkley

Piedmont is also providing, by overnight delivery, fifteen (15) paper copies of this testimony in accordance with Commission Rule R 1-28(e)(1).

Thank you for your assistance with this matter. If you have any questions regarding this filing, you may reach me at the number shown above.

Sincerely,

/s/ James H. Jeffries IV
James H. Jeffries IV

JHJ/sko

cc: Beth Culpepper
Bruce Barkley
Brian Heslin
James West
Robert Page
Warren Hicks
Joe Eason
Margaret Force

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the attached is being served this date upon all of the parties to this docket electronically or by depositing a copy of the same in the United States Mail, First Class Postage Prepaid, at the addresses contained in the official service list in this proceeding.

This the 9th day of August, 2019.

/s/ James H. Jeffries IV
James H. Jeffries IV

**BEFORE THE NORTH CAROLINA UTILITIES COMMISSION
DOCKET NO. G-9, SUB 743**

In the Matter of:)	
)	
Application of Piedmont Natural Gas)	REBUTTAL TESTIMONY OF
Company, Inc. for Adjustment of Rates)	ROBERT B. HEVERT FOR
and Charges Applicable to Gas Service in)	PIEDMONT NATURAL GAS
North Carolina)	COMPANY, INC.

1 **I. WITNESS IDENTIFICATION AND QUALIFICATIONS**

2 **Q. PLEASE STATE YOUR NAME, AFFILIATION AND BUSINESS**
3 **ADDRESS.**

4 A. My name is Robert B. Hevert. I am a Partner of ScottMadden, Inc. My business
5 address is 1900 West Park Drive, Suite 250, Westborough, Massachusetts 01581.

6 **Q. ARE YOU THE SAME ROBERT HEVERT THAT SUBMITTED DIRECT**
7 **TESTIMONY IN THIS PROCEEDING?**

8 A. Yes, I submitted Direct Testimony before the North Carolina Utilities Commission
9 ("Commission") on behalf of Piedmont Natural Gas Company, Inc.
10 ("Piedmont" or the "Company").

11 **Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?**

12 A. My Rebuttal Testimony responds to the direct testimony of Dr. J. Randall
13 Woolridge, in particular his ROE recommendation. My testimony also updates
14 many of the analyses contained in my Direct Testimony, and provides several
15 additional analyses developed in response to Dr. Woolridge. The conclusions
16 discussed throughout my Rebuttal Testimony are supported by the data and
17 analyses presented in Exhibit RBH-R-1, which has been prepared by me or
18 under my direction.

1 **II. RESPONSE TO ATTORNEY GENERAL WITNESS DR. WOOLRIDGE**

2 **Q. PLEASE PROVIDE A SUMMARY OVERVIEW OF YOUR RESPONSE TO**
3 **DR. WOOLRIDGE.**

4 A. It is important to keep in mind that no financial model is more reliable than all
5 others at all times, and under all market conditions. At times, certain models'
6 assumptions become incompatible with market conditions, and their results do not
7 make practical sense. Consequently, we cannot always take model results as given,
8 and assume their results are reasonable measures of the Cost of Equity. Rather, we
9 should apply reasoned judgment in vetting model assumptions, and in assessing the
10 reasonableness of their results.

11 In this proceeding, Dr. Woolridge has given considerable weight to the
12 Constant Growth Discounted Cash Flow method,¹ even though his results fall well
13 below returns recently authorized for other natural gas utilities.² Table 1 (below)
14 summarizes our respective ROE recommendations.

15 **Table 1: Summary of ROE Recommendations**

Witness	ROE Range		ROE Recommendation
	Low	High	
Dr. Woolridge (AG)	7.60%	8.70%	8.70%/9.00% ³
Mr. Hevert (Piedmont)	10.00%	11.00%	10.60%

16

¹ Dr. Woolridge's 8.70 percent recommendation equals his DCF estimate. See, Exhibit JRW-8.

² Source: Regulatory Research Associates.

³ Dr. Woolridge offers an alternative ROE of 8.70 percent if the Commission accepts the Company's proposed capital structure.

1 **Q. IS THE PRINCIPAL USE OF A SINGLE METHOD COMMON IN**
2 **FINANCIAL THEORY AND PRACTICE?**

3 A. No, it is not. Considering multiple methods is a more robust approach, less
4 susceptible to the limitations of any one particular model and its underlying
5 assumptions. The Constant Growth Discounted Cash Flow (“DCF”), Capital Asset
6 Pricing Model (“CAPM”),⁴ Risk Premium, and Expected Earnings methods
7 provide alternative perspectives and capture different aspects of investor behavior.
8 Each perspective is important, especially when we consider that models are meant
9 to estimate an unobservable parameter (the Cost of Equity), that is set by the buying
10 and selling behavior of investors whose decisions are motivated by any number of
11 factors. We cannot assume one model reasonably captures all motivating factors,
12 for all investors, under all market conditions, at all times. As Dr. Roger Morin
13 notes:

14 Each methodology requires the exercise of considerable judgment
15 on the reasonableness of the assumptions underlying the
16 methodology and on the reasonableness of the proxies used to
17 validate the theory. The inability of the DCF model to account for
18 changes in relative market valuation, discussed below, is a vivid
19 example of the potential shortcomings of the DCF model when
20 applied to a given company. Similarly, the inability of the CAPM
21 to account for variables that affect security returns other than beta
22 tarnishes its use.

23 No one individual method provides the necessary level of precision
24 for determining a fair return, but each method provides useful
25 evidence to facilitate the exercise of an informed judgment.
26 Reliance on any single method or preset formula is inappropriate
27 when dealing with investor expectations because of possible

⁴ Including the Empirical CAPM, or “ECAPM”.

1 measurement difficulties and vagaries in individual companies'
2 market data.⁵

3 Professor Eugene Brigham recommends the CAPM, DCF, and Bond Yield Plus

4 Risk Premium approaches:

5 Three methods typically are used: (1) the Capital Asset Pricing
6 Model (CAPM), (2) the discounted cash flow (DCF) method, and
7 (3) the bond-yield-plus-risk-premium approach. These methods are
8 not mutually exclusive – no method dominates the others, and all
9 are subject to error when used in practice. Therefore, when faced
10 with the task of estimating a company's cost of equity, we generally
11 use all three methods and then choose among them on the basis of
12 our confidence in the data used for each in the specific case at hand.⁶

13 Similarly, Dr. Morin (quoting, in part, Professor Stewart Myers), stated:

14 Use more than one model when you can. Because estimating the
15 opportunity cost of capital is difficult, only a fool throws away
16 useful information. That means you should not use any one model
17 or measure mechanically and exclusively. Beta is helpful as one
18 tool in a kit, to be used in parallel with DCF models or other
19 techniques for interpreting capital market data.

20 ***

21 While it is certainly appropriate to use the DCF methodology to
22 estimate the cost of equity, there is no proof that the DCF produces
23 a more accurate estimate of the cost of equity than other
24 methodologies. Sole reliance on the DCF model ignores the capital
25 market evidence and financial theory formalized in the CAPM and
26 other risk premium methods. The DCF model is one of many tools
27 to be employed in conjunction with other methods to estimate the
28 cost of equity. It is not a superior methodology that supplants other
29 financial theory and market evidence. The broad usage of the DCF
30 methodology in regulatory proceedings in contrast to its virtual
31 disappearance in academic textbooks does not make it superior to
32 other methods. The same is true of the Risk Premium and CAPM
33 methodologies.⁷

⁵ Roger A. Morin, New Regulatory Finance, Public Utility Reports, Inc., 2006, at 428.

⁶ *Ibid.*, at 430 – 431, citing Eugene Brigham, Louis Gapenski, Financial Management: Theory and Practice, 7th Ed., 1994, at 341.

⁷ Roger A. Morin, New Regulatory Finance, Public Utility Reports, Inc., 2006, at 430–431.

1 Put another way, the models used to estimate the Cost of Equity are general
2 descriptions of investor behavior, not precise definitions of it. Investors appreciate
3 that strict adherence to a single approach, or to the specific results of a single
4 approach, may lead to flawed or misleading conclusions. That position is consistent
5 with the *Hope* and *Bluefield* principle that it is the analytical result, as opposed to
6 the method employed, that is controlling in arriving at just and reasonable rates. In
7 my view, the Commission's practice of considering multiple methods, giving less
8 weight to models that produce unduly low (or high) results is consistent with theory
9 and practice, and should be maintained in this proceeding.

10 **Q. HAVE OTHER REGULATORY COMMISSIONS RECOGNIZED THE**
11 **IMPORTANCE OF CONSIDERING MULTIPLE METHODS IN SETTING**
12 **AUTHORIZED ROES?**

13 A. Yes. For example, in Baltimore Gas and Electric Company's 2016 rate case, the
14 Maryland Public Service Commission discussed the importance of considering
15 multiple analytical methods given the complexity of determining the investor-
16 required ROE:

17 The ROE witnesses used various analyses to estimate the
18 appropriate return on equity [...] including the DCF model, the
19 IRR/DCF, the traditional CAPM, the ECAPM, and risk premium
20 methodologies. Although the witnesses argued strongly over the
21 correctness of their competing analyses, we are not willing to rule
22 that there can be only one correct method for calculating an ROE.
23 Neither will we eliminate any particular methodology as unworthy
24 of basing a decision. The subject is far too complex to reduce to a
25 single mathematical formula. That conclusion is made apparent, in
26 practice, by the fact that the expert witnesses used discretion to
27 eliminate outlier returns that they testified were too high or too low

1 to be considered reasonable, even when using their own preferred
2 methodologies.⁸

3 **Q. HAS THE COMMISSION LIKEWISE EXPRESSED CONCERN WITH**
4 **DCF MODEL RESULTS?**

5 A. Yes, in its July 2017 *Order Accepting Stipulation* authorizing a 9.90 percent ROE
6 for Duke Energy Carolinas, the Commission noted it “carefully evaluated the DCF
7 analysis recommendations” of the ROE witnesses (which ranged from 8.45 percent
8 to 8.80 percent) and determined that “all of these DCF analyses in the current
9 market produce unrealistically low results.”⁹

10 **Q. IS IT YOUR VIEW THAT THE DCF MODEL SHOULD BE GIVEN NO**
11 **WEIGHT IN DETERMINING THE COMPANY’S COST OF EQUITY?**

12 A. No, it is not. It is my view, however, that we should carefully consider the range of
13 results all models produce. As discussed later in my Rebuttal Testimony, doing so
14 fully supports my ROE range and recommendation.

15 **Q. PLEASE NOW BRIEFLY SUMMARIZE DR. WOOLDRIDGE’S ROE**
16 **ANALYSES AND RECOMMENDATIONS.**

17 A. Dr. Woolridge finds the Company’s ROE likely falls in the range of 7.60 percent to
18 8.70 percent, but recommends an ROE of 9.00 percent to reflect “a small increase

⁸ In the matter of the application of Baltimore Gas and Electric Company for adjustments to its electric and gas base rates, Public Service Commission of Maryland, Case No. 9406, Order No. 87591, at 153. Citations omitted.

⁹ State of North Carolina Utilities Commission, Docket No. E-7, Sub 1146, In the Matter of Application of Duke Energy Carolinas, LLC, for Adjustment of Rates and Charges Applicable to Electric Utility Service in North Carolina, Order Accepting Stipulation, Deciding Contested Issues, and Requiring Revenue Reduction, July 25, 2017.

1 in risk associated with [his] adjustment of the proposed capital structure”.¹⁰ If the
2 Commission accepts the Company’s proposed capital structure, Dr. Woolridge
3 believes the ROE should fall to 8.70 percent.¹¹ In each case, Dr. Woolridge’s
4 recommendation is based on his Constant Growth DCF, and CAPM analyses.

5 **Q. WHAT ARE THE SPECIFIC AREAS IN WHICH YOU DISAGREE WITH**
6 **DR. WOOLRIDGE’S ANALYSES AND RECOMMENDATIONS?**

7 A. There are several areas in which I disagree with Dr. Woolridge, including: (1) the
8 overall reasonableness of Dr. Woolridge’s ROE recommendation; (2) Dr.
9 Woolridge’s application of the Constant Growth DCF model; (3) Dr. Woolridge’s
10 application of the CAPM; (4) the reasonableness of the Bond Yield Plus Risk
11 Premium analysis; (5) Dr. Woolridge’s position that the Expected Earnings
12 approach is not an accurate measure of investor expectations; (6) the relevance of
13 Market-to-Book (“M/B”) ratios in determining the ROE; (7) Dr. Woolridge’s
14 position that the Company is less risky than its peers; (8) the application of a
15 flotation cost adjustment; and (9) the risks associated with the Company’s projected
16 capital expenditures. Lastly, although we review similar data and come to similar
17 conclusions regarding economic conditions in North Carolina, I have some
18 concerns with Dr. Woolridge’s assessment of the effect of his ROE
19 recommendation on the Company’s revenue requirement.

¹⁰ Direct Testimony of J. Randall Woolridge, PhD, at 2.

¹¹ *Ibid.*

Recommended ROE

Q. IS DR. WOOLRIDGE'S 9.00 PERCENT ROE RECOMMENDATION CONSISTENT WITH RETURNS RECENTLY AUTHORIZED IN NORTH CAROLINA?

A. No, it is not. The lowest authorized return for a natural gas utility in a base rate case by the Commission was 9.70 percent.¹² That return is 70 basis points above Dr. Woolridge's recommendation, 100 basis points above his recommendation assuming the Company's proposed capital structure is adopted, and 210 basis points above the low end of his range. Dr. Woolridge has provided no evidence to support the conclusion that the Company is so less risky than its peers that investors would accept a return 70 to 210 basis points below those authorized by the Commission.

Constant Growth DCF Model

Q. PLEASE SUMMARIZE YOUR CONCERNS WITH THE CONSTANT GROWTH DCF MODEL AND DR. WOOLRIDGE'S APPLICATION OF THE MODEL.

A. There are several practical concerns with Dr. Woolridge's application of the model, and his interpretation of its results. For example, Dr. Woolridge's approach includes a degree of subjectivity that prevents us from replicating the fundamental inputs that drive his results. Moreover, Dr. Woolridge's judgment is to give "primary weight"¹³ to growth rate projections produced by equity analysts, despite

¹² Since 2000. Source: Regulatory Research Associates.

¹³ Direct Testimony of J. Randall Woolridge, Ph.D., at 50.

1 his assertion that those analysts knowingly and persistently produce biased growth
2 rate forecasts.

3 **Q. WHAT GROWTH RATES DID DR. WOOLRIDGE REVIEW IN HIS**
4 **CONSTANT GROWTH DCF ANALYSIS?**

5 A. Dr. Woolridge reviewed a number of growth rates, including historical and
6 projected Dividends Per Share (“DPS”), Book Value Per Share (“BVPS”), and
7 Earnings Per Share (“EPS”) growth rates as reported by Value Line; analysts’
8 consensus EPS growth rate projections from Yahoo!, Reuters, and Zacks; and an
9 estimate of “Sustainable Growth” provided by Value Line.¹⁴ Dr. Woolridge states
10 that in arriving at his growth rate projections for the proxy group he gave “primary
11 weight” to projected EPS growth rates.

¹⁴ Exhibit JRW-8.

Table 2: Summary of Dr. Woolridge's Growth Rate Estimates¹⁵

	Dr. Woolridge's Proxy Group
Value Line Historical Growth Rates (DPS, BVPS, EPS)	6.20%
Value Line Projected Growth Rates (DPS, BVPS, EPS)	6.30%
Sustainable Growth	5.00%
Analyst Projected EPS Growth Rates (excl. Value Line) – Mean/Median	5.60% / 6.20%
Dr. Woolridge's Assumed DCF Growth Rate	6.00%

Q. PLEASE SUMMARIZE DR. WOOLRIDGE'S REFERENCE TO A MARCH 2015 REPORT BY MOODY'S REGARDING THE EFFECT OF AUTHORIZED ROEs ON UTILITIES' NEAR-TERM CREDIT PROFILES.

A. Dr. Woolridge points to that report and concludes lower authorized ROEs are not impairing utilities' credit profiles, and are not "detering them from raising record amounts of capital."¹⁶ He argues the Moody's article "supports the prevailing/emerging belief that lower authorized ROEs are unlikely to hurt the financial integrity of utilities or their ability to attract capital."¹⁷

Q. DO YOU AGREE WITH DR. WOOLRIDGE'S ASSESSMENT OF THAT ARTICLE?

A. No, I do not. The March 2015 Moody's article makes clear utilities' cash flow had benefited from increased deferred taxes, which themselves were due to bonus depreciation. In that report, Moody's noted the rise in deferred taxes eventually

¹⁵ *Ibid.*, at 49-50.; Exhibit JRW-8, at 1, 6.

¹⁶ Direct Testimony of J. Randall Woolridge, Ph.D., at 68.

¹⁷ *Ibid.*, at 69.

1 would reverse.¹⁸ In January 2018, Moody's spoke to the effect of that reversal on
2 utility credit profiles in the context of tax reform:

3 Tax reform is credit negative for US regulated utilities because the
4 lower 21% statutory tax rate reduces cash collected from customers,
5 while the loss of bonus depreciation reduces tax deferrals, all else
6 being equal. Moody's calculates that the recent changes in tax laws
7 will dilute a utility's ratio of cash flow before changes in working
8 capital to debt by approximately 150 - 250 basis points on average,
9 depending to some degree on the size of the company's capital
10 expenditure programs. From a leverage perspective, Moody's
11 estimates that debt to total capitalization ratios will increase, based
12 on the lower value of deferred tax liabilities.¹⁹

13 In June 2018, Moody's changed its outlook on the U.S. regulated sector to
14 "negative" from "stable". Moody's explained that its change in outlook
15 "...primarily reflects a degradation in key financial credit ratios, specifically the
16 ratio of cash flow from operations to debt, funds from operations ("FFO") to debt
17 and retained cash flow to debt, as well as certain book leverage ratios."²⁰ The
18 sector's outlook could remain "negative" if cash flow-based metrics continue to
19 decline, or if there emerge signs of a more "contentious" regulatory environment
20 (which, Moody's notes, is not fully reflected in lower authorized returns). Dr.
21 Woolridge's reference to a 2015 article does not consider Moody's more recent
22 position.

¹⁸ Moody's Investors Service, *Lower Authorized Returns Will Not Hurt Near-Term Credit Profiles*, March 10, 2015, at 4.

¹⁹ Moody's Investors' Service, *Rating Action: Moody's changes outlooks on 25 US regulated utilities primarily impacted by tax reform*, January 19, 2018.

²⁰ Moody's Investors Service, *Announcement: Moody's changes the US regulated utility sector outlook to negative from stable*, June 18, 2018.

1 **Q. DO YOU AGREE WITH DR. WOOLRIDGE’S POSITION THAT**
2 **ANALYSTS’ EARNINGS GROWTH PROJECTIONS ARE**
3 **CONSISTENTLY BIASED?**

4 A. No, I do not. Dr. Woolridge argues analysts’ earnings growth estimates are “overly
5 optimistic and upwardly biased”, and suggests relying on analysts’ estimates is a
6 methodological error.²¹ He further asserts “the DCF should also be adjusted
7 downward from the projected EPS growth rate to remove the upward bias...”²² Dr.
8 Woolridge’s position, however, is based on observations of the broad market; he
9 has provided no evidence that any of the growth rates used in my (or his) DCF
10 analyses are the result of a consistent and pervasive bias on the part of the analysts
11 providing those projections. Notably, despite his view that they are biased, it was
12 by “[g]iving primary weight to the projected EPS growth rate of Wall Street
13 analysts” that Dr. Woolridge arrived at his assumed growth rates.²³

14 **Q. WHAT IS YOUR RESPONSE TO DR. WOOLRIDGE ON THAT POINT?**

15 A. There is no reason to believe the analyst growth rates used in my DCF analyses are
16 biased. As a practical matter, the October 2003 Global Research Analyst Settlement
17 required financial institutions to insulate investment banking from analysis,
18 prohibited analysts from participating in “road shows,” and required the settling

²¹ Direct Testimony of J. Randall Woolridge, Ph.D., at 46.

²² *Ibid.*, at 47.

²³ *Ibid.*, at 50.

1 financial institutions to fund independent third-party research.²⁴ I have reviewed
2 the Letters of Acceptance, Waiver and Consent signed by financial institutions that
3 were party to the Global Settlement, and found no reference to misconduct by
4 analysts following the utility sector.

5 Moreover, pursuant to Regulation AC, which became effective in April
6 2003, analysts must certify that "...the views expressed in the report accurately
7 reflect his or her personal views, and disclose whether or not the analyst received
8 compensation or other payments in connection with his or her specific
9 recommendations or views."²⁵ I further understand industry practice is to avoid
10 conflicts of interest by ensuring that compensation is not directly or indirectly
11 linked to the opinions contained in those reports. Dr. Woolridge has not explained
12 why any of the analysts covering our respective proxy companies would bias their
13 projections despite those certification requirements.

14 **Q. IS THE USE OF ANALYSTS' EARNINGS GROWTH PROJECTIONS IN**
15 **THE DCF MODEL SUPPORTED BY FINANCIAL LITERATURE?**

16 A. Yes, it is. Several published articles support the use of analysts' earnings growth
17 projections in the DCF model. Dr. Robert Harris, for example, found financial
18 analysts' earnings forecasts (referred to in the article as "FAF") to be appropriate in

²⁴ The 2002 Global Financial Settlement resolved an investigation by the U.S. Securities and Exchange Commission and the New York Attorney General's Office of a number of investment banks related to concerns about conflicts of interest that might influence the independence of investment research provided by equity analysts.

²⁵ Securities and Exchange Commission, 17 CFR PART 242 [Release Nos. 33-8193; 34-47384; File No. S7-30-02], RIN 3235-AI60 Regulation Analyst Certification.

1 calculating the expected Market Risk Premium:²⁶

2 ... a growing body of knowledge shows that analysts' earnings
3 forecasts are indeed reflected in stock prices. Such studies typically
4 employ a consensus measure of FAF calculated as a simple average
5 of forecasts by individual analysts.²⁷

6 Dr. Harris further noted that:

7 Given the demonstrated relationship of FAF to equity prices and the
8 direct theoretical appeal of expectational data, it is no surprise that
9 FAF have been used in conjunction with DCF models to estimate
10 equity return requirements.²⁸

11 Similarly, in *Estimating Shareholder Risk Premia Using Analysts Growth*
12 *Forecasts*, Harris and Marston presented "estimates of shareholder required rates
13 of return and risk premia which are derived using forward-looking analysts' growth
14 forecasts."²⁹ As Harris and Marston reported:

15 ... in addition to fitting the theoretical requirement of being forward-
16 looking, the utilization of analysts' forecasts in estimating return
17 requirements provides reasonable empirical results that can be
18 useful in practical applications.³⁰

19 Here again, the finding was clear: Analysts' earnings forecasts are highly related to
20 stock price valuations and are appropriate inputs to stock valuation and ROE
21 estimation models.³¹

²⁶ See, Robert S. Harris, *Using Analysts' Growth Forecasts to Estimate Shareholder Required Rates of Return*, Financial Management, 1986, at 66.

²⁷ *Ibid.*, at 59.

²⁸ *Ibid.*, at 60.

²⁹ Robert S. Harris, Felicia C. Marston, *Estimating Shareholder Risk Premia Using Analysts' Growth Forecasts*, Financial Management, Summer 1992.

³⁰ *Ibid.*, at 63.

³¹ In the *Risk Premium Approach to Measuring a Utility's Cost of Equity*, published in Financial Management, Spring 1985, Brigham, Shome and Vinson noted that "evidence in the current literature indicates that (i) analysts' forecasts are superior to forecasts based solely on time series data; and (ii) investors do rely on analysts' forecasts."

1 **Q. DO YOU AGREE WITH DR. WOOLRIDGE’S POSITION THAT “THE**
2 **DCF SHOULD ALSO BE ADJUSTED DOWNWARD FROM THE**
3 **PROJECTED EPS GROWTH RATE TO REMOVE THE UPWARD**
4 **BIAS”?**³²

5 A. No. If current stock prices (and therefore the dividend yield) already reflect
6 analysts’ bias, it is unclear why it is necessary to adjust the growth rate. Although
7 Dr. Woolridge argues “...long-term earnings per share growth rate forecasts of Wall
8 Street securities analysts are overly optimistic and upwardly biased”³³ in general,
9 he has not demonstrated that to be true for the natural gas companies in the proxy
10 group. To that point, I reviewed quarterly earnings presentations of companies in
11 his proxy group and found analysts’ growth rate projections to be within, or even
12 toward the lower end if not below, the long-term growth rate ranges provided by
13 the companies’ management teams (*see*, Table 3, below). I therefore do not believe
14 the earnings projections included in our respective analyses are likely to be
15 systematically biased.

³² Direct Testimony of J. Randall Woolridge, Ph.D., at 47.

³³ *Ibid.*, at 72.

**Table 3: Analysts' Earnings Growth Projections
Relative to Management Presentations³⁴**

Company	Ticker	Zacks Earnings Growth	First Call Earnings Growth	Investor Presentation Earnings Growth Range
New Jersey Resources Corp.	NJR	7.00%	6.00%	6.00% - 8.00%
Northwest Natural Hold. Co.	NWN	4.50%	4.00%	3.00% - 5.00%
ONE Gas, Inc.	OGS	5.90%	5.00%	6.00% - 8.00%
South Jersey Industries, Inc.	SJI	7.20%	5.50%	6.00% - 8.00%

Q. PLEASE SUMMARIZE DR. WOOLRIDGE'S ARGUMENT THAT YOUR APPROACH LEADS TO "AN OVERSTATED EQUITY COST RATE."³⁵

A. Dr. Woolridge states that combining Zack's, First Call, and Value Line growth rates leads to an overstated EPS growth rate. He principally argues Value Line's estimates are overstated due to the use of a three-year based period, especially if that base period includes years with "abnormally high or low earnings."³⁶

Q. WHAT IS YOUR RESPONSE TO DR. WOOLRIDGE ON THAT POINT?

A. Although Dr. Woolridge criticizes specific growth rates he considers too high, he fails to consider the implications of individual growth rates that would be unsustainably low. For example, on page 15, footnote 13 of his Direct Testimony, Dr. Woolridge states "inflation remains low and is also in the 2.0% to 2.5% range". Yet, Value Line projects earnings growth of 2.50 percent for New Jersey Resources Corporation, and First Call projects earnings growth rate of 2.42 percent for Spire

³⁴ Source: Zacks, Yahoo! Finance, and individual company fourth quarter 2018, first quarter 2019, and second quarter 2019 investor presentations.

³⁵ See, Direct Testimony of J. Randall Woolridge, Ph.D., at 72.

³⁶ *Ibid.*, at 73.

1 Inc.³⁷ Because the Constant Growth DCF model assumes growth in perpetuity,
2 nominal growth rates in the range of 2.40 percent to 2.50 percent suggest modest,
3 or even negative real perpetual growth.³⁸ It is unlikely investors would commit
4 capital to an equity investment expected to contract (on a real basis) in perpetuity.
5 Consequently, if we are concerned with growth rates that may be considered too
6 high, we also should be concerned with those that are too low.

7 **Q. DO YOU AGREE WITH DR. WOOLRIDGE THAT DIVIDEND AND BOOK**
8 **VALUE GROWTH RATES ARE APPROPRIATE MEASURES OF**
9 **EXPECTED GROWTH FOR THE CONSTANT GROWTH DCF MODEL?**³⁹

10 A. No, EPS growth is the fundamental driver of the ability to pay dividends. As noted
11 in my Direct Testimony, to reduce growth to a single measure we assume a fixed
12 payout ratio, and a constant growth rate for EPS, DPS, and BVPS.⁴⁰ Exhibit RBH-
13 R-8 illustrates that, under the Constant Growth DCF model's strict assumptions,
14 earnings, dividends, book value, and stock prices all grow at the same, constant rate
15 in perpetuity.

³⁷ Exhibit (RBH-1).

³⁸ That is, those growth rates are only marginally above the 2.00 percent lower bound of the inflation rate Dr. Woolridge observes, and equal to or below the 2.50 percent upper bound.

³⁹ Direct Testimony of J. Randall Woolridge, Ph.D., at 42.

⁴⁰ Direct Testimony of Robert B. Hevert, at 61.

1 **Q. DO YOU AGREE WITH DR. WOOLRIDGE THAT HISTORICAL**
2 **GROWTH RATES ARE APPROPRIATE MEASURES OF EXPECTED**
3 **GROWTH FOR THE CONSTANT GROWTH DCF MODEL?⁴¹**

4 A. No, I do not. As Dr. Woolridge acknowledges, the growth component of the
5 Constant Growth DCF model is a forward-looking measure reflecting investors'
6 expectations of future growth.⁴² To the extent historical growth influences
7 expectations of future growth, it already will be reflected in analysts' consensus
8 earnings growth estimates. Carlton and Vander Weide found "overwhelming
9 evidence that consensus analysts' forecast of future growth is superior to
10 historically oriented growth measures in predicting the firm's stock price."⁴³
11 Consequently, I do not believe historical growth rates are appropriate for the
12 Constant Growth DCF model.

13 **Q. HAVE YOU UNDERTAKEN ANY ANALYSES TO DETERMINE WHICH**
14 **MEASURES OF GROWTH ARE STATISTICALLY RELATED TO THE**
15 **PROXY COMPANIES' STOCK VALUATION LEVELS?**

16 A. Yes, I have. My analysis is based on the methodological approach used by
17 Professors Carleton and Vander Weide, who compared the predictive capability of
18 historical growth estimates and analysts' forecasts on the valuation levels of sixty-
19 five utility companies.⁴⁴ I structured the analysis to understand whether projected

⁴¹ Direct Testimony of J. Randall Woolridge, Ph.D., at 42-43.

⁴² *Ibid.*, at 41-42.

⁴³ Vander Weide and Carleton, *Investor Growth Expectations: Analysts vs History*, The Journal of Portfolio Management (Spring 1988).

⁴⁴ *Ibid.*

1 earnings, dividend, book value, or retention growth rates best explain utility stock
2 valuations. In particular, my analysis examined the statistical relationship between
3 the Price/Earnings (“P/E”) ratios of the natural gas and electric utilities as classified
4 by Value Line, and the projected EPS, DPS, and BVPS growth rates as reported by
5 Value Line, as well as the historical EPS, DPS, and BVPS as reported by Value
6 Line. To determine which, if any, of those growth rates are statistically related to
7 utility stock valuations, I performed a series of regression analyses in which the
8 projected growth rates were explanatory variables and the P/E ratio was the
9 dependent variable. The results of those analyses are presented in Exhibit RBH-R-
10 9.

11 In that analysis, I performed nine separate regressions with the P/E as the
12 dependent variable, and historical EPS, DPS, and BVPS; and projected EPS, DPS
13 and BVPS, respectively, as the independent variable. I also performed a single
14 regression analysis that included all nine variables as potential explanatory
15 variables. I then reviewed the T- and F-Statistics to determine whether the variables
16 and equations were statistically significant.⁴⁵

17 **Q. WHAT DID THOSE ANALYSES REVEAL?**

18 A. As shown in Exhibit RBH-R-9, the only growth rate that was statistically significant
19 and positively related to the P/E ratio was projected Earnings Per Share. Because
20 EPS growth is the only growth rate that is both statistically and positively related

⁴⁵ In general, a T-Statistic of 2.00 or greater indicates that the variable is likely to be different than zero, or “statistically significant.” The F-Statistic is used to determine whether the model as a whole has statistically significant predictive capability.

1 to utility valuation, earnings is the proper measure of growth in the Constant
2 Growth DCF Model.

3 **Q. DO YOU HAVE ANY CONCERNS WITH DR. WOOLRIDGE'S**
4 **SPECIFICATION OF THE RETENTION GROWTH RATE?**

5 A. Yes, I do. The full form of the model assumes growth is a function of its expected
6 earnings, and the extent to which it retains earnings to invest in the enterprise. The
7 form of the model on which Dr. Woolridge relies is its simplest form, which defines
8 growth solely as a function of internally generated funds. As discussed in my Direct
9 Testimony, the full form of the Retention Growth model ($br + sv$) reflects growth
10 from internally generated funds and from issuances of equity.⁴⁶

11 **Capital Asset Pricing Model**

12 **Q. PLEASE BRIEFLY DESCRIBE DR. WOOLRIDGE'S CAPM ANALYSIS**
13 **AND RESULTS.**

14 A. Dr. Woolridge's CAPM analysis produces an estimated Cost of Equity of 7.60
15 percent.⁴⁷ I strongly disagree an estimate that low is a reasonable measure of the
16 Company's Cost of Equity. As discussed below, Dr. Woolridge's unduly low
17 CAPM estimate principally falls from his estimated Market Risk Premium.

18 Dr. Woolridge combines a risk-free rate of 4.00 percent and a Market Risk
19 Premium ("MRP") of 5.50 percent to the average Beta coefficient of his and my
20 proxy groups (0.65). In estimating the MRP, Dr. Woolridge reviews a series of

⁴⁶ Direct Testimony of Robert B. Hevert, at 65; Exhibit_(RBH-2).

⁴⁷ Direct Testimony of J. Randall Woolridge, Ph.D., at 64.

1 studies that calculate the MRP using different methods; he also considers the results
2 of his “Building Blocks” approach. Based on that review, Dr. Woolridge argues the
3 MRP ranges from 4.00 percent to 6.00 percent and, within that range, 5.50 percent
4 is reasonable.⁴⁸

5 **Q. DOES DR. WOOLRIDGE EXPRESS ANY CONCERNS REGARDING**
6 **YOUR CAPM ANALYSIS?**

7 A. Dr. Woolridge’s principal disagreements with my CAPM analysis include: (1) the
8 Market Risk Premium component of the model; and (2) the use of current, near-
9 term projected, and long-term projected Treasury yields that are abnormally high
10 relative to current yields.

11 **Q. PLEASE BRIEFLY SUMMARIZE DR. WOOLRIDGE’S CONCERNS**
12 **REGARDING YOUR USE OF EXPECTED MARKET RETURNS.**

13 A. Regarding the use of expected market returns, Dr. Woolridge suggests the result is
14 “excessive.”⁴⁹ Dr. Woolridge also points to the long-term EPS growth rates for the
15 S&P 500 based on the data from Bloomberg and Value Line, respectively, and notes
16 that they “are inconsistent with both historic and projected economic and earnings
17 growth in the U.S”.⁵⁰ To support his position that the expected market return
18 included in the CAPM analysis is overstated, Dr. Woolridge references MRPs
19 provided in academic studies, assumed by investment banks and management

⁴⁸ *Ibid.*, at 63.

⁴⁹ *Ibid.*, at 79.

⁵⁰ *Ibid.*, at 82.

1 consulting firms, and found in surveys of financial professionals.⁵¹

2 **Q. WHAT IS YOUR RESPONSE TO DR. WOOLRIDGE ON THOSE POINTS?**

3 A. Dr. Woolridge refers to two surveys of financial professionals in support of his MRP
4 and in defense of his critique that my estimates are excessive; the Duke Chief
5 Financial Officer (“Duke CFO”) survey and the Philadelphia Federal Reserve
6 Survey of Professional Forecasters.⁵² Looking to the Federal Bank of
7 Philadelphia’s First Quarter 2019 survey, only 16 of 38 participants responded to
8 the question regarding the expected return for the S&P 500 over the next ten years,
9 and 21 of 38 responded to the question regarding expected return on ten-year
10 Treasury bonds.⁵³

11 Even if all 38 economists provided expected market returns and Treasury
12 yields, Dr. Woolridge gives economists’ interest rate projections little weight, going
13 so far as to note that in a Bloomberg survey, “100% of the economists were
14 wrong.”⁵⁴ Yet, Dr. Woolridge gives economists’ forecasts of market returns and
15 GDP considerable weight in supporting his expected Market Risk Premium. It is
16 unclear why Dr. Woolridge finds economists’ estimates appropriate for his analyses,
17 but improper for mine.

18 As for the Duke CFO survey, Dr. Woolridge’s 9.00 percent ROE

⁵¹ *Ibid.*, at 79.

⁵² *Ibid.*, at 56-57.

⁵³ See, Federal Reserve Bank of Philadelphia, Survey of Professional Forecasters, First Quarter of 2019 at 19.

⁵⁴ Direct Testimony of J. Randall Woolridge, Ph.D., at 11. [emphasis included]

1 recommendation, which applies to a company that is less risky than the overall
 2 market,⁵⁵ is 279 basis points above the expected market return suggested by the
 3 survey results. If the survey were a reasonable method of determining the expected
 4 market return, Dr. Woolridge's ROE recommendation would be no higher than 6.21
 5 percent.⁵⁶ Lastly, over time the survey results have rather significantly
 6 underestimated actual market performance (*see*, Table 4, below).

7 **Table 4: S&P 500 Market Return: Accuracy of Survey Estimates⁵⁷**

	Actual	Survey Estimate
2018	-4.38%	6.57%
2017	21.83%	5.00%
2016	11.96%	4.32%
2015	1.38%	6.07%
2014	13.69%	5.00%
2013	32.39%	3.40%
2012	16.00%	4.00%
2011	2.11%	5.30%
2010	15.06%	6.28%
Average	12.23%	5.10%

8
 9 The Duke CFO Survey authors also have noted a distinction between the
 10 expected market return on one hand, and the "hurdle rate" on the other. In the Third
 11 Quarter 2017 survey, the authors reported an average hurdle rate, which is the return
 12 required for capital investments, of 13.50 percent. The authors further reported the

⁵⁵ Dr. Woolridge agrees that Beta coefficients for our proxy companies are less than 1.0.

⁵⁶ 6.21 percent equals the expected annual average market return over the next 10 years suggested by the Duke CFO survey. *Duke/CFO Magazine Global Business Outlook survey – U.S., Fourth Quarter 2018*, at 45.

⁵⁷ Source: Duff & Phelps, *2019 SBBI Yearbook* Appendix A-1; <http://www.cfosurvey.org> (One-year return estimates as of fourth quarter of the previous year).

1 average Weighted Average Cost of Capital, which includes the cost of debt, was
2 9.20 percent even though the expected market return was 6.50 percent.⁵⁸ In my
3 view, Dr. Woolridge's reference to a 3.15 percent⁵⁹ expected Market Risk Premium
4 estimate based on the Duke CFO Survey should be given little weight.

5 **Q. DO YOU AGREE WITH DR. WOOLRIDGE'S REFERENCE TO STUDIES**
6 **THAT REPORT MRP ESTIMATES BASED ON EXPECTED GEOMETRIC**
7 **RETURNS?**

8 A. No, I do not. The MRP should reflect the expected arithmetic average return. The
9 important distinction between the arithmetic and geometric averages is that the
10 arithmetic mean assumes that each periodic return is an independent observation
11 and, therefore, incorporates uncertainty into the calculation of the long-term
12 average. The geometric mean, on the other hand, is a backward-looking calculation
13 that equates a beginning value to an ending value. Although geometric averages
14 provide a standardized basis of review of historical performance across investments
15 or investment managers, they do not reflect forward-looking uncertainty. That is
16 why investors and researchers commonly use the arithmetic mean when estimating
17 the risk premium over historical periods to estimate the Cost of Equity. As
18 Morningstar notes:

19 The arithmetic average equity risk premium can be demonstrated to
20 be the most appropriate when discounting future cash flows. For
21 use as the expected equity risk premium in either the CAPM or the
22 building block approach, the arithmetic mean or the simple

⁵⁸ Duke/CFO Magazine Global Business Outlook Survey – U.S., Third Quarter 2017.

⁵⁹ Direct Testimony of J. Randall Woolridge, Ph.D., at 60.

1 difference of the arithmetic means of the stock market returns and
2 riskless rates is the relevant number.⁶⁰

3 Lastly, investment risk, or volatility, typically is measured based on the
4 standard deviation. The standard deviation, in turn, is a function of the arithmetic
5 mean, not the geometric mean. In that regard, the Beta coefficients applied in
6 CAPM analyses are a function of the standard deviation of returns.⁶¹

7 **Q. TURNING TO DR. WOOLRIDGE'S POSITION THAT THE EPS**
8 **GROWTH RATES USED TO DEVELOP YOUR ESTIMATED MARKET**
9 **RETURN ARE TOO HIGH,⁶² DID YOU CONSIDER WHERE YOUR**
10 **ESTIMATE FALLS WITHIN THE RANGE OF HISTORICAL**
11 **OBSERVATIONS?**

12 A. Yes. I gathered the annual capital appreciation return on Large Company Stocks
13 reported by Morningstar for the years 1926 through 2018, produced a histogram of
14 those observations (*see* Chart 1, below), and calculated the probability that a given
15 capital appreciation return estimate would be observed. The results of that analysis
16 demonstrate that capital appreciation rates of 10.81 percent to 12.11 percent and
17 higher actually occurred quite often,⁶³ representing approximately the 51st and 53rd
18 percentiles, respectively.

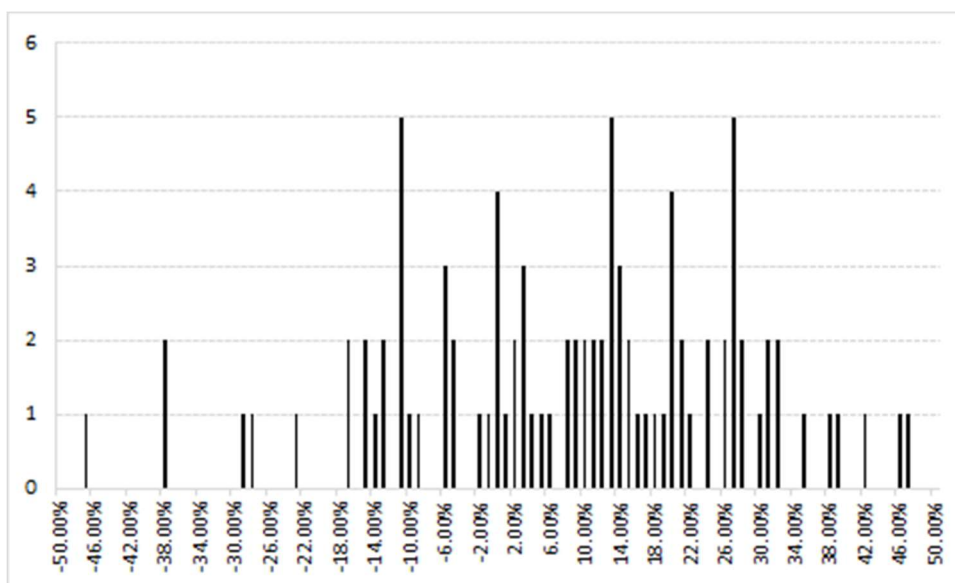
⁶⁰ Morningstar, Inc., 2013 Ibbotson SBBI Valuation Yearbook, at 56.

⁶¹ *See*, Direct Testimony of Robert B. Hevert, at 68-69.

⁶² Direct Testimony of J. Randall Woolridge, Ph.D., at 79.

⁶³ Under the Constant Growth DCF model's assumptions, the growth rate equals the rate of capital appreciation.

**Chart 1: Frequency Distribution of Capital Appreciation Returns,
1926-2018⁶⁴**



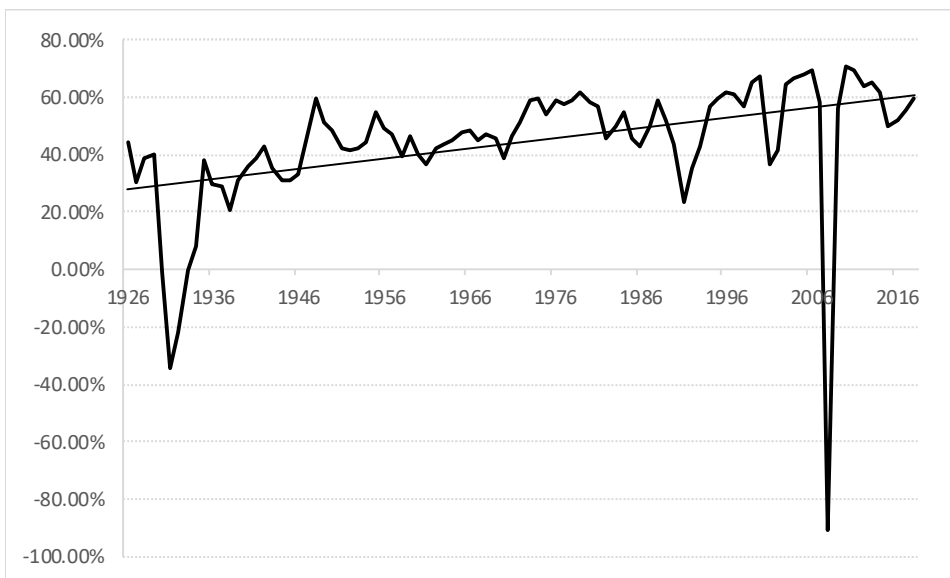
As to Dr. Woolridge’s analysis of the S&P 500 EPS and Gross Domestic Product (“GDP”) growth rates (in his Table 10), his conclusion that net income of the S&P 500 would grow to approximately equal that of GDP⁶⁵ is substantially driven by his unduly low GDP growth rate. Under the Sustainable Growth model, if the retention ratio is higher now than it historically has been, there would be reason to believe expected growth rates would be higher than historical growth rates. To determine whether that has been the case, I calculated the annual retention ratio from 1926 to 2018 using earnings and dividends data published by Dr. Robert J. Shiller. As shown in Chart 2 (below), that data indicates the S&P 500 earnings retention has trended upward over time and is currently well above its historical

⁶⁴ Duff & Phelps, 2019 SBBI Yearbook, at A-3.

⁶⁵ Direct Testimony of J. Randall Woolridge, Ph.D., at 88-92.

1 average. Consequently, the Sustainable Growth model included in my and Dr.
 2 Woolridge's DCF analyses suggests that the future growth of the S&P 500 could
 3 outpace its historical growth.

4 **Chart 2: S&P 500 Annual Earnings Retention Ratio, 1926 – 2018⁶⁶**



5
 6 Lastly, although Dr. Woolridge is concerned with the expected market return
 7 based on Value Line estimates, all six CAPM results derived from that measure fall
 8 outside my recommended range.

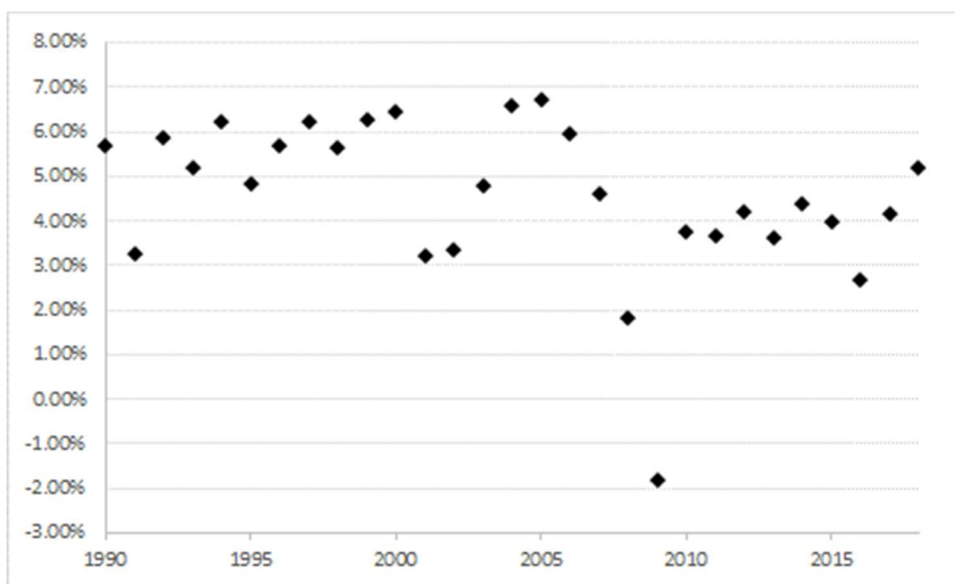
9 **Q. WHAT IS THE BASIS OF DR. WOOLRIDGE'S CONCERN WITH YOUR**
 10 **MRP AS IT RELATES TO HISTORICAL NOMINAL GDP GROWTH**
 11 **RATES?**

12 A. Dr. Woolridge argues "nominal GDP growth in recent decades has slowed and that
 13 a figure in the range of 3.0% to 5.0% is more appropriate today for the U.S.

⁶⁶ Source: <http://www.econ.yale.edu/~shiller/data.htm>.

1 economy.”⁶⁷ To support his position, Dr. Woolridge reviews average nominal GDP
2 growth over periods of ten to 50 years. As shown on Chart 3 (below), however,
3 since 1990 (that is, in “recent decades”) the annual nominal growth rate in GDP has
4 remained relatively stable, but for the period 2008 to 2012, which includes the
5 recent recession. Over that time, annual nominal GDP growth rates greater than
6 5.00 percent (the high end of Dr. Woolridge’s suggested range) occurred in 13 of
7 29 years.

8 **Chart 3: Annual Nominal GDP Growth Rates**⁶⁸



9
⁶⁷ Direct Testimony of J. Randall Woolridge, Ph.D., at 85.

⁶⁸ Source: Bureau of Economic Analysis, June 27, 2019 update.

1 **Q. AT PAGES 86 AND 87 OF HIS TESTIMONY DR. WOOLRIDGE REFERS**
2 **TO A 2015 STUDY BY MCKINSEY & CO., AND ARGUES THAT REAL**
3 **GDP GROWTH MAY FALL BY 40.00 PERCENT. DO YOU AGREE WITH**
4 **DR. WOOLRIDGE’S CONCLUSION?**

5 A. No, I do not. Dr. Woolridge argues future real global economic growth will fall to
6 2.10 percent, principally due to slowing growth in the working age population. He
7 argues that is the case “even if productivity remains at the rapid rate of the past fifty
8 years of 1.80%”.⁶⁹ McKinsey, however, also points to five “sector case studies”,
9 that find “more than enough productivity-acceleration scope to counter slower labor
10 growth.”⁷⁰ Based on those studies, McKinsey finds sufficient potential for
11 productivity growth to reach 4.00 percent. Of note, about three-quarters of that
12 global potential “would come from the broader adoption of existing best practices”,
13 which the firm would characterize as “catch-up” productivity improvements.”⁷¹ As
14 to the remainder, McKinsey states:

15 The remaining one-quarter, or about one percentage point a year,
16 could come from technological, operational, or business innovations
17 that go beyond today’s best practices and that “push the frontier” of
18 the world’s GDP potential. In contrast to some observers, we do not
19 find that a drying up of technological or business innovations will
20 act as a constraint to growth. On the contrary, we see a strong
21 innovation pipeline in both developed and developing economies in
22 the sectors we studied. Our estimate of the potential here is based
23 only on the innovations that we can foresee. It is quite possible that

⁶⁹ Direct Testimony of J. Randall Woolridge, Ph.D., at 87.

⁷⁰ McKinsey Global Institute, *Global Growth: Can Productivity Save the Day In An Aging World?*, January 2015, at PDF 9.

⁷¹ *Ibid.*, at 53 (PDF 63).

1 waves of innovation may, in reality, push the frontier far further than
2 we can ascertain based on the current evidence.⁷²

3 In short, the McKinsey study does not conclude the declining workforce
4 necessarily means lower real global GDP growth. Rather, the potential for
5 meaningful productivity increases may provide greater avenues for global real
6 economic growth well greater than Dr. Woolridge assumes.

7 **Q. WHAT IS YOUR RESPONSE TO DR. WOOLRIDGE'S REFERENCE TO**
8 **GDP FORECASTS PROVIDED BY THE *SURVEY OF PROFESSIONAL***
9 ***FORECASTERS*, THE ENERGY INFORMATION ADMINISTRATION,**
10 **AND THE CONGRESSIONAL BUDGET OFFICE ("CBO")? ⁷³**

11 A. First, Dr. Woolridge has not demonstrated that investors rely on the surveys cited
12 in his testimony. Second, as Dr. Woolridge points out, the *Survey of Professional*
13 *Forecasters* relates to the years 2019 to 2029; given Dr. Woolridge's concern with
14 my growth rates over the coming period of three-to-five years, his use of the *Survey*
15 *of Professional Forecasters* does not address that issue. As to the CBO and EIA
16 forecast, those projections cover only 15 to 25 years of a perpetual period, and are
17 not consensus forecasts. In addition, because the EIA's GDP growth forecast is an
18 input to its annual energy projections, the assumptions and methods underlying its
19 GDP forecast are for that specific purpose.

20 The CBO provides updates regarding its forecasting record. In that context,
21 the CBO noted that comparisons to other forecasts are not always apt, at least in

⁷² *Ibid.*

⁷³ Direct Testimony of J. Randall Woolridge, Ph.D., at 85-86.

1 part because they may be based on different assumptions and used for different
2 purposes.⁷⁴ The CBO also observes that it is required to assume that future fiscal
3 policy generally will reflect current law, so that it may provide a benchmark against
4 which proposed changes in law may be assessed.⁷⁵ The CBO goes on to explain
5 that “because forecasters make different assumptions about future fiscal policy, it
6 is difficult to compare the quality of forecasts without considering the role of
7 expected changes in laws.”⁷⁶ The CBO also notes that among its two-year forecasts
8 (since the early 1980s), the forecast error for “real output growth” and inflation
9 (measured by the Consumer Price Index) has been 1.30 percentage points and 0.90
10 percentage points, respectively.⁷⁷

11 As to the accuracy of the EIA’s GDP forecast, the agency reviews its
12 projections in its *Annual Energy Outlook (“AEO”) Retrospective Review*. In the
13 *AEO Retrospective Review*, the EIA notes: “[t]he projections in the AEO are not
14 statements of what will happen but of what may happen given assumptions in the
15 underlying National Energy Modeling System (NEMS).”⁷⁸ As EIA makes clear,

⁷⁴ See, *CBO’s Economic Forecasting Record: 2017 Update*, October 2017, at 4–5.

⁷⁵ *Ibid.*, at 8. “CBO is required by statute to assume that future fiscal policy will generally reflect the provisions in current law, an approach that derives from the agency’s responsibility to provide a benchmark for lawmakers as they consider proposed changes in law. When the Administration prepares its forecasts, however, it assumes that the fiscal policy in the President’s proposed budget will be adopted. Forecast errors may be driven by those different assumptions, especially when forecasts are made while policymakers are considering major changes to current fiscal policy.”

⁷⁶ *Ibid.*, at 4–5.

⁷⁷ *Ibid.*, at 9. Root mean square error.

⁷⁸ U.S. Energy Information Administration, *Annual Energy Outlook Retrospective Review: Evaluation of AEO2018 and Prior Reference Case Projections*, December 2018, at 1. Clarification added.

1 the Reference case assumes current laws and regulations are unchanged throughout
2 the projection period.⁷⁹ The agency's projections therefore are based on the
3 economic environment at the time of the forecast. As shown in Table 3 of the *AEO*
4 *Retrospective Review*, the EIA compares its past real GDP growth projections to
5 actual real GDP growth. In its 1994 forecast of GDP growth – a time during which
6 the U.S. was coming out of a recession – the agency generally underestimated GDP
7 growth. During the stronger economic times of the 2000s, the agency generally
8 overestimated GDP growth into the future.⁸⁰ The agency's 2018 to 2050 reference
9 case is based on the current economic environment of below average GDP growth,
10 inflation, and interest rates.⁸¹

11 **Q. HOW DOES THE HISTORICAL RELATIONSHIP BETWEEN INTEREST**
12 **RATES AND RISK PREMIUMS COMPARE TO YOUR MRP ESTIMATES?**

13 A. As discussed in my Direct Testimony, the Equity Risk Premium is inversely related
14 to the level of interest rates.⁸² I therefore considered whether there is a similar
15 inverse relationship between interest rates and the Market Risk Premium. To do so,
16 I gathered the monthly market return and long-term (income only) return on
17 government bonds as reported by Duff & Phelps. For each month, the interest rate
18 was subtracted from the market return to arrive at the annualized Market Risk

⁷⁹ U.S. Energy Information Administration, *Annual Energy Outlook 2018 with Projections to 2050*, February 2018, at 9.

⁸⁰ U.S. Energy Information Administration, *Annual Energy Outlook Retrospective Review: Evaluation of 2014 and Prior Reference Case Projections*, March 2015, Table 3, at 7-8.

⁸¹ U.S. Energy Information Administration, *Annual Energy Outlook 2018 with Projections to 2050*, February 2018, at Table 20.

⁸² Direct Testimony of Robert B. Hevert, at 73.

1 Premium.⁸³

2 With that data, I performed two regression analyses. The first was a simple
3 linear regression in which the dependent variable was the Market Risk Premium,
4 and the independent variable was the income-only return on long-term government
5 bonds. That analysis showed that the Market Risk Premium has been negatively
6 related to interest rates, with a high level of statistical significance. To determine
7 whether a portion of that relationship was simply a matter of time (that is, whether
8 it simply was a trend) a second analysis that included time (as measured by the
9 monthly date) as an additional explanatory variable was undertaken. In that case,
10 interest rates again were negative and significant, but the trend variable was
11 insignificant. The results of both analyses are provided in Exhibit RBH-R-10.⁸⁴

12 **Q. DR. WOOLRIDGE STATES THAT COMPANIES WITH LOWER BETAS**
13 **HAVE LESS MARKET RISK,⁸⁵ IMPLYING A LOWER REQUIRED**
14 **RETURN. IS HE CORRECT?**

15 A. Although I agree utilities are less risky than the overall market, it is important to
16 understand how Beta coefficients and their components reflect systematic risk. As
17 shown below in Chart 4, since 2012 the correlation between the S&P 500 Index and
18 Dr. Woolridge's proxy group companies (*i.e.* low-Beta coefficient companies) has

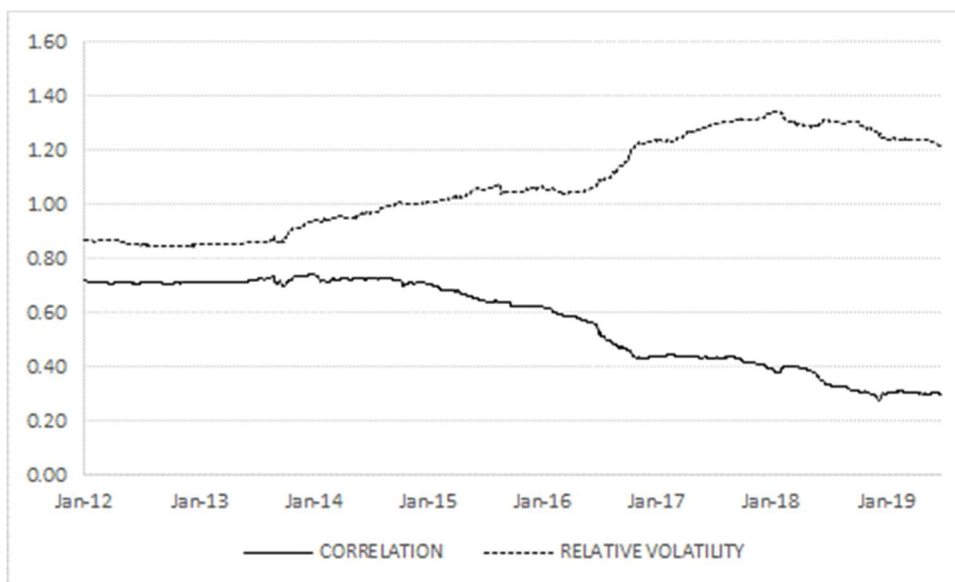
⁸³ Source: Duff & Phelps, 2019 SBBI, Appendix A-1, Appendix A-7. I calculated returns on a monthly basis because annual returns likely mask the variation in data and may not provide as reliable results as the more granular monthly calculations.

⁸⁴ I recognize that the R-squared for the regression analyses are low, even though the regression equation, and the regression coefficients are highly statistically significant.

⁸⁵ Direct Testimony of J. Randall Woolridge, Ph.D., at 54.

declined, while the relative risk has increased. As such, the CAPM may not adequately reflect the expected systematic risk and returns required by investors in low-Beta coefficient companies, such as utilities.

Chart 4: Components of Beta Coefficients Over Time⁸⁶



Q. WHAT CONCLUSIONS DO YOU DRAW FROM CHART 4?

A. Beginning in 2012 the Federal Reserve began its third round of Quantitative Easing, which was meant to put downward pressure on long-term interest rates. The effect of that policy may have been to encourage investors, at times, to “reach for yield” by investing in dividend-paying sectors, such as utilities. When macroeconomic conditions evolved such that interest rates began to increase, or other growth-based sectors appeared more appealing, investors would rotate out of the utility sectors. Because utilities faced downward credit pressure due to the TCJA, and because

⁸⁶ Source: S&P Global Market Intelligence. Calculated as an index.

1 utilities could not benefit from the TCJA in ways other sectors could, they became
2 relatively less attractive. In summary, since 2012, federal policies have affected
3 trading decisions in ways that have caused the utility sector's correlation with the
4 overall market to fall.

5 At the same time, the volatility in utility returns increased relative to the
6 overall market. The question is whether current Beta coefficients, even though
7 adjusted, reasonably reflect expected returns. As discussed below, published
8 research has found low-Beta coefficient companies have tended to earn returns
9 greater than those predicted by the CAPM. Given the decline in correlations
10 discussed above, that may be an even more acute concern in the current market.

11 **Q. IN YOUR VIEW, DO THOSE FACTORS LIKELY EXPLAIN THE**
12 **DIFFERENCE IN BETA COEFFICIENTS PROVIDED BY BLOOMBERG**
13 **AND VALUE LINE?**

14 A. Yes, they do. As explained in my Direct Testimony, Bloomberg's default method
15 is to calculate Beta coefficients over two years (as opposed to Value Line's five-
16 year convention).⁸⁷ Because correlations have fallen over the past two years, the
17 relationship shown in Chart 4 will have a particularly meaningful effect on
18 Bloomberg Beta coefficients. As discussed, earlier, however, the fall in correlations
19 may largely be related to Federal policy initiatives that are not likely to persist over
20 the long-term. That being the case, an important question is whether the change in

⁸⁷ Direct Testimony of Robert B. Hevert, at 71. *See*, also, Exhibit_(RBH-4).

1 Beta coefficients reasonably represents the long-term investor expectations.

2 **Q. WITH THOSE POINTS IN MIND, IS THERE A METHOD THAT MAY BE**
3 **APPLIED TO ADDRESS THE CHANGE IN BETA COEFFICIENTS?**

4 A. Yes. One method of doing so is to apply the Empirical form of the CAPM, which
5 adjusts for the CAPM's tendency to under-estimate returns for companies that (like
6 utilities) have Beta coefficients less than the market mean of 1.00, and over-
7 estimate returns for relatively high-Beta coefficient stocks.⁸⁸ Fama and French
8 describe the empirical issue addressed by the ECAPM noting that "[t]he returns on
9 the low beta portfolios are too high, and the returns on the high beta portfolios are
10 too low."⁸⁹ Similarly, Dr. Roger Morin observes "[w]ith few exceptions, the
11 empirical studies agree that ... low-beta securities earn returns somewhat higher
12 than the CAPM would predict, and high-beta securities earn less than predicted."⁹⁰
13 As Dr. Morin also explains, the ECAPM "makes use" of those findings, and
14 estimates the Cost of Equity based on the following equation:⁹¹

15
$$k_e = R_f + \alpha + \beta(MRP - \alpha) \quad [1]$$

16 where α , or "alpha", is an adjustment to the risk/return line, and "MRP" is the
17 Market Risk Premium (defined above). Summarizing empirical evidence regarding
18 the range of estimates for alpha, Dr. Morin explains that the model "reduces to the

⁸⁸ Roger A. Morin, New Regulatory Finance (Public Utility Reports, Inc., 2006), at 175 - 176.

⁸⁹ Eugene F. Fama and Kenneth R. French, The Capital Asset Pricing Model: Theory and Evidence, Journal of Economic Perspectives, Vol. 18, No. 3, Summer 2004, at 33.

⁹⁰ Roger A. Morin, New Regulatory Finance (Public Utility Reports, Inc., 2006), at 175.

⁹¹ *Ibid.*, at 189.

1 following more pragmatic form:”⁹²

$$2 \quad k_e = R_f + 0.25(R_m - R_f) + 0.75\beta(R_m - R_f) \quad [2]$$

3 where:

4 k_e = the investor-required ROE;

5 R_f = the risk-free rate of return;

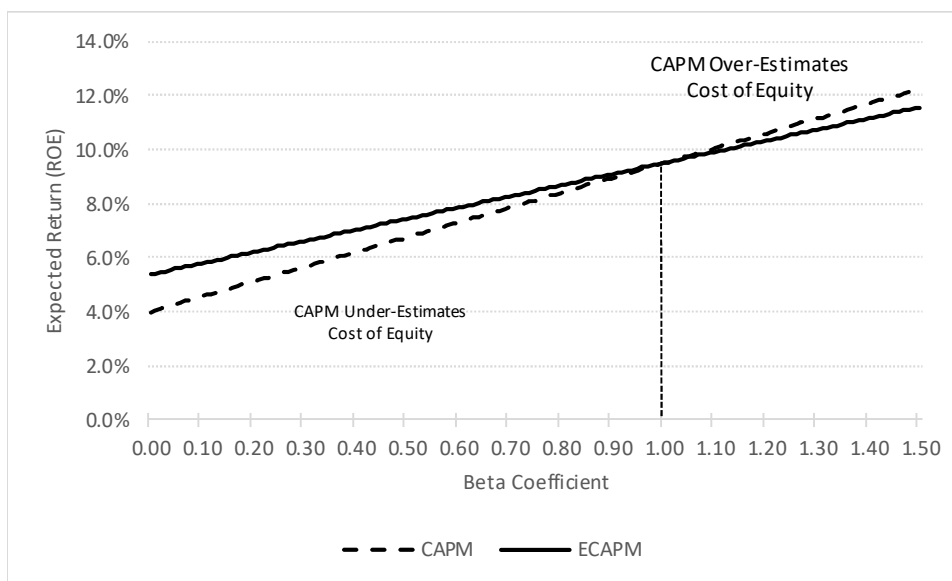
6 β = the adjusted Beta coefficient of an individual security; and

7 R_m = the required return on the market.

8 The relationship between expected returns under the CAPM and ECAPM
9 approaches can be seen in Chart 5, below. Chart 5, which reflects Dr. Woolridge’s
10 risk-free rate and MRP, illustrates the extent to which the CAPM under-states the
11 expected return relative to the ECAPM when Beta coefficients – whether adjusted
12 or unadjusted – are less than 1.00.

⁹² *Ibid.*, at 190. Equations [1] and [2] tend to produce similar results when “alpha” is in the range of 1.00 percent to 2.00 percent. *See*, Exhibit RBH-R-11. As Dr. Morin explains, alpha coefficients in that range are highly consistent with those identified in prior published research.

Chart 5: CAPM and ECAPM Expected Returns⁹³



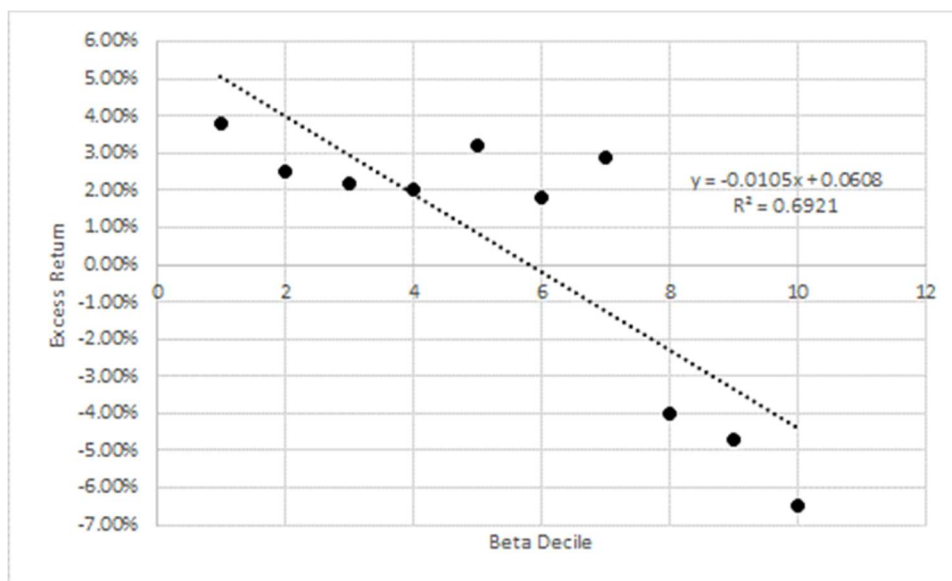
Q. HAVE YOU UNDERTAKEN ANY INDEPENDENT ANALYSES TO DETERMINE WHETHER THERE IS A RELATIONSHIP BETWEEN BETA COEFFICIENTS AND EXCESS RETURNS PRODUCED BY THE CAPM AND ECAPM?

A. Yes, I performed an analysis of excess returns produced by the CAPM, by Beta coefficient decile, over the ten years ended 2018. The analysis compared the observed returns of the companies in the S&P 500 Index to expected returns based on the CAPM. Observed returns were calculated as the total return for each company from the first day of a given year to the end of that year. The expected

⁹³ Exhibit RBH-R-11. Source: Direct Testimony of J. Randall Woolridge, Ph.D., at 64; Exhibit JRW-9, page 1. The finding that the ECAPM is not an adjustment to the Beta coefficient also is clear in Equation [1] ($k_e = R_f + \alpha + \beta(MRP - \alpha)$), in which the alpha coefficient increases the intercept (the expected return when the Beta coefficient equals zero), and reduces the Market Risk Premium. Please note that the use of Dr. Woolridge's CAPM estimates in Chart 5 is for illustrative purposes only.

return for each company was calculated using the CAPM as applied to the following annual data: (1) a risk-free rate equal to the average 30-year Treasury yield for that year; (2) an adjusted Beta coefficient as of the beginning of the year using Bloomberg's standard calculation method (two years of weekly return data, using the S&P 500 Index as the comparison benchmark); and (3) a market return equal to the S&P 500 Index total return for that year. The companies were grouped into deciles each year based on their Beta coefficients, and the median excess return (or return deficiency) was calculated for each decile group. Excess returns were calculated as the observed return less the return implied by the CAPM. Chart 6 (below) summarizes those results.

Chart 6: Excess Returns Under CAPM⁹⁴

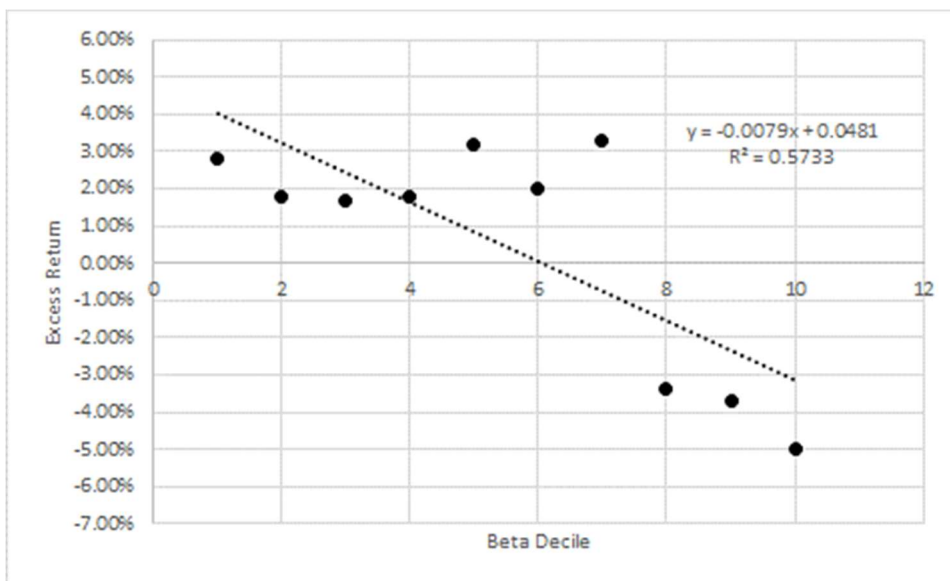


As Chart 6 demonstrates, the relationship between Excess Return and Beta

⁹⁴ Source: Bloomberg Professional Services.

coefficient deciles is strong, with deciles explaining approximately 69.00 percent of the Excess Return. Using the same data and calculating the Excess Return by reference to the ECAPM (as defined by Equation [2], above), produces the same downward sloping relationship, but not to the same degree (*see* Chart 7, below).

Chart 7: Excess Returns Under ECAPM⁹⁵



There are two principal observations to be drawn from the data presented in Charts 6 and 7. First, under the ECAPM the slope coefficient is somewhat less negative (relative to the CAPM), suggesting a flatter relationship between Beta coefficient deciles and the excess return. The flatter slope moves closer to the point at which the excess return is zero across all deciles. Second, the excess return values are somewhat moderated under the ECAPM; the high excess returns are lower than under the CAPM, and the low excess returns are higher. Again, that

⁹⁵ Source: Bloomberg Professional Services.

1 finding suggests the ECAPM mitigates, but does not solve the issue of the CAPM
2 underestimating returns for low-Beta coefficient firms.

3 In summary, Charts 6 and 7 support the position that the CAPM tends to
4 underestimate returns for low-Beta coefficient firms, and the ECAPM moderates
5 that effect to some extent, but it does not appear to eliminate it. Because the
6 ECAPM mitigates the drift in Beta coefficients (which Dr. Woolridge addresses in
7 his discussion of adjusted Beta coefficients), I believe it is a reasonable method,
8 and have included results based on the ECAPM in my updated analyses.⁹⁶

9 **Q. PLEASE SUMMARIZE DR. WOOLRIDGE'S CONCERNS WITH THE**
10 **RISK-FREE RATE ESTIMATES INCLUDED IN YOUR CAPM**
11 **ANALYSES.**

12 A. Dr. Woolridge finds the projected Treasury bond yields "excessive", and argues
13 investors would not buy bonds at their current yield, if they believe yields will
14 increase.⁹⁷

15 **Q. WHAT IS YOUR RESPONSE?**

16 A. Dr. Woolridge's concern is misplaced. In his CAPM analysis, Dr. Woolridge relies
17 on a 4.00 percent risk-free rate,⁹⁸ 137 basis points above the current 30-day average
18 risk-free rate. Still, Dr. Woolridge argues investors give such projections no weight
19 in their decision to purchase bonds at current yields. I disagree. The Cost of Equity
20 is fundamentally forward-looking, and the use of projected Treasury (such as the

⁹⁶ Exhibit RBH-R-5.

⁹⁷ Direct Testimony of J. Randall Woolridge, Ph.D., at 77.

⁹⁸ *Ibid.*, at 53.

1 4.00 percent Dr. Woolridge applies) is consistent with that principle.

2 **Bond Yield Plus Risk Premium Analysis**

3 **Q. PLEASE SUMMARIZE DR. WOOLRIDGE'S RESPONSE TO YOUR**
4 **BOND YIELD PLUS RISK PREMIUM ANALYSIS.**

5 A. Dr. Woolridge believes the Risk Premium derived from the analysis is "inflated"
6 and "is a gauge of *commission* behavior and not *investor* behavior."⁹⁹ Dr.
7 Woolridge further argues that the Risk Premium approach results reflect "other
8 utility- and rate case-specific information in setting ROEs" and points to what he
9 views as a potential discrepancy between settled and litigated cases.¹⁰⁰ He then
10 suggests the analysis overstates the actual ROE, because the estimated risk
11 premium is based on historical Treasury yields, whereas the model is applied to
12 current and expected yields.¹⁰¹

13 **Q. PLEASE SUMMARIZE DR. WOOLRIDGE'S POSITION REGARDING**
14 **THE YIELDS USED IN YOUR BOND YIELD PLUS RISK PREMIUM**
15 **ANALYSIS.**

16 A. As discussed above, Dr. Woolridge disagrees with my use of Treasury yields that
17 fall between 50 and 150 basis points above the current Treasury yield of 2.55
18 percent he presents. As explained above, the use of projected Treasury yields is
19 entirely appropriate.

⁹⁹ *Ibid.*, at 96 [*emphasis included*].

¹⁰⁰ *Ibid.*

¹⁰¹ *Ibid.*

1 **Q. WHAT IS YOUR RESPONSE TO DR. WOOLRIDGE’S POSITION THAT**
2 **THE RISK PREMIUM ANALYSIS IS A STUDY OF UTILITY**
3 **COMMISSION BEHAVIOR, RATHER THAN INVESTOR BEHAVIOR?**

4 A. Those cases, and their associated decisions, reflect the same type of market-based
5 analyses at issue in this proceeding. As noted earlier, because authorized returns
6 are publicly available (the proxy companies disclose authorized returns, by
7 jurisdiction, in their 2018 SEC Form 10-Ks),¹⁰² it therefore is reasonable to
8 conclude that data is reflected, at least to some degree, in investors’ return
9 expectations and requirements. From that perspective, ROE recommendations,
10 such as Dr. Woolridge’s, that are far removed from prevailing levels should be
11 reconciled by reference to differences in risk. I do not believe Dr. Woolridge’s
12 recommendation reasonably does so.

13 **Q. WHAT IS YOUR RESPONSE TO DR. WOOLRIDGE’S POSITION THAT**
14 **YOUR ANALYSIS APPLIES AN HISTORICAL RISK PREMIUM TO**
15 **PROJECTED RATES AND, AS SUCH, OVERSTATES THE COST OF**
16 **EQUITY?**¹⁰³

17 A. I applied both historical and projected interest rates to the regression coefficients
18 developed in the Risk Premium analysis, not to an average historical risk premium.

¹⁰² *See, for example*, Atmos Energy Group, SEC Form 10-K for the period ending September 30, 2018, at 7; Northwest Natural Gas Company, SEC Form 10-K for the period ending December 31, 2018, at 35; ONE Gas Inc., SEC Form 10-K for the period ending December 31, 2018, at 27-29; Southwest Gas Holdings, SEC Form 10-K for the period ending December 31, 2018, Exhibit 13.01, at 10; Spire Inc., SEC Form 10-K for the period ending September 30, 2018, at 124-125.

¹⁰³ Direct Testimony of J. Randall Woolridge, Ph.D., at 96.

1 As discussed in my Direct Testimony, the regression coefficients specifically
2 recognize that as interest rates decrease, the Equity Risk Premium increases.¹⁰⁴ A
3 consequence of that relationship is that interest rates and the Cost of Equity
4 generally move in the same direction, but not on a one-to-one basis. As projected
5 interest rates increase, the Cost of Equity also increases, but not to the same degree.
6 Dr. Woolridge's concern that I applied projected interest rates to an historical risk
7 premium is misplaced, in that (1) the analysis does not rely on an historical risk
8 premium; and (2) because the estimated Equity Risk Premium does not increase in
9 lock step with interest rates, the resulting ROE estimate does not overstate the Cost
10 of Equity.

11 **Q. WHAT IS YOUR RESPONSE TO DR. WOOLRIDGE'S POSITION THAT**
12 **YOUR RISK PREMIUM ANALYSIS MUST TAKE INTO**
13 **CONSIDERATION THE SPECIFIC ASPECTS OF THIS PROCEEDING**
14 **RELATIVE TO ALL OTHERS?**¹⁰⁵

15 A. There is no disagreement that every case has its unique set of issues and
16 circumstances. Reviewing over 1,100 cases over many economic cycles and using
17 that data to develop the relationship between the Equity Risk Premium and interest
18 rates mitigates that concern.

¹⁰⁴ Direct Testimony of Robert B. Hevert, at 74.

¹⁰⁵ Direct Testimony of J. Randall Woolridge, Ph.D., at 96.

1 **Q. IS IT A CONCERN, AS DR. WOOLRIDGE ARGUES, TO INCLUDE BOTH**
2 **FULLY LITIGATED AND SETTLED RATE CASES IN YOUR RISK**
3 **PREMIUM ANALYSIS?**¹⁰⁶

4 A. No, it is not. Of the 1,121 rate cases in Risk Premium analysis (*see* Exhibit RBH-
5 R-6), 775 were fully litigated and 346 were settled. More recently (from January
6 2015 through June 28, 2019), 37 cases were fully litigated and 73 were settled.
7 Over the same period, the difference in average authorized returns between the two,
8 however, was approximately 4 basis points. Further, the same inverse relationship
9 between interest rates and the Equity Risk Premium is present, whether the analysis
10 includes fully litigated rate cases, settled rate cases, or both.¹⁰⁷ I therefore disagree
11 with Dr. Woolridge's concern.

12 **Expected Earnings Analysis**

13 **Q. PLEASE SUMMARIZE DR. WOOLRIDGE'S CONCERNS WITH YOUR**
14 **EXPECTED EARNINGS ANALYSIS.**

15 A. Dr. Woolridge argues the Expected Earnings approach is inappropriate because: (1)
16 it is accounting-based and does not measure market based investor return
17 requirements; (2) book equity does not change with investor return requirements as
18 do market prices; (3) the approach is circular; and (4) the data partially reflect
19 earnings of non-regulated operations.¹⁰⁸

¹⁰⁶ *Ibid.*

¹⁰⁷ Exhibit RBH-R-12.

¹⁰⁸ Direct Testimony of J. Randall Woolridge, Ph.D., at 98-100.

1 **Q. WHAT IS YOUR RESPONSE TO DR. WOOLRIDGE?**

2 A. Although I agree economic and financial factors, and the market-based models that
3 depend on them are important, I do not agree those factors invalidate the Expected
4 Earnings approach. As discussed in my Direct Testimony, no single method best
5 captures investor expectations at all times and under all conditions. Market-based
6 models necessarily require us to draw inferences from market data, based on the
7 assumptions and construction of methods such as the DCF and CAPM approaches.
8 The simplicity of the Expected Earnings approach is a benefit, not a detriment.

9 Further, utility rates are set based on the book value of equity. The Expected
10 Earnings approach provides a direct measure of the book-based return comparable-
11 risk utilities are expected to earn. In that sense, it is a direct measure of the expected
12 opportunity cost on the book value of equity. Equally important, because it looks
13 to the earnings expected of comparable-risk companies, the approach is consistent
14 with the *Hope* and *Bluefield* “comparable return” standard. As Dr. Morin notes, the
15 method “is easily understood, and is firmly anchored in regulatory tradition,”
16 concluding that “because the investment base for ratemaking purposes is expressed
17 in book value terms, a rate of return on book value, as is the case with [Expected]
18 Earnings, is highly meaningful.”¹⁰⁹

19 Lastly, among the growth rates Dr. Woolridge considers in his DCF analyses
20 is the “sustainable growth” method. Under that method, expected growth depends

¹⁰⁹ Roger A. Morin, New Regulatory Finance, Public Utilities Reports, Inc., 2006 at 392. 395.
[clarification added].

1 on the expected return on the book value of common equity, and the extent to which
2 that return is retained (that is, not paid in dividends). Although he does not adjust
3 them to reflect average book value balances, Dr. Woolridge reports mean and
4 median expected returns of 9.90 percent and 10.00 percent, respectively.¹¹⁰

5 Market-To-Book Ratios and the Cost of Equity

6 **Q. PLEASE BRIEFLY SUMMARIZE DR. WOOLRIDGE'S POSITION**
7 **REGARDING THE RELATIONSHIP BETWEEN M/B RATIOS AND THE**
8 **COST OF EQUITY.**

9 A. Dr. Woolridge suggests M/B ratios greater than one¹¹¹ indicate the subject
10 company's earned Return on Equity exceeds its Cost of Equity.¹¹² To support his
11 position, Dr. Woolridge provides a regression analysis reflecting the relationship
12 between the Return on Equity and M/B ratios for natural gas utilities and electric
13 utilities. Because the R-Squared is 50.00 percent, Dr. Woolridge concludes there is
14 a "strong positive relationship" between M/B ratios and the ROE for utilities.¹¹³

15 **Q. WHAT IS YOUR RESPONSE TO DR. WOOLRIDGE ON THOSE POINTS?**

16 A. The M/B ratio equals the market value (or stock price) per share, divided by the
17 total common equity (or the book value) per share. Book value per share is an
18 accounting construct that reflects historical costs. In contrast, market value per

¹¹⁰ See, Exhibit JRW-8.

¹¹¹ M/B ratios in excess of unity simply means that the firm is worth more as a going concern than the book value of its assets.

¹¹² Direct Testimony of J. Randall Woolridge, Ph.D., at 30-32, 97.

¹¹³ *Ibid.*, at 31 and Exhibit JRW-4.

1 share (*i.e.*, the stock price) is forward-looking, and a function of many variables,
2 including, but not limited to, expected earnings and cash flow growth, expected
3 payout ratios, measures of “earnings quality,” the regulatory climate, the equity
4 ratio, expected capital expenditures, and the earned return on common equity.¹¹⁴

5 As Dr. Morin states, it is rarely the case in cost of service-based regulation that M/B
6 ratios equal 1.00, which further complicates the Constant Growth DCF method:

7 The third and perhaps most important reason for caution and
8 skepticism is that application of the DCF model produces estimates
9 of common equity cost that are consistent with investors’ expected
10 return only when stock price and book value are reasonably similar,
11 that is, when the M/B is close to unity. As shown below, application
12 of the standard DCF model to utility stocks understates the
13 investor’s expected return when the market-to-book (M/B) ratio of
14 a given stock exceeds unity. This was particularly relevant in the
15 capital market environment of the 1990s and 2000s whose utility
16 stocks are trading at M/B ratios well above unity and have been for
17 nearly two decades. The converse is also true, that is, the DCF
18 model overstates the investor’s return when the stock’s M/B ratio is
19 less than unity. The reason for the distortion is that the DCF market
20 return is applied to a book value rate base by the regulator, that is, a
21 utility’s earnings are limited to earnings on a book value rate base.¹¹⁵

22 As Dr. Morin notes, in the context of rate setting, the M/B ratio often is
23 discussed relative to the Constant Growth DCF model. Under certain restrictive
24 assumptions, that model can be rewritten to express the M/B ratio as follows:¹¹⁶

25
$$\frac{M}{B} = \frac{ROE - g}{k - g} \quad [3]$$

¹¹⁴ See, Roger A. Morin, New Regulatory Finance, Public Utility Reports, Inc., 2006, at 366. Please note, Dr. Morin cites several academic articles that address the various factors that affect the M/B ratio for utilities.

¹¹⁵ *Ibid.*, at 434.

¹¹⁶ B. Branch, A. Sharma, C. Chawla, and F. Tu, *An Updated Model of Price-to-Book*, Journal of Applied Finance, No. 1 (2014).

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

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

5 and the Constant Growth DCF model:

$$6 \quad P = \frac{D}{P} + g \quad [5]$$

7 Dr. Woolridge's assumed relationship between the accounting Return on
8 Equity and the Cost of Equity simply falls from the Constant Growth DCF model;
9 one cannot be assumed without the other. Any inferences drawn from relationships
10 among M/B, ROE, and k from Equation [3] therefore rely on the explicit acceptance
11 of all assumptions underlying the Constant Growth DCF model, including a
12 constant dividend growth rate in perpetuity, and the constancy of the DCF result.
13 Equally important, Equation [5] only can be drawn from the Constant Growth DCF
14 model if we assume: (1) a constant dividend payout ratio in perpetuity; (2) no stock
15 issuances or repurchases; and (3) that the firm is in a steady state, in which the book
16 equity growth rate equals the dividend growth rate, in perpetuity. Taken together,
17 those assumptions are quite restrictive, and call into question the definitive linkage
18 between M/B, ROE, and k that Dr. Woolridge assumes.

19 **Q. WHAT WOULD BE THE RESULT IF REGULATORY COMMISSIONS DID**
20 **FORCE M/B RATIOS TOWARD UNITY?**

21 **A.** Looking to Dr. Woolridge's Gas Proxy Group, the average capital loss for equity

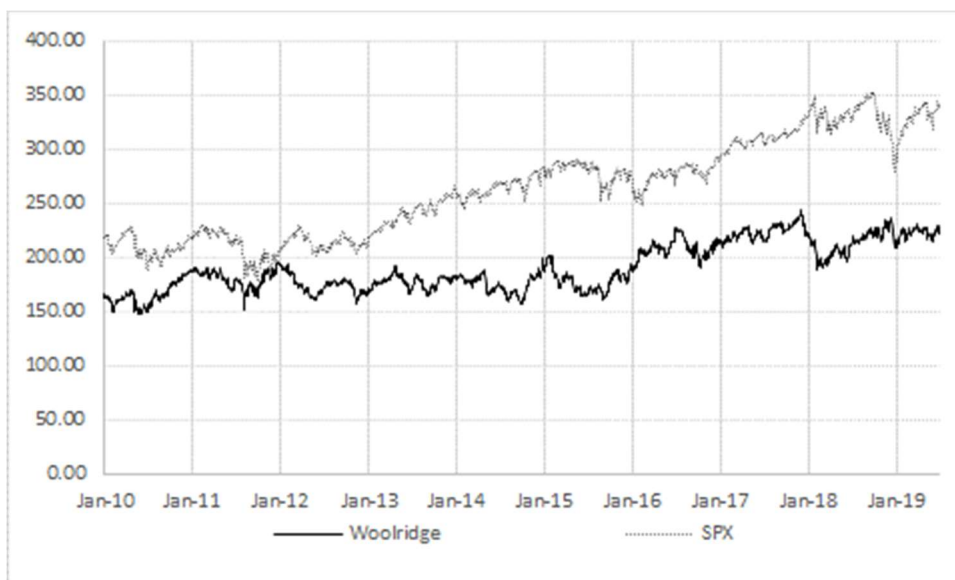
1 investors would be about 55.13 percent.¹¹⁷ That loss would not just affect investors,
2 it also would substantially diminish the ability of utilities to attract external capital.
3 To summarize, if regulatory commissions were to set rates with an eye toward
4 moving the M/B ratio toward unity, that practice may well impede the ability to
5 attract the capital required to support its operations, especially in markets during
6 which the M/B ratio for the overall market is significantly greater than 100.00
7 percent.

8 **Q. HAVE UTILITY M/B RATIOS GENERALLY EXCEEDED 1.00?**

9 A. Yes, they have. Chart 8 (below) demonstrates that since 2010, Dr. Woolridge's, and
10 my proxy groups' M/B ratio have exceeded 1.00, and generally have moved with
11 the S&P 500 Index M/B ratio. If Dr. Woolridge is of the view that M/B ratios
12 greater than 1.00 reflect earned returns greater than the Cost of Equity, it follows
13 that utility commissions have long been incorrect in their ROE determinations.

¹¹⁷ Based on Dr. Woolridge's proxy group average M/B ratio of 222.88. $(222.88-100.00)/222.88 = 55.13$ percent. Exhibit JRW-2, page 1.

1 **Chart 8: Comparison Groups, S&P 500 Market/Book Ratios**
 2 **(2010 – 2019)¹¹⁸**



3
 4 Although the broad market represents a cross section of risk and return
 5 profiles, of which the utility sector is just one, the observed variation in market-
 6 level M/B ratios speaks to the time-varying influence of general macroeconomic
 7 factors, not to any failure of regulation. The relationship between both Dr.
 8 Woolridge's and my proxy group M/B ratios, and the S&P 500 M/B ratio, is
 9 positive and statistically significant. That is the case even when we control for
 10 serial correlation.¹¹⁹ We therefore reasonably can conclude that broad
 11 macroeconomic and capital market factors affect both utilities and non-regulated
 12 entities.

¹¹⁸ Source: S&P Global Market Intelligence, Bloomberg Professional. Note, Dr. Woolridge and I have the same proxy group.

¹¹⁹ Using the Prais-Winsten routine.

1 **Q. HAVE UTILITY M/B RATIOS GENERALLY EXCEEDED 1.00?**

2 A. Yes, they have. As Chart 9 (below) demonstrates, since 1990 the average M/B ratio
3 for the S&P 500 Index has been 2.88; it has never reached unity.

4 **Chart 9: S&P 500 M/B Ratio Over Time¹²⁰**



5
6 If investors felt the returns they expected had so significantly exceeded the
7 returns they required, they would adjust their requirements. In Dr. Woolridge's
8 construct, the difference between expected and required returns would dissipate,
9 and take with it the difference between market and book values. As Chart 9
10 indicates, that has not occurred (the M/B ratio has remained greater than 1.00).

11 **Q. ARE YOU AWARE OF LITERATURE THAT HAS FOCUSED ON THE M/B**
12 **RATIOS OF REGULATED UTILITIES?**

13 A. Yes. Literature focusing on utilities has long concluded that regulation may not

¹²⁰ Source: Bloomberg Professional Services.

1 necessarily result in M/B ratios approaching unity. As noted by Phillips in 1993:

2 Many question the assumption that market price should equal book
3 value, believing that 'the earnings of utilities should be sufficiently
4 high to achieve market-to-book ratios which are consistent with
5 those prevailing for stocks of unregulated companies.'¹²¹

6 In 1988 Bonbright stated:

7 In the first place, commissions cannot forecast, except within wide
8 limits, the effect their rate orders will have on the market prices of
9 the stocks of the companies they regulate. In the second place,
10 whatever the initial market prices may be, they are sure to change
11 not only with the changing prospects for earnings, but with the
12 changing outlook of an inherently volatile stock market. In short,
13 market prices are beyond the control, though not beyond the
14 influence, of rate regulation. Moreover, even if a commission did
15 possess the power of control, any attempt to exercise it ... would
16 result in harmful, uneconomic shifts in public utility rate levels.¹²²

17 And in 1972 Stewart Myers came to the following conclusion:

18 In short, a straightforward application of the cost of capital to a book
19 value rate base does not automatically imply that the market and
20 book values will be equal. This is an obvious but important point.
21 If straightforward approaches did imply equality of market and book
22 values, then there would be no need to estimate the cost of capital.
23 It would suffice to lower (raise) allowed earnings whenever markets
24 were above (below) book.¹²³

25 Lastly, corporate finance managers have considered metrics such as Stern

26 Stewart & Company's Economic Value Added,¹²⁴ and related value-based-

¹²¹ Charles F. Phillips, The Regulation of Public Utilities – Theory and Practice (Public Utility Reports, Inc., 1993) at 395.

¹²² James C. Bonbright, Albert L. Danielsen and David R. Kamerschen, Principles of Public Utility Rates (Public Utilities Reports, Inc., 1988), at 334.

¹²³ Stewart C. Myers, *The Application of Finance Theory to Public Utility Rate Cases*, The Bell Journal of Economics and Management Science, Vol. 3, No. 1 (Spring 1972), at 58-97.

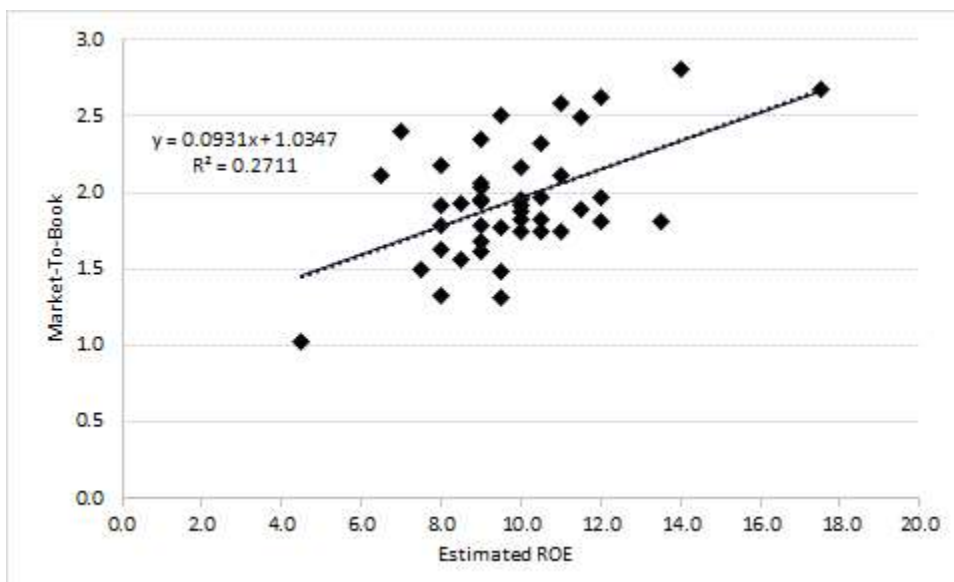
¹²⁴ See, G. Bennett Stewart, The Quest for Value, HarperCollins Publishers, Inc., 1990.

management systems¹²⁵ that focus on elements of Return on Net Assets, and Return on Invested Capital. That practice suggests accounting-based performance measures are relevant to investors.

Q. HAVE YOU REVIEWED THE ROE AND M/B RATIO DATA PROVIDED IN EXHIBIT JRW-4?

A. Yes. Although the earned Return on Equity may be one factor explaining M/B ratios, it is not the only factor. I have updated the chart contained in Exhibit JRW-4, including the regression coefficients, based on the methodology described by Dr. Woolridge,¹²⁶ using recent data from Value Line in Chart 10 (below).

Chart 10: Update of Exhibit JRW-4, With Regression Coefficients¹²⁷



Based on an update of Dr. Woolridge's data, an M/B ratio of 1.00 is associated with

¹²⁵ See, Institute of Management Accountants, *Measuring and Managing Shareholder Value Creation*, 1997.

¹²⁶ Direct Testimony of J. Randall Woolridge, Ph.D., at 30 - 31; Exhibit JRW-4.

¹²⁷ Source: Value Line, downloaded July 29, 2019.

1 an ROE of negative 0.37 percent,¹²⁸ a condition that is highly improbable. Dr.
2 Woolridge's data, therefore, do not support the theory that ROEs greater than 1.00
3 indicate the subject company's return exceeds investors' required returns.

4 **Q. HAVE YOU ANALYZED WHETHER THE ACTUAL EARNED RETURN**
5 **ON EQUITY EXPLAINS THE M/B RATIOS FOR THE COMPANIES IN**
6 **DR. WOOLRIDGE'S EXHIBIT JRW-4?**

7 A. Yes, I have. Using data provided by S&P Global Market Intelligence, I performed
8 a regression analysis in which the M/B ratio was the dependent variable, and the
9 Return on Average Common Equity ("ROACE") for 2018 was the explanatory
10 variable. As shown in Exhibit RBH-R-13, the R-squared was 28.46 percent. An R-
11 squared of 28.46 percent means that factors other than ROACE explain up to 71.54
12 percent of M/B ratios in the proxy group.¹²⁹ Those results support the position that
13 although the earned Return on Equity is a factor that explains M/B ratios, it is not
14 the only factor. In any case, the regression equation indicates that an M/B ratio of
15 1.00 (that is, 100.00 percent) is associated with a Return on Common Equity of
16 approximately -28.83 percent; an M/B ratio of 1.10 relates to an ROACE of
17 approximately -28.81 percent. Because those estimates are not meaningful, I do
18 not agree that M/B ratios greater than 1.00 demonstrate earnings in excess of
19 investors' requirements.

¹²⁸ $1.00 = 1.03 + (9.31 \times -0.0037)$.

¹²⁹ $0.7154 = (1 - 0.2846)$.

Relative Risk

Q. AT PAGE 100 OF HIS TESTIMONY, DR. WOOLRIDGE ARGUES THE COMPANY'S CREDIT RATING IS "IN LINE WITH OTHER GAS COMPANIES." DO YOU BELIEVE CREDIT RATINGS ARE FULL MEASURES OF RISK TO EQUITY INVESTORS?

A. Although over the long-term, credit ratings (and therefore credit spreads) may be directionally related to equity risk, a change in one is not a direct measure of a change in the other. Debt and equity are entirely different securities with different risk/return characteristics, different lives, and different investors. Debt investors have a contractual, senior claim on cash flows not available to equity investors and as such, equity investors bear the residual risk of ownership. Moreover, debt investors' exposure to business and financial risk is finite (due to the finite life of debt) whereas equity investors are exposed to residual risk in perpetuity. Consequently, any inferences drawn from differences in credit ratings regarding the Company's Cost of Equity should be drawn with caution.

A visible measure of the distinction of the risks to which debt and equity investors are exposed is the difference in their respective Beta coefficients. Although I disagree with his conclusions, Dr. Woolridge recommends an average Beta coefficient of 0.65¹³⁰ for his proxy group.¹³¹ Duff & Phelps notes that as of June 2019, debt Beta coefficients for A-rated debt was 0.09,¹³² far below the equity

¹³⁰ The average Value Line Beta coefficient for my proxy group is 0.675. *See*, Exhibit RBH-R-4.

131 Exhibit JRW-9, at 1.

Source: Duff & Phelps Cost of Capital Navigator.

1 Beta coefficient assumed by Dr. Woolridge. In fact, a debt Beta coefficient of 0.71
2 currently is associated with Caa rated debt, which is considered below investment
3 grade.¹³³ Those differences are a clear indication that the risks assumed by debt
4 investors are far different than those assumed by equity investors.

5 **Q. DOES THE DATA PROVIDED BY DR. WOOLRIDGE INDICATE A**
6 **RELATIONSHIP BETWEEN COST OF EQUITY ESTIMATES AND**
7 **CREDIT RATINGS?**

8 A. No, they do not. Using the growth rates and dividend yields reported by Dr.
9 Woolridge, I produced Constant Growth DCF results for each of the comparison
10 companies.¹³⁴ Those results do not support Dr. Woolridge's conclusion. For
11 example, New Jersey Resources Corporation is rated A, and Southwest Gas
12 Corporation is rated BBB+, two credit "notches" apart. Yet, based on Dr.
13 Woolridge's data, their DCF results are 8.81 percent and 8.71 percent, respectively,
14 only 10 basis points apart. On the other hand, New Jersey Resources Corporation
15 (A), and Spire Inc., (A-) are one credit notch apart, but their DCF results differ by
16 246 basis points. We cannot say, based on Dr. Woolridge's primary method, that
17 there is a definitive relationship between credit rating notches and Cost of Equity
18 estimates.

¹³³ *Ibid.*

¹³⁴ Exhibit RBH-R-14. The following comparisons are based on 30-day average dividend yields.

1 assets. As explained in my Direct Testimony, to the extent flotation costs are not
2 recovered, the issuing company is denied a portion of the opportunity to earn its
3 expected (or required) return.¹³⁸

4 Capital Expenditures

5 **Q. DID DR. WOOLRIDGE ADDRESS THE COMPANY'S CAPITAL**
6 **EXPENDITURES?**

7 A. Yes, Dr. Woolridge reasons that because S&P and Moody's account for capital
8 expenditures in their credit ratings, and that the Company's credit ratings are in line
9 with the proxy group, that any additional risk has been accounted for. As discussed
10 above however, credit risk is not a direct measure of equity risk and as such, the
11 Company's projected capital expenditures should be considered in determining the
12 appropriate authorized ROE.

13 North Carolina Economic Conditions

14 **Q. PLEASE BRIEFLY SUMMARIZE DR. WOOLRIDGE'S RESPONSE TO**
15 **YOUR ASSESSMENT OF ECONOMIC CONDITIONS IN NORTH**
16 **CAROLINA.**

17 A. In my Direct Testimony I reviewed several measures of economic conditions,
18 including the rate of unemployment, real Gross Domestic Product growth, median
19 household income, residential natural gas rates, and broad measures of income and

¹³⁸ Direct Testimony of Robert B. Hevert at 32.

1 consumption.¹³⁹ Based on that review, I found economic conditions in North
2 Carolina have improved since the Company's last rate case; Dr. Woolridge
3 generally agrees with that conclusion.¹⁴⁰ Dr. Woolridge argues, however, that
4 although economic conditions generally have improved, certain measures do not
5 support the Company's proposed Rate of Return, including my recommended
6 ROE.¹⁴¹

7 Dr. Woolridge then calculates what he believes to be the incremental effect
8 of his proposed overall Rate of Return on the Company's overall revenue
9 requirement. He suggests his recommendations (his proposed capital structure and
10 9.00 percent ROE) would reduce the Company's annual operating income by about
11 \$58 million, from approximately \$253 million to \$195 million, reducing the overall
12 revenue requirement by the same amount.¹⁴²

13 **Q. WHAT IS YOUR RESPONSE TO DR. WOOLRIDGE ON THOSE POINTS?**

14 A. Although we generally agree economic conditions in North Carolina have
15 improved since the Company's last rate case, I do not agree with Dr. Woolridge's
16 conclusions regarding the effect of his proposal on the Company's overall revenue
17 requirement. First, Dr. Woolridge's Exhibit JRW-13, page 2 of 2 appears to contain
18 a calculation error. There, he seems to have transposed the short-term debt, and
19 long-term debt balances, such that the long-term debt balance is associated with the

¹³⁹ See, Direct Testimony of Robert B. Hevert, at 37 – 44.

¹⁴⁰ Direct Testimony of J. Randall Woolridge, PhD, at 104.

¹⁴¹ *Ibid.*, at 104 – 105.

¹⁴² *Ibid.*, at 106, Exhibit JRW-13.

1 short-term debt cost rate, and the short-term debt balance is associated with the long
2 term-debt cost rate. Dr. Woolridge's \$195 million Operating Income calculation
3 therefore is understated; the corrected amount is about \$223 million. As a result,
4 the difference in Operating Income between Dr. Woolridge's proposed Rate of
5 Return and the Company's proposal is about \$30.4 million, not \$58 million (*see*
6 Exhibit RBH-R-15).¹⁴³

7 It is important to put that corrected difference in perspective. Dr.
8 Woolridge's Exhibit JRW-13 refers to Ms. Powers' Exhibit_(PKP-7). There, Ms.
9 Powers provides the Company's proposed revenue requirement of about \$1.00
10 billion. The \$30.4 million difference in Operating Income therefore represents
11 about 3.03 percent of the total revenue requirement. Because his recommendation
12 falls entirely on equity investors, Dr. Woolridge's recommendation reflects a
13 \$33.40 million, or 18.36 percent reduction in net income (*see*, Exhibit RBH-R-15).

¹⁴³ Assumes the current Federal and State Income Tax expenses remain constant.

1 **Q. WHAT ARE YOUR CONCLUSIONS REGARDING ECONOMIC**
2 **CONDITIONS IN NORTH CAROLINA?**

3 A. I appreciate there seems to be no fundamental disagreement that conditions have
4 improved since the Company's last rate case. I also appreciate that the Commission
5 has the difficult task of considering those conditions as it balances the interests of
6 investors and consumers. In my view, Dr. Woolridge's recommendations would
7 have a disproportionate effect, reducing the income available to equity investors to
8 a far greater degree than the revenue requirement borne by consumers.

9 **V. CONCLUSION AND RECOMMENDATION**

10 **Q. WHAT IS YOUR OVERALL CONCLUSION REGARDING THE**
11 **COMPANY'S COST OF EQUITY?**

12 A. Lastly, for the reasons discussed throughout my Rebuttal Testimony, I find Dr.
13 Woolridge's ROE recommendations to be unduly low. In my view, market
14 conditions and model results continue to support my 10.00 percent to 11.00 percent
15 ROE recommendation.

16 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

17 A. Yes, it does.

Exhibit RBH-R-1

Capital Asset Pricing Model Results
Bloomberg and Value Line Derived Market Risk Premium

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
			Ex-Ante Market Risk Premium		CAPM Result		ECAPM Result	
		Average Beta	Bloomberg	Value Line	Bloomberg	Value Line	Bloomberg	Value Line
	Risk-Free Rate	Coefficient	Market DCF	Market DCF	Market DCF	Market DCF	Market DCF	Market DCF
			Derived	Derived	Derived	Derived	Derived	Derived
PROXY GROUP AVERAGE BLOOMBERG BETA COEFFICIENT								
Current 30-Year Treasury [9]	2.63%	0.575	12.25%	12.15%	9.68%	9.62%	10.98%	10.91%
Near Term Projected 30-Year Treasury [10]	2.70%	0.575	12.25%	12.15%	9.75%	9.69%	11.05%	10.98%
Long Term Projected 30-Year Treasury [11]	3.70%	0.575	12.25%	12.15%	10.75%	10.69%	12.05%	11.98%
Mean					10.06%	10.00%	11.36%	11.29%

			Ex-Ante Market Risk Premium		CAPM Result		ECAPM Result	
		Average Beta	Bloomberg	Value Line	Bloomberg	Value Line	Bloomberg	Value Line
	Risk-Free Rate	Coefficient	Market DCF	Market DCF	Market DCF	Market DCF	Market DCF	Market DCF
			Derived	Derived	Derived	Derived	Derived	Derived
PROXY GROUP AVERAGE VALUE LINE AVERAGE BETA COEFFICIENT								
Current 30-Year Treasury [9]	2.63%	0.675	12.25%	12.15%	10.90%	10.83%	11.89%	11.82%
Near Term Projected 30-Year Treasury [10]	2.70%	0.675	12.25%	12.15%	10.97%	10.90%	11.96%	11.89%
Long Term Projected 30-Year Treasury [11]	3.70%	0.675	12.25%	12.15%	11.97%	11.90%	12.96%	12.89%
Mean					11.28%	11.21%	12.27%	12.20%

Notes:

[1] See Notes [9], [10], and [11]

[2] Source: Exhibit RBH-R-4

[3] Source: Exhibit RBH-R-3

[4] Source: Exhibit RBH-R-3

[5] Equals Col. [1] + (Col. [2] x Col. [3])

[6] Equals Col. [1] + (Col. [2] x Col. [4])

[7] Equals Col. [1] + (0.75 x Col. [2] x Col. [3]) + (0.25 x Col. [3])

[8] Equals Col. [1] + (0.75 x Col. [2] x Col. [4]) + (0.25 x Col. [4])

[9] Source: Bloomberg Professional

[10] Source: Blue Chip Financial Forecasts, Vol. 38, No. 7, July 1, 2019, at 2.

[11] Source: Blue Chip Financial Forecasts, Vol. 38, No. 6, June 1, 2019, at 14.

**Before the
North Carolina Utilities Commission**

Docket No. G-9, Sub 743

General Rate Case

**Rebuttal Testimony
of
Bruce P. Barkley**

**On Behalf Of
Piedmont Natural Gas Company, Inc.**



August 9, 2019

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

2 A. My name is Bruce P. Barkley. My business address is 4720 Piedmont
3 Row Drive, Charlotte, North Carolina.

4 **Q. By whom and in what capacity are you employed?**

5 A. I am employed by Piedmont Natural Gas Company, Inc. ("Piedmont"
6 or "the Company") as Vice President – Regulatory and Community
7 Relations.

8 **Q. Please describe your educational and professional background.**

9 A. I obtained a Bachelor of Science Degree in Business Administration
10 with a concentration in Accounting from the University of North
11 Carolina at Chapel Hill in 1984 and an MBA Degree from Wake
12 Forest University. I obtained my CPA license in 1987. From 1988
13 through 2001, I was employed by Public Service Company of North
14 Carolina, Inc., where I was responsible for regulatory filings and
15 reports submitted to the North Carolina Utilities Commission
16 ("NCUC" or "Commission"). Prior to joining Piedmont, I held
17 various positions with Progress Energy, Inc. and subsequently Duke
18 Energy Corporation ("Duke Energy") in Regulatory Affairs, Fuels, and
19 Regulatory Accounting. I joined Piedmont in 2015 and began serving
20 in my current role in 2016.

21 **Q. Mr. Barkley, have you previously filed testimony in this case?**

22 A. Yes. I prefled direct testimony in this proceeding on April 1, 2019.

23 **Q. What is the purpose of your rebuttal testimony in this proceeding?**

1 A. The purpose of my rebuttal testimony is to address matters raised by
2 the testimony of public witnesses and to address the public interest
3 inherent in the potential impact of the stipulated revenue requirement
4 on our customers in light of changing economic conditions. In the
5 latter regard, I also address the economic conditions testimony of
6 Attorney General witness Woolridge.

7 **Q. Can you comment on the public's response to Piedmont's rate filing in**
8 **this case?**

9 A. Yes. Several public witnesses appeared and testified at the public hearings
10 set by the Commission in this case. The issues raised by the witnesses
11 generally fell into five categories: 1) the proposed rate increase will have
12 a disproportionate impact on low income customers; 2) environmental
13 concerns associated with fossil fuel infrastructure and how Piedmont
14 should be focusing on renewable energy; 3) belief that the rate increase is
15 unjustified; 4) safety concerns associated with natural gas; and 5) a
16 purported lack of need/demand for additional fossil fuel infrastructure.

17 **Q. What is Piedmont's response to each of these issues?**

18 A. Regarding the contention that the proposed rate increase will have a
19 disproportionate impact on the low-income population, it is a reality of our
20 society that some customers are better able to afford their utility services
21 than others. Piedmont undertakes many efforts on a continuous basis to
22 assist low-income customers who are having difficulty paying their bills
23 including working out payment plans, advising such customers on steps

1 they can take to save energy/money, and referring customers to outside
2 agencies that can assist them in paying their utility bills. Piedmont is also
3 aware that many charitable organizations also will help low-income
4 customers in situations where they cannot pay their utility bills and
5 Piedmont frequently directs customers to these organizations.
6 Notwithstanding all of this, it will remain true that some portion of
7 Piedmont's customers will struggle to pay increased rates but it is also true
8 that even at increased levels, the total costs paid by Piedmont's customers
9 for natural gas service have remained flat or been reduced for the last
10 decade. In fact, the Company projects lower rates for the upcoming winter
11 compared with the prior winter, even after the impact of this general rate
12 proceeding is considered. There is no other essential service that I can
13 think of that can make the same statement.

14 Regarding public witnesses' environmental concerns associated
15 with fossil fuel infrastructure and how Piedmont should be focusing on
16 renewable energy, I note that the use and reliance on clean and low cost
17 natural gas has permitted electric utilities to move away from, and, in
18 some instances, discontinue burning coal, a higher-emitting energy source
19 than natural gas. More to the point though, this proceeding is not the
20 proper forum to address the policy issues of how to react to global
21 warming and whether and how to promote renewable energy sources. I
22 believe the Commission's attention in this proceeding should be focused
23 on deriving just and reasonable rates for Piedmont's customers and

1 approving a fair rate of return for the Company. In short, environmental
2 concerns and climate change are not issues before the Commission in this
3 proceeding and are not matters the Commission has the authority to
4 resolve.

5 Regarding witnesses who contend that Piedmont's proposed rate
6 increase is unjustified, they did not appear to understand the utility
7 ratemaking process or the dynamics of Piedmont's ongoing costs to
8 provide service. This lack of comprehension by public witnesses is not
9 surprising given the relative complexity of utility ratemaking but it stands
10 in stark contrast to the position of the Public Staff who engaged in an
11 exhaustive investigation of Piedmont's costs and concluded that a rate
12 increase was required as reflected in the Stipulation.

13 Regarding witness safety concerns associated with natural gas, I
14 would note that natural gas is inherently safe and that the vast majority of
15 incidents involving natural gas explosions occur as a result of third-party
16 negligence or damage to utility pipelines. I would also note that these
17 concerns were raised primarily in the context of statements regarding
18 Atlantic Coast Pipeline or the Robeson LNG project, neither of which are
19 properly before the Commission in this proceeding.

20 Regarding witness statements that contend that North Carolina
21 does not need additional fossil fuel infrastructure, such as the Robeson
22 LNG facility or ACP, I would point out that both of these projects are
23 supported by demonstrable and growing demand from North Carolina

1 customers who need additional gas supplies (and the infrastructure
2 necessary to provide those supplies).

3 **Q. Do you have anything else to add to your response to public witness**
4 **testimony?**

5 A. Yes. At the Wilmington Public Hearing, a witness testified that
6 Piedmont's construction of Line 434 exacerbated flooding associated with
7 Hurricane Florence in Robeson County. We have investigated this claim
8 and cannot substantiate it. We can confirm that the Line 434 project was
9 underway at the time Hurricane Florence impacted North Carolina and
10 that a significant amount of rainfall from that storm caused widespread
11 flooding throughout most of the eastern part of the State. Our project
12 manager for this project has indicated that the Line 434 project did not
13 increase the amount of impervious surfaces in the vicinity of the pipeline
14 and did not alter the existing hydrology. As such, we are unable to
15 confirm the existence of any negative impact on Hurricane Florence
16 related flooding caused by our Line 434 project.

17 **Q. How does the current economic situation compare to what customers**
18 **have seen since 2013?**

19 A. I would say that the current economic environment in which our
20 customers operate is sound and has continued to improve over the course
21 of this proceeding. All indications are that economies of this State and the
22 Nation are positive.

23 **Q. Can you please explain the basis for this assessment?**

1 A. Yes. As the Commission is aware, there are a myriad of broad ranging
2 factors that are regularly evaluated and reported on in assessing the
3 economic health of North Carolina and the United States. In the past
4 several years, since the filing of Piedmont's last rate case, many of these
5 indicators reveal a steadily improving economy.

6 **Q. Can you provide some examples?**

7 A. Yes, there are many indicators that the economy is improved and
8 improving, including the following:

- 9 • As reported by the NC Dept. of Commerce in July of this year, North
10 Carolina employers continue to add jobs in our state. The number of
11 employed North Carolinians has risen over the year for the past 111
12 straight months.
- 13 • As reported by the US Bureau of Labor Statistics, in July 2019, total
14 employment in the United States grew by 0.2% (more than 247,000 new
15 jobs), compared to 0.3% for North Carolina (16,068 new jobs).
- 16 • According to the same source, North Carolina's job postings have
17 increased by 10.4% over the year.
- 18 • Real gross domestic product (GDP) increased in all 50 states and the
19 District of Columbia in the first quarter of 2019, and increased at an
20 annual rate of 2.1% in the second quarter of 2019 according to the Bureau
21 of Economic Analysis ("BEA").
- 22 • Individual real disposable personal income (DPI) increased \$69.7 billion
23 (0.4 percent) and personal consumption expenditures (PCE) increased

1 \$41.0 billion (0.3 percent) in June 2019 according to estimates released
2 July 30, 2019 by the BEA.

- 3 • As reported by the same source, wages and salaries, the largest component
4 of personal income, increased 0.5 percent in June 2019 after increasing 0.2
5 percent in May.
- 6 • According to BEA, personal savings as a percentage of disposable income
7 remain higher in both the 1st and 2nd quarters of 2019, compared to all
8 four quarters in 2018.
- 9 • According to the United States Census Bureau, North Carolina exports
10 increased .4% in 2018, compared to 2017.
- 11 • According to the same source, privately-owned housing starts in June
12 2019 were at a seasonally adjusted annual rate of 1,253,000, 6.2 % above
13 the June 2018 rate of 1,180,000.
- 14 • The Census Bureau also reported that new orders for manufactured goods
15 in June increased \$3.1 billion (or 0.6 percent) to \$493.8 billion.
- 16 • Business investment increased in the second quarter of 2019 according to
17 BEA. BEA also reports that in 2018, expenditures by foreign direct
18 investors to acquire, establish, or expand U.S. businesses totaled \$296.4
19 billion, up 8.7 percent from \$272.8 billion in 2017.
- 20 • North Carolina continues to rank as one of the best states for business by
21 Chief Executive Magazine.
- 22 • On October 24, 2018, Forbes Magazine ranked Raleigh, Charlotte and
23 Durham as the 2nd, 5th and 13th Best Places for Business and Careers in the

1 Nation and on November 28, 2018, Forbes selected North Carolina as
2 having the best business climate in the U.S. The publication noted that
3 North Carolina's labor, energy and tax costs are all well below the
4 national average and rank as the second lowest in the U.S. overall, per
5 Moody's Analytics.

- 6 • North Carolina has experienced a significant number of new business
7 project announcements in the last 24 months. For example, on July 25,
8 2019, WFAE, Charlotte's NPR News Source, reported that financial
9 software company AvidXchange is planning to build a second in
10 Charlotte and increase its workforce by 1,200. This follows an
11 announcement from Lowe's in June that it plans to build a tech center in
12 Charlotte's South End and add 1,600 positions.

13 **Q. What is your conclusion based upon these statistics?**

14 A. In my opinion, they provide substantial grounds upon which to be
15 optimistic that the economy continues to be strong. This is shown in
16 everything from construction starts, new projects coming into the state,
17 personal disposable income growth, better employment rates, growth in
18 GDP, and greater confidence among consumers and the business
19 community.

20 This positive economic outlook supports the reasonableness of the
21 settled return on equity in this proceeding and provides support for the
22 notion that such return will not be unreasonably harmful to customers.

1 **Q. Are you aware of any published economist reports that support your**
2 **conclusions as they relate to the prospects for the North Carolina**
3 **economy?**

4 A. Yes. On May 30, 2019, Professor John Connaughton, an economist
5 from the University of North Carolina at Charlotte, presented the
6 economic report for 2018 and his forecast for the next 18 months.
7 According to Professor Connaughton, the country is in the second-
8 longest economic expansion since 1854. Connaughton said that
9 consumer confidence remains strong and that “[d]espite what is likely
10 to be the short-lived spike in GSP growth during 2018, the longer-term
11 outlook, at a more modest rate of growth, is fairly optimistic.” He
12 noted that in April, the Consumer Confidence Index was at 129.2, up
13 from the March index of 124.2. Connaughton predicts that it will take
14 a considerable negative event to slow the economy during 2019 or into
15 2020 in light of the national unemployment rate consistently below 4.0
16 percent, more job openings than job seekers, modest interest rates, and
17 continued consumer optimism.

18 **Q. How does this evidence comport with Dr. Woolridge’s testimony**
19 **on economic conditions?**

20 A. Dr. Woolridge makes essentially three points regarding current
21 economic conditions in North Carolina in his direct testimony: (1) the
22 unemployment rate in Piedmont’s service territory is allegedly
23 somewhat higher than the State average: (2) the median household

1 income in North Carolina is 10% below the US norm; and (3) natural
2 gas rates in North Carolina are more than 15% higher than the national
3 average. While Dr. Woolridge does not identify the source of these
4 statistics, I am not challenging them in my rebuttal testimony.

5 **Q. Do you have any comments on these statistics?**

6 A. Yes. It is not clear to me how Dr. Woolridge calculated the
7 unemployment rate within Piedmont's service territory because our
8 service territory covers a broad and economically diverse portion of
9 the State. Assuming his figures are accurate, the unemployment rate
10 he cites for Piedmont's service territory is extremely low by historic
11 standards. With respect to his citation to median household income, it
12 is unclear to me how that relates to the impact analysis for our
13 customers. Every jurisdiction in the United States has different costs
14 of living and different median household incomes. The fact that
15 median household income is somewhat lower in North Carolina than
16 in other locations in the United States is neither particularly surprising
17 nor particularly meaningful without an examination of a host of other
18 factors that would reveal how North Carolina households fare overall
19 when costs of living and incomes are compared. Even if that
20 examination showed that North Carolina households are more
21 economically challenged than in some places in the United States –
22 which they undoubtedly are in some cases – that analysis says nothing
23 about the relative impact of the stipulated annual revenue requirement

1 on those households. As stated previously in my testimony, costs in
2 North Carolina are among the lowest in the nation. Finally, the mere
3 fact that natural gas rates are higher in a state that has no native gas
4 production capacity, which is located a great distance from any such
5 production capacity, and which has populations spread across large
6 rural areas does not provide meaningful information as to whether the
7 annual revenue requirement set forth in the Stipulation is just and
8 reasonable and otherwise fair to customers in light of changing
9 economic conditions.

10 **Q. Does this conclude your testimony?**

11 **A. Yes.**