waller

Waller Lansden Dortch & Davis, LLP
511 Union Street, Suite 2700
P.O. Box 198966
Nashville, TN 37219-8966

615.244.6380 main
615.244.6804 fax
wallerlaw.com

Paul S. Davidson
615.850.8942 direct
paul.davidson@wallerlaw.com

July 2, 2020

Via Email and U.S. Mail

Executive Director Earl Taylor
c/o Ectory Lawless
Tennessee Public Utility Commission
502 Deaderick Street, Fourth Floor
Nashville, Tennessee 37243

Re: Piedmont Natural Gas Company, Inc. Petition for an Adjustment of Rates, Charges, and Tariffs Applicable to Service in Tennessee; Docket No.: 20-_00086

Dear Mr. Taylor:

Enclosed please find for filing the original and four copies of the following documents:

1. Petition;
2. Direct testimony and exhibits of:
   a. Sasha Weintraub
   b. John Sullivan
   c. Brian Weisker
   d. Pia Powers
   e. Kally Couzens
   f. Quynh Bowman
   g. Dylan D'Ascendis
   h. Dane Watson
   i. Paul Normand (Cash Working Capital)
   j. Paul Normand (Cost of Service)
3. Redline of Revised Tariff included as Exhibit_(PKP-2) to the testimony of Pia K. Powers;
4. Minimum Filing Guidelines (some of which are being filed under seal); and
5. Proposed Procedural Schedule.

This material is also being filed today by way of email to the Tennessee Public Utility Commission docket manager, Ectory Lawless. Please file the original and provide a "filed" stamped copy of the same via our office courier.

A courtesy copy of this filing is being provided to the Consumer Advocate and Protection Division of the Office of the Attorney General and Reporter. Please be advised that Piedmont has

reached out to the Consumer Advocate's representatives and is working collaboratively with them on a proposed Protective Order for this proceeding which we hope to file with the Commission shortly.

Please do not hesitate to call me if you have any questions.

Very truly yours,

Paul S. Davidson

PSD:cdg
Enclosures

cc: David Foster
Michelle Mairs
Vance Broemel
Daniel Whitaker
Bruce Barkley
Pia Powers
James Jeffries
Melinda McGrath

BEFORE THE TENNESSEE PUBLIC UTILITY COMMISSION
DOCKET NO. 20-00086

In the Matter of:	)	
	)	**DIRECT TESTIMONY OF**
Application of Piedmont Natural Gas	)	**DYLAN W. D'ASCENDIS FOR**
Company, Inc. for Adjustment of Rates	)	**PIEDMONT NATURAL GAS**
and Charges Applicable to Gas Service in	)	**COMPANY, INC.**
Tennessee		

I. WITNESS IDENTIFICATION AND QUALIFICATIONS

Q. PLEASE STATE YOUR NAME, AFFILIATION AND BUSINESS ADDRESS.

A. My name is Dylan W. D'Ascendis. I am a Director at ScottMadden, Inc. ("ScottMadden") My business address is 3000 Atrium Way, Suite 241, Mount Laurel, NJ 08054.

Q. ON WHOSE BEHALF ARE YOU SUBMITTING THIS TESTIMONY?

A. I am submitting this direct testimony ("Direct Testimony") before the Tennessee Public Utility Commission (the "Commission") on behalf of Piedmont Natural Gas Company, Inc. ("Piedmont" or the "Company").

Q. PLEASE SUMMARIZE YOUR PROFESSIONAL EXPERIENCE AND EDUCATIONAL BACKGROUND.

A. I have offered expert testimony on behalf of investor-owned utilities before 19 state regulatory commissions in the United States, one Canadian province, and one American Arbitration Association panel on rate of return issues including, but not limited to, common equity cost rate, rate of return, valuation, capital structure issues, relative investment risk, and credit quality issues.

I am a graduate of the University of Pennsylvania, where I received a Bachelor of Arts degree in Economic History. I have also received a Master of Business Administration with high honors and concentrations in Finance and International Business from Rutgers University. I am a Certified Rate of Return Analyst ("CRRA") and a Certified Valuation Analyst ("CVA"). My full professional qualifications are provided in Appendix B.

II. SUMMARY OF EXHIBITS

Q. DO YOU SPONSOR ANY EXHIBITS IN SUPPORT OF YOUR TESTIMONY?

A. My conclusions are supported by the data and analyses presented in Exhibit DWD-1 through Exhibit DWD-9, which have been prepared by our team at ScottMadden and reviewed and approved by me:

- Exhibit DWD-1 presents the Constant Growth Discounted Cash Flow ("DCF") model results;
- Exhibit DWD-2 presents the derivation of the proxy group retention growth rate applicable to the Constant Growth DCF model;
- Exhibit DWD-3 presents the derivation of the Market Risk Premium for use in the Capital Asset Pricing Model ("CAPM"), and Empirical Capital Asset Pricing Model ("ECAPM");
- Exhibit DWD-4 presents the Value Line and Bloomberg Financial Beta coefficients for the proxy group for use in the CAPM and ECAPM analyses;
- Exhibit DWD-5 presents the CAPM and ECAPM results;
- Exhibit DWD-6 presents the Bond Yield Plus Risk Premium analysis;
- Exhibit DWD-7 presents the Expected Earnings analysis;
- Exhibit DWD-8 presents regulatory mechanisms in place for the Company's proxy group; and
- Exhibit DWD-9 presents the derivation of flotation costs applicable to the

Company's Cost of Equity.

III. PURPOSE AND OVERVIEW OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?

A. The purpose of my Direct Testimony is to present evidence and provide a recommendation regarding the Company's Return on Equity ("ROE").[1] My analyses and conclusions are supported by the data presented in Exhibit DWD-1 through Exhibit DWD-9.

Q. PLEASE PROVIDE A BRIEF OVERVIEW OF THE ANALYSES THAT LED TO YOUR ROE RECOMMENDATION.

A. Because all models are subject to various assumptions and constraints, equity analysts and investors tend to use multiple methods to develop their return requirements. I therefore applied three widely accepted approaches to develop my ROE recommendation: (1) the Constant Growth form of the DCF model; (2) the traditional and empirical forms of the CAPM method; and (3) the Bond Yield Plus Risk Premium analysis. I also applied the Expected Earnings approach as a check on the DCF, CAPM, and Bond Yield Plus Risk Premium results. Those analyses indicate that the Company's Cost of Equity is in the range of 9.90 percent to 10.70 percent.

In addition to the methods noted above, I reviewed the Company's capital spending plan and regulatory recovery mechanisms and calculated the cost of issuing additional shares of common stock. As discussed in Section IV, I also considered the currently unstable capital market and macroeconomic environment

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

in which utilities such as Piedmont operate. Although I did not make explicit adjustments to my ROE estimates for those factors, I did consider them in determining where the Company's Cost of Equity falls within the range of analytical results.

My analyses recognize that estimating the Cost of Equity is an empirical, but not an entirely mathematical exercise; it relies on both quantitative and qualitative data and analyses, all of which are used to inform the judgment that inevitably must be applied. I therefore considered my analytical results in the context of such Company-specific and general capital market factors as those summarized above. Based on the quantitative and qualitative analyses discussed throughout my Direct Testimony, I find 10.30 percent, within a range of 9.90 percent to 10.70 percent, to be a reasonable and appropriate estimate of the Company's Cost of Equity.

No single model is more reliable than all others under all market conditions, and all require the use of reasoned judgment in their application, and in interpreting their results. The results of each ROE model therefore should be assessed in the context of current and expected capital market conditions, and relative to other appropriate benchmarks. In developing my recommendation, I recognized that the low and high ends of the range of results (set by the low end of the range of Constant Growth DCF model results, and the high end of the range of ECAPM results, respectively) are not likely to be reasonable estimates of the Company's Cost of Equity. In large measure, that is because those results are far removed from the returns recently authorized in other jurisdictions.

Q. ARE THERE OTHER FACTORS THAT SHOULD BE CONSIDERED IN DETERMINING THE WEIGHT GIVEN TO THE METHODS AND RESULTS SUMMARIZED ABOVE?

A. Yes. All models used to estimate the Cost of Equity are subject to certain assumptions, which may become more, or less, relevant as market conditions and market data change. An important consideration is the consistency of each model's underlying assumptions with current and expected market conditions, and the reasonableness of its results relative to observable benchmarks. As discussed below in Section IV, that consideration is especially important during market disruptions such as the market we are currently experiencing.

For example, the Constant Growth DCF model assumes the estimated Cost of Equity will remain constant in perpetuity regardless of whether and how market conditions change. Risk Premium-based methods (such as the CAPM), on the other hand, provide a measure of risk and have the benefit of directly considering investors' expectations regarding future market returns. Other Risk Premium approaches (*e.g.*, the Bond Yield Plus Risk Premium approach) reflect the well-documented finding that the Cost of Equity does not move in lock-step with interest rates. For example, at times interest rates fall because investors are so risk averse they would rather accept a very modest return on Treasury securities than take on the risk of equity ownership. In such circumstances, low interest rates suggest an increasing, not a decreasing, Cost of Equity. The Expected Earnings analysis, which is used as a corroborating method, calculates the Cost of Equity based on the opportunity cost of the return of an alternative investment in an enterprise with

similar risk. Because those methods provide different perspectives on investor return requirements, their use in combination enables a more comprehensive assessment of the Cost of Equity.

In summary, each model has strengths and weaknesses and it is important to recognize those differences in estimating the Cost of Equity. As noted above, the Constant Growth DCF model requires constant assumptions, inputs, and results in perpetuity, whereas Risk Premium-based methods provide the ability to reflect investors' views of risk, future market returns, and the relationship between interest rates and the Cost of Equity. The Expected Earnings method provides an observable and straightforward measure of the expected return on the book value of equity. Because it is largely insulated from potential distortions arising from unstable market conditions, including it in the set of models used to estimate the Company's Cost of Equity serves to attenuate potentially distorted results from other methods. On balance, I believe my recommendation reasonably reflects the methods investors apply, and the factors they consider in developing their return requirements.

Q. HOW IS THE REMAINDER OF YOUR DIRECT TESTIMONY ORGANIZED?

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

- Section IV – Highlights the current capital market conditions and their effect on the Company's Cost of Equity;
- Section V – Discusses the regulatory guidelines and financial considerations pertinent to the development of the cost of capital;

- Section VI – Explains the selection of the proxy group used to develop the analytical results;
- Section VII – Explains the analyses and the analytical bases for my ROE recommendation;
- Section VIII – Provides a discussion of specific business risks and other considerations that have a direct bearing on the Company's Cost of Equity; and
- Section IX – Summarizes my conclusions and recommendations.
- Appendix A – Explains in detail the analysis and inputs for each Cost of Equity model.

IV. CAPITAL MARKET ENVIRONMENT

Q. PLEASE DESCRIBE THE RECENT CAPITAL MARKET DISLOCATION AND ITS IMPLICATIONS FOR ESTIMATING THE COMPANY'S COST OF EQUITY.

A. The recent, dramatic shifts in the capital markets brought about by COVID-19, the "coronavirus", cannot be overstated. From February 12 to May 29, the S&P 500 lost about 10.00 percent of its value, and the utility sector lost about 14.00 percent.[2] During that time the broad market and the utility sector both had lost as much as 34.00 percent.[3] The VIX, which measures expected market volatility, increased

[2] Source: S&P Capital IQ. Utility sector measured by the XLU, and Dow Jones Utility Average.
[3] Source: S&P Capital IQ. Utility sector measured by the XLU, and Dow Jones Utility Average. Largest losses occurred on March 23, 2020.

six-fold (from 13.68 on February 14 to 82.69 on March 16); on March 9, the 30-year Treasury yield fell below 1.00 percent.[4]

Central banks have implemented multiple policies to address the financial market instability. On March 3, 2020, the Federal Reserve reduced the overnight lending rate by 50 basis points, to a target range of 1.00 percent to 1.25 percent. It did so in light of the "evolving risks to economic activity" posed by the coronavirus, and despite its view that "[t]he fundamentals of the U.S. economy remain strong."[5] On March 12, 2020, the Federal Reserve Bank of New York ("FRBNY") released a statement regarding "Treasury Reserve Management Purchases and Repurchase Operations". In that statement, the FRBNY announced that from March 13 to April 13, 2020 it would purchase $60 billion of Treasury securities "across a range of maturities".[6] The FRBNY also stated it had updated its monthly schedule of repurchase agreement operations to "address temporary disruptions in Treasury financing markets."[7] Together, the FRBNY's changes were meant to "address highly unusual disruptions in Treasury financing markets associated with the coronavirus outbreak."[8]

Three days later, on March 15, 2020, the Bank of Canada, the Bank of England, the Bank of Japan, the European Central Bank, the Federal Reserve, and the Swiss National Bank announced "a coordinated action to enhance the provision

4 Source: Bloomberg Professional.
5 Federal Reserve Press Release, March 3, 2020.
6 Federal Reserve Bank of New York, *Statement Regarding Treasury Reserve Management Purchases and Repurchase Operations*, March 12, 2020.
7 *Ibid*.
8 *Ibid*.

of liquidity via the standing U.S. dollar liquidity swap line arrangements."[9] That same day, the Federal Reserve lowered the Federal Funds rate by an additional 100 basis points, to a target range of 0.00 percent to 0.25 percent, and announced its plan to increase holdings of Treasury securities and agency mortgage-backed securities by a total of $700 billion.[10]

In late March, the Federal Reserve announced additional initiatives to support the capital markets, including a new method to measure counterparty credit risk derivatives contracts, an optional extension of the regulatory capital transition for the new credit loss accounting standard,[11] and the establishment of a "temporary FIMA Repo Facility" intended to support "the smooth functioning of financial markets, including the U.S. Treasury market, and thus maintain the supply of credit to U.S. households and businesses."[12]

On March 23, the U.S. House of Representatives introduced a bill providing approximately $2.5 trillion of economic stimulus payments; on March 25, the U.S. Senate passed the Coronavirus Aid, Relief, and Economic Security Act, which was signed into law on March 27, 2020. On April 24, President Trump signed the Paycheck Protection Program and Health Care Enhancement Act that provided an additional $484 billion in emergency aid.[13]

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9 Federal Reserve Press Release, Coordinated Central Bank Action to Enhance the Provision of Global U.S. Dollar Liquidity, March 15, 2020.

10 Federal Reserve Press Release, Implementation Note issued March 15, 2020.

11 Joint Press Release, *Agencies announce two actions to support lending to households and businesses*, March 27, 2020.

12 Federal Reserve Press Release, March 31, 2020.

13 S&P Global Market Intelligence, *Trump signs $484B coronavirus relief package into law*, April 24, 2020.

On April 6, the Federal Reserve announced it would "establish a facility to facilitate lending to small businesses via the Small Business Administration's Paycheck Protection Program ("PPP") by providing term financing backed by PPP loans"[14]. On April 9, it "took additional actions to provide up to $2.3 trillion in loans to support the economy", explaining that the "funding will assist households and employers of all sizes and bolster the ability of state and local governments to deliver critical services during the coronavirus pandemic."[15] By April 29, Securities Held Outright on the Federal Reserve's balance sheet increased to $5.56 trillion from $3.81 trillion on February 5, 2020.[16]

The May 1, 2020 edition of *Blue Chip Financial Forecasts* ("*Blue Chip*") discussed the pandemic's effect on the general economy as follows:

> This time in economic history will forever be marked with footnotes and asterisks denoting the "COVID Recession." This period is unique for the enormous numbers we'll see in the plunge in GDP, the height of the unemployment rate, the magnitude of the federal budget deficit and the rapid surge in the Federal Reserve balance sheet. Footnotes and asterisks are justified because the cause of this recession is not economic; it's a world-wide disease epidemic. It is truly a Black Swan event that precludes conventional economic modeling.[17]

Blue Chip further explained that the uncertainty created by the pandemic is reflected in the wide range of Gross Domestic Product ("GDP") forecasts among its survey participants:

> …the average of the forecasts for Q2 is -27.8%, with the "highest" -6.0% and the lowest -45.0% (all [Seasonally Adjusted Annual

[14] Federal Reserve Press Release, April 6, 2020.
[15] Federal Reserve Press Release, April 9, 2020.
[16] Federal Reserve Schedule H.4.1.
[17] Blue Chip Financial Forecasts, May 1, 2020, at 1.

> Rates]). In April, the average estimate was -15.9%. The average for Q3 shows that GDP should return to positive growth, 7.4%, while the range runs from -41.7% to +55.0%. As an indication that those extreme numbers are not totally huge outliers, the bottom ten forecasts average -13.5% and the top ten average +26.1%. [18]

According to the U.S. Department of Labor ("DOL"), the seasonally adjusted insured unemployment rate for the week ending April 4, 2020 was 8.20 percent. As DOL explained, "[t]his marks the highest level of the seasonally adjusted insured unemployment rate in the history of the seasonally adjusted series." The previous high, set in May 1975, was 7.00 percent.[19] By April 11th, the rate increased to 11.00 percent.[20] For the month of April 2020, the national unemployment rate stood at 14.70 percent (seasonally adjusted), which the Bureau of Labor Statistics noted was "the highest rate and the largest over-the-month increase in the history of the series."[21] On April 29, 2020, the Bureau of Economic Analysis released its estimate for GDP for the first quarter of 2020, showing real GDP declined by 4.80 percent (annual rate) in the first three months of the year.[22]

It is within that broad context that on April 2, Standard & Poor's ("S&P") downgraded its outlook on the utility sector from "Stable" to "Negative", explaining that it expects a 12.00 percent contraction in GDP during the second quarter of 2020, reducing commercial and industrial usage.[23] On May 4, S&P observed the utility sector's credit profile had been "helped by proactive measures

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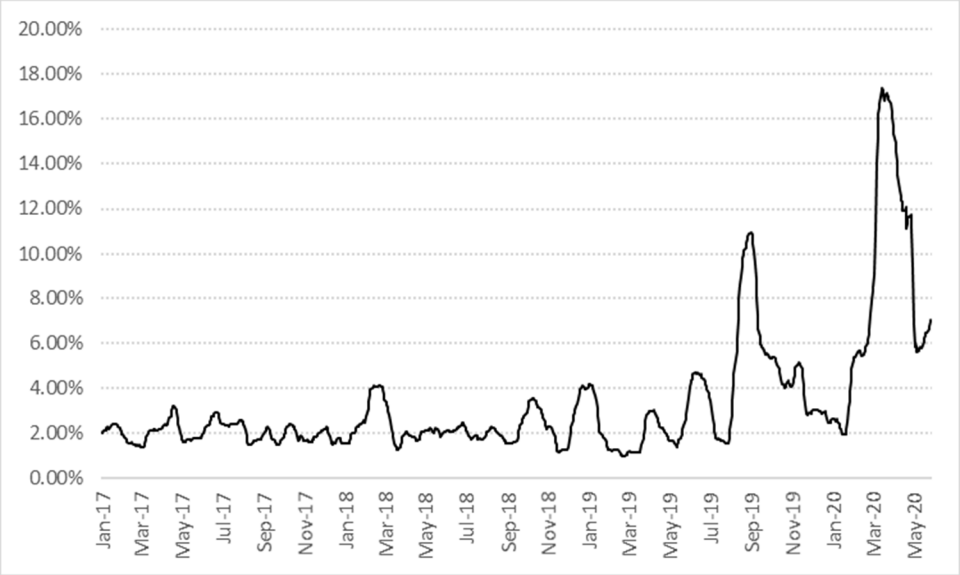
18 *Ibid*. [clarification added]
19 U.S. Department of Labor News Release, April 16, 2020.
20 U.S. Department of Labor News Release, April 23, 2020
21 U.S. Bureau of Labor Statistics News Release, May 8, 2020.
22 U.S. Bureau of Economic Analysis News Release, April 29, 2020.
23 S&P Global Ratings, *COVID-19: The Outlook For North American Regulated Utilities Turns Negative*, April 2, 2020, at 1, 6-7.

the industry [had] taken to ensure liquidity through revolving credit facilities and issuing debt."[24] S&P further noted consistent access to capital is critical to utilities' credit quality, given they "often operate with negative discretionary cash flow".[25] Despite those findings, S&P maintained its negative outlook for the utility sector.

Despite those central bank actions, the 30-Year Treasury bond yield has remained highly volatile, as seen in the Coefficient of Variation (*see*, Chart 1, below).

Chart 1: Coefficient of Variation in 30-Year Treasury Yields[26]

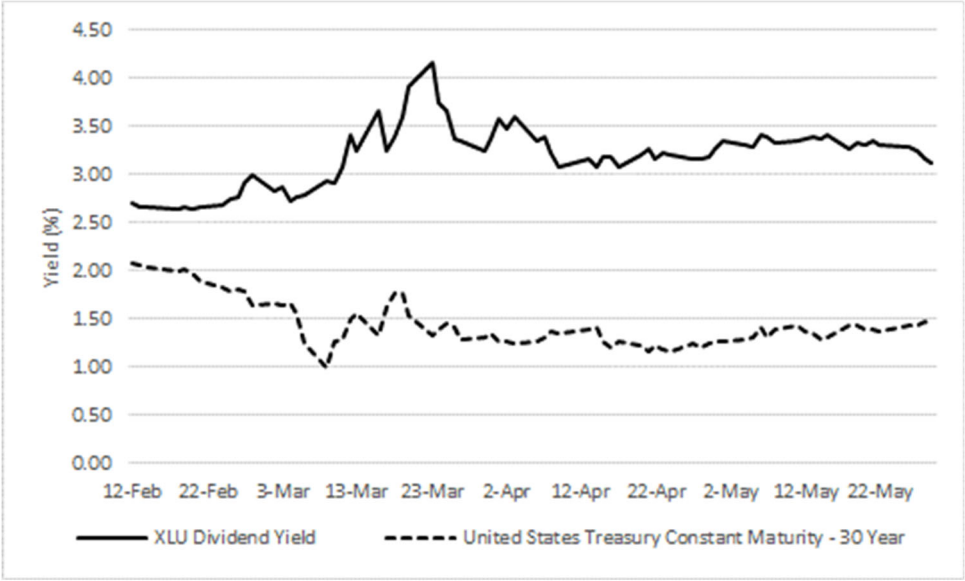


Investor reactions to the market instability also are reflected in the "yield spread", or the difference between dividend yields and long-term Government bond yields. As the 30-year Treasury yield fell, utility dividend yields increased, widening the yield spread (*see* Chart 2, below). That pattern, in which utility dividend yields move in the opposite direction of interest rates, reflects the

[24] S&P Global Market Intelligence, *S&P credits utilities' moves to bolster liquidity against virus impacts*, May 6, 2020.
[25] *Ibid*.
[26] Source: S&P Global Market Intelligence.

disjointed capital market, and investors' reactions to it. Under more "normal" conditions, dividend yields tend to be directionally related to Treasury yields, such that the yield spread remains relatively constant. But that relationship has a limit. Investors will not continuously bid up utility prices as interest rates fall; the widening yield spread demonstrates as much.

Chart 2: Utility Dividend Yields and Treasury Yields[27]

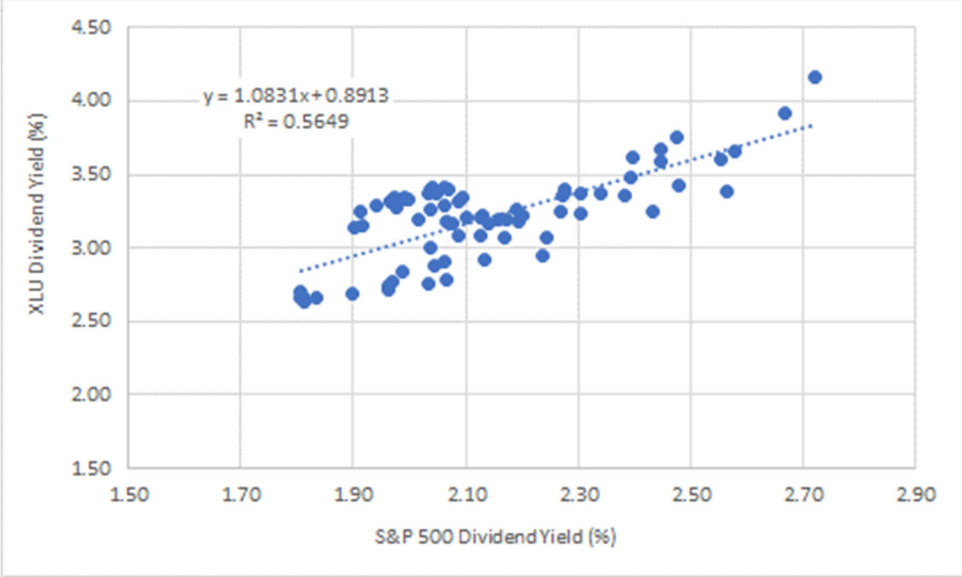


From a slightly different perspective, from January 1 to February 11, 2020, the correlation between the S&P 500 dividend yield and the utility sector dividend yield was about 15.00 percent. From February 12 through May 29, 2020, it increased to 75.16 percent (*see* Chart 3, below). That increasing correlation is not surprising. As Morningstar recently explained, during volatile markets there often is little distinction in returns across assets or portfolios. That is, "correlations go to 1."[28] When that happens, utility stocks lose their "defensive" quality.

[27] Source: S&P Capital IQ.

[28] Morningstar, Correlations *Going to 1: Amid Market Collapse, U.S. Stock Fund Factors Show Little Differentiation*, March 6, 2020.

Chart 3: Utility Sector Dividend Yield vs. S&P 500 Dividend Yield (2/12/2020 – 5/29/2020)[29]

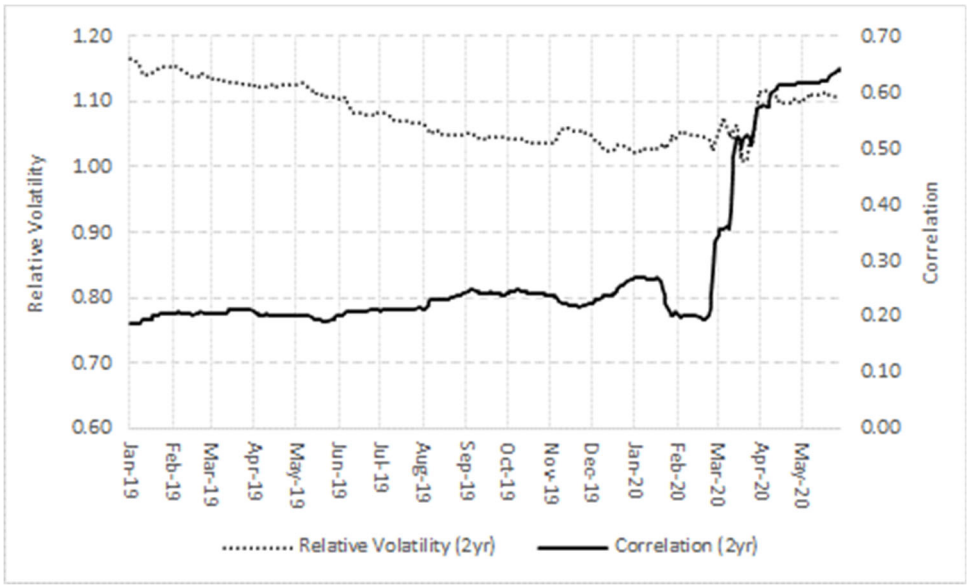


A direct consequence of stronger correlations is higher Beta coefficients. As discussed in Appendix A, Beta coefficients are a function of two parameters: (1) relative volatility (the standard deviation of the subject company's returns relative to the standard deviation of the market return; and (2) the correlation between the subject company's returns and the market return.[30] Under the CAPM, higher Beta coefficients indicate an increase in the Cost of Equity. Applying Bloomberg's two-year calculation convention, the increase in correlations, and in relative volatility, since mid-February 2020 (Chart 4, below) is apparent.

[29] Source: S&P Capital IQ. Utility sector represented by the XLU. Please note, R^2 of 0.5649 indicates a correlation coefficient (R) of 0.7516.

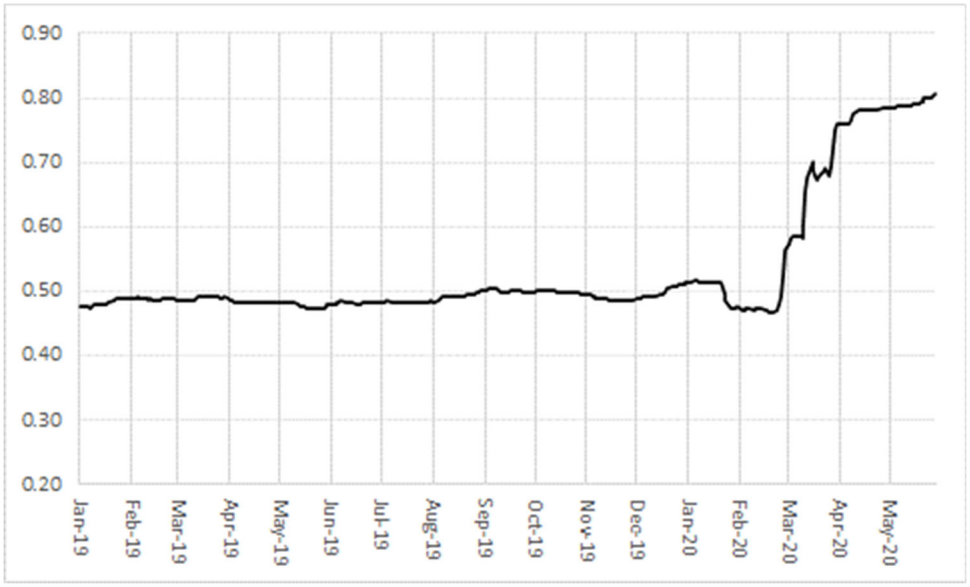
[30] *See,* Equation [8].

Chart 4: Components of Proxy Group (Two-Year) Beta Coefficients[31]



Not surprisingly, the increased correlation and relative volatility combine to produce significantly increased (adjusted) Beta coefficients.

Chart 5: Proxy Group (Two-Year) Beta Coefficients Over Time[32]

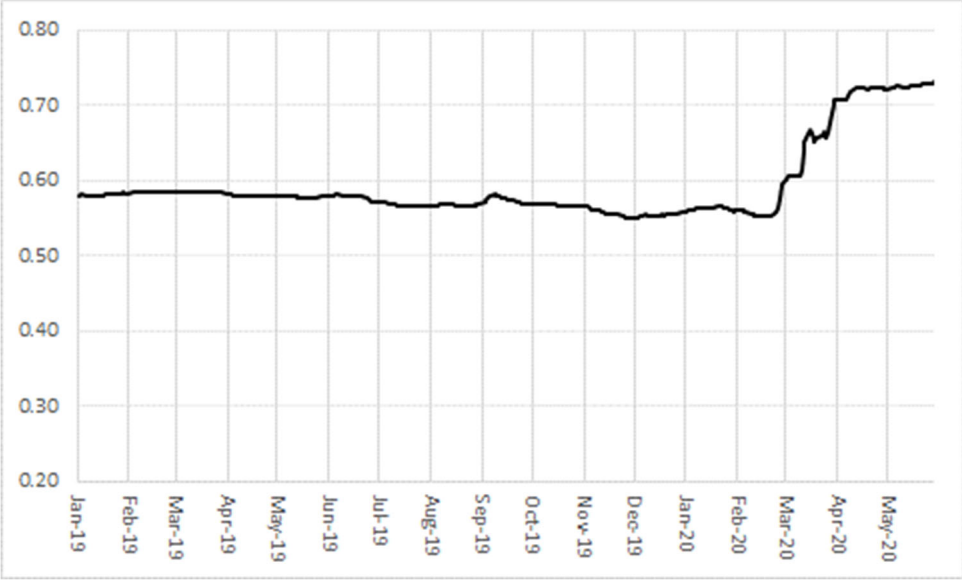


[31] Source: S&P Global Market Intelligence. Weekly returns calculated over 24 months.

[32] Source: S&P Global Market Intelligence. Beta coefficients based on weekly returns calculated over 24 months.

Even if we extend the calculation period to five years, the increase in correlations increases calculated Beta coefficients well above their January and February 2020 levels (see Chart 6, below).

Chart 6: Proxy Group (Five-Year) Beta Coefficients Over Time[33]



Q. WHAT CONCERNS HAVE THE CREDIT RATING AGENCIES NOTED REGARDING THE EFFECTS OF COVID-19 ON THE UTILITY SECTOR DISLOCATION?

A. As noted earlier, S&P downgraded its outlook for the North American utility sector from stable to negative. In its review of how COVID-19 may affect the utility sector, S&P explained it expects a 12.00 percent contraction in GDP during the second quarter of 2020, reducing commercial and industrial usage. S&P further noted that although companies with decoupling structures may be able to offset some of that lower usage, bad debt expenses likely will increase. Even though some utilities may be able to defer those costs, S&P notes that in prior incidents utilities

[33] Source: S&P Global Market Intelligence. Beta coefficients based on weekly returns calculated over 60 months.

have negotiated with regulatory commissions to "write off some of these costs as part of a larger agreement."[34]

Regarding liquidity and capital access, S&P observes that "the industry continues to exhibit adequate liquidity and access to the debt markets, despite uneven performance of the commercial paper market for tier 2 issuers", but availability to equity markets "remains extraordinarily challenging."[35] S&P expects the negative discretionary cash flow associated with high capital investment commitments and the "lack of access to the equity markets" to "lead to a weakening of credit measures."[36]

Although utilities have some discretion as to how they may reduce capital investments while maintaining safe and reliable service, in a prolonged recession they may consider reducing dividend payments. As S&P notes, "[t]here is precedent that during times of high financial stress, utilities have reduced their dividends and we would expect that the industry, if necessary, would use this lever, acting prudently to preserve credit quality."[37] It is through such "levers" that S&P expects the sector to remain a high quality, investment grade industry.[38]

Moody's Investor Services ("Moody's") similarly observed that "[i]n a prolonged economic downturn, boards of directors are likely to review dividend plans as an option to conserve cash."[39] Moody's expects companies with higher

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34 S&P Global Ratings, *COVID-19: The Outlook For North American Regulated Utilities Turns Negative*, April 2, 2020, at 7.
35 *Ibid*.
36 *Ibid*.
37 *Ibid*., at 9.
38 *Ibid.*
39 Moody's Investors Service, *Dividends a major source of cash if coronavirus downturn is prolonged*, April 6, 2020, at 1.

payout ratios as more likely to reduce dividends, and sees the potential for average dividend payout ratios to increase to about 80.00 percent from a median of 63.00 percent in 2019.[40] In Moody's view, the ability to reduce dividends provides utilities "with a significant source of internal cash that could help them offset the impact of a potentially prolonged coronavirus-related economic downturn."[41]

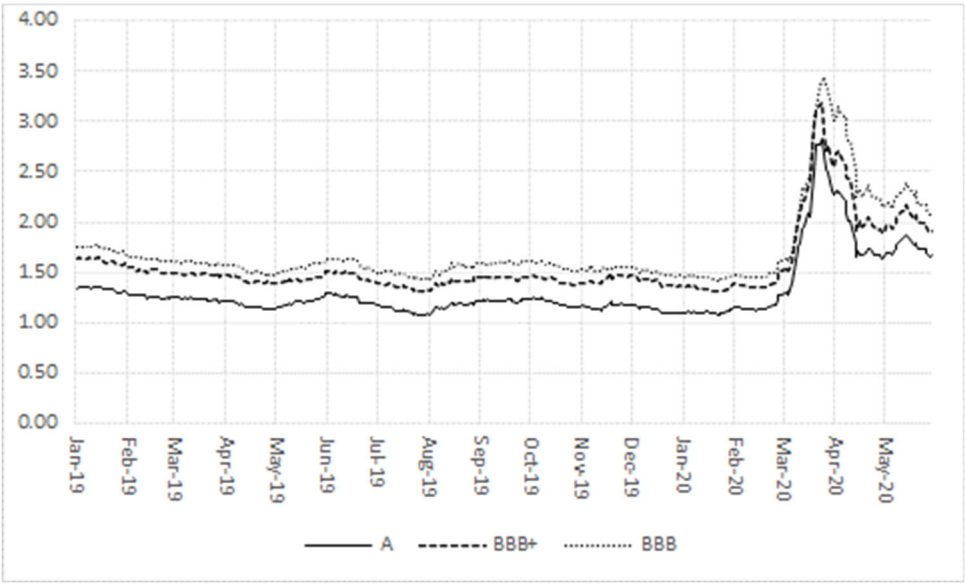
Q. HAVE UTILITY CREDIT SPREADS REFLECTED THE CONCERNS NOTED BY S&P AND MOODY'S?

A. Yes, they have. As Chart 7 (below) demonstrates, credit spreads for A, BBB+, and BBB-rated utility debt increased significantly from February 19 to May 29, 2020, over 40.00 percent by the end of the period and more than doubling during the period. Looking back to 2007, before the 2008/2009 Financial Crisis, utility credit spreads as of May 29, 2020 were in the top 90th to 91st percentile. Put another way, even considering the Financial Crisis, credit spreads currently are at historically high levels.

40 *Ibid*., at 2-3.
41 *Ibid*., at 1.

Chart 7: Utility Credit Spreads

(January 1, 2019 to May 29, 2020)[42]



Q. WHAT CONCLUSIONS DO YOU DRAW FROM THOSE ANALYSES?

A. Because underlying Treasury yields have been depressed due to investors seeking the safety of Treasury securities, the relevant measure of incremental return requirements is the change in credit spreads. Debt investors have a contractual, senior claim on cash flows over a limited horizon whereas equity investors bear the residual risk of ownership in perpetuity. Despite those protections, the additional return required by debt investors approximately doubled during the current market dislocation. Given its lower priority claim on cash flows and its perpetual exposure to risk, we can assume the increase in the Cost of Equity would be greater than the increase in credit spreads. Again, even if we cannot precisely measure the increase in the Cost of Equity associated with the current market dislocation, we reasonably can conclude it has increased.

[42] Source: Bloomberg Professional. Data based on Fair Value Curves for 30-year maturities.

Second, S&P and Moody's both point to reducing the growth in dividends as a means of preserving credit quality in the event of a prolonged economic downturn. Doing so, however, comes at the expense of equity investors. The potential tension between maintaining credit quality and preserving dividends is another reason the Cost of Equity may increase more than credit spreads.

Lastly, S&P and Moody's discuss the importance of cash flow in the rating process. The two principal sources of cash flow to utilities are net income and depreciation. A reduction in the Company's ROE, therefore, would reduce the Company's earnings, cash flow, and ability to internally fund capital investments and dividends, putting further downward pressure on credit metrics and stock prices.

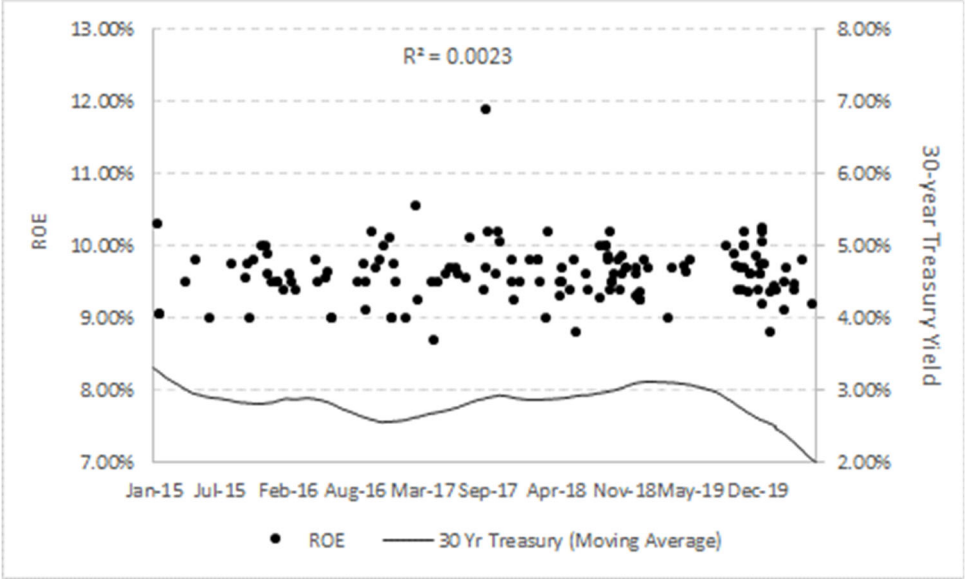
If dividends are maintained despite lower earnings and cash flow, payout ratios will increase. As Moody's observed, over time companies with higher payout ratios are more likely to reduce dividends, which would put further downward pressure on stock valuations. And as S&P noted, reduced equity valuations diminish the ability to access external equity, further eroding credit quality.

In short, during a period of heightened and possibly prolonged market uncertainty, observable market information makes clear that utility investors now face greater risks and require higher returns.

Q. HAVE AUTHORIZED RETURNS MOVED IN STEP WITH THE LOW INTEREST RATE ENVIRONMENT?

A. No, they have not. As Chart 8 demonstrates, despite the decline in yields in 2015 and 2016, and again in 2019-2020, regulatory commissions have not been inclined to reduce authorized returns. The constancy of authorized returns as interest rates fell also is consistent with the widely accepted principle that the Equity Risk Premium increases as interest rates fall.

Chart 8: Authorized Returns for Natural Gas Utilities (2015 – 2020)[43]



Q. WHAT ARE YOUR OBSERVATIONS RELATED TO RECENTLY AUTHORIZED RETURNS FOR NATURAL GAS UTILITIES?

A. As Chart 8 above demonstrates, there has been no meaningful trend since 2015; time explains less than 1.00 percent of the change in ROEs, and the trend is statistically insignificant. Over that same period, authorized returns for natural gas

[43] Excludes Limited Issue Rate Riders. Source: Regulatory Research Associates.

utilities ranged from 8.70 percent to 11.88 percent, with an average and median of 9.61 percent and 9.60 percent, respectively.[44] Authorized returns for natural gas utilities from January 1, 2019 through May 29, 2020 ranged from 8.80 percent to 10.25 percent, with an average and median of 9.63 percent and 9.70 percent, respectively.[45]

Q. WHAT CONCLUSIONS DO YOU DRAW FROM YOUR REVIEW OF THE CURRENT CAPITAL MARKET ENVIRONMENT AND ITS IMPLICATIONS ON THE COMPANY'S COST OF EQUITY?

A. When markets become this uncertain, and this disrupted, investors increase their return requirements. Estimating that additional return becomes increasingly complex. That is the technical issue. The practical issue is plain: When utility investors are faced with such extraordinary market uncertainty, regulatory supportiveness becomes critically important.

I appreciate that the Commission has the difficult task of balancing the interests of customers and investors. I also appreciate doing so becomes increasingly difficult under stressed economic and financial conditions. We should not lose sight of the common interest customers and investors have in a financially strong utility. On balance, I believe the Company's Cost of Equity falls in the range of 9.90 percent to 10.70 percent. Given the uncertainty surrounding the eventual scope and duration of the current market dislocation, I believe an ROE toward the upper end of my recommended range would be justified; however, in my view, an

[44] Excludes Limited Issue Riders. Source: Regulatory Research Associates.
[45] Source: Regulatory Research Associates.

ROE of 10.30 percent is a reasonable, if not conservative, estimate of the Company's Cost of Equity.

V. SUMMARY OF ISSUES SURROUNDING COST OF EQUITY ESTIMATION IN REGULATORY PROCEEDINGS

Q. BEFORE ADDRESSING THE SPECIFIC ASPECTS OF THIS PROCEEDING, PLEASE PROVIDE AN OVERVIEW OF THE ISSUES SURROUNDING THE COST OF EQUITY IN REGULATORY PROCEEDINGS, GENERALLY.

A. In general terms, the Cost of Equity is the return investors require to make an equity investment in a firm. That is, investors will provide funds to a firm only if the return they *expect* is equal to, or greater than, the return they *require* to accept the risk of providing funds to the firm. From the firm's perspective, that required return, whether it is provided to debt or equity investors, has a cost. Individually, we speak of the "Cost of Debt" and the "Cost of Equity" as measures of those costs; together, they are referred to as the "Cost of Capital."

The Cost of Capital (including the costs of both debt and equity) is based on the economic principle of "opportunity costs." Investing in any asset, whether debt or equity securities, implies a forgone opportunity to invest in alternative assets. For an investment to be sensible, its expected return must be at least equal to the return expected on alternative, comparable risk investment opportunities. Because investments with like risks should offer similar returns, the opportunity cost of an investment should equal the return available on an investment of

comparable risk. In that important respect, the returns required by debt and equity investors represent a cost to the Company.

Although both debt and equity have required costs, they differ in certain fundamental ways. Most noticeably, the Cost of Debt is contractually defined and directly observed as the interest rate or yield on debt securities.[46] The Cost of Equity, on the other hand, is neither directly observable nor a contractual obligation. Rather, equity investors have a claim on cash flows only after debt holders are paid; the uncertainty (or risk) associated with those residual cash flows determines the Cost of Equity. Because equity investors bear the "residual risk," they take greater risks and require higher returns than debt holders. In that basic sense, equity and debt investors differ; they invest in different securities, face different risks, and require different returns.

Whereas the Cost of Debt can be directly observed, the Cost of Equity must be estimated based on market data and various financial models. As discussed throughout my Direct Testimony, each model is subject to specific assumptions, which may be more or less applicable as market conditions change. Because the Cost of Equity is premised on opportunity costs, the models typically are applied to a group of "comparable" or "proxy" companies. The choice of models (including their inputs), the selection of proxy companies, and the interpretation of the model results all require the application of reasoned judgment. That judgment should consider data and information that is not necessarily included in the models themselves.

[46] The observed interest rate may be adjusted to reflect issuance costs.

In the end, the estimated Cost of Equity should reflect the return that investors require in light of the subject company's risks, and the returns available on comparable investments. A given utility stock may require a higher return based on the risks to which it is exposed, or the growth it may expect, relative to other utilities. That is, although utilities may be viewed as a "sector", not all require the same return. The assessment of relative risk and growth prospects, and their effect on the Cost of Equity, requires the application of reasoned, experienced judgment applied to a variety of data, much of which is qualitative.

Q. PLEASE PROVIDE A BRIEF SUMMARY OF THE GUIDELINES ESTABLISHED BY THE UNITED STATES SUPREME COURT ("THE SUPREME COURT") FOR THE PURPOSE OF DETERMINING THE RETURN ON EQUITY.

A. The Supreme Court established the guiding principles for establishing a fair return for capital in two cases: (1) *Bluefield Water Works and Improvement Co. v. Public Service Comm'n of West Virginia* ("*Bluefield*");[47] and (2) F*ederal Power Comm'n v. Hope Natural Gas Co*. ("*Hope*").[48] In those cases, the Supreme Court recognized that the fair rate of return on equity should be: (1) comparable to returns investors expect to earn on other investments of similar risk; (2) sufficient to assure confidence in the company's financial integrity; and (3) adequate to maintain and support the company's credit and to attract capital.

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

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

Q. HAS THE COMMISSION PROVIDED SIMILAR GUIDANCE?

A. Yes, it has. For example, in its Order in Docket No. 19-00028 earlier this year, the Commission cited both *Hope* and *Bluefield* in noting that:

> The Commission must also approve a rate that provides the regulated utility an opportunity to earn a just and reasonable return on its investments.
>
> There is no single, precise measure of the fair rate of return a utility is allowed an opportunity to earn. Therefore, the Commission must exercise its judgment in making an appropriate determination. The Commission, however, is not without guidance in exercising its judgment:
>
> > A public utility is entitled to such rates as will permit it to earn a return on the value of the property which it employs for the convenience of the public equal to that generally being made at the same time and in the same general part of the country on investments in other business undertakings which are attended by corresponding risks and uncertainties; but it has no constitutional right to profits such as are realized or anticipated in highly profitable enterprises or speculative ventures. The return should be reasonably sufficient to assure confidence in the financial soundness of the utility and should be adequate, under efficient and economical management, to maintain and support its credit and enable it to raise the money necessary for the proper discharge of its public duties.

The United States Supreme Court likewise has found regulated utilities are entitled to a return that is "just and reasonable." The rate a utility is permitted to charge should enable it "to operate successfully, to maintain its financial integrity, to attract capital, and to compensate investors for the risks assumed."[49]

[49] Tennessee Public Utility Commission, Docket No. 19-00028, Order, January 30, 2020, at 7-8

Q. ASIDE FROM THOSE LONG-HELD STANDARDS, WHY IS IT IMPORTANT FOR A UTILITY TO BE ALLOWED THE OPPORTUNITY TO EARN A RETURN ADEQUATE TO ATTRACT EQUITY CAPITAL AT REASONABLE TERMS?

A. A return that is adequate to attract capital at reasonable terms enables the utility to provide safe and reliable service while maintaining its financial integrity. In keeping with the *Hope* and *Bluefield* standards, that return should be commensurate with the returns expected elsewhere in the market for investments of equivalent risk. The consequence of the Commission's order in this case, therefore, should be to provide Piedmont the opportunity to earn a return on equity that is: (1) adequate to attract capital at reasonable terms; (2) sufficient to ensure its financial integrity; and (3) commensurate with returns on investments in enterprises having corresponding risks. To the extent Piedmont is provided a reasonable opportunity to earn its market-based Cost of Equity, neither customers nor shareholders should be disadvantaged. In fact, a return that is adequate to attract capital at reasonable terms enables the Company to provide safe, reliable natural gas utility service while maintaining its financial integrity.

Q. HOW IS THE COST OF EQUITY ESTIMATED IN REGULATORY PROCEEDINGS?

A. As noted earlier (and as discussed in more detail later in my Direct Testimony), the Cost of Equity is estimated by the use of various financial models. By their nature, those models produce a range of results from which the ROE is determined. That determination must be based on a comprehensive review of relevant data and

information; it does not necessarily lend itself to a strict mathematical solution. The key consideration in determining the ROE is to ensure the overall analysis reasonably reflects investors' view of the financial markets in general, and the subject company (in the context of the proxy companies), in particular.

In summary, practitioners, academics, and regulatory commissions recognize that financial models are not precise quantifications of investor behavior, but are tools to be used in the ROE estimation process. They appreciate that the strict adherence to any single approach, or to the specific results of any single approach, can lead to flawed or misleading conclusions. That position is consistent with the *Hope* and *Bluefield* principle that it is the analytical result, as opposed to the method employed, that is controlling in arriving at ROE determinations. A reasonable ROE estimate therefore considers multiple methods, and the reasonableness of their individual and collective results in the context of observable, relevant market information.

VI. PROXY GROUP SELECTION

Q. AS A PRELIMINARY MATTER, WHY IS IT NECESSARY TO SELECT A GROUP OF PROXY COMPANIES TO DETERMINE THE COST OF EQUITY FOR PIEDMONT?

A. First, it is important to bear in mind that the Cost of Equity for a given enterprise depends on the risks attendant to the business in which the company is engaged. According to financial theory, the value of a given company is equal to the aggregate market value of its constituent business units. The value of individual business units reflects the risks and opportunities inherent in the sectors in which

those units operate. In this proceeding, we are focused on estimating the Cost of Equity for the Company's Tennessee operations. Because the ROE is a market-based concept, and given the fact that the Company's jurisdictional operations within Tennessee are not a separate entity with its own stock price, it is necessary to establish a group of companies that are both publicly-traded and comparable to Piedmont to serve as its "proxy" for purposes of the ROE estimation process.

Even if the Company's Tennessee jurisdictional assets did constitute the entirety of the parent company's operations, it is possible that transitory events could bias its market value in one way or another over a given period of time. A significant benefit of using a proxy group is that it serves to moderate the effects of anomalous, temporary events associated with any one company.

Q. DOES THE SELECTION OF A PROXY GROUP SUGGEST THAT ANALYTICAL RESULTS WILL BE TIGHTLY CLUSTERED AROUND AVERAGE (*I.E.*, MEAN) RESULTS?

A. No. For example, the DCF approach calculates the Cost of Equity using the expected dividend yield and projected growth. Despite the care taken to ensure risk comparability, market expectations regarding future risks and growth opportunities will vary from company to company. Therefore, even within a group of similarly situated companies, it is common for analytical results to reflect a seemingly wide range.[50] An ongoing issue is how to best estimate the market-required ROE within that range. That determination necessarily must consider a wide range of both empirical and qualitative information.

[50] In Appendix A, I provide more complete descriptions of the models used to estimate the Cost of Equity.

Q. PLEASE PROVIDE A SUMMARY PROFILE OF PIEDMONT.

A. Piedmont provides natural gas distribution service to approximately one million customers in North Carolina, South Carolina and Tennessee.[51] Of this total customer base, the Company's Tennessee operations serves approximately 191,000 customers.[52] Piedmont currently has senior unsecured ratings of A3 (outlook: Stable) and A- (outlook: Stable) from Moody's Investor Service and Standard & Poor's Rating Services, respectively.[53]

Q. HOW WERE THE COMPANIES INCLUDED IN YOUR PROXY GROUP SELECTED?

A. Beginning with the universe of companies that Value Line classifies as Natural Gas Utilities, which includes ten domestic U.S. utilities, we then applied the following screening criteria:

- Because certain of the models used in my analyses assume that earnings and dividends grow over time, I excluded companies that do not consistently pay quarterly cash dividends;
- To ensure that the growth rates used in my analyses are not biased by a single analyst, all the companies in my proxy group are covered by at least two utility industry equity analysts;
- All the companies in the proxy group have investment grade senior unsecured bond and/or corporate credit ratings from S&P;

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51 *See,* https://news.duke-energy.com/releases/duke-energy-completes-acquisition-of-piedmont-natural-gas.

52 Company-provided.

53 *See,* Fourth Quarter 2019 Earnings Review and Business Update https://www.duke-energy.com/_/media/pdfs/our-company/investors/news-and-events/2019/4qresults/4q2019slides.pdf?la=en at 39.

- To incorporate companies that are primarily regulated gas distribution utilities, we included companies with at least 60.00 percent of operating income derived from regulated natural gas utility operations; and
- We eliminated companies currently known to be party to a merger, or transformative transaction.

Q. WHAT COMPANIES MET THOSE SCREENING CRITERIA?

A. The criteria discussed above resulted in a proxy group of the following seven companies:

Table 1: Proxy Group Screening Results

Company	Ticker
Atmos Energy Corporation	ATO
New Jersey Resources Corporation	NJR
Northwest Natural Gas Company	NWN
ONE Gas, Inc.	OGS
South Jersey Industries, Inc.	SJI
Southwest Gas Corporation	SWX
Spire Inc.	SR

VII. COST OF EQUITY ESTIMATION

Q. PLEASE BRIEFLY DISCUSS THE ROE IN THE CONTEXT OF THE REGULATED RATE OF RETURN.

A. Regulated utilities primarily use common stock and long-term debt to finance their capital investments. The overall rate of return ("ROR") weighs the costs of the individual sources of capital by their respective book values. While the cost of debt can be directly observed, the Cost of Equity is market-based and, therefore, must be estimated based on observable market information.

Q. HOW IS THE REQUIRED ROE DETERMINED?

A. Because the Cost of Equity is not directly observable, it must be estimated based on both quantitative and qualitative information. Although several empirical models have been developed for that purpose, all are subject to limiting assumptions or other constraints. Consequently, many finance texts recommend using multiple approaches to estimate the Cost of Equity.[54] When faced with the task of estimating the Cost of Equity, analysts and investors are inclined to gather and evaluate as much relevant data as reasonably can be analyzed and, therefore, rely on multiple analytical approaches.

As discussed earlier, no individual model is more reliable than all others under all market conditions, and that the application of judgement is important in developing ROE estimates. Regulators in other states, such as North Carolina,

[54] *See, for example,* Eugene Brigham, Louis Gapenski, Financial Management: Theory and Practice, 7th Ed., 1994, at 341, and Tom Copeland, Tim Koller and Jack Murrin, Valuation: Measuring and Managing the Value of Companies, 3rd Ed., 2000, at 214.

Hawaii and Massachusetts, have made similar findings.[55] It therefore is both prudent and appropriate to use multiple methods to mitigate the effects of assumptions and inputs associated with any single approach. As noted earlier, for purposes of my ultimate recommendations in this case, my team and I applied the Constant Growth DCF model, the CAPM and ECAPM, the Bond Yield Plus Risk Premium, and then checked those results using an Expected Earnings approach.

Q. WHY WERE THESE FOUR MODELS SELECTED?

A. For two reasons. First, because the purpose of ROE analysis is to estimate the return that investors require, it is important to use the models on which those investors rely. As discussed in Appendix A, the models we applied are commonly used in practice. Second, the models focus on different aspects of return requirements, and provide different insights to investors' views of risk and return. Using multiple models provides a broader, and therefore a more reliable, perspective on investors' return requirements.

Q. PLEASE BRIEFLY DESCRIBE THE CONSTANT GROWTH DCF MODEL.

A. The Constant Growth DCF approach defines the Cost of Equity as the sum of: (1) the expected dividend yield, and (2) expected long-term growth. The expected dividend yield generally equals the expected annual dividend divided by the current

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[55] *See*, *for example*: (1) State of North Carolina Utilities Commission*, In the Matter of Application of Public Service Company of North Carolina, Inc. for a General Increase in its Rates and Charges*, Docket No. G-5, Sub 565, *Order Approving Rate Increase and Integrity Management Tracker*, October 28, 2016, at 35-36; (2) Public Utilities Commission of the State of Hawaii, Docket No. 7700, Order No. 13704 in Docket No. 7700, *In the Matter of the Application of Hawaiian Electric Company, Inc. For Approval of Rate Increases and Revised Rate Schedules and Rules*, December 28, 1994 at 92; and (3) The Commonwealth of Massachusetts Department of Public Utilities, *Investigation by the Department of Public Utilities*, Docket D.P.U. 15-155, September 30, 2016, at 376-378.

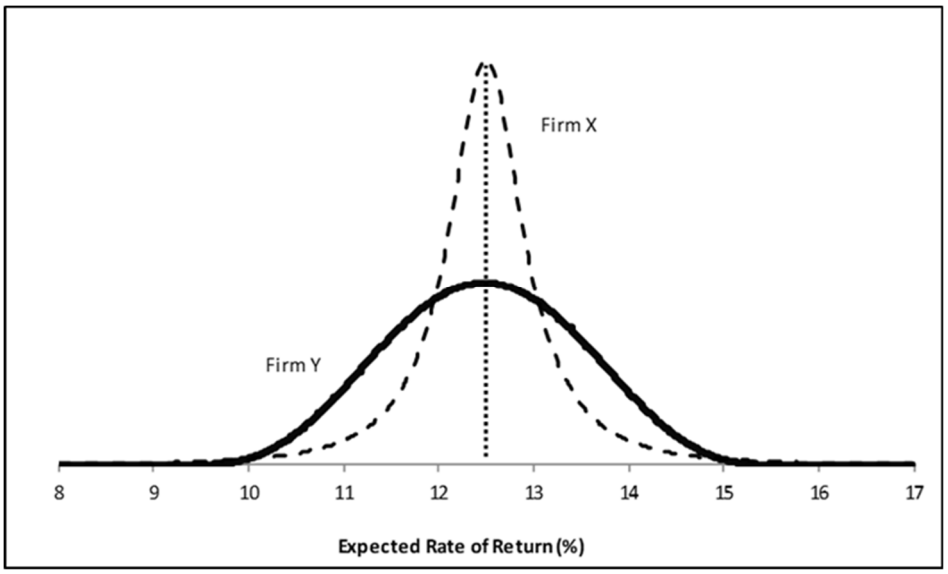
stock price, and the growth rate is based on analysts' expectations of earnings growth. Under the model's strict assumptions, the growth rate equals the rate of capital appreciation (that is, the growth in the stock price).[56] In that regard, it does not matter whether the investor holds the stock in perpetuity, or for a finite period during which the investor collects (and reinvests) dividends, then sells at the prevailing market price. Under the model's assumptions, the result is the same either way.

Q. PLEASE BRIEFLY DESCRIBE THE CAPITAL ASSET PRICING MODEL.

A. Whereas DCF models focus on expected cash flows, Risk Premium-based models such as the CAPM focus on the additional return that investors require for taking on additional risk. In finance, "risk" generally refers to the variation in expected returns, rather than the expected return, itself. Consider two firms, X and Y, with expected returns, and the expected variation in returns noted in Chart 9, below. Although the two have the same expected return (12.50 percent), Firm Y's are far more variable. From that perspective, Firm Y would be considered the riskier investment.

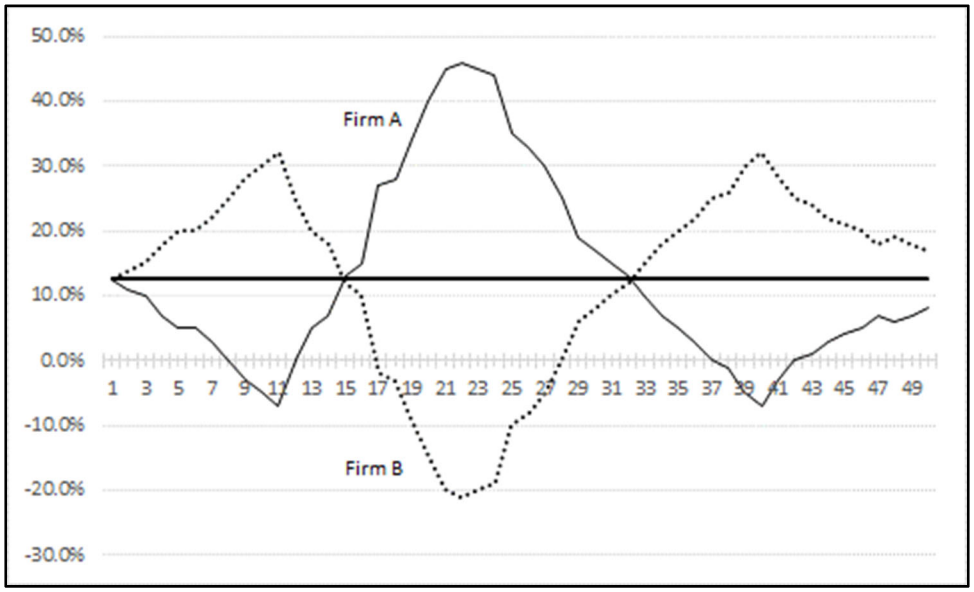
[56] As discussed in Appendix A, the model assumes that earnings, dividends, book value, and the stock price all grow at the same constant rate in perpetuity.

Chart 9: Expected Return and Risk



Now consider two other firms, Firm A and Firm B. Both have expected returns of 12.50 percent, and both are equally risky as measured by their volatility. But as Firm A's returns go up, Firm B's returns go down. That is, the returns are negatively correlated.

Chart 10: Relative Risk



If we were to combine Firms A and B into a portfolio, we would expect a 12.50 percent return with no uncertainty because of the opposing symmetry of their risk profiles. That is, we can diversify away the risk. As long as two stocks are not perfectly correlated, we can achieve diversification benefits by combining them into a portfolio. That is the essence of the Capital Asset Pricing Model - because we can combine firms into a portfolio, the only risk that matters is the risk that remains after diversification, *i.e*., the "non-diversifiable" risk.

The CAPM defines the Cost of Equity as the sum of the "risk-free" rate, and a premium to reflect the additional risk associated with equity investments. The "risk-free" rate is the yield on a security viewed as having no default risk, such as long-term Treasury bonds, and essentially sets the baseline of the CAPM. That is, an investor would expect a higher return than the risk-free rate to purchase an asset that carries risk. The difference between that higher return (*i.e.*, the required return) and the risk-free rate is the risk premium.

$$\text{Risk-Free Rate} + \text{Risk Premium} = \text{Required Return} \quad [1]$$

The Risk Premium is defined as a security's Beta coefficient multiplied by the risk premium of the overall market (the "Market Risk Premium" or "MRP"). The Beta coefficient is a measure of the subject company's risk relative to the overall market, *i.e.*, the "non-diversifiable" risk. A Beta coefficient of 1.00 means that the security is equally as risky as the overall market; a value below 1.00 represents a security with less risk than the overall market, and a value over 1.00 represents a security with more risk than the overall market. Equation [2] provides the general format of the CAPM formula:

Risk-Free Rate + (Beta Coefficient x Market Risk Premium) = Required Return [2]

The Empirical CAPM approach, which is a variant of the CAPM, calculates the product of the adjusted Beta coefficient and the Market Risk Premium and applies a weight of 75.00 percent to that result. The model then applies a 25.00 percent weight to the Market Risk Premium, without any effect from the Beta coefficient. The results of the two calculations are summed, along with the risk-free rate, to produce the ROE estimate. This approach addresses the tendency of low-Beta coefficient securities to realize returns somewhat higher than the traditional CAPM would predict, and high-Beta coefficient securities to realize returns lower than predicted. That is, the ECAPM addresses the tendency of the CAPM to underestimate the Cost of Equity for low-Beta coefficient companies, such as regulated utilities.

Q. PLEASE BRIEFLY DESCRIBE THE BOND YIELD PLUS RISK PREMIUM.

A. This approach is based on the basic financial principle that equity investors bear the risk associated with ownership and therefore require a premium over the return they would have earned as a bondholder. That is, because returns to equity holders are riskier than returns to bondholders, equity investors must be compensated for bearing that additional risk (that difference often is referred to as the "Equity Risk Premium"). Bond Yield Plus Risk Premium approaches estimate the Cost of Equity as the sum of the Equity Risk Premium and the yield on a particular class of bonds.

Bond Yield + Equity Risk Premium = Required Return [3]

Q. PLEASE BRIEFLY DESCRIBE THE EXPECTED EARNINGS APPROACH.

A. The Expected Earnings analysis calculates the forward-looking (*i.e.*, expected) rate of earnings on book value of each proxy company by adjusting the expected return on equity as reported by Value Line[57] for the expected change in equity (*i.e.*, shares of common equity) of each company to arrive at an adjusted expected return on equity for each proxy group company. This figure represents the return on book value investors expect each proxy company to earn in the near future (usually three to five years).

Q. WHAT ARE THE RESULTS OF THE CONSTANT GROWTH DCF ANALYSIS IN THIS CASE?

A. The results of the model described in Appendix A, part A are provided in Table 2, below.[58]

[57] Value Line Investment Survey.

[58] *See,* Appendix A for a more detailed description of the models, assumptions, and inputs described in this Section.

Table 2: Summary of DCF Results[59]

	Median	Median High
30-Day Average	10.05%	11.37%
90-Day Average	9.94%	11.25%
180-Day Average	9.88%	11.20%

Q. PLEASE DISCUSS THE IMPACTS OF THE CURRENT CAPITAL MARKETS ON THE DCF RESULTS.

A. As noted in Section IV, investor reactions can be observed through the "yield spread", the difference between the dividend yields on utility stocks and Treasury yields. A widening yield spread is indicative of investors rotating capital from equities to Treasuries. Subsequently, as investors rotate out of equities, dividend yields increase, as has been the case for utilities (*see*, Chart 2 above).

Q. PLEASE SUMMARIZE THE REMAINING ANALYTICAL RESULTS.

A. The Risk Premium-based results, including the CAPM, Bond Yield Plus Risk Premium and Expected Earnings methods, explained in detail in Appendix A, parts B, C and D, respectively, are provided below.

[59] For the purposes of my Direct Testimony, more emphasis has been placed on the median results of the Constant Growth DCF analysis, because the mean results are affected by an anomalously high growth rate for Northwest Natural Gas Company of 26.50 percent from Value Line due to the company's significant losses in 2017.

Table 3: Summary of CAPM Results

	Bloomberg Derived Market Risk Premium	**Value Line Derived Market Risk Premium**
CAPM - Average Bloomberg Beta Coefficient		
Current 30-Year Treasury (1.33%)	12.48%	12.83%
Near Term Projected 30-Year Treasury (1.63%)	12.79%	13.14%
Long Term Projected 30-Year Treasury (3.40%)	14.56%	14.91%
CAPM - Average Value Line Beta Coefficient		
Current 30-Year Treasury (1.33%)	11.65%	11.98%
Near Term Projected 30-Year Treasury (1.63%)	11.96%	12.29%
Long Term Projected 30-Year Treasury (3.40%)	13.73%	14.05%
ECAPM - Average Bloomberg Beta Coefficient		
Current 30-Year Treasury (1.33%)	12.73%	13.09%
Near Term Projected 30-Year Treasury (1.63%)	13.04%	13.40%
Long Term Projected 30-Year Treasury (3.40%)	14.80%	15.16%
ECAPM - Average Value Line Beta Coefficient		
Current 30-Year Treasury (1.33%)	12.11%	12.45%
Near Term Projected 30-Year Treasury (1.63%)	12.42%	12.76%
Long Term Projected 30-Year Treasury (3.40%)	14.18%	14.52%

Table 4: Bond Yield Plus Risk Premium Results

Treasury Yield	Return on Equity
Current 30-Year Treasury (1.33%)	10.39%
Near Term Projected 30-Year Treasury (1.63%)	10.13%
Long Term Projected 30-Year Treasury (3.40%)	9.91%

Table 5: Expected Earnings Results

	Return on Equity
Average	9.78%
Median	9.54%

Q. PLEASE DISCUSS THE IMPACTS OF THE CURRENT CAPITAL MARKETS ON THE RISK PREMIUM AND EXPECTED EARNINGS RESULTS.

A. As noted in Section IV, and observed in Chart 4, during periods of market uncertainty, the correlations of asset classes go to one. When correlations between utility returns and those of the broad market increase, the resulting Beta coefficients also increase (*see, for example*, Charts 5 and 6 above). Further, the resulting market uncertainty, and the rotation into Treasury yields, has the effect of increasing the MRP component of the CAPM Model. Ultimately, the increase in both Beta coefficients and the MRP results in increased CAPM derived results.

Turning to the Bond Yield Plus Risk Premium, which as Chart 12 (below) demonstrates, over time there has been a statistically significant, negative relationship between the 30-year Treasury yield and the Equity Risk Premium. Therefore, as investors rotate into Treasury yields, similarly to the MRP, the Equity

Risk Premium component of the Bond Yield Plus Risk Premium approach will increase.

Lastly, as discussed in Section IV, the coronavirus pandemic has negatively affected GDP and business activity, factors that affect a utility's earnings. Because GDP and business activity are expected to shrink, utility earnings are also expected to shrink, reducing the return investors can expect. Although the Expected Earnings approach in Exhibit No. DWD-7 looks out to the period 2023-2025, given the potential length and uncertainty regarding the duration of both the impact of the coronavirus on the economy and the recovery, it is reasonable that investors might expect earnings three to five years out to continue to be impacted. That same level of elevated uncertainty can be observed throughout the models and their results as discussed throughout my Direct Testimony.

VIII. OTHER CONSIDERATIONS

Q. WHAT ADDITIONAL INFORMATION DID YOU CONSIDER IN ASSESSING THE ANALYTICAL RESULTS NOTED ABOVE?

A. Because the analytical methods discussed above provide a range of estimates, there are additional factors that should be taken into consideration when establishing a reasonable range for the Company's Cost of Equity. Those factors include the risks associated with the Company's capital spending plan and regulatory recovery mechanisms as well as flotation costs associated with equity issuances.

Capital Spending and Regulatory Mechanisms

Q. HAVE YOU REVIEWED THE COMPANY'S REGULATORY RECOVERY MECHANISMS?

A. Yes. An important element of my analysis is assessment of the Company's ability to earn its requested ROE. Accordingly, I have reviewed the Company's most recent financial statements, tariff, and capital spending plans. The Company's regulatory environment should provide the opportunity to recover its costs and earn a reasonable return on its investments. The Company currently has in place an Integrity Management Rider ("IMR") to recover investments and related costs associated with compliance with prevailing Federal standards for pipeline integrity and safety that are not otherwise included in current base rates. However, as part of the instant docket, the Company has indicated an intent to make a filing in the future to opt into an annual review of its rates as allowed by Tennessee statute. This intention, if acted upon and ultimately approved by the Commission, would allow the Company to join its two peer investor-owned gas utilities in Tennessee operating under an annual mechanism tariff.

Q. ARE ALTERNATIVE REGULATION MECHANISMS COMMON AMONG THE PROXY GROUP COMPANIES?

A. Yes, they are. Exhibit DWD-8 provides a summary of alternative regulation mechanisms and cost trackers currently in effect at each gas utility subsidiary of the proxy group companies. As Exhibit DWD-8 demonstrates, substantially all the

proxy companies have system integrity investment recovery mechanisms and/or annual formula-based rate mechanisms in place.[60]

As noted earlier, the *Hope* and *Bluefield* "Comparable Earnings" standard requires the allowed Return on Equity to be commensurate with the returns on investments of similar risk. To the extent the proxy companies have mechanisms in place to address revenue shortfalls and cost recovery, a similar mechanism for Piedmont would serve to make it more comparable to its peers.

Q. WHAT ARE YOUR CONCLUSIONS REGARDING THE EFFECT OF THE COMPANY'S CAPITAL INVESTMENT PLAN?

A. Because of the scope of the Company's capital investment plan, the Commission's decision regarding the ROE in this proceeding will directly affect the Company's ability to fund such capital investments with operating cash flows, and will also impact the financial community's view of its financial profile.

Flotation Costs

Q. WHAT ARE FLOTATION COSTS?

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

Q. ARE FLOTATION COSTS PART OF THE UTILITY'S INVESTED COSTS OR PART OF THE UTILITY'S EXPENSES?

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

[60] Only two of the 23 proxy group operating companies do not have a capital recovery mechanism.

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

Q. IS THE NEED TO CONSIDER FLOTATION COSTS ELIMINATED BECAUSE PIEDMONT IS A WHOLLY OWNED SUBSIDIARY?

A. No, it is not. Wholly owned subsidiaries such as Piedmont receive equity capital from their parents, and provide returns on the capital that roll up to the parent, which is designated to attract and raise capital based on the returns of those subsidiaries. To deny recovery of issuance costs associated with capital that is invested in the subsidiaries ultimately would penalize the investors that fund the utility operations, and would inhibit the utility's ability to obtain new equity capital at a reasonable cost. This is important for companies such as Piedmont, that are planning continued capital expenditures in the near term, and for which access to capital (at reasonable cost rates) to fund such required expenditures will be critical.

Q. HOW WAS THE FLOTATION COST RECOVERY ADJUSTMENT CALCULATED?

A. The DCF calculation was modified to provide a dividend yield that would reimburse investors for issuance costs. My estimate of flotation costs recognizes the costs of issuing equity that were incurred by the proxy companies in their most recent two issuances. As shown in Exhibit DWD-9, an adjustment of 0.04 percent (*i.e.*, 4 basis points) reasonably represents flotation costs for the Company.

Q. IS THE NEED TO CONSIDER FLOTATION COSTS RECOGNIZED BY THE ACADEMIC AND FINANCIAL COMMUNITIES?

A. Yes. The need to compensate investors for equity issuance costs is recognized by the academic and financial communities in the same spirit that investors are reimbursed for the costs of issuing debt. For example, Dr. Morin notes that "[t]he costs of issuing [common stock] are just as real as operating and maintenance expenses or costs incurred to build utility plants, and fair regulatory treatment must permit the recovery of these costs."[61] Dr. Morin further notes that "equity capital raised in a given stock issue remains on the utility's common equity account and continues to provide benefits to ratepayers indefinitely."[62] This treatment is consistent with the philosophy of a fair rate of return. As explained by Dr. Shannon Pratt:

> Flotation costs occur when a company issues new stock. The business usually incurs several kinds of flotation or transaction costs, which reduce the actual proceeds received by the business. Some of these are direct out-of-pocket outlays, such as fees paid to underwriters, legal expenses, and prospectus preparation costs. Because of this reduction in proceeds, the business's required returns must be greater to compensate for the additional costs. Flotation costs can be accounted for either by amortizing the cost, thus reducing the net cash flow to discount, or by incorporating the cost into the cost of equity capital. Since flotation costs typically are not applied to operating cash flow, they must be incorporated into the cost of equity capital.[63]

Similarly, Morningstar has commented on the need to reflect flotation costs in the cost of capital:

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61 Roger A. Morin, New Regulatory Finance, Public Utility Reports, Inc., 2006, at 321.
62 *Ibid.*, at 327.
63 Shannon P. Pratt & Roger J. Grabowski, Cost of Capital: Applications and Examples at 586 (4th ed. 2010).

> Although the cost of capital estimation techniques set forth later in this book are applicable to rate setting, certain adjustments may be necessary. One such adjustment is for flotation costs (amounts that must be paid to underwriters by the issuer to attract and retain capital).[64]

Q. HAVE REGULATORY COMMISSIONS IN OTHER JURISDICTIONS RECOGNIZED FLOTATION COSTS WHEN DETERMINING THE AUTHORIZED ROE?

A. Yes. FERC, along with regulatory commissions in jurisdictions such as Arkansas, Connecticut, and Mississippi, have recognized flotation costs when determining the authorized ROE.[65] Although the method by which flotation costs are reflected in rates may vary (*e.g.*, implicit versus explicit basis point increases to authorized ROE), the recognition of those costs is not limited to, or constrained by, recent equity issuances. For instance, the Arkansas Commission stated that "including some level of valid, sustainable, measurable, and material flotation costs in equity return is appropriate."[66]

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64 Morningstar, Inc. Ibbotson SBBI 2013 Valuation Yearbook, at 25.

65 *See*, *for example*, FERC Docket Nos. EL05-19-002 and ER05-168-001, *Golden Spread Electric Cooperative, Inc., v. Southwestern Public Service Company,* Opinion No. 501, 123 FERC ¶ 61,047, (April 21, 2008); Arkansas Public Service Commission, Docket No. 04-176-U, *In the Matter of the Application of Arkansas Western Gas Company for Approval of a General Change in Rates and Tariffs*, Order No. 6, October 31, 2005, at 34; Connecticut Public Utilities Regulatory Authority, Docket No. 14-05-06, *Application of the Connecticut Light and Power Company to Amend Rate Schedules*, Decision, December 17, 2014, at 133-134, 145 (Table 64), and 223 (PP 280-281); Mississippi Public Service Commission, Docket No. 01-UN-0548, *Notice of Intent of Mississippi Power Company to Change Rates for Electric Service in its Certificated Areas in the Twenty-Three Counties of Southeast Mississippi*, Final Order, December 3, 2001, at 26.

66 Arkansas Public Service Commission, Docket No. 04-176-U, *In the Matter of the Application of Arkansas Western Gas Company for Approval of a General Change in Rates and Tariffs*, Order No. 6, October 31, 2005, at 34.

Q. ARE YOU PROPOSING TO ADJUST THE RECOMMENDED ROE BY 4 BASIS POINTS TO REFLECT THE EFFECT OF FLOTATION COSTS ON THE COMPANY'S ROE?

A. No. Rather, I have considered the effect of flotation costs, in addition to the Company's regulatory recovery of its capital spending plan relative to the proxy group, in determining where the Company's ROE falls within the range of results.

IX. CONCLUSIONS AND RECOMMENDATION

Q. WHAT IS YOUR CONCLUSION REGARDING THE COMPANY'S COST OF EQUITY?

A. As discussed earlier in my Direct Testimony, it is prudent and appropriate to consider multiple methodologies to arrive at an ROE recommendation for Piedmont. Based upon the performance of several analyses to estimate the Company's Cost of Equity and consideration of several market-wide and Company-specific issues, I believe that a rate of return on common equity in the range of 9.90 percent to 10.70 percent represents the range of equity investors' required rate of return for investment in natural gas utilities similar to Piedmont in today's capital markets. Within that range, it is my view that an ROE of 10.30 percent is reasonable and appropriate.

As discussed earlier in my Direct Testimony, my recommendation reflects analytical results based on a proxy group of natural gas utilities. My recommendation also considers (but does not make specific adjustments for) other factors, including regulatory recovery of capital spending and the direct costs associated with equity issuances.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, it does.

APPENDIX A: COST OF COMMON EQUITY MODELS

A. Constant Growth DCF Model

Q. PLEASE MORE FULLY DESCRIBE THE CONSTANT GROWTH DCF APPROACH.

A. The Constant Growth DCF approach is based on the theory that a stock's current price represents the present value of all expected future cash flows. In its simplest form, the Constant Growth DCF model expresses the Cost of Equity as the discount rate that sets the current price equal to expected cash flows:

$$P_0=\frac{D_1}{(1+k)}+\frac{D_2}{(1+k)^2}+\ldots+\frac{D_t}{(1+k)^t} \quad [4]$$

where P_0 represents the current stock price, $D_1 \ldots D_t$ represent expected future dividends, and k is the discount rate, or required ROE. Equation [4] is a standard present value calculation that can be simplified and rearranged into the familiar form:

$$k=\frac{D(1+g)}{P_0}+g \quad [5]$$

Equation [5] often is referred to as the "Constant Growth DCF" model, in which the first term is the expected dividend yield and the second term is the expected long-term growth rate.

Q. WHAT ASSUMPTIONS ARE REQUIRED FOR THE CONSTANT GROWTH DCF MODEL?

A. The Constant Growth DCF model assumes: (1) earnings, book value, and dividends all grow at the same, constant rate in perpetuity; (2) the dividend payout ratio remains constant; (3) the Price to Earnings multiple remains constant in

perpetuity; (4) the discount rate (that is, the estimated Cost of Equity) is greater than the expected growth rate; and (5) the calculated Cost of Equity remains constant, also in perpetuity. These simplifying assumptions, which may become more or less relevant as market conditions change, are required to derive the familiar Constant Growth DCF model provided in Equation [5].

Q. WHAT MARKET DATA WAS USED TO CALCULATE THE DIVIDEND YIELD COMPONENT OF YOUR DCF MODEL?

A. The dividend yield is based on the proxy companies' current annualized dividend, and average closing stock prices over the 30-, 90-, and 180-trading day periods as of May 29, 2020.

Q. WHY ARE THREE AVERAGING PERIODS USED TO CALCULATE AN AVERAGE STOCK PRICE?

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

Q. WERE THERE ANY ADJUSTMENTS TO THE DIVIDEND YIELD TO ACCOUNT FOR PERIODIC GROWTH IN DIVIDENDS?

A. Yes. Because utilities increase their quarterly dividends at different times throughout the year, it is reasonable to assume that dividend increases will be evenly distributed over calendar quarters. Given that assumption, it is appropriate to calculate the expected dividend yield by applying one-half of the long-term

growth rate to the current dividend yield.[67] That adjustment ensures that the expected dividend yield is representative of the coming 12-month period and does not overstate the dividends to be paid during that time.

Q. IS IT IMPORTANT TO SELECT APPROPRIATE MEASURES OF LONG-TERM GROWTH IN APPLYING THE DCF MODEL?

A. Yes. In its Constant Growth form, the DCF model (*i.e.*, as presented in Equation [5] above) assumes a single growth estimate in perpetuity. To reduce the long-term growth rate to a single measure, we must assume a fixed payout ratio, and that earnings per share ("EPS"), dividends per share, and book value per share all grow at the same constant rate in perpetuity. Because dividend growth can only be sustained by earnings growth, the model should incorporate a variety of long-term earnings growth estimates. That can be accomplished by averaging measures of long-term growth that tend to be least influenced by capital allocation decisions that companies may make in response to near-term changes in the business environment. Because such decisions may directly affect near-term dividend payout ratios, estimates of earnings growth are more indicative of long-term investor expectations than are dividend growth estimates. For the purposes of the Constant Growth DCF model, therefore, growth in EPS represents the appropriate measure of long-term growth.

[67] Exhibit DWD-1.

Q. PLEASE SUMMARIZE THE FINDINGS OF ACADEMIC RESEARCH ON THE APPROPRIATE MEASURE OF GROWTH FOR ESTIMATING EQUITY RETURNS USING THE DCF MODEL.

A. The relationship between various growth rates and stock valuation metrics has been the subject of much academic research.[68] As noted over 40 years ago by Charles Phillips in The Economics of Regulation:

> For many years, it was thought that investors bought utility stocks largely on the basis of dividends. More recently, however, studies indicate that the market is valuing utility stocks with reference to total per share earnings, so that the earnings-price ratio has assumed increased emphasis in rate cases.[69]

Subsequent academic research has clearly and consistently indicated that measures of earnings and cash flow are strongly related to returns, and that analysts' forecasts of growth are superior to other measures of growth in predicting stock prices.[70] For example, Vander Weide and Carleton state that "[our] results … are consistent with the hypothesis that investors use analysts' forecasts, rather than historically oriented growth calculations, in making stock buy-and-sell decisions."[71] Other research specifically notes the importance of analysts' growth estimates in determining the Cost of Equity, and in the valuation of equity

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68 *See,* Harris, Robert, *Using Analysts' Growth Forecasts to Estimate Shareholder Required Rate of Return,* Financial Management (Spring 1986).

69 Charles F. Phillips, Jr., The Economics of Regulation, at 285 (Rev. ed. 1969).

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

71 Vander Weide and Carleton, *Investor Growth Expectations: Analysts vs. History*, The Journal of Portfolio Management (Spring 1988). The Vander Weide and Carleton study was updated in 2004 under the direction of Dr. Vander Weide. The results of the updated study were consistent with the original study's conclusions.

securities. Dr. Robert Harris noted that "a growing body of knowledge shows that analysts' earnings forecasts are indeed reflected in stock prices."[72] Citing Cragg and Malkiel, Dr. Harris notes that those authors "found that the evaluations of companies that analysts make are the sorts of ones on which market valuation is based."[73] Similarly, Brigham, Shome, and Vinson noted that "evidence in the current literature indicates that (i) analysts' forecasts are superior to forecasts based solely on time series data, and (ii) investors do rely on analysts' forecasts."[74]

To that point, the research of Carleton and Vander Weide demonstrates that earnings growth projections have a statistically significant relationship to stock valuation levels, while dividend growth rates do not.[75] Those findings suggest that investors form their investment decisions based on expectations of growth in earnings, not dividends. Consequently, earnings growth, not dividend growth, is the appropriate estimate for the purpose of the Constant Growth DCF model.

Q. PLEASE SUMMARIZE THE INPUTS TO THE CONSTANT GROWTH DCF MODEL.

A. The application the DCF model to the proxy group of natural gas utility companies used the following inputs for the price and dividend terms:

- The average daily closing prices for the 30-, 90-, and 180-trading days ended May 29, 2020, for the term P_0; and

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72 Robert S. Harris, *Using Analysts' Growth Forecasts to Estimate Shareholder Required Rate of Return*, Financial Management (Spring 1986).

73 *Ibid*.

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

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

- The annualized dividend per share as of May 29, 2020, for the term D_0.

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

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

Q. PLEASE DESCRIBE THE RETENTION GROWTH ESTIMATE AS APPLIED IN THE DCF MODEL.

A. The Retention Growth model, which is a generally recognized and widely taught method of estimating long-term growth, is an alternative approach to the use of analysts' earnings growth estimates. The model estimates growth as a function of: (1) expected earnings, and (2) the extent to which earnings are retained. In its simplest form, the model represents long-term growth as the product of the retention ratio (*i.e.*, the percentage of earnings not paid out as dividends (referred to below as "b") and the expected return on book equity (referred to below as "r")). Thus, the simple "b x r" form of the model projects growth as a function of internally generated funds. That form of the model is limiting, however, in that it does not provide for growth funded from external equity.

The "br + sv" form of the Retention Growth estimate used in my DCF analysis is meant to reflect growth from both internally generated funds (*i.e.*, the "br" term) and from issuances of equity (*i.e.*, the "sv" term). The first term, which is the product of the retention ratio (*i.e.*, "b", or the portion of net income not paid

in dividends) and the expected Return on Equity (*i.e.*, "r") represents the portion of net income that is "plowed back" into the Company as a means of funding growth. The "sv" term is represented as:

$$\left(\frac{m}{b}\text{-}1\right) \text{ x Growth rate in Common Shares} \quad [6]$$

where $\frac{m}{b}$ is the market-to-book ratio. In this form, the "sv" term reflects an element of growth as the product of: (a) the growth in shares outstanding, and (b) that portion of the market-to-book ratio that exceeds unity. As shown in Exhibit DWD-2, all components of the Retention Growth model may be derived from data provided by Value Line.

Q. HOW WERE THE HIGH AND LOW DCF RESULTS CALCULATED?

A. The proxy group median low, median, and median high DCF results were calculated by using the maximum EPS growth rate as reported by Value Line, Zacks, First Call, and the Retention Growth method for each proxy group company in combination with the dividend yield for each of the proxy companies. The proxy group median high results then reflect the median of the maximum DCF results for the proxy group as a whole. A similar approach was used to calculate the proxy group median low results using instead the minimum of the Value Line, Zacks, First Call, and Retention Growth method growth rates for each company. For the purposes of my Direct Testimony, I have put more emphasis on the median results of my Constant Growth DCF analysis, because the mean results are affected by an anomalously high growth rate for Northwest Natural Gas Company of 26.50 percent from Value Line due to the company's significant losses in 2017.

Q. WHAT ARE THE RESULTS OF THE DCF ANALYSIS?

A. The results of my DCF analysis are summarized in Table 6 below (*see* also Exhibit DWD-1).

Table 6: Constant Growth DCF Results[76]

	Median	Median High
30-Day Average	10.05%	11.37%
90-Day Average	9.94%	11.25%
180-Day Average	9.88%	11.20%

B. CAPM Analysis

Q. PLEASE DESCRIBE THE GENERAL FORM OF THE CAPM ANALYSIS.

A. The CAPM is a risk premium-based method that estimates the Cost of Equity as a function of a risk-free return plus a risk premium (to compensate investors for the non-diversifiable or "systematic" risk of that security). The CAPM describes the relationship between a security's investment risk and the market rate of return, and assumes all other risk, *i.e.*, all non-market or unsystematic risk, can be eliminated through portfolio diversification. The risk that cannot be diversified away is referred to as "undiversifiable", or "systematic", risk. The CAPM also assumes investors require compensation only for the systematic risk, which results from macroeconomic and other events that affect the returns on all assets.

As shown in Equation [7], below, the CAPM is defined by four components, each of which theoretically must be a forward-looking estimate:

$$k_e = r_f + \beta(r_m - r_f) \quad [7]$$

where:

k = the required market ROE for a security;

[76] Exhibit DWD-1.

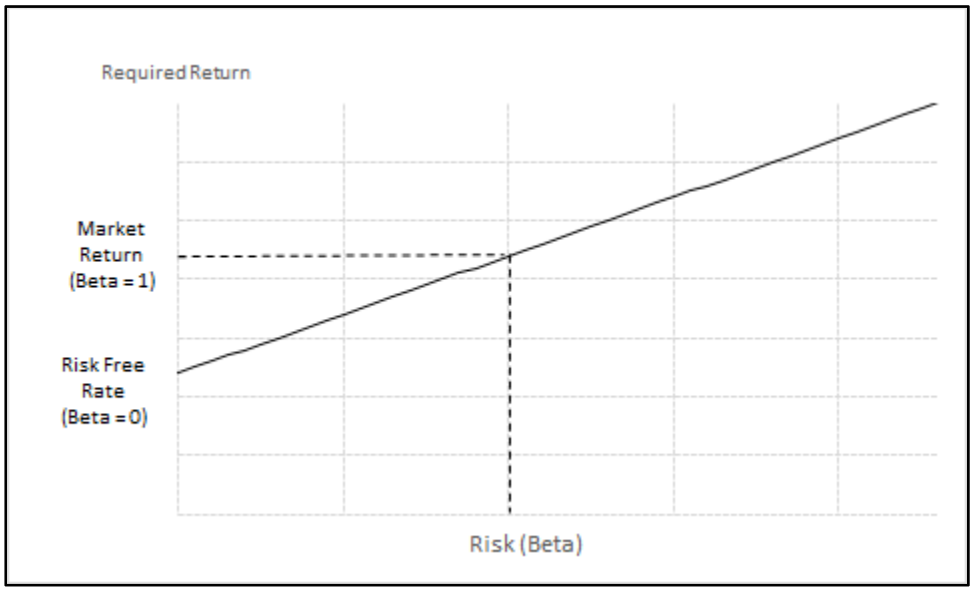
β = the Beta coefficient of that security;

r_f = the risk-free rate of return; and

r_m = the required return on the market as a whole.

Equation [7] describes the Security Market Line ("SML"), or the CAPM risk-return relationship, which is graphically depicted in Chart 11 below. The intercept is the risk-free rate (r_f) which has a Beta coefficient of zero, the slope is the expected market risk premium ($r_m - r_f$). By definition, r_m, the return on the market has a Beta coefficient of 1.00. Under the CAPM, the expected Equity Risk Premium on a given security is proportional to its Beta coefficient.

Chart 11: Security Market Line



Intuitively, higher Beta coefficients indicate that the subject company's returns have been relatively volatile and have moved in tandem with the overall market. Consequently, if a company has a Beta coefficient of 1.00, it is as risky as the market and does not provide any diversification benefit.

In Equation [7], the term ($r_m - r_f$) represents the Market Risk Premium.[77] According to the theory underlying the CAPM, because unsystematic risk can be diversified away by adding securities to their investment portfolios, the market will not compensate investors for bearing that risk. Therefore, investors should be concerned only with systematic or non-diversifiable risk. Non-diversifiable risk is measured by the Beta coefficient, which is defined as:

$$\beta_j = \frac{\sigma_j}{\sigma_m} \times \rho_{j,m} \quad [8]$$

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

Q. WHAT ASSUMPTIONS WERE INCLUDED IN THE CAPM ANALYSIS?

A. Because utility equity is a long duration investment, three different estimates of the risk-free rate were used: (1) the current 30-day average yield on 30-year Treasury bonds (*i.e.*, 1.33 percent)[78]; (2) the near-term projected 30-year Treasury yield (*i.e.*, 1.63 percent);[79] and (3) the long-term projected 30-year Treasury yield (*i.e.*, 3.40 percent).[80]

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77 The Market Risk Premium is defined as the incremental return of the market over the risk-free rate.
78 Bloomberg Professional Services.
79 *See,* Blue Chip Financial Forecasts, Vol. 39, No. 6, June 1, 2020, at 2. Consensus projections of the 30-year Treasury yield for the six quarters ending September 2021.
80 *See, Ibid*, at 14. Consensus projections of the 30-year Treasury yield for the periods 2022-2026 and 2027-2031.

Q. WHY IS THE 30-YEAR TREASURY YIELD APPROPRIATE FOR USE IN THE CAPM ANALYSIS?

A. In determining the security most relevant to the application of the CAPM, it is important to select the term (or maturity) that best matches the life of the underlying investment. Because utility equity has a perpetual life, the 30-year Treasury yield is the appropriate measure of the risk-free rate.

Q. PLEASE DESCRIBE THE EX-ANTE APPROACH TO ESTIMATING THE MARKET RISK PREMIUM.

A. The approach is based on the market required return, less the current 30-year Treasury bond yield. To estimate the market required return, the market capitalization weighted average ROE based on the Constant Growth DCF model was calculated using data from Bloomberg and Value Line. With respect to Bloomberg-derived growth estimates, the expected dividend yield was calculated (using the same one-half growth rate assumption described earlier) and combined that amount with the projected earnings growth rate to arrive at the market capitalization weighted average DCF result. That calculation was repeated for each of the companies for which Bloomberg provided both dividend yields and consensus growth rates. The current 30-year Treasury yield was then subtracted from that amount to arrive at the market DCF-derived ex-ante market risk premium estimate. In the case of Value Line, the same calculation was made, again using all companies for which five-year earnings growth rates were available. The results of those calculations are provided in Exhibit DWD-3.

Q. HOW WERE THE EXPECTED MARKET RISK PREMIUM AND RISK-FREE RATE ESTIMATES APPLIED?

A. Each of the *ex-ante* Market Risk Premiums discussed above, together with the current, near-term projected, and long-term projected 30-year Treasury bond yields as inputs to the CAPM analysis.

Q. WHAT BETA COEFFICIENTS WERE USED IN THE CAPM MODEL?

A. As shown in Exhibit DWD-4, Beta coefficients reported by Value Line and Bloomberg were considered, both of which adjust their calculated (or raw) Beta coefficients to reflect the tendency of the Beta coefficient to regress to the market mean of 1.00. A notable difference between the two is that Value Line calculates the Beta coefficient over a five-year period, whereas Bloomberg's calculation is based on two years of data.

Q. WHAT ARE THE RESULTS OF THE CAPM ANALYSIS?

A. The results of the CAPM analysis are summarized in Table 7 below (*see* also Exhibit DWD-5).

Table 7: Summary of CAPM Results

	Bloomberg Derived Market Risk Premium	Value Line Derived Market Risk Premium
Average Bloomberg Beta Coefficient		
Current 30-Year Treasury (1.33%)	12.48%	12.83%
Near Term Projected 30-Year Treasury (1.63%)	12.79%	13.14%
Long Term Projected 30-Year Treasury (3.40%)	14.56%	14.91%
Average Value Line Beta Coefficient		
Current 30-Year Treasury (1.33%)	11.65%	11.98%
Near Term Projected 30-Year Treasury (1.63%)	11.96%	12.29%
Long Term Projected 30-Year Treasury (3.40%)	13.73%	14.05%

Q. IS THE DIFFERENCE IN CAPM RESULTS BASED ON BLOOMBERG AND VALUE LINE BETA COEFFICIENTS CONCERNING?

A. No. Because Bloomberg calculates Beta coefficients over two years, the ongoing market instability will be more acutely reflected in them than it would be in Value Line's Beta coefficients, which are calculated over five years. Further, because Value Line reports are provided on a periodic basis, they are not as current as the Bloomberg Beta coefficients, which may be calculated at any time. That said, as demonstrated in Chart 6 above, applying Value Line's method to current data indicates Beta coefficients calculated on that basis also have increased. From that perspective, the CAPM results based on the "Average Value Line Beta Coefficient" may be considered conservatively low.

Q. IS THERE ANOTHER FORM OF THE CAPM THAT SHOULD BE CONSIDERED?

A. Yes. To address the change in Beta coefficients discussed above, the Empirical CAPM approach should also be considered, which calculates the product of the adjusted Beta coefficient and the Market Risk Premium, and applies a weight of 75.00 percent to that result. The model then applies a 25.00 percent weight to the Market Risk Premium, without any effect from the Beta coefficient.[81] The results of the two calculations are summed, along with the risk-free rate, to produce the ECAPM result, as noted in Equation [9] below:

$$k_e = r_f + 0.75\beta(r_m - r_f) + (0.25(r_m - r_f) \quad [9]$$

where:

k_e = the required market ROE;

β = adjusted Beta coefficient of an individual security;

r_f = the risk-free rate of return; and

r_m = the required return on the market as a whole.

Q. WHAT IS THE BENEFIT OF THE ECAPM APPROACH?

A. The ECAPM addresses the tendency of the CAPM to under-estimate the Cost of Equity for companies, such as regulated utilities, with relatively low Beta coefficients. As discussed below, the ECAPM recognizes the results of academic research indicating that the risk-return relationship is different (in essence, flatter)

[81] *See, e.g.*, Roger A. Morin, New Regulatory Finance, at 189-190 (2006).

than estimated by the CAPM, and that the CAPM under-estimates the alpha, or the constant return term.[82]

Numerous tests of the CAPM have measured the extent to which security returns and Beta coefficients are related as predicted by the CAPM. The ECAPM method reflects the finding that the actual SML described by the CAPM formula is not as steeply sloped as the predicted SML.[83] Fama and French state that "[t]he returns on the low beta portfolios are too high, and the returns on the high beta portfolios are too low."[84] Similarly, Morin states:

> With few exceptions, the empirical studies agree that . . . low-beta securities earn returns somewhat higher than the CAPM would predict, and high-beta securities earn less than predicted
>
> . . . .
>
> Therefore, the empirical evidence suggests that the expected return on a security is related to its risk by the following approximation:
>
> $$K = R_F + x\,(R_M - R_F) + (1-x)\beta(R_M - R_F)$$
>
> where x is a fraction to be determined empirically. The value of x that best explains the observed relationship Return = 0.0829 + 0.0520 β is between 0.25 and 0.30. If x = 0.25, the equation becomes:
>
> $$K = R_F + 0.25(R_M - R_F) + 0.75\,\beta(R_M - R_F)$$ [85]

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82 *Ibid*., at 191 ("The ECAPM and the use of adjusted betas comprised two separate features of asset pricing. Even if a company's beta is estimated accurately, the CAPM still understates the return for low-beta stocks.").

83 *Ibid*., at 175. The Security Market Line plots the CAPM estimate on the Y-axis, and Beta coefficients on the X-axis.

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

85 Roger A. Morin, New Regulatory Finance, at 175, 190 (2006).

Analysts may argue using adjusted Beta coefficients addresses the empirical issues with the CAPM by increasing the expected returns for low Beta coefficient stocks and decreasing the returns for high Beta coefficient stocks, concluding that there is no need for the ECAPM approach. I disagree with that argument. Beta coefficients are adjusted because of their general regression tendency to converge toward 1.00 over time, *i.e.*, over successive calculations. As also noted earlier, numerous studies have determined that at any given point in time, the SML described by the CAPM formula is not as steeply sloped as the predicted SML. To that point, Morin states:

> Some have argued that the use of the ECAPM is inconsistent with the use of adjusted betas, such as those supplied by Value Line and Bloomberg. This is because the reason for using the ECAPM is to allow for the tendency of betas to regress toward the mean value of 1.00 over time, and, since Value Line betas are already adjusted for such trend, an ECAPM analysis results in double-counting. This argument is erroneous. Fundamentally, the ECAPM is not an adjustment, increase or decrease, in beta. This is obvious from the fact that the expected return on high beta securities is actually lower than that produced by the CAPM estimate. The ECAPM is a formal recognition that the observed risk-return tradeoff is flatter than predicted by the CAPM based on myriad empirical evidence. The ECAPM and the use of adjusted betas comprised two separate features of asset pricing. Even if a company's beta is estimated accurately, the CAPM still understates the return for low-beta stocks. Even if the ECAPM is used, the return for low-beta securities is understated if the betas are understated. Referring back to Figure 6-1, the ECAPM is a return (vertical axis) adjustment and not a beta (horizontal axis) adjustment. Both adjustments are necessary. [86]

It therefore is appropriate to rely on adjusted Beta coefficients in both the CAPM and ECAPM. As with the CAPM, my application of the ECAPM uses the Market DCF-derived *ex-ante* Market Risk Premium estimate, the current yield on

[86] *Ibid.*, at 191.

30-year Treasury securities as the risk-free rate, and two estimates of the Beta coefficient. The results of the ECAPM analyses are shown on Exhibit DWD-5 and summarized in Table 8 below.

Table 8: Summary of ECAPM Results

	Bloomberg Derived Market Risk Premium	Value Line Derived Market Risk Premium
Average Bloomberg Beta Coefficient		
Current 30-Year Treasury (1.33%)	12.73%	13.09%
Near Term Projected 30-Year Treasury (1.63%)	13.04%	13.40%
Long Term Projected 30-Year Treasury (3.40%)	14.80%	15.16%
Average Value Line Beta Coefficient		
Current 30-Year Treasury (1.33%)	12.11%	12.45%
Near Term Projected 30-Year Treasury (1.63%)	12.42%	12.76%
Long Term Projected 30-Year Treasury (3.40%)	14.18%	14.52%

C. Bond Yield Plus Risk Premium Approach

Q. PLEASE DESCRIBE THE BOND YIELD PLUS RISK PREMIUM APPROACH.

A. This approach is based on the basic financial tenet that equity investors bear the residual risk associated with ownership and therefore require a premium over the return they would have earned as a bondholder. That is, because returns to equity holders are riskier than returns to bondholders, equity investors must be compensated for bearing that additional risk. Risk premium approaches, therefore, estimate the Cost of Equity as the sum of the equity risk premium and the yield on a particular class of bonds. Because the Equity Risk Premium is not directly observable, it typically is estimated using a variety of approaches, some of which

incorporate *ex-ante*, or forward-looking, estimates of the Cost of Equity, and others that consider historical, or *ex-post*, estimates. An alternative approach is to use actual authorized returns for gas distribution companies to estimate the Equity Risk Premium.

Q. PLEASE EXPLAIN HOW THE BOND YIELD PLUS RISK PREMIUM ANALYSIS WAS PERFORMED.

A. As suggested above, the Risk Premium as the difference between authorized ROEs and the then-prevailing level of long-term (*i.e.*, 30-year) Treasury yields. Data from 1,155 natural gas rate proceedings between January 1, 1980 and May 29, 2020 was used in the analysis. The average period between the filing of the case and the date of the final order (that is, the lag period) was then calculated. To reflect the prevailing level of interest rates during the pendency of the proceedings, the average 30-year Treasury yield over the average lag period (approximately 187 days) was calculated.

Because the data covers several economic cycles,[87] the analysis also may be used to assess the stability of the Equity Risk Premium. As noted above, the Equity Risk Premium is not constant over time; prior research has shown it is directly related to expected market volatility, and inversely related to the level of interest rates.[88] That finding is particularly relevant given the relatively low level of current Treasury yields.

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

88 *See*, *e.g.*, Robert S. Harris and Felicia C. Marston, *Estimating Shareholder Risk Premia Using Analysts' Growth Forecasts*, Financial Management, Summer 1992, at 63-70; Eugene F. Brigham, Dilip K. Shome, and Steve R. Vinson, *The Risk Premium Approach to Measuring a Utility's Cost of Equity*, Financial Management, Spring 1985, at 33-45; and Farris M. Maddox, Donna T. Pippert, and Rodney N. Sullivan, *An Empirical Study of Ex Ante Risk Premiums for the Electric Utility Industry*, Financial Management, Autumn 1995, at 89-95.

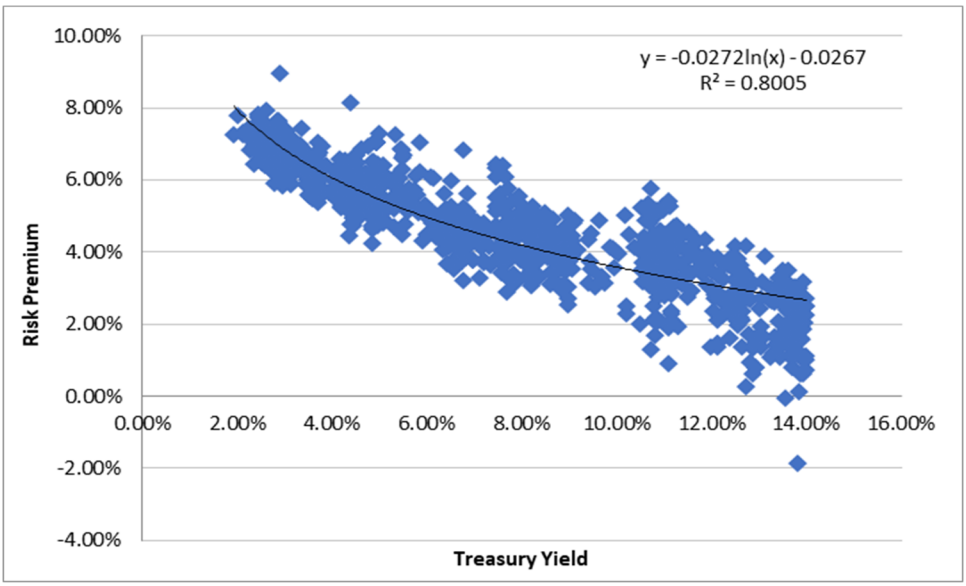
Q. HOW WAS THE RELATIONSHIP BETWEEN INTEREST RATES AND THE EQUITY RISK PREMIUM MODELED?

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

$$RP = \alpha + \beta(LN(T_{30}) \quad [10]$$

As shown in Chart 12 (below), the semi-log form is useful when measuring an absolute change in the dependent variable (in this case, the Risk Premium) relative to a proportional change in the independent variable (the 30-year Treasury yield).

Chart 12: Equity Risk Premium



As Chart 12 demonstrates, over time there has been a statistically significant, negative relationship between the 30-year Treasury yield and the Equity Risk Premium. An important consequence of that relationship is that simply applying the long-term average Equity Risk Premium of 4.77 percent would significantly understate the Cost of Equity. Based on the regression coefficients in Chart 12, however, the implied ROE is between 9.91 percent and 10.39 percent (*see* Exhibit DWD-6 and Table 9, below).

Table 9: Bond Yield Plus Risk Premium Results

Treasury Yield	Return on Equity
Current 30-Year Treasury (1.33%)	10.39%
Near Term Projected 30-Year Treasury (1.63%)	10.13%
Long Term Projected 30-Year Treasury (3.40%)	9.91%

D. Expected Earnings Analysis

Q. PLEASE EXPLAIN HOW THE EXPECTED EARNINGS ANALYSIS IS CONDUCTED.

A. The Expected Earnings analysis typically takes the actual earnings on book value of investment for each of the members of the proxy group and compares those values to the rate of return in question. Although the traditional approach uses data based on historical accounting records, it is common to use forecasted data in conducting the analysis. Projected returns on book investment are provided by various industry publications (*e.g.,* Value Line), which were used in the analysis.

The analysis relied on Value Line's projected Return on Common Equity for the period 2023-2025, and adjusted those projected returns to account for the fact that they reflect common shares outstanding at the end of the period, rather than the average shares outstanding over the course of the year.[89] The Expected Earnings analysis results in an average value of 9.78 percent and a median value of 9.54 percent (*see* Exhibit DWD-7).

Q. DO YOU RECOGNIZE THAT FERC RECENTLY DECIDED IT WOULD NOT INCLUDE EXPECTED EARNINGS ANALYSES AMONG THE METHODS USED TO DEVELOP ELECTRIC TRANSMISSION ROES?[90]

A. Yes, I do. As FERC explained in Opinion 569-A, however, "[w]hile we do not adopt the Expected Earnings model in our revised methodology here for the reasons

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89 The rationale for that adjustment is straightforward: Earnings are achieved over the course of a year, and should be related to the equity that was, on average, in place during that year. See, Leopold A. Bernstein, Financial Statement Analysis: Theory, Application, and Interpretation, Irwin, 4th Ed., 1988, at 630.

90 *See*, 169 FERC ¶ 61,129, Opinion No. 569, at para. 200. *See also,* 171 FERC ¶ 61,154, Opinion 569-A, at para 125-132.

discussed above, we do not necessarily foreclose its use in future proceedings if parties can demonstrate that the concerns discussed above have been addressed."[91] That aside, I am not suggesting the Expected Earnings model should be used to the exclusion of others. As other regulatory commissions have explained, because we are trying to estimate an unobservable parameter (the Cost of Equity) we should not rule out any particular methodology as unworthy of basing an ROE decision. Like all ROE models, the Expected Earnings approach provides valuable information, even though it has potential limitations. To that point, investors consider expected earnings when evaluating their investment options. In my view, it is reasonable to consider the Expected Earnings method as a check on market-based model results in determining the Company's ROE.

[91] 171 FERC ¶ 61,154, Opinion 569-A, at P. 132.

scottmadden
MANAGEMENT CONSULTANTS

Resume of:
Dylan W. D'Ascendis, CRRA, CVA
Director

Summary

Dylan is an experienced consultant and a Certified Rate of Return Analyst (CRRA) and Certified Valuation Analyst (CVA). He has served as a consultant for investor-owned and municipal utilities and authorities for 11 years. Dylan has extensive experience in rate of return analyses, class cost of service, rate design, and valuation for regulated public utilities. He has testified as an expert witness in the subjects of rate of return, cost of service, rate design, and valuation before 19 regulatory commissions in the U.S. and an American Arbitration Association panel.

He also maintains the benchmark index against which the Hennessy Gas Utility Mutual Fund performance is measured.

Areas of Specialization

- Regulation and Rates
- Utilities
- Mutual Fund Benchmarking
- Capital Market Risk
- Financial Modeling
- Valuation
- Regulatory Strategy
- Rate Case Support
- Rate of Return
- Cost of Service
- Rate Design

Recent Expert Testimony Submission/Appearances

Jurisdiction	***Topic***
Massachusetts Department of Public Utilities	Rate of Return
New Jersey Board of Public Utilities	Rate of Return
Hawaii Public Utilities Commission	Cost of Service, Rate Design
South Carolina Public Service Commission	Return on Common Equity
American Arbitration Association	Valuation

Recent Assignments

- Provided expert testimony on the cost of capital for ratemaking purposes before numerous state utility regulatory agencies
- Maintains the benchmark index against which the Hennessy Gas Utility Mutual Fund performance is measured
- Sponsored valuation testimony for a large municipal water company in front of an American Arbitration Association Board to justify the reasonability of their lease payments to the City
- Co-authored a valuation report on behalf of a large investor-owned utility company in response to a new state regulation which allowed the appraised value of acquired assets into rate base

Recent Publications and Speeches

- Co-Author of: "Decoupling, Risk Impacts and the Cost of Capital", co-authored with Richard A. Michelfelder, Ph.D., Rutgers University and Pauline M. Ahern. The Electricity Journal, March, 2020.
- Co-Author of: "Decoupling Impact and Public Utility Conservation Investment", co-authored with Richard A. Michelfelder, Ph.D., Rutgers University and Pauline M. Ahern. Energy Policy Journal, 130 (2019), 311-319.
- "Establishing Alternative Proxy Groups", before the Society of Utility and Regulatory Financial Analysts: 51st Financial Forum, April 4, 2019, New Orleans, LA.
- "Past is Prologue: Future Test Year", Presentation before the National Association of Water Companies 2017 Southeast Water Infrastructure Summit, May 2, 2017, Savannah, GA.
- Co-author of: "Comparative Evaluation of the Predictive Risk Premium Model™, the Discounted Cash Flow Model and the Capital Asset Pricing Model", co-authored with Richard A. Michelfelder, Ph.D., Rutgers University, Pauline M. Ahern, and Frank J. Hanley, The Electricity Journal, May, 2013.
- "Decoupling: Impact on the Risk and Cost of Common Equity of Public Utility Stocks", before the Society of Utility and Regulatory Financial Analysts: 45th Financial Forum, April 17-18, 2013, Indianapolis, IN.

SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Regulatory Commission of Alaska				
Alaska Power Company	07/16	Alaska Power Company	Docket No. TA857-2	Rate of Return
Alberta Utilities Commission				
AltaLink, L.P., and EPCOR Distribution & Transmission, Inc.	01/20	AltaLink, L.P., and EPCOR Distribution & Transmission, Inc.	2021 Generic Cost of Capital, Proceeding ID. 24110	Rate of Return
Arizona Corporation Commission				
Arizona Water Company	12/19	Arizona Water Company – Western Group	Docket No. W01445A-19-0278	Rate of Return
Arizona Water Company	08/18	Arizona Water Company – Northern Group	Docket No. W01445A-18-0164	Rate of Return
Colorado Public Utilities Commission				
Summit Utilities, Inc.	04/18	Colorado Natural Gas Company	Docket No. 18AL-0305G	Return on Equity
Atmos Energy Corporation	06/17	Atmos Energy Corporation	Docket No. 17AL-0429G	Return on Equity
Delaware Public Service Commission				
Tidewater Utilities, Inc.	11/13	Tidewater Utilities, Inc.	Docket No. 13-466	Capital Structure
Hawaii Public Utilities Commission				
Lanai Water Company, Inc.	12/19	Lanai Water Company, Inc.	Docket No. 2019-0386	Cost of Service / Rate Design
Manele Water Resources, LLC	8/19	Manele Water Resources, LLC	Docket No. 2019-0311	Cost of Service / Rate Design
Kaupulehu Water Company	02/18	Kaupulehu Water Company	Docket No. 2016-0363	Rate of Return
Aqua Engineers, LLC	05/17	Puhi Sewer & Water Company	Docket No. 2017-0118	Cost of Service / Rate Design
Hawaii Resources, Inc.	09/16	Laie Water Company	Docket No. 2016-0229	Cost of Service / Rate Design
Illinois Commerce Commission				
Utility Services of Illinois, Inc.	11/17	Utility Services of Illinois, Inc.	Docket No. 17-1106	Cost of Service / Rate Design
Aqua Illinois, Inc.	04/17	Aqua Illinois, Inc.	Docket No. 17-0259	Rate of Return
Utility Services of Illinois, Inc.	04/15	Utility Services of Illinois, Inc.	Docket No. 14-0741	Rate of Return
Indiana Utility Regulatory Commission				
Aqua Indiana, Inc.	03/16	Aqua Indiana, Inc. Aboite Wastewater Division	Docket No. 44752	Rate of Return
Twin Lakes, Utilities, Inc.	08/13	Twin Lakes, Utilities, Inc.	Docket No. 44388	Rate of Return
Kansas Corporation Commission				
Atmos Energy	07/19	Atmos Energy	19-ATMG-525-RTS	Rate of Return
Louisiana Public Service Commission				
Louisiana Water Service, Inc.	06/13	Louisiana Water Service, Inc.	Docket No. U-32848	Rate of Return
Maryland Public Service Commission				
FirstEnergy, Inc.	08/18	Potomac Edison Company	Case No. 9490	Rate of Return
Massachusetts Department of Public Utilities				

SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Unitil Corporation	12/19	Fitchburg Gas & Electric Co. (Elec.)	D.P.U. 19-130	Rate of Return
Unitil Corporation	12/19	Fitchburg Gas & Electric Co. (Gas)	D.P.U. 19-131	Rate of Return
Liberty Utilities	07/15	Liberty Utilities d/b/a New England Natural Gas Company	Docket No. 15-75	Rate of Return
Mississippi Public Service Commission				
Atmos Energy	03/19	Atmos Energy	Docket No. 2015-UN-049	Capital Structure
Atmos Energy	07/18	Atmos Energy	Docket No. 2015-UN-049	Capital Structure
Missouri Public Service Commission				
Indian Hills Utility Operating Company, Inc.	10/17	Indian Hills Utility Operating Company, Inc.	Case No. SR-2017-0259	Rate of Return
Raccoon Creek Utility Operating Company, Inc.	09/16	Raccoon Creek Utility Operating Company, Inc.	Docket No. SR-2016-0202	Rate of Return
New Jersey Board of Public Utilities				
Aqua New Jersey, Inc.	12/18	Aqua New Jersey, Inc.	Docket No. WR18121351	Rate of Return
Middlesex Water Company	10/17	Middlesex Water Company	Docket No. WR17101049	Rate of Return
Middlesex Water Company	03/15	Middlesex Water Company	Docket No. WR15030391	Rate of Return
The Atlantic City Sewerage Company	10/14	The Atlantic City Sewerage Company	Docket No. WR14101263	Cost of Service / Rate Design
Middlesex Water Company	11/13	Middlesex Water Company	Docket No. WR1311059	Capital Structure
North Carolina Utilities Commission				
Aqua North Carolina, Inc.	12/19	Aqua North Carolina, Inc.	Docket No. W-218 Sub 526	Rate of Return
Carolina Water Service, Inc.	06/19	Carolina Water Service, Inc.	Docket No. W-354 Sub 364	Rate of Return
Carolina Water Service, Inc.	09/18	Carolina Water Service, Inc.	Docket No. W-354 Sub 360	Rate of Return
Aqua North Carolina, Inc.	07/18	Aqua North Carolina, Inc.	Docket No. W-218 Sub 497	Rate of Return
Public Utilities Commission of Ohio				
Aqua Ohio, Inc.	05/16	Aqua Ohio, Inc.	Docket No. 16-0907-WW-AIR	Rate of Return
Pennsylvania Public Utility Commission				
Valley Energy, Inc.	07/19	C&T Enterprises	Docket No. R-2019-3008209	Rate of Return
Wellsboro Electric Company	07/19	C&T Enterprises	Docket No. R-2019-3008208	Rate of Return
Citizens' Electric Company of Lewisburg	07/19	C&T Enterprises	Docket No. R-2019-3008212	Rate of Return
Steelton Borough Authority	01/19	Steelton Borough Authority	Docket No. A-2019-3006880	Valuation
Mahoning Township, PA	08/18	Mahoning Township, PA	Docket No. A-2018-3003519	Valuation
SUEZ Water Pennsylvania Inc.	04/18	SUEZ Water Pennsylvania Inc.	Docket No. R-2018-000834	Rate of Return

scottmadden
MANAGEMENT CONSULTANTS

Testimony Listing of:
Dylan W. D'Ascendis, CRRA, CVA
Director

SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Columbia Water Company	09/17	Columbia Water Company	Docket No. R-2017-2598203	Rate of Return
Veolia Energy Philadelphia, Inc.	06/17	Veolia Energy Philadelphia, Inc.	Docket No. R-2017-2593142	Rate of Return
Emporium Water Company	07/14	Emporium Water Company	Docket No. R-2014-2402324	Rate of Return
Columbia Water Company	07/13	Columbia Water Company	Docket No. R-2013-2360798	Rate of Return
Penn Estates Utilities, Inc.	12/11	Penn Estates, Utilities, Inc.	Docket No. R-2011-2255159	Capital Structure / Long-Term Debt Cost Rate
South Carolina Public Service Commission				
Blue Granite Water Co.	12/19	Blue Granite Water Company	Docket No. 2019-292-WS	Rate of Return
Carolina Water Service, Inc.	02/18	Carolina Water Service, Inc.	Docket No. 2017-292-WS	Rate of Return
Carolina Water Service, Inc.	06/15	Carolina Water Service, Inc.	Docket No. 2015-199-WS	Rate of Return
Carolina Water Service, Inc.	11/13	Carolina Water Service, Inc.	Docket No. 2013-275-WS	Rate of Return
United Utility Companies, Inc.	09/13	United Utility Companies, Inc.	Docket No. 2013-199-WS	Rate of Return
Utility Services of South Carolina, Inc.	09/13	Utility Services of South Carolina, Inc.	Docket No. 2013-201-WS	Rate of Return
Tega Cay Water Services, Inc.	11/12	Tega Cay Water Services, Inc.	Docket No. 2012-177-WS	Capital Structure
Virginia State Corporation Commission				
WGL Holdings, Inc.	7/18	Washington Gas Light Company	PUR-2018-00080	Rate of Return
Atmos Energy Corporation	5/18	Atmos Energy Corporation	PUR-2018-00014	Rate of Return
Aqua Virginia, Inc.	7/17	Aqua Virginia, Inc.	PUR-2017-00082	Rate of Return
Massanutten Public Service Corp.	08/14	Massanutten Public Service Corp.	PUE-2014-00035	Rate of Return / Rate Design

Exhibit (DWD-1)

Constant Growth Discounted Cash Flow Model
30 Day Average Stock Price

Company	Ticker	[1] Annualized Dividend	[2] Average Stock Price	[3] Dividend Yield	[4] Expected Dividend Yield	[5] Zacks Earnings Growth	[6] First Call Earnings Growth	[7] Value Line Earnings Growth	[8] Retention Growth Estimate	[9] Average Earnings Growth	[10] Low ROE	[11] Mean ROE	[12] High ROE
Atmos Energy Corporation	ATO	$2.30	$100.19	2.30%	2.38%	7.20%	7.50%	7.00%	8.97%	7.67%	9.38%	10.05%	11.37%
New Jersey Resources Corporation	NJR	$1.25	$33.28	3.76%	3.84%	6.00%	6.00%	2.00%	4.06%	4.51%	5.79%	8.36%	9.87%
Northwest Natural Holding Company	NWN	$1.91	$62.94	3.03%	3.22%	NA	3.75%	26.50%	6.34%	12.20%	6.84%	15.42%	29.94%
ONE Gas, Inc.	OGS	$2.16	$81.08	2.66%	2.74%	5.50%	5.00%	6.50%	5.05%	5.51%	7.73%	8.25%	9.25%
South Jersey Industries, Inc.	SJI	$1.18	$27.25	4.33%	4.54%	10.20%	10.20%	12.50%	6.70%	9.90%	11.17%	14.44%	17.10%
Southwest Gas Holdings, Inc.	SWX	$2.28	$74.52	3.06%	3.17%	6.00%	8.20%	8.00%	7.00%	7.30%	9.15%	10.47%	11.38%
Spire Inc.	SR	$2.49	$71.83	3.47%	3.55%	4.70%	4.65%	5.50%	3.63%	4.62%	7.16%	8.17%	9.06%
Proxy Group Mean				3.23%	3.35%	6.60%	6.47%	9.71%	5.96%	7.39%	8.18%	10.74%	14.00%
Proxy Group Median				3.06%	3.22%	6.00%	6.00%	7.00%	6.34%	7.30%	7.73%	10.05%	11.37%

Notes:
[1] Source: Bloomberg Professional
[2] Source: Bloomberg Professional, equals indicated number of trading day average as of May 29, 2020
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.5 x [9])
[5] Source: Zacks
[6] Source: Yahoo! Finance
[7] Source: Value Line
[8] Source: Exhibit DWD-2, Value Line
[9] Equals Average([5], [6], [7], [8])
[10] Equals [3] x (1 + 0.5 x Minimum([5], [6], [7], [8])) + Minimum([5], [6], [7], [8])
[11] Equals [4] + [9]
[12] Equals [3] x (1 + 0.5 x Maximum([5], [6], [7], [8])) + Maximum([5], [6], [7], [8])

Constant Growth Discounted Cash Flow Model
90 Day Average Stock Price

Company	Ticker	[1] Annualized Dividend	[2] Average Stock Price	[3] Dividend Yield	[4] Expected Dividend Yield	[5] Zacks Earnings Growth	[6] First Call Earnings Growth	[7] Value Line Earnings Growth	[8] Retention Growth Estimate	[9] Average Earnings Growth	[10] Low ROE	[11] Mean ROE	[12] High ROE
Atmos Energy Corporation	ATO	$2.30	$105.33	2.18%	2.27%	7.20%	7.50%	7.00%	8.97%	7.67%	9.26%	9.94%	11.25%
New Jersey Resources Corporation	NJR	$1.25	$35.70	3.50%	3.58%	6.00%	6.00%	2.00%	4.06%	4.51%	5.54%	8.09%	9.61%
Northwest Natural Holding Company	NWN	$1.91	$66.01	2.89%	3.07%	NA	3.75%	26.50%	6.34%	12.20%	6.70%	15.27%	29.78%
ONE Gas, Inc.	OGS	$2.16	$84.89	2.54%	2.61%	5.50%	5.00%	6.50%	5.05%	5.51%	7.61%	8.13%	9.13%
South Jersey Industries, Inc.	SJI	$1.18	$27.84	4.24%	4.45%	10.20%	10.20%	12.50%	6.70%	9.90%	11.08%	14.35%	17.00%
Southwest Gas Holdings, Inc.	SWX	$2.28	$72.33	3.15%	3.27%	6.00%	8.20%	8.00%	7.00%	7.30%	9.25%	10.57%	11.48%
Spire Inc.	SR	$2.49	$76.32	3.26%	3.34%	4.70%	4.65%	5.50%	3.63%	4.62%	6.95%	7.96%	8.85%
Proxy Group Mean				3.11%	3.23%	6.60%	6.47%	9.71%	5.96%	7.39%	8.05%	10.61%	13.87%
Proxy Group Median				3.15%	3.27%	6.00%	6.00%	7.00%	6.34%	7.30%	7.61%	9.94%	11.25%

Notes:
[1] Source: Bloomberg Professional
[2] Source: Bloomberg Professional, equals indicated number of trading day average as of May 29, 2020
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.5 x [9])
[5] Source: Zacks
[6] Source: Yahoo! Finance
[7] Source: Value Line
[8] Source: Exhibit DWD-2, Value Line
[9] Equals Average([5], [6], [7], [8])
[10] Equals [3] x (1 + 0.5 x Minimum([5], [6], [7], [8])) + Minimum([5], [6], [7], [8])
[11] Equals [4] + [9]
[12] Equals [3] x (1 + 0.5 x Maximum([5], [6], [7], [8])) + Maximum([5], [6], [7], [8])

Constant Growth Discounted Cash Flow Model
180 Day Average Stock Price

Company	Ticker	[1] Annualized Dividend	[2] Average Stock Price	[3] Dividend Yield	[4] Expected Dividend Yield	[5] Zacks Earnings Growth	[6] First Call Earnings Growth	[7] Value Line Earnings Growth	[8] Retention Growth Estimate	[9] Average Earnings Growth	[10] Low ROE	[11] Mean ROE	[12] High ROE
Atmos Energy Corporation	ATO	$2.30	$107.90	2.13%	2.21%	7.20%	7.50%	7.00%	8.97%	7.67%	9.21%	9.88%	11.20%
New Jersey Resources Corporation	NJR	$1.25	$39.60	3.16%	3.23%	6.00%	6.00%	2.00%	4.06%	4.51%	5.19%	7.74%	9.25%
Northwest Natural Holding Company	NWN	$1.91	$67.97	2.81%	2.98%	NA	3.75%	26.50%	6.34%	12.20%	6.61%	15.18%	29.68%
ONE Gas, Inc.	OGS	$2.16	$88.44	2.44%	2.51%	5.50%	5.00%	6.50%	5.05%	5.51%	7.50%	8.02%	9.02%
South Jersey Industries, Inc.	SJI	$1.18	$29.78	3.96%	4.16%	10.20%	10.20%	12.50%	6.70%	9.90%	10.79%	14.06%	16.71%
Southwest Gas Holdings, Inc.	SWX	$2.28	$77.17	2.95%	3.06%	6.00%	8.20%	8.00%	7.00%	7.30%	9.04%	10.36%	11.28%
Spire Inc.	SR	$2.49	$79.51	3.13%	3.20%	4.70%	4.65%	5.50%	3.63%	4.62%	6.82%	7.82%	8.72%
Proxy Group Mean				2.94%	3.05%	6.60%	6.47%	9.71%	5.96%	7.39%	7.88%	10.44%	13.69%
Proxy Group Median				2.95%	3.06%	6.00%	6.00%	7.00%	6.34%	7.30%	7.50%	9.88%	11.20%

Notes:
[1] Source: Bloomberg Professional
[2] Source: Bloomberg Professional, equals indicated number of trading day average as of May 29, 2020
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.5 x [9])
[5] Source: Zacks
[6] Source: Yahoo! Finance
[7] Source: Value Line
[8] Source: Exhibit DWD-2, Value Line
[9] Equals Average([5], [6], [7], [8])
[10] Equals [3] x (1 + 0.5 x Minimum([5], [6], [7], [8])) + Minimum([5], [6], [7], [8])
[11] Equals [4] + [9]
[12] Equals [3] x (1 + 0.5 x Maximum([5], [6], [7], [8])) + Maximum([5], [6], [7], [8])

Exhibit (DWD-2)

Retention Growth Estimate

Company	Ticker	[1] Projected Earnings per share 2023-2025	[2] Projected Dividend Declared per share 2023-25	[3] Retention Ratio (B)	[4] Projected Book Value per Share 2023-25	[5] Return on Book Value (R)	[6] B x R	[7] Projected Common Shares Outstanding 2020	[8] Projected Common Shares Outstanding 2023-25	[9] Common Shares Growth Rate	[10] 2020 High Price	[11] 2020 Low Price	[12] 2020 Price Midpoint	[13] Projected Book Value per Share 2020	[14] Market/ Book Ratio	[15] "S"	[16] "V"	[17] S x V	[18] BR + SV
Atmos Energy Corporation	ATO	6.00	3.00	50.00%	66.20	9.06%	4.53%	125.00	145.00	5.02%	$ 121.10	$ 77.90	$ 99.50	52.80	1.88	9.46%	46.93%	4.44%	8.97%
New Jersey Resources Corporation	NJR	2.40	1.57	34.58%	25.80	9.30%	3.22%	96.00	100.00	1.36%	$ 44.70	$ 21.10	$ 32.90	20.30	1.62	2.20%	38.30%	0.84%	4.06%
Northwest Natural Holding Company	NWN	3.50	1.97	43.71%	29.85	11.73%	5.13%	31.00	32.00	1.05%	$ 77.30	$ 50.50	$ 63.90	29.65	2.16	2.27%	53.60%	1.22%	6.34%
ONE Gas, Inc.	OGS	4.75	2.80	41.05%	49.60	9.58%	3.93%	53.00	55.00	1.23%	$ 97.00	$ 63.70	$ 80.35	42.10	1.91	2.35%	47.60%	1.12%	5.05%
South Jersey Industries, Inc.	SJI	2.50	1.40	44.00%	20.60	12.14%	5.34%	95.00	102.00	2.37%	$ 33.40	$ 19.60	$ 26.50	16.85	1.57	3.73%	36.42%	1.36%	6.70%
Southwest Gas Holdings, Inc.	SWX	6.00	2.65	55.83%	60.00	10.00%	5.58%	57.00	65.00	4.43%	$ 81.60	$ 45.70	$ 63.65	48.25	1.32	5.84%	24.19%	1.41%	7.00%
Spire Inc.	SR	5.15	3.00	41.75%	72.00	7.15%	2.99%	52.00	55.00	1.87%	$ 88.00	$ 57.40	$ 72.70	54.00	1.35	2.52%	25.72%	0.65%	3.63%
																		Average	5.96%

Notes:
[1] Source: Value Line
[2] Source: Value Line
[3] Equals 1 - [2] / [1]
[4] Source: Value Line
[5] Equals [1] / [4]
[6] Equals [3] x [5]
[7] Source: Value Line
[8] Source: Value Line
[9] Equals ([8] / [7]) ^ 0.33 - 1
[10] Source: Value Line
[11] Source: Value Line
[12] Equals Average ([10], [11])
[13] Source: Value Line
[14] Equals [12] / [13]
[15] Equals [9] x [14]
[16] Equals 1 - (1 / [14])
[17] Equals [15] x [16]
[18] Equals [6] + [17]

Exhibit (DWD-3)

Ex-Ante Market Risk Premium
Market DCF Method Based - Bloomberg

[1]	[2]	[3]
S&P 500 Est. Required Market Return	Current 30-Year Treasury (30-day average)	Implied Market Risk Premium
13.48%	1.33%	12.15%

Company	Ticker	[4] Market Capitalization	[5] Weight in Index	[6] Estimated Dividend Yield	[7] Long-Term Growth Est.	[8] DCF Result	[9] Weighted DCF Result
Agilent Technologies Inc	A	27,147.12	0.10%	0.81%	10.30%	11.15%	0.0114%
American Airlines Group Inc	AAL	4,440.39	0.02%	0.71%	-7.34%	-6.65%	-0.0011%
Advance Auto Parts Inc	AAP	9,627.18	0.04%	0.60%	12.08%	12.72%	0.0046%
Apple Inc	AAPL	1,378,058.47	5.18%	1.01%	10.78%	11.84%	0.6139%
AbbVie Inc	ABBV	163,317.35	0.61%	5.09%	2.41%	7.56%	0.0464%
AmerisourceBergen Corp	ABC	19,392.42	0.07%	1.76%	12.18%	14.04%	0.0102%
ABIOMED Inc	ABMD	10,065.86	0.04%	0.00%	16.00%	16.00%	0.0061%
Abbott Laboratories	ABT	167,898.80	0.63%	1.51%	8.10%	9.66%	0.0610%
Accenture PLC	ACN	128,630.94	0.48%	1.58%	10.50%	12.16%	0.0589%
Adobe Inc	ADBE	186,264.21	0.70%	0.00%	18.00%	18.00%	0.1261%
Analog Devices Inc	ADI	41,613.56	0.16%	2.11%	12.13%	14.37%	0.0225%
Archer-Daniels-Midland Co	ADM	21,836.56	0.08%	3.68%	9.10%	12.95%	0.0106%
Automatic Data Processing Inc	ADP	62,957.65	0.24%	2.39%	12.30%	14.84%	0.0351%
Alliance Data Systems Corp	ADS	2,206.60	0.01%	2.27%	-4.44%	-2.22%	-0.0002%
Autodesk Inc	ADSK	46,111.84	0.17%	0.00%	31.35%	31.35%	0.0544%
Ameren Corp	AEE	18,438.67	0.07%	2.69%	7.06%	9.84%	0.0068%
American Electric Power Co Inc	AEP	42,248.46	0.16%	3.31%	6.68%	10.10%	0.0160%
AES Corp/The	AES	8,304.69	0.03%	4.64%	6.99%	11.79%	0.0037%
Aflac Inc	AFL	26,167.51	0.10%	3.10%	0.11%	3.21%	0.0032%
American International Group Inc	AIG	25,890.40	0.10%	4.31%	15.85%	20.50%	0.0200%
Apartment Investment and Management Co	AIV	5,488.62	0.02%	4.45%	3.01%	7.53%	0.0016%
Assurant Inc	AIZ	6,119.13	N/A	2.52%	N/A	N/A	N/A
Arthur J Gallagher & Co	AJG	17,875.49	0.07%	1.91%	8.88%	10.87%	0.0073%
Akamai Technologies Inc	AKAM	17,168.64	0.06%	0.00%	11.80%	11.80%	0.0076%
Albemarle Corp	ALB	8,135.50	0.03%	1.97%	10.07%	12.14%	0.0037%
Align Technology Inc	ALGN	19,345.76	0.07%	0.00%	14.17%	14.17%	0.0103%
Alaska Air Group Inc	ALK	4,191.19	0.02%	0.93%	-19.37%	-18.53%	-0.0029%
Allstate Corp/The	ALL	30,723.70	0.12%	2.15%	7.05%	9.27%	0.0107%
Allegion plc	ALLE	9,194.36	0.03%	1.07%	6.17%	7.28%	0.0025%
Alexion Pharmaceuticals Inc	ALXN	26,477.21	0.10%	0.00%	11.09%	11.09%	0.0110%
Applied Materials Inc	AMAT	51,487.81	0.19%	1.53%	15.32%	16.97%	0.0329%
Amcor PLC	AMCR	16,075.01	0.06%	4.57%	8.90%	13.68%	0.0083%
Advanced Micro Devices Inc	AMD	63,010.04	0.24%	0.00%	20.33%	20.33%	0.0482%
AMETEK Inc	AME	21,041.22	0.08%	0.73%	9.16%	9.92%	0.0079%
Amgen Inc	AMGN	135,120.43	0.51%	2.74%	8.13%	10.98%	0.0558%
Ameriprise Financial Inc	AMP	17,135.78	0.06%	2.94%	3.90%	6.90%	0.0044%
American Tower Corp	AMT	114,448.42	0.43%	1.75%	15.64%	17.52%	0.0754%
Amazon.com Inc	AMZN	1,218,195.62	4.58%	0.00%	34.86%	34.86%	1.5973%
Arista Networks Inc	ANET	17,673.98	0.07%	0.00%	16.04%	16.04%	0.0107%
ANSYS Inc	ANSS	24,223.51	0.09%	0.00%	11.50%	11.50%	0.0105%
Anthem Inc	ANTM	74,149.87	0.28%	1.13%	13.41%	14.62%	0.0408%
Aon PLC	AON	45,512.11	0.17%	0.92%	11.05%	12.02%	0.0206%
AO Smith Corp	AOS	7,654.17	0.03%	2.03%	8.00%	10.11%	0.0029%
Apache Corp	APA	4,072.43	0.02%	2.42%	-18.00%	-15.80%	-0.0024%
Air Products and Chemicals Inc	APD	53,369.53	0.20%	2.06%	11.98%	14.16%	0.0284%
Amphenol Corp	APH	28,571.56	0.11%	1.04%	8.12%	9.20%	0.0099%
Aptiv PLC	APTV	19,204.90	0.07%	0.41%	9.46%	9.89%	0.0071%
Alexandria Real Estate Equities Inc	ARE	19,398.67	0.07%	2.70%	4.13%	6.89%	0.0050%
Atmos Energy Corp	ATO	12,571.18	0.05%	2.24%	7.34%	9.66%	0.0046%
Activision Blizzard Inc	ATVI	55,459.54	0.21%	0.55%	11.12%	11.70%	0.0244%
AvalonBay Communities Inc	AVB	21,955.50	0.08%	4.06%	5.85%	10.02%	0.0083%
Broadcom Inc	AVGO	116,447.23	0.44%	4.46%	9.05%	13.71%	0.0601%
Avery Dennison Corp	AVY	9,223.24	0.03%	2.09%	4.50%	6.64%	0.0023%
American Water Works Co Inc	AWK	22,989.91	0.09%	1.69%	8.19%	9.95%	0.0086%
American Express Co	AXP	76,528.64	0.29%	1.83%	7.04%	8.94%	0.0257%
AutoZone Inc	AZO	26,805.32	0.10%	0.00%	8.43%	8.43%	0.0085%
Boeing Co/The	BA	82,306.85	0.31%	1.38%	65.59%	67.43%	0.2088%
Bank of America Corp	BAC	209,255.74	0.79%	3.08%	9.25%	12.47%	0.0981%
Baxter International Inc	BAX	45,653.62	0.17%	0.88%	11.95%	12.88%	0.0221%
Best Buy Co Inc	BBY	20,171.35	0.08%	2.82%	4.46%	7.34%	0.0056%
Becton Dickinson and Co	BDX	71,555.49	0.27%	1.42%	8.32%	9.80%	0.0264%
Franklin Resources Inc	BEN	9,346.43	0.04%	5.74%	-6.79%	-1.24%	-0.0004%
Brown-Forman Corp	BF/B	30,411.50	0.11%	1.03%	4.38%	5.43%	0.0062%
Biogen Inc	BIIB	50,113.25	0.19%	0.00%	1.98%	1.98%	0.0037%
Bank of New York Mellon Corp/The	BK	32,911.91	0.12%	3.35%	4.43%	7.86%	0.0097%

Company	Ticker	[4] Market Capitalization	[5] Weight in Index	[6] Estimated Dividend Yield	[7] Long-Term Growth Est.	[8] DCF Result	[9] Weighted DCF Result
Booking Holdings Inc	BKNG	67,102.95	0.25%	0.00%	19.73%	19.73%	0.0498%
Baker Hughes Co	BKR	17,045.96	0.06%	4.40%	17.77%	22.56%	0.0145%
BlackRock Inc	BLK	81,094.22	0.31%	2.75%	3.84%	6.64%	0.0203%
Ball Corp	BLL	23,230.98	0.09%	0.80%	6.07%	6.89%	0.0060%
Bristol-Myers Squibb Co	BMY	135,127.83	0.51%	3.01%	11.35%	14.53%	0.0739%
Broadridge Financial Solutions Inc	BR	13,904.40	0.05%	1.78%	6.50%	8.34%	0.0044%
Berkshire Hathaway Inc	BRK/B	451,152.95	1.70%	0.00%	-3.10%	-3.10%	-0.0526%
Boston Scientific Corp	BSX	54,276.07	0.20%	0.00%	11.18%	11.18%	0.0228%
BorgWarner Inc	BWA	6,665.01	0.03%	2.18%	6.87%	9.12%	0.0023%
Boston Properties Inc	BXP	13,358.64	0.05%	4.62%	3.97%	8.68%	0.0044%
Citigroup Inc	C	99,739.04	0.38%	4.27%	-1.53%	2.71%	0.0102%
Conagra Brands Inc	CAG	16,945.38	0.06%	2.44%	7.35%	9.88%	0.0063%
Cardinal Health Inc	CAH	15,968.74	0.06%	3.57%	4.84%	8.49%	0.0051%
Carrier Global Corp	CARR	17,730.27	N/A	0.00%	N/A	N/A	N/A
Caterpillar Inc	CAT	65,019.08	0.24%	3.53%	4.25%	7.85%	0.0192%
Chubb Ltd	CB	55,038.50	0.21%	2.52%	9.05%	11.68%	0.0242%
Cboe Global Markets Inc	CBOE	11,680.83	0.04%	1.40%	6.30%	7.74%	0.0034%
CBRE Group Inc	CBRE	14,740.64	0.06%	0.00%	8.45%	8.45%	0.0047%
Crown Castle International Corp	CCI	71,747.89	0.27%	2.83%	17.63%	20.72%	0.0559%
Carnival Corp	CCL	11,475.37	0.04%	4.32%	-2.50%	1.77%	0.0008%
Cadence Design Systems Inc	CDNS	25,486.98	0.10%	0.00%	11.09%	11.09%	0.0106%
CDW Corp/DE	CDW	15,784.50	0.06%	1.38%	13.10%	14.57%	0.0086%
Celanese Corp	CE	10,629.96	0.04%	2.81%	3.61%	6.47%	0.0026%
Cerner Corp	CERN	22,187.01	0.08%	0.53%	11.91%	12.47%	0.0104%
CF Industries Holdings Inc	CF	6,279.23	0.02%	4.11%	11.05%	15.39%	0.0036%
Citizens Financial Group Inc	CFG	10,281.52	0.04%	6.42%	30.88%	38.29%	0.0148%
Church & Dwight Co Inc	CHD	18,459.17	0.07%	1.28%	7.87%	9.20%	0.0064%
CH Robinson Worldwide Inc	CHRW	10,920.91	0.04%	2.54%	8.37%	11.01%	0.0045%
Charter Communications Inc	CHTR	129,536.96	0.49%	0.00%	42.98%	42.98%	0.2095%
Cigna Corp	CI	72,807.33	0.27%	0.03%	11.07%	11.11%	0.0304%
Cincinnati Financial Corp	CINF	9,479.25	N/A	4.39%	N/A	N/A	N/A
Colgate-Palmolive Co	CL	61,952.70	0.23%	2.47%	4.81%	7.33%	0.0171%
Clorox Co/The	CLX	25,973.85	0.10%	2.04%	5.12%	7.22%	0.0071%
Comerica Inc	CMA	5,053.91	0.02%	7.39%	-0.20%	7.18%	0.0014%
Comcast Corp	CMCSA	180,740.64	0.68%	2.30%	5.03%	7.39%	0.0503%
CME Group Inc	CME	65,478.23	0.25%	3.31%	8.43%	11.87%	0.0292%
Chipotle Mexican Grill Inc	CMG	27,999.79	0.11%	0.00%	15.17%	15.17%	0.0160%
Cummins Inc	CMI	25,020.42	0.09%	3.15%	3.26%	6.47%	0.0061%
CMS Energy Corp	CMS	16,766.85	0.06%	2.78%	6.87%	9.75%	0.0061%
Centene Corp	CNC	38,367.32	0.14%	0.00%	14.65%	14.65%	0.0211%
CenterPoint Energy Inc	CNP	8,936.49	0.03%	4.16%	-1.62%	2.51%	0.0008%
Capital One Financial Corp	COF	30,979.30	0.12%	2.36%	6.75%	9.19%	0.0107%
Cabot Oil & Gas Corp	COG	7,907.74	0.03%	2.02%	23.75%	26.00%	0.0077%
Cooper Cos Inc/The	COO	16,904.69	0.06%	0.02%	8.93%	8.95%	0.0057%
ConocoPhillips	COP	45,234.89	0.17%	4.00%	-15.00%	-11.30%	-0.0192%
Costco Wholesale Corp	COST	136,196.60	0.51%	1.26%	7.48%	8.78%	0.0450%
Coty Inc	COTY	2,770.04	0.01%	8.93%	-1.77%	7.08%	0.0007%
Campbell Soup Co	CPB	15,382.94	0.06%	2.76%	7.92%	10.78%	0.0062%
Copart Inc	CPRT	20,986.76	N/A	0.00%	N/A	N/A	N/A
salesforce.com Inc	CRM	157,116.16	0.59%	0.00%	19.32%	19.32%	0.1142%
Cisco Systems Inc	CSCO	201,910.20	0.76%	2.95%	5.38%	8.41%	0.0639%
CSX Corp	CSX	54,792.05	0.21%	1.47%	8.77%	10.31%	0.0212%
Cintas Corp	CTAS	25,800.29	0.10%	1.03%	12.00%	13.09%	0.0127%
CenturyLink Inc	CTL	10,788.45	0.04%	10.18%	-1.33%	8.79%	0.0036%
Cognizant Technology Solutions Corp	CTSH	28,650.74	0.11%	1.63%	10.08%	11.79%	0.0127%
Corteva Inc	CTVA	20,462.93	0.08%	1.87%	9.69%	11.64%	0.0090%
Citrix Systems Inc	CTXS	18,285.51	0.07%	0.94%	9.33%	10.32%	0.0071%
CVS Health Corp	CVS	85,705.95	0.32%	3.05%	7.36%	10.52%	0.0339%
Chevron Corp	CVX	171,201.94	0.64%	5.63%	38.90%	45.62%	0.2938%
Concho Resources Inc	CXO	10,724.17	0.04%	1.47%	8.80%	10.33%	0.0042%
Dominion Energy Inc	D	71,344.73	0.27%	4.44%	5.00%	9.55%	0.0256%
Delta Air Lines Inc	DAL	16,079.60	0.06%	1.40%	-0.50%	0.90%	0.0005%
DuPont de Nemours Inc	DD	37,225.53	0.14%	2.39%	1.96%	4.38%	0.0061%
Deere & Co	DE	47,592.05	0.18%	2.06%	0.41%	2.47%	0.0044%
Discover Financial Services	DFS	14,552.35	0.05%	3.76%	29.12%	33.42%	0.0183%
Dollar General Corp	DG	48,207.25	0.18%	0.76%	11.50%	12.30%	0.0223%
Quest Diagnostics Inc	DGX	15,817.80	0.06%	1.89%	5.46%	7.40%	0.0044%
DR Horton Inc	DHI	20,103.64	0.08%	1.26%	10.55%	11.87%	0.0090%
Danaher Corp	DHR	117,950.91	0.44%	0.43%	8.52%	8.97%	0.0398%
Walt Disney Co/The	DIS	211,875.09	0.80%	1.04%	19.55%	20.69%	0.1649%
Discovery Inc	DISCA	14,793.71	0.06%	0.00%	-0.63%	-0.63%	-0.0004%
DISH Network Corp	DISH	16,589.59	0.06%	0.00%	1.62%	1.62%	0.0010%
Digital Realty Trust Inc	DLR	39,735.46	0.15%	3.13%	15.80%	19.17%	0.0287%
Dollar Tree Inc	DLTR	23,217.93	0.09%	0.00%	8.68%	8.68%	0.0076%
Dover Corp	DOV	13,998.85	0.05%	2.04%	10.30%	12.45%	0.0066%
Dow Inc	DOW	28,667.44	0.11%	7.36%	-2.66%	4.60%	0.0050%

Company	Ticker	[4] Market Capitalization	[5] Weight in Index	[6] Estimated Dividend Yield	[7] Long-Term Growth Est.	[8] DCF Result	[9] Weighted DCF Result
Domino's Pizza Inc	DPZ	15,093.24	0.06%	0.80%	12.98%	13.84%	0.0079%
Duke Realty Corp	DRE	12,701.82	0.05%	2.73%	-0.65%	2.07%	0.0010%
Darden Restaurants Inc	DRI	9,982.52	0.04%	3.44%	6.52%	10.07%	0.0038%
DTE Energy Co	DTE	20,664.74	0.08%	3.79%	5.87%	9.77%	0.0076%
Duke Energy Corp	DUK	62,938.05	0.24%	4.52%	4.60%	9.22%	0.0218%
DaVita Inc	DVA	9,860.93	0.04%	0.00%	9.56%	9.56%	0.0035%
Devon Energy Corp	DVN	4,136.99	0.02%	3.93%	0.55%	4.49%	0.0007%
DXC Technology Co	DXC	3,605.37	0.01%	4.36%	-6.42%	-2.20%	-0.0003%
DexCom Inc	DXCM	34,934.99	0.13%	0.00%	30.99%	30.99%	0.0407%
Electronic Arts Inc	EA	35,473.93	0.13%	0.00%	8.09%	8.09%	0.0108%
eBay Inc	EBAY	31,999.99	0.12%	1.39%	13.10%	14.58%	0.0175%
Ecolab Inc	ECL	61,483.81	0.23%	0.89%	6.90%	7.82%	0.0181%
Consolidated Edison Inc	ED	25,077.70	0.09%	4.07%	3.62%	7.77%	0.0073%
Equifax Inc	EFX	18,639.90	0.07%	1.02%	7.41%	8.47%	0.0059%
Edison International	EIX	21,962.18	0.08%	4.37%	4.54%	9.01%	0.0074%
Estee Lauder Cos Inc/The	EL	71,088.93	0.27%	0.74%	10.70%	11.48%	0.0307%
Eastman Chemical Co	EMN	9,251.68	0.03%	3.86%	4.47%	8.42%	0.0029%
Emerson Electric Co	EMR	36,457.94	0.14%	3.23%	6.51%	9.85%	0.0135%
EOG Resources Inc	EOG	29,666.88	0.11%	2.86%	-1.12%	1.73%	0.0019%
Equinix Inc	EQIX	61,750.41	0.23%	1.52%	18.80%	20.47%	0.0475%
Equity Residential	EQR	22,535.93	0.08%	3.94%	3.51%	7.52%	0.0064%
Eversource Energy	ES	28,160.24	0.11%	2.71%	6.64%	9.44%	0.0100%
Essex Property Trust Inc	ESS	15,881.37	0.06%	3.40%	3.92%	7.39%	0.0044%
E*TRADE Financial Corp	ETFC	10,066.45	0.04%	1.26%	-11.58%	-10.39%	-0.0039%
Eaton Corp PLC	ETN	33,960.00	0.13%	3.45%	8.82%	12.42%	0.0159%
Entergy Corp	ETR	20,380.49	0.08%	3.68%	5.17%	8.94%	0.0069%
Evergy Inc	EVRG	13,982.59	0.05%	3.34%	6.70%	10.15%	0.0053%
Edwards Lifesciences Corp	EW	46,416.98	0.17%	0.00%	13.75%	13.75%	0.0240%
Exelon Corp	EXC	37,311.25	0.14%	3.99%	0.77%	4.77%	0.0067%
Expeditors International of Washington I	EXPD	12,709.97	0.05%	1.36%	9.25%	10.67%	0.0051%
Expedia Group Inc	EXPE	11,205.32	0.04%	0.67%	10.97%	11.68%	0.0049%
Extra Space Storage Inc	EXR	12,489.13	0.05%	3.75%	1.54%	5.32%	0.0025%
Ford Motor Co	F	22,708.90	0.09%	2.38%	13.51%	16.05%	0.0137%
Diamondback Energy Inc	FANG	6,719.80	0.03%	3.52%	17.94%	21.77%	0.0055%
Fastenal Co	FAST	23,699.59	0.09%	2.43%	13.85%	16.45%	0.0147%
Facebook Inc	FB	641,304.66	2.41%	0.00%	22.16%	22.16%	0.5346%
Fortune Brands Home & Security Inc	FBHS	8,409.25	0.03%	1.58%	6.39%	8.01%	0.0025%
Freeport-McMoRan Inc	FCX	13,169.37	0.05%	0.55%	136.19%	137.12%	0.0679%
FedEx Corp	FDX	34,108.77	0.13%	1.99%	14.06%	16.19%	0.0208%
FirstEnergy Corp	FE	22,894.51	0.09%	3.70%	0.65%	4.36%	0.0038%
F5 Networks Inc	FFIV	8,825.13	0.03%	0.00%	4.02%	4.02%	0.0013%
Fidelity National Information Services I	FIS	85,773.87	0.32%	1.05%	18.40%	19.55%	0.0631%
Fiserv Inc	FISV	71,480.84	0.27%	0.00%	13.89%	13.89%	0.0373%
Fifth Third Bancorp	FITB	13,803.97	0.05%	5.58%	9.77%	15.63%	0.0081%
FLIR Systems Inc	FLIR	6,044.92	0.02%	1.57%	10.40%	12.06%	0.0027%
Flowserve Corp	FLS	3,396.29	0.01%	3.07%	3.00%	6.11%	0.0008%
FleetCor Technologies Inc	FLT	20,430.15	0.08%	0.03%	13.02%	13.05%	0.0100%
FMC Corp	FMC	12,738.90	0.05%	1.79%	9.73%	11.60%	0.0056%
Fox Corp	FOXA	17,508.71	0.07%	2.22%	-3.73%	-1.55%	-0.0010%
First Republic Bank/CA	FRC	18,528.18	0.07%	0.73%	6.49%	7.25%	0.0051%
Federal Realty Investment Trust	FRT	6,043.84	0.02%	5.26%	3.16%	8.51%	0.0019%
TechnipFMC PLC	FTI	3,317.45	0.01%	2.65%	9.50%	12.27%	0.0015%
Fortinet Inc	FTNT	22,501.48	0.08%	0.00%	16.68%	16.68%	0.0141%
Fortive Corp	FTV	20,541.49	0.08%	0.44%	8.67%	9.13%	0.0071%
General Dynamics Corp	GD	42,120.32	0.16%	2.94%	4.58%	7.58%	0.0120%
General Electric Co	GE	57,468.39	0.22%	0.61%	6.07%	6.69%	0.0145%
Gilead Sciences Inc	GILD	97,627.88	0.37%	3.46%	0.76%	4.23%	0.0155%
General Mills Inc	GIS	38,211.00	0.14%	3.11%	5.87%	9.07%	0.0130%
Globe Life Inc	GL	8,197.86	0.03%	0.93%	4.90%	5.86%	0.0018%
Corning Inc	GLW	17,342.00	0.07%	3.82%	4.13%	8.03%	0.0052%
General Motors Co	GM	37,036.26	0.14%	2.84%	13.21%	16.23%	0.0226%
Alphabet Inc	GOOGL	976,896.64	3.67%	0.00%	14.18%	14.18%	0.5212%
Genuine Parts Co	GPC	12,032.75	0.05%	3.75%	4.70%	8.54%	0.0039%
Global Payments Inc	GPN	53,686.49	0.20%	0.42%	17.56%	18.02%	0.0364%
Gap Inc/The	GPS	3,316.49	0.01%	8.01%	6.37%	14.63%	0.0018%
Garmin Ltd	GRMN	17,224.08	0.06%	2.67%	6.90%	9.66%	0.0063%
Goldman Sachs Group Inc/The	GS	70,439.31	0.26%	2.57%	5.13%	7.77%	0.0206%
WW Grainger Inc	GWW	16,554.74	0.06%	1.95%	9.47%	11.51%	0.0072%
Halliburton Co	HAL	10,308.01	0.04%	4.43%	12.95%	17.67%	0.0069%
Hasbro Inc	HAS	10,071.70	0.04%	3.72%	12.50%	16.45%	0.0062%
Huntington Bancshares Inc/OH	HBAN	9,016.40	0.03%	6.76%	-9.27%	-2.82%	-0.0010%
Hanesbrands Inc	HBI	3,431.63	0.01%	4.76%	0.84%	5.62%	0.0007%
HCA Healthcare Inc	HCA	36,091.46	0.14%	0.28%	8.66%	8.95%	0.0122%
Home Depot Inc/The	HD	267,245.92	1.01%	2.39%	9.12%	11.62%	0.1168%
Hess Corp	HES	14,580.13	0.05%	2.14%	-23.46%	-21.57%	-0.0118%
HollyFrontier Corp	HFC	5,091.32	0.02%	4.46%	-2.81%	1.58%	0.0003%

Company	Ticker	[4] Market Capitalization	[5] Weight in Index	[6] Estimated Dividend Yield	[7] Long-Term Growth Est.	[8] DCF Result	[9] Weighted DCF Result
Hartford Financial Services Group Inc/Th	HIG	13,710.69	0.05%	3.41%	12.00%	15.62%	0.0081%
Huntington Ingalls Industries Inc	HII	8,090.40	0.03%	2.13%	40.00%	42.55%	0.0130%
Hilton Worldwide Holdings Inc	HLT	21,989.61	0.08%	0.19%	1.28%	1.47%	0.0012%
Harley-Davidson Inc	HOG	3,268.72	0.01%	2.03%	2.10%	4.15%	0.0005%
Hologic Inc	HOLX	13,684.90	0.05%	0.00%	8.85%	8.85%	0.0046%
Honeywell International Inc	HON	102,364.50	0.39%	2.43%	7.17%	9.69%	0.0373%
Hewlett Packard Enterprise Co	HPE	12,448.22	0.05%	4.97%	1.92%	6.94%	0.0032%
HP Inc	HPQ	21,646.63	0.08%	4.64%	4.77%	9.52%	0.0078%
H&R Block Inc	HRB	3,272.08	0.01%	6.14%	10.00%	16.44%	0.0020%
Hormel Foods Corp	HRL	26,259.61	0.10%	1.89%	3.89%	5.81%	0.0057%
Henry Schein Inc	HSIC	8,668.15	0.03%	0.00%	0.70%	0.70%	0.0002%
Host Hotels & Resorts Inc	HST	8,417.21	0.03%	3.59%	-2.30%	1.25%	0.0004%
Hershey Co/The	HSY	28,222.75	0.11%	2.32%	6.83%	9.24%	0.0098%
Humana Inc	HUM	54,290.42	0.20%	0.62%	11.72%	12.37%	0.0253%
Howmet Aerospace Inc	HWM	5,704.23	0.02%	0.00%	51.10%	51.10%	0.0110%
International Business Machines Corp	IBM	110,897.71	0.42%	5.28%	2.67%	8.03%	0.0335%
Intercontinental Exchange Inc	ICE	53,217.32	0.20%	1.22%	9.91%	11.20%	0.0224%
IDEXX Laboratories Inc	IDXX	26,234.10	0.10%	0.00%	12.27%	12.27%	0.0121%
IDEX Corp	IEX	12,015.20	0.05%	1.31%	11.33%	12.71%	0.0057%
International Flavors & Fragrances Inc	IFF	14,231.50	0.05%	2.23%	7.30%	9.61%	0.0051%
Illumina Inc	ILMN	53,368.35	0.20%	0.00%	18.55%	18.55%	0.0372%
Incyte Corp	INCY	22,152.53	0.08%	0.00%	23.25%	23.25%	0.0194%
IHS Markit Ltd	INFO	27,708.73	0.10%	0.68%	12.20%	12.93%	0.0135%
Intel Corp	INTC	266,445.62	1.00%	2.07%	5.93%	8.05%	0.0807%
Intuit Inc	INTU	75,707.14	0.28%	0.72%	15.10%	15.88%	0.0452%
International Paper Co	IP	13,383.06	0.05%	6.03%	4.40%	10.56%	0.0053%
Interpublic Group of Cos Inc/The	IPG	6,666.29	0.03%	5.66%	0.19%	5.86%	0.0015%
IPG Photonics Corp	IPGP	8,240.48	N/A	0.00%	N/A	N/A	N/A
IQVIA Holdings Inc	IQV	28,552.90	0.11%	0.00%	11.20%	11.20%	0.0120%
Ingersoll Rand Inc	IR	11,747.91	0.04%	0.35%	10.20%	10.57%	0.0047%
Iron Mountain Inc	IRM	7,415.86	0.03%	9.65%	0.06%	9.70%	0.0027%
Intuitive Surgical Inc	ISRG	67,641.81	0.25%	0.00%	6.66%	6.66%	0.0169%
Gartner Inc	IT	10,852.61	0.04%	0.00%	12.50%	12.50%	0.0051%
Illinois Tool Works Inc	ITW	54,485.64	0.20%	2.51%	5.27%	7.85%	0.0161%
Invesco Ltd	IVZ	3,657.40	0.01%	9.91%	-9.60%	-0.17%	0.0000%
Jacobs Engineering Group Inc	J	10,931.23	0.04%	0.89%	7.25%	8.17%	0.0034%
JB Hunt Transport Services Inc	JBHT	12,620.47	0.05%	0.93%	13.05%	14.04%	0.0067%
Johnson Controls International plc	JCI	23,364.72	0.09%	3.43%	9.37%	12.96%	0.0114%
Jack Henry & Associates Inc	JKHY	13,856.67	0.05%	0.91%	12.10%	13.07%	0.0068%
Johnson & Johnson	JNJ	391,895.94	1.47%	2.66%	5.47%	8.21%	0.1210%
Juniper Networks Inc	JNPR	8,038.61	0.03%	3.28%	7.86%	11.26%	0.0034%
JPMorgan Chase & Co	JPM	296,505.80	1.12%	3.74%	5.70%	9.55%	0.1065%
Nordstrom Inc	JWN	2,532.41	0.01%	2.32%	6.00%	8.39%	0.0008%
Kellogg Co	K	22,379.78	0.08%	3.54%	2.48%	6.07%	0.0051%
KeyCorp	KEY	11,558.56	0.04%	6.25%	3.36%	9.72%	0.0042%
Keysight Technologies Inc	KEYS	20,166.25	0.08%	0.00%	13.92%	13.92%	0.0106%
Kraft Heinz Co/The	KHC	37,229.25	0.14%	5.25%	4.75%	10.13%	0.0142%
Kimco Realty Corp	KIM	4,805.36	0.02%	6.92%	4.10%	11.16%	0.0020%
KLA Corp	KLAC	27,282.40	0.10%	1.72%	10.58%	12.39%	0.0127%
Kimberly-Clark Corp	KMB	48,166.98	0.18%	3.00%	4.36%	7.42%	0.0134%
Kinder Morgan Inc	KMI	35,731.50	0.13%	6.74%	4.55%	11.44%	0.0154%
CarMax Inc	KMX	14,329.74	0.05%	0.00%	9.11%	9.11%	0.0049%
Coca-Cola Co/The	KO	200,485.53	0.75%	3.51%	2.76%	6.32%	0.0476%
Kroger Co/The	KR	25,645.44	0.10%	2.02%	5.25%	7.32%	0.0071%
Kohl's Corp	KSS	2,983.84	0.01%	3.65%	4.83%	8.57%	0.0010%
Kansas City Southern	KSU	14,302.44	0.05%	1.05%	11.75%	12.86%	0.0069%
Loews Corp	L	9,354.75	N/A	0.00%	N/A	N/A	N/A
L Brands Inc	LB	4,477.07	0.02%	2.86%	11.50%	14.52%	0.0024%
Leidos Holdings Inc	LDOS	14,955.79	0.06%	1.32%	10.36%	11.74%	0.0066%
Leggett & Platt Inc	LEG	4,046.35	N/A	5.28%	N/A	N/A	N/A
Lennar Corp	LEN	18,291.91	0.07%	0.49%	8.60%	9.11%	0.0063%
Laboratory Corp of America Holdings	LH	17,041.10	0.06%	0.00%	4.89%	4.89%	0.0031%
L3Harris Technologies Inc	LHX	43,055.34	0.16%	1.71%	16.64%	18.50%	0.0300%
Linde PLC	LIN	106,266.00	0.40%	1.88%	9.50%	11.47%	0.0458%
LKQ Corp	LKQ	8,346.96	0.03%	0.00%	2.60%	2.60%	0.0008%
Eli Lilly and Co	LLY	146,289.10	0.55%	1.94%	13.97%	16.04%	0.0883%
Lockheed Martin Corp	LMT	108,932.29	0.41%	2.55%	7.85%	10.50%	0.0430%
Lincoln National Corp	LNC	7,329.00	0.03%	4.30%	9.00%	13.49%	0.0037%
Alliant Energy Corp	LNT	12,315.51	0.05%	3.06%	5.46%	8.61%	0.0040%
Lowe's Cos Inc	LOW	98,414.61	0.37%	1.84%	16.45%	18.44%	0.0683%
Lam Research Corp	LRCX	39,726.55	0.15%	1.71%	10.47%	12.27%	0.0183%
Southwest Airlines Co	LUV	18,919.28	0.07%	0.63%	-0.20%	0.43%	0.0003%
Las Vegas Sands Corp	LVS	36,613.20	0.14%	1.62%	9.10%	10.80%	0.0149%
Lamb Weston Holdings Inc	LW	8,771.10	0.03%	1.43%	-1.85%	-0.43%	-0.0001%
LyondellBasell Industries NV	LYB	21,277.11	0.08%	6.67%	5.50%	12.35%	0.0099%
Live Nation Entertainment Inc	LYV	10,582.19	N/A	0.00%	N/A	N/A	N/A

Company	Ticker	[4] Market Capitalization	[5] Weight in Index	[6] Estimated Dividend Yield	[7] Long-Term Growth Est.	[8] DCF Result	[9] Weighted DCF Result
Mastercard Inc	MA	302,015.43	1.14%	0.49%	15.00%	15.52%	0.1763%
Mid-America Apartment Communities Inc	MAA	13,305.90	N/A	3.44%	N/A	N/A	N/A
Marriott International Inc/MD	MAR	28,696.65	0.11%	0.54%	-1.62%	-1.08%	-0.0012%
Masco Corp	MAS	12,304.19	0.05%	1.17%	8.92%	10.14%	0.0047%
McDonald's Corp	MCD	138,539.39	0.52%	2.72%	6.79%	9.60%	0.0500%
Microchip Technology Inc	MCHP	23,556.83	0.09%	1.54%	12.40%	14.03%	0.0124%
McKesson Corp	MCK	25,681.25	0.10%	1.08%	5.88%	6.98%	0.0067%
Moody's Corp	MCO	50,139.38	0.19%	0.83%	11.70%	12.57%	0.0237%
Mondelez International Inc	MDLZ	74,399.43	0.28%	2.27%	7.75%	10.11%	0.0283%
Medtronic PLC	MDT	132,113.58	0.50%	2.29%	6.80%	9.17%	0.0456%
MetLife Inc	MET	32,682.27	0.12%	5.08%	5.85%	11.07%	0.0136%
MGM Resorts International	MGM	8,473.48	0.03%	1.41%	17.47%	19.00%	0.0061%
Mohawk Industries Inc	MHK	6,679.90	0.03%	0.00%	9.00%	9.00%	0.0023%
McCormick & Co Inc/MD	MKC	23,282.60	0.09%	1.38%	9.17%	10.61%	0.0093%
MarketAxess Holdings Inc	MKTX	19,280.76	N/A	0.47%	N/A	N/A	N/A
Martin Marietta Materials Inc	MLM	11,937.18	0.04%	1.13%	10.66%	11.85%	0.0053%
Marsh & McLennan Cos Inc	MMC	54,042.86	0.20%	1.75%	9.60%	11.44%	0.0233%
3M Co	MMM	89,983.72	0.34%	3.76%	7.05%	10.94%	0.0370%
Monster Beverage Corp	MNST	37,865.19	0.14%	0.00%	9.39%	9.39%	0.0134%
Altria Group Inc	MO	72,569.27	0.27%	8.64%	6.05%	14.95%	0.0408%
Mosaic Co/The	MOS	4,582.36	0.02%	1.60%	38.35%	40.26%	0.0069%
Marathon Petroleum Corp	MPC	22,850.17	0.09%	6.61%	4.05%	10.80%	0.0093%
Merck & Co Inc	MRK	203,745.45	0.77%	2.97%	8.23%	11.32%	0.0868%
Marathon Oil Corp	MRO	4,220.27	0.02%	2.34%	-3.25%	-0.95%	-0.0002%
Morgan Stanley	MS	69,644.01	0.26%	3.18%	-0.03%	3.16%	0.0083%
MSCI Inc	MSCI	27,490.45	0.10%	0.85%	11.75%	12.65%	0.0131%
Microsoft Corp	MSFT	1,389,665.43	5.23%	1.09%	13.74%	14.91%	0.7792%
Motorola Solutions Inc	MSI	23,015.21	0.09%	1.87%	8.85%	10.80%	0.0094%
M&T Bank Corp	MTB	13,553.29	0.05%	4.17%	0.41%	4.59%	0.0023%
Mettler-Toledo International Inc	MTD	19,006.48	0.07%	0.00%	8.17%	8.17%	0.0058%
Micron Technology Inc	MU	53,284.83	0.20%	0.00%	6.95%	6.95%	0.0139%
Maxim Integrated Products Inc	MXIM	15,378.95	0.06%	3.33%	8.03%	11.50%	0.0067%
Mylan NV	MYL	8,824.24	0.03%	0.66%	1.73%	2.39%	0.0008%
Noble Energy Inc	NBL	4,187.77	0.02%	1.95%	9.49%	11.53%	0.0018%
Norwegian Cruise Line Holdings Ltd	NCLH	4,014.39	0.02%	0.00%	-16.58%	-16.58%	-0.0025%
Nasdaq Inc	NDAQ	19,435.83	0.07%	1.64%	11.84%	13.58%	0.0099%
NextEra Energy Inc	NEE	125,083.85	0.47%	2.19%	8.39%	10.67%	0.0502%
Newmont Corp	NEM	46,927.12	0.18%	1.63%	12.75%	14.49%	0.0256%
Netflix Inc	NFLX	184,598.95	0.69%	0.00%	31.97%	31.97%	0.2220%
NiSource Inc	NI	9,122.11	0.03%	3.55%	4.62%	8.25%	0.0028%
NIKE Inc	NKE	153,295.32	0.58%	0.95%	11.12%	12.13%	0.0699%
NortonLifeLock Inc	NLOK	13,418.07	0.05%	2.19%	7.50%	9.78%	0.0049%
Nielsen Holdings PLC	NLSN	4,951.45	0.02%	1.73%	8.75%	10.55%	0.0020%
Northrop Grumman Corp	NOC	55,878.76	0.21%	1.67%	18.99%	20.81%	0.0437%
National Oilwell Varco Inc	NOV	4,841.14	N/A	1.44%	N/A	N/A	N/A
ServiceNow Inc	NOW	73,979.71	0.28%	0.00%	29.60%	29.60%	0.0824%
NRG Energy Inc	NRG	8,799.34	0.03%	3.33%	-11.05%	-7.91%	-0.0026%
Norfolk Southern Corp	NSC	45,674.18	0.17%	2.14%	5.98%	8.18%	0.0141%
NetApp Inc	NTAP	9,851.22	0.04%	4.38%	7.05%	11.58%	0.0043%
Northern Trust Corp	NTRS	16,438.19	0.06%	3.58%	7.55%	11.26%	0.0070%
Nucor Corp	NUE	12,725.95	0.05%	3.81%	5.25%	9.16%	0.0044%
NVIDIA Corp	NVDA	218,337.30	0.82%	0.17%	17.71%	17.90%	0.1470%
NVR Inc	NVR	11,858.18	0.04%	0.00%	2.44%	2.44%	0.0011%
Newell Brands Inc	NWL	5,576.92	0.02%	7.01%	-6.04%	0.76%	0.0002%
News Corp	NWSA	7,210.96	0.03%	1.57%	3.29%	4.88%	0.0013%
Realty Income Corp	O	18,994.34	0.07%	5.05%	3.64%	8.78%	0.0063%
Old Dominion Freight Line Inc	ODFL	20,179.75	0.08%	0.39%	8.74%	9.14%	0.0069%
ONEOK Inc	OKE	15,186.26	0.06%	9.88%	6.38%	16.57%	0.0095%
Omnicom Group Inc	OMC	11,740.56	0.04%	4.73%	0.90%	5.66%	0.0025%
Oracle Corp	ORCL	169,568.21	0.64%	1.78%	10.33%	12.21%	0.0779%
O'Reilly Automotive Inc	ORLY	30,969.91	0.12%	0.00%	10.55%	10.55%	0.0123%
Otis Worldwide Corp	OTIS	22,801.63	0.09%	1.58%	4.80%	6.41%	0.0055%
Occidental Petroleum Corp	OXY	11,655.24	0.04%	12.36%	12.20%	25.31%	0.0111%
Paycom Software Inc	PAYC	17,407.59	0.07%	0.00%	19.70%	19.70%	0.0129%
Paychex Inc	PAYX	25,927.95	0.10%	3.44%	6.55%	10.10%	0.0099%
People's United Financial Inc	PBCT	4,862.33	0.02%	6.28%	2.00%	8.34%	0.0015%
PACCAR Inc	PCAR	25,535.39	0.10%	1.78%	4.53%	6.36%	0.0061%
Healthpeak Properties Inc	PEAK	13,262.98	0.05%	6.01%	4.10%	10.23%	0.0051%
Public Service Enterprise Group Inc	PEG	25,807.12	0.10%	3.84%	4.43%	8.35%	0.0081%
PepsiCo Inc	PEP	182,525.68	0.69%	3.04%	4.17%	7.27%	0.0499%
Pfizer Inc	PFE	212,139.10	0.80%	3.95%	5.50%	9.56%	0.0763%
Principal Financial Group Inc	PFG	10,576.77	N/A	5.84%	N/A	N/A	N/A
Procter & Gamble Co/The	PG	286,976.49	1.08%	2.61%	7.11%	9.81%	0.1059%
Progressive Corp/The	PGR	45,466.10	N/A	2.82%	N/A	N/A	N/A
Parker-Hannifin Corp	PH	23,075.29	0.09%	1.97%	8.87%	10.92%	0.0095%
PulteGroup Inc	PHM	9,109.00	0.03%	1.40%	6.49%	7.93%	0.0027%

Company	Ticker	[4] Market Capitalization	[5] Weight in Index	[6] Estimated Dividend Yield	[7] Long-Term Growth Est.	[8] DCF Result	[9] Weighted DCF Result
Packaging Corp of America	PKG	9,618.01	0.04%	3.13%	10.00%	13.28%	0.0048%
PerkinElmer Inc	PKI	11,190.97	0.04%	0.28%	7.18%	7.47%	0.0031%
Prologis Inc	PLD	67,580.25	0.25%	2.52%	5.12%	7.71%	0.0196%
Philip Morris International Inc	PM	114,231.02	0.43%	6.42%	5.97%	12.58%	0.0541%
PNC Financial Services Group Inc/The	PNC	48,382.66	0.18%	4.03%	-5.84%	-1.92%	-0.0035%
Pentair PLC	PNR	6,486.48	0.02%	2.06%	4.94%	7.05%	0.0017%
Pinnacle West Capital Corp	PNW	8,763.24	0.03%	4.07%	4.90%	9.06%	0.0030%
PPG Industries Inc	PPG	23,985.02	0.09%	2.08%	1.76%	3.85%	0.0035%
PPL Corp	PPL	21,465.35	0.08%	5.93%	-0.30%	5.63%	0.0045%
Perrigo Co PLC	PRGO	7,465.88	0.03%	1.68%	0.00%	1.68%	0.0005%
Prudential Financial Inc	PRU	24,079.20	0.09%	7.09%	7.25%	14.60%	0.0132%
Public Storage	PSA	35,437.48	0.13%	3.97%	3.82%	7.86%	0.0105%
Phillips 66	PSX	34,174.16	0.13%	4.65%	5.22%	10.00%	0.0128%
PVH Corp	PVH	3,223.07	0.01%	0.15%	2.90%	3.05%	0.0004%
Quanta Services Inc	PWR	5,101.24	0.02%	0.54%	10.00%	10.57%	0.0020%
Pioneer Natural Resources Co	PXD	15,101.47	0.06%	2.35%	20.05%	22.63%	0.0129%
PayPal Holdings Inc	PYPL	182,006.68	0.68%	0.00%	20.39%	20.39%	0.1396%
QUALCOMM Inc	QCOM	90,984.18	0.34%	3.15%	13.66%	17.03%	0.0583%
Qorvo Inc	QRVO	12,017.26	0.05%	0.19%	11.91%	12.12%	0.0055%
Royal Caribbean Cruises Ltd	RCL	10,860.82	0.04%	1.50%	-48.40%	-47.26%	-0.0193%
Everest Re Group Ltd	RE	7,933.82	0.03%	3.14%	10.00%	13.30%	0.0040%
Regency Centers Corp	REG	7,265.52	0.03%	5.56%	5.68%	11.40%	0.0031%
Regeneron Pharmaceuticals Inc	REGN	62,742.16	0.24%	0.00%	9.02%	9.02%	0.0213%
Regions Financial Corp	RF	10,853.98	0.04%	5.55%	-1.84%	3.66%	0.0015%
Robert Half International Inc	RHI	5,814.92	0.02%	2.65%	0.29%	2.94%	0.0006%
Raymond James Financial Inc	RJF	9,493.47	0.04%	2.09%	3.50%	5.63%	0.0020%
Ralph Lauren Corp	RL	5,486.44	0.02%	3.01%	4.71%	7.79%	0.0016%
ResMed Inc	RMD	23,265.58	0.09%	0.99%	13.80%	14.85%	0.0130%
Rockwell Automation Inc	ROK	25,036.51	0.09%	1.89%	7.18%	9.14%	0.0086%
Rollins Inc	ROL	13,700.68	N/A	1.02%	N/A	N/A	N/A
Roper Technologies Inc	ROP	41,111.39	0.15%	0.52%	12.33%	12.89%	0.0199%
Ross Stores Inc	ROST	34,458.33	0.13%	0.50%	8.90%	9.42%	0.0122%
Republic Services Inc	RSG	27,202.96	0.10%	1.93%	5.57%	7.55%	0.0077%
Raytheon Technologies Corp	RTX	97,829.67	0.37%	2.84%	-4.34%	-1.56%	-0.0057%
SBA Communications Corp	SBAC	35,064.73	0.13%	0.59%	29.90%	30.57%	0.0403%
Starbucks Corp	SBUX	91,115.72	0.34%	2.12%	13.16%	15.42%	0.0528%
Charles Schwab Corp/The	SCHW	46,231.00	0.17%	1.99%	4.50%	6.54%	0.0114%
Sealed Air Corp	SEE	4,996.77	0.02%	2.00%	3.29%	5.32%	0.0010%
Sherwin-Williams Co/The	SHW	53,921.58	0.20%	0.89%	10.36%	11.29%	0.0229%
SVB Financial Group	SIVB	11,062.47	0.04%	0.00%	10.00%	10.00%	0.0042%
JM Smucker Co/The	SJM	12,992.34	0.05%	3.03%	1.62%	4.68%	0.0023%
Schlumberger Ltd	SLB	25,632.90	0.10%	4.63%	36.00%	41.46%	0.0400%
SL Green Realty Corp	SLG	3,266.99	0.01%	7.92%	4.34%	12.43%	0.0015%
Snap-on Inc	SNA	7,049.20	0.03%	3.32%	4.06%	7.45%	0.0020%
Synopsys Inc	SNPS	27,279.18	0.10%	0.00%	14.35%	14.35%	0.0147%
Southern Co/The	SO	60,323.37	0.23%	4.45%	4.38%	8.93%	0.0203%
Simon Property Group Inc	SPG	17,642.07	0.07%	13.49%	0.90%	14.45%	0.0096%
S&P Global Inc	SPGI	78,297.32	0.29%	0.81%	8.90%	9.75%	0.0287%
Sempra Energy	SRE	36,932.10	0.14%	3.30%	7.41%	10.84%	0.0151%
STERIS PLC	STE	14,087.10	0.05%	0.96%	10.10%	11.11%	0.0059%
State Street Corp	STT	21,455.26	0.08%	3.43%	8.95%	12.53%	0.0101%
Seagate Technology PLC	STX	13,611.39	0.05%	4.85%	4.83%	9.80%	0.0050%
Constellation Brands Inc	STZ	33,408.87	0.13%	1.76%	1.82%	3.60%	0.0045%
Stanley Black & Decker Inc	SWK	19,335.24	0.07%	2.15%	9.50%	11.75%	0.0085%
Skyworks Solutions Inc	SWKS	19,776.73	0.07%	1.49%	12.11%	13.70%	0.0102%
Synchrony Financial	SYF	11,890.13	0.04%	4.35%	-3.52%	0.76%	0.0003%
Stryker Corp	SYK	73,472.83	0.28%	1.17%	8.10%	9.32%	0.0257%
Sysco Corp	SYY	28,000.21	0.11%	3.10%	3.80%	6.96%	0.0073%
AT&T Inc	T	219,877.50	0.83%	6.75%	4.48%	11.39%	0.0942%
Molson Coors Beverage Co	TAP	8,463.13	0.03%	3.84%	0.10%	3.94%	0.0013%
TransDigm Group Inc	TDG	22,971.00	0.09%	7.65%	6.18%	14.06%	0.0122%
TE Connectivity Ltd	TEL	26,800.14	0.10%	2.27%	9.28%	11.65%	0.0117%
Truist Financial Corp	TFC	49,559.89	0.19%	4.91%	2.10%	7.07%	0.0132%
Teleflex Inc	TFX	16,845.93	0.06%	0.37%	13.50%	13.90%	0.0088%
Target Corp	TGT	61,166.89	0.23%	2.27%	8.43%	10.80%	0.0248%
Tiffany & Co	TIF	15,546.67	N/A	1.60%	N/A	N/A	N/A
TJX Cos Inc/The	TJX	63,200.00	0.24%	1.06%	7.55%	8.65%	0.0206%
Thermo Fisher Scientific Inc	TMO	137,912.98	0.52%	0.24%	8.30%	8.55%	0.0444%
T-Mobile US Inc	TMUS	123,625.78	0.47%	0.30%	12.15%	12.47%	0.0580%
Tapestry Inc	TPR	3,754.94	0.01%	7.85%	8.05%	16.22%	0.0023%
T Rowe Price Group Inc	TROW	27,510.66	0.10%	2.97%	0.76%	3.73%	0.0039%
Travelers Cos Inc/The	TRV	27,048.38	0.10%	3.17%	10.30%	13.64%	0.0139%
Tractor Supply Co	TSCO	14,109.19	0.05%	1.20%	11.16%	12.43%	0.0066%
Tyson Foods Inc	TSN	22,383.83	0.08%	2.77%	2.78%	5.58%	0.0047%
Trane Technologies PLC	TT	21,578.95	0.08%	2.37%	3.16%	5.57%	0.0045%
Take-Two Interactive Software Inc	TTWO	15,515.59	0.06%	0.00%	6.33%	6.33%	0.0037%

Company	Ticker	[4] Market Capitalization	[5] Weight in Index	[6] Estimated Dividend Yield	[7] Long-Term Growth Est.	[8] DCF Result	[9] Weighted DCF Result
Twitter Inc	TWTR	24,299.96	0.09%	0.00%	32.77%	32.77%	0.0300%
Texas Instruments Inc	TXN	108,976.32	0.41%	3.06%	10.70%	13.92%	0.0571%
Textron Inc	TXT	7,044.82	0.03%	0.26%	2.83%	3.09%	0.0008%
Under Armour Inc	UAA	3,752.23	0.01%	0.00%	18.10%	18.10%	0.0026%
United Airlines Holdings Inc	UAL	8,144.68	0.03%	0.00%	-5.70%	-5.70%	-0.0017%
UDR Inc	UDR	10,904.88	0.04%	3.88%	6.13%	10.13%	0.0042%
Universal Health Services Inc	UHS	8,955.50	0.03%	0.38%	6.67%	7.06%	0.0024%
Ulta Beauty Inc	ULTA	13,740.62	0.05%	0.00%	15.68%	15.68%	0.0081%
UnitedHealth Group Inc	UNH	289,113.49	1.09%	1.50%	12.40%	13.99%	0.1522%
Unum Group	UNM	3,081.82	N/A	7.79%	N/A	N/A	N/A
Union Pacific Corp	UNP	115,261.57	0.43%	2.29%	9.50%	11.90%	0.0516%
United Parcel Service Inc	UPS	85,967.62	0.32%	4.01%	6.09%	10.21%	0.0330%
United Rentals Inc	URI	10,006.95	0.04%	0.00%	6.32%	6.32%	0.0024%
US Bancorp	USB	53,563.64	0.20%	4.73%	6.43%	11.31%	0.0228%
Visa Inc	V	379,448.49	1.43%	0.61%	13.52%	14.17%	0.2023%
Varian Medical Systems Inc	VAR	11,024.03	0.04%	0.00%	8.40%	8.40%	0.0035%
VF Corp	VFC	21,814.64	0.08%	3.49%	8.80%	12.44%	0.0102%
ViacomCBS Inc	VIAC	12,960.94	0.05%	4.44%	4.79%	9.33%	0.0045%
Valero Energy Corp	VLO	27,169.03	0.10%	5.89%	-0.41%	5.47%	0.0056%
Vulcan Materials Co	VMC	14,345.29	0.05%	1.26%	14.00%	15.34%	0.0083%
Vornado Realty Trust	VNO	6,920.30	0.03%	9.09%	4.66%	13.95%	0.0036%
Verisk Analytics Inc	VRSK	28,018.90	0.11%	0.63%	9.18%	9.83%	0.0104%
VeriSign Inc	VRSN	25,304.30	0.10%	0.00%	3.20%	3.20%	0.0030%
Vertex Pharmaceuticals Inc	VRTX	74,661.32	0.28%	0.00%	36.11%	36.11%	0.1014%
Ventas Inc	VTR	13,038.97	0.05%	8.32%	-0.28%	8.03%	0.0039%
Verizon Communications Inc	VZ	237,438.18	0.89%	4.33%	2.63%	7.01%	0.0627%
Westinghouse Air Brake Technologies Corp	WAB	11,620.93	0.04%	0.82%	7.66%	8.50%	0.0037%
Waters Corp	WAT	12,372.45	0.05%	0.00%	3.89%	3.89%	0.0018%
Walgreens Boots Alliance Inc	WBA	37,667.84	0.14%	4.33%	1.47%	5.83%	0.0083%
Western Digital Corp	WDC	13,297.73	0.05%	3.38%	-1.20%	2.16%	0.0011%
WEC Energy Group Inc	WEC	28,934.81	0.11%	2.76%	6.46%	9.30%	0.0101%
Welltower Inc	WELL	21,153.68	0.08%	5.69%	-1.18%	4.48%	0.0036%
Wells Fargo & Co	WFC	108,431.71	0.41%	7.54%	9.41%	17.30%	0.0706%
Whirlpool Corp	WHR	7,572.70	0.03%	4.04%	-3.07%	0.91%	0.0003%
Willis Towers Watson PLC	WLTW	26,120.47	0.10%	1.37%	10.00%	11.44%	0.0112%
Waste Management Inc	WM	45,222.20	0.17%	2.03%	4.61%	6.69%	0.0114%
Williams Cos Inc/The	WMB	24,785.61	0.09%	7.81%	7.58%	15.68%	0.0146%
Walmart Inc	WMT	351,549.06	1.32%	1.75%	4.98%	6.77%	0.0895%
WR Berkley Corp	WRB	10,357.07	0.04%	2.02%	12.40%	14.54%	0.0057%
Westrock Co	WRK	7,274.70	0.03%	4.73%	-5.50%	-0.90%	-0.0002%
West Pharmaceutical Services Inc	WST	15,901.03	0.06%	0.31%	9.60%	9.92%	0.0059%
Western Union Co/The	WU	8,226.31	0.03%	4.41%	5.30%	9.83%	0.0030%
Weyerhaeuser Co	WY	15,065.90	N/A	1.75%	N/A	N/A	N/A
Wynn Resorts Ltd	WYNN	8,983.27	0.03%	1.20%	20.00%	21.32%	0.0072%
Xcel Energy Inc	XEL	34,151.86	0.13%	2.64%	5.89%	8.61%	0.0111%
Xilinx Inc	XLNX	22,358.63	0.08%	1.65%	8.20%	9.91%	0.0083%
Exxon Mobil Corp	XOM	192,256.77	0.72%	7.67%	16.84%	25.15%	0.1819%
DENTSPLY SIRONA Inc	XRAY	10,191.62	0.04%	0.82%	-1.32%	-0.50%	-0.0002%
Xerox Holdings Corp	XRX	3,379.76	0.01%	6.33%	0.50%	6.84%	0.0009%
Xylem Inc/NY	XYL	11,935.58	0.04%	1.50%	25.00%	26.69%	0.0120%
Yum! Brands Inc	YUM	27,007.47	0.10%	2.08%	11.17%	13.36%	0.0136%
Zimmer Biomet Holdings Inc	ZBH	26,127.38	0.10%	0.79%	4.31%	5.11%	0.0050%
Zebra Technologies Corp	ZBRA	13,873.89	0.05%	0.00%	11.90%	11.90%	0.0062%
Zions Bancorp NA	ZION	5,391.88	0.02%	4.14%	-5.06%	-1.03%	-0.0002%
Zoetis Inc	ZTS	66,201.99	0.25%	0.57%	6.08%	6.67%	0.0166%
Total Market Capitalization:		26,583,241.46					13.48%

Notes:
[1] Equals sum of Col. [9]
[2] Source: Bloomberg Professional
[3] Equals [1] − [2]
[4] Source: Bloomberg Professional
[5] Equals weight in S&P 500 based on market capitalization
[6] Source: Bloomberg Professional
[7] Source: Bloomberg Professional
[8] Equals ([6] x (1 + (0.5 x [7]))) + [7]
[9] Equals Col. [5] x Col. [8]

Ex-Ante Market Risk Premium
Market DCF Method Based - Value Line

[1]	[2]	[3]
S&P 500 Est. Required Market Return	Current 30-Year Treasury (30-day average)	Implied Market Risk Premium
13.86%	1.33%	12.53%

Company	Ticker	[4] Market Capitalization	[5] Weight in Index	[6] Estimated Dividend Yield	[7] Long-Term Growth Est.	[8] DCF Result	[9] Weighted DCF Result
Agilent Technologies Inc	A	25,330.10	0.10%	0.88%	10.50%	11.43%	0.0120%
American Airlines Group Inc	AAL	4,173.90	0.02%	0.00%	2.00%	2.00%	0.0003%
Advance Auto Parts Inc	AAP	9,378.39	0.04%	0.74%	11.00%	11.78%	0.0046%
Apple Inc	AAPL	1,380,346.00	5.71%	1.03%	14.00%	15.10%	0.8625%
AbbVie Inc	ABBV	134,658.00	0.56%	5.18%	8.00%	13.39%	0.0746%
AmerisourceBergen Corp	ABC	18,856.83	0.08%	1.81%	7.00%	8.87%	0.0069%
ABIOMED Inc	ABMD	8,858.39	0.04%	0.00%	10.50%	10.50%	0.0038%
Abbott Laboratories	ABT	159,355.20	0.66%	1.60%	9.50%	11.18%	0.0737%
Accenture PLC	ACN	124,489.50	0.52%	1.67%	7.50%	9.23%	0.0476%
Adobe Inc	ADBE	185,293.30	0.77%	0.00%	19.50%	19.50%	0.1495%
Analog Devices Inc	ADI	42,210.45	0.17%	2.17%	7.00%	9.25%	0.0161%
Archer-Daniels-Midland Co	ADM	19,619.25	0.08%	4.07%	9.00%	13.25%	0.0108%
Automatic Data Processing Inc	ADP	57,928.44	0.24%	2.81%	12.00%	14.98%	0.0359%
Alliance Data Systems Corp	ADS	2,098.21	0.01%	1.91%	7.50%	9.48%	0.0008%
Autodesk Inc	ADSK	43,142.82	N/A	0.00%	N/A	N/A	N/A
Ameren Corp	AEE	17,364.48	0.07%	2.89%	6.00%	8.98%	0.0064%
American Electric Power Co Inc	AEP	38,502.42	0.16%	3.70%	5.00%	8.79%	0.0140%
AES Corp/The	AES	8,623.84	N/A	4.40%	N/A	N/A	N/A
Aflac Inc	AFL	25,292.40	0.10%	3.25%	7.00%	10.36%	0.0108%
American International Group Inc	AIG	24,394.77	0.10%	4.57%	28.50%	33.72%	0.0340%
Apartment Investment and Management Co	AIV	5,473.73	0.02%	4.57%	-1.50%	3.04%	0.0007%
Assurant Inc	AIZ	6,050.35	0.03%	2.50%	11.50%	14.14%	0.0035%
Arthur J Gallagher & Co	AJG	17,194.82	0.07%	1.99%	13.50%	15.62%	0.0111%
Akamai Technologies Inc	AKAM	16,311.76	0.07%	0.00%	14.00%	14.00%	0.0094%
Albemarle Corp	ALB	7,244.58	0.03%	2.26%	4.00%	6.31%	0.0019%
Align Technology Inc	ALGN	18,588.70	0.08%	0.00%	19.50%	19.50%	0.0150%
Alaska Air Group Inc	ALK	3,709.42	0.02%	0.00%	2.00%	2.00%	0.0003%
Allstate Corp/The	ALL	30,939.81	0.13%	2.23%	9.00%	11.33%	0.0145%
Allegion plc	ALLE	8,976.50	0.04%	1.32%	9.00%	10.38%	0.0039%
Alexion Pharmaceuticals Inc	ALXN	22,974.50	0.10%	0.00%	37.50%	37.50%	0.0356%
Applied Materials Inc	AMAT	52,233.19	0.22%	1.55%	7.50%	9.11%	0.0197%
Amcor PLC	AMCR	15,299.55	N/A	5.08%	N/A	N/A	N/A
Advanced Micro Devices Inc	AMD	66,032.69	0.27%	0.00%	18.00%	18.00%	0.0492%
AMETEK Inc	AME	19,462.72	0.08%	0.85%	12.50%	13.40%	0.0108%
Amgen Inc	AMGN	133,987.60	0.55%	2.87%	6.50%	9.46%	0.0525%
Ameriprise Financial Inc	AMP	16,314.09	0.07%	3.16%	11.00%	14.33%	0.0097%
American Tower Corp	AMT	102,028.40	0.42%	2.07%	9.00%	11.16%	0.0471%
Amazon.com Inc	AMZN	1,303,925.00	5.39%	0.00%	33.50%	33.50%	1.8073%
Arista Networks Inc	ANET	16,999.68	0.07%	0.00%	5.50%	5.50%	0.0039%
ANSYS Inc	ANSS	23,297.37	0.10%	0.00%	9.50%	9.50%	0.0092%
Anthem Inc	ANTM	70,565.60	0.29%	1.36%	14.00%	15.46%	0.0451%
Aon PLC	AON	45,126.89	0.19%	0.92%	7.50%	8.45%	0.0158%
AO Smith Corp	AOS	6,842.00	0.03%	2.26%	6.00%	8.33%	0.0024%
Apache Corp	APA	4,510.22	0.02%	0.84%	13.50%	14.40%	0.0027%
Air Products and Chemicals Inc	APD	52,855.52	0.22%	2.24%	12.00%	14.37%	0.0314%
Amphenol Corp	APH	26,915.07	0.11%	1.10%	9.00%	10.15%	0.0113%
Aptiv PLC	APTV	18,275.58	0.08%	0.00%	9.50%	9.50%	0.0072%
Alexandria Real Estate Equities Inc	ARE	16,232.17	0.07%	2.82%	16.50%	19.55%	0.0131%
Atmos Energy Corp	ATO	12,158.74	0.05%	2.43%	7.00%	9.52%	0.0048%
Activision Blizzard Inc	ATVI	56,836.05	0.24%	0.56%	8.00%	8.58%	0.0202%
AvalonBay Communities Inc	AVB	21,916.55	0.09%	4.13%	2.50%	6.68%	0.0061%
Broadcom Inc	AVGO	111,193.30	0.46%	4.67%	17.00%	22.07%	0.1015%
Avery Dennison Corp	AVY	8,811.20	0.04%	2.24%	11.00%	13.36%	0.0049%
American Water Works Co Inc	AWK	21,831.13	0.09%	1.82%	8.50%	10.40%	0.0094%
American Express Co	AXP	73,037.65	0.30%	1.90%	7.50%	9.47%	0.0286%
AutoZone Inc	AZO	26,142.38	0.11%	0.00%	13.00%	13.00%	0.0141%
Boeing Co/The	BA	75,234.21	0.31%	0.00%	16.00%	16.00%	0.0498%
Bank of America Corp	BAC	202,436.20	0.84%	3.14%	5.00%	8.22%	0.0688%
Baxter International Inc	BAX	44,443.36	0.18%	1.12%	9.00%	10.17%	0.0187%
Best Buy Co Inc	BBY	21,200.40	0.09%	2.70%	9.00%	11.82%	0.0104%
Becton Dickinson and Co	BDX	65,892.33	0.27%	1.32%	9.00%	10.38%	0.0283%
Franklin Resources Inc	BEN	9,014.19	0.04%	6.04%	6.50%	12.74%	0.0048%
Brown-Forman Corp	BF/B	32,776.95	0.14%	1.02%	11.00%	12.08%	0.0164%
Biogen Inc	BIIB	59,151.19	0.24%	0.00%	9.50%	9.50%	0.0232%
Bank of New York Mellon Corp/The	BK	30,848.83	0.13%	3.56%	3.00%	6.61%	0.0084%

Company	Ticker	[4] Market Capitalization	[5] Weight in Index	[6] Estimated Dividend Yield	[7] Long-Term Growth Est.	[8] DCF Result	[9] Weighted DCF Result
Booking Holdings Inc	BKNG	65,453.21	0.27%	0.00%	7.00%	7.00%	0.0190%
Baker Hughes Co	BKR	10,146.50	0.04%	4.61%	45.50%	51.16%	0.0215%
BlackRock Inc	BLK	78,479.76	0.32%	2.85%	7.00%	9.95%	0.0323%
Ball Corp	BLL	20,920.74	0.09%	0.94%	21.00%	22.04%	0.0191%
Bristol-Myers Squibb Co	BMY	139,562.70	0.58%	2.92%	9.50%	12.56%	0.0725%
Broadridge Financial Solutions Inc	BR	13,886.21	0.06%	1.79%	9.00%	10.87%	0.0062%
Berkshire Hathaway Inc	BRK/B	-	N/A	0.00%	N/A	N/A	N/A
Boston Scientific Corp	BSX	51,863.24	0.21%	0.00%	13.50%	13.50%	0.0290%
BorgWarner Inc	BWA	6,167.47	0.03%	2.29%	6.00%	8.36%	0.0021%
Boston Properties Inc	BXP	12,511.68	0.05%	4.92%	3.50%	8.51%	0.0044%
Citigroup Inc	C	96,129.17	0.40%	4.49%	3.50%	8.07%	0.0321%
Conagra Brands Inc	CAG	15,942.00	0.07%	2.66%	5.00%	7.73%	0.0051%
Cardinal Health Inc	CAH	15,461.40	0.06%	3.66%	12.50%	16.39%	0.0105%
Carrier Global Corp	CARR	N/A	N/A	0.00%	N/A	N/A	N/A
Caterpillar Inc	CAT	62,698.43	0.26%	3.56%	4.00%	7.63%	0.0198%
Chubb Ltd	CB	47,280.79	0.20%	2.98%	9.00%	12.11%	0.0237%
Cboe Global Markets Inc	CBOE	11,119.92	0.05%	1.43%	12.50%	14.02%	0.0065%
CBRE Group Inc	CBRE	13,271.74	0.05%	0.00%	7.50%	7.50%	0.0041%
Crown Castle International Corp	CCI	63,534.11	0.26%	3.33%	14.00%	17.56%	0.0462%
Carnival Corp	CCL	10,541.75	0.04%	0.00%	-2.50%	-2.50%	-0.0011%
Cadence Design Systems Inc	CDNS	24,593.58	0.10%	0.00%	10.00%	10.00%	0.0102%
CDW Corp/DE	CDW	15,543.43	0.06%	1.39%	11.00%	12.47%	0.0080%
Celanese Corp	CE	10,179.52	0.04%	2.88%	7.00%	9.98%	0.0042%
Cerner Corp	CERN	20,625.72	0.09%	1.06%	9.50%	10.61%	0.0091%
CF Industries Holdings Inc	CF	5,958.97	0.02%	4.47%	29.50%	34.63%	0.0085%
Citizens Financial Group Inc	CFG	9,244.14	0.04%	7.20%	1.50%	8.75%	0.0033%
Church & Dwight Co Inc	CHD	17,706.69	0.07%	1.33%	7.50%	8.88%	0.0065%
CH Robinson Worldwide Inc	CHRW	10,446.57	0.04%	2.63%	8.00%	10.74%	0.0046%
Charter Communications Inc	CHTR	105,871.70	0.44%	0.00%	33.50%	33.50%	0.1467%
Cigna Corp	CI	70,136.41	0.29%	0.02%	14.00%	14.02%	0.0407%
Cincinnati Financial Corp	CINF	8,724.92	0.04%	4.48%	11.00%	15.73%	0.0057%
Colgate-Palmolive Co	CL	60,359.53	0.25%	2.50%	5.50%	8.07%	0.0202%
Clorox Co/The	CLX	25,718.51	0.11%	2.17%	2.50%	4.70%	0.0050%
Comerica Inc	CMA	4,622.98	0.02%	8.18%	8.00%	16.51%	0.0032%
Comcast Corp	CMCSA	178,405.60	0.74%	2.35%	9.50%	11.96%	0.0883%
CME Group Inc	CME	64,675.70	0.27%	1.88%	2.50%	4.40%	0.0118%
Chipotle Mexican Grill Inc	CMG	28,648.34	0.12%	0.00%	14.50%	14.50%	0.0172%
Cummins Inc	CMI	23,871.40	0.10%	3.24%	4.00%	7.30%	0.0072%
CMS Energy Corp	CMS	15,866.93	0.07%	2.99%	7.50%	10.60%	0.0070%
Centene Corp	CNC	37,828.25	0.16%	0.00%	13.00%	13.00%	0.0203%
CenterPoint Energy Inc	CNP	8,497.93	0.04%	3.55%	6.50%	10.17%	0.0036%
Capital One Financial Corp	COF	27,992.46	0.12%	2.60%	-0.50%	2.09%	0.0024%
Cabot Oil & Gas Corp	COG	7,537.07	0.03%	2.27%	11.50%	13.90%	0.0043%
Cooper Cos Inc/The	COO	14,578.45	0.06%	0.02%	11.00%	11.02%	0.0066%
ConocoPhillips	COP	47,896.93	0.20%	3.81%	10.50%	14.51%	0.0288%
Costco Wholesale Corp	COST	134,655.00	0.56%	0.93%	10.00%	10.98%	0.0612%
Coty Inc	COTY	2,502.97	0.01%	15.24%	4.50%	20.08%	0.0021%
Campbell Soup Co	CPB	15,558.91	0.06%	2.91%	1.50%	4.43%	0.0029%
Copart Inc	CPRT	20,253.99	0.08%	0.00%	14.00%	14.00%	0.0117%
salesforce.com Inc	CRM	157,998.50	0.65%	0.00%	31.50%	31.50%	0.2059%
Cisco Systems Inc	CSCO	191,756.80	0.79%	3.17%	7.00%	10.28%	0.0816%
CSX Corp	CSX	52,327.26	0.22%	1.52%	9.50%	11.09%	0.0240%
Cintas Corp	CTAS	25,021.61	0.10%	1.21%	14.00%	15.29%	0.0158%
CenturyLink Inc	CTL	10,867.34	0.04%	10.10%	2.50%	12.73%	0.0057%
Cognizant Technology Solutions Corp	CTSH	28,434.96	0.12%	1.67%	4.00%	5.70%	0.0067%
Corteva Inc	CTVA	18,776.58	N/A	2.15%	N/A	N/A	N/A
Citrix Systems Inc	CTXS	16,905.26	0.07%	1.02%	9.00%	10.07%	0.0070%
CVS Health Corp	CVS	82,502.10	0.34%	3.16%	6.00%	9.25%	0.0316%
Chevron Corp	CVX	173,629.00	0.72%	5.55%	10.50%	16.34%	0.1174%
Concho Resources Inc	CXO	11,485.67	0.05%	1.38%	6.00%	7.42%	0.0035%
Dominion Energy Inc	D	66,071.25	0.27%	4.81%	10.50%	15.56%	0.0425%
Delta Air Lines Inc	DAL	14,491.63	0.06%	0.00%	6.00%	6.00%	0.0036%
DuPont de Nemours Inc	DD	35,860.52	N/A	2.52%	N/A	N/A	N/A
Deere & Co	DE	44,631.26	0.18%	2.14%	5.00%	7.19%	0.0133%
Discover Financial Services	DFS	12,561.45	0.05%	4.29%	4.50%	8.89%	0.0046%
Dollar General Corp	DG	44,988.21	0.19%	0.81%	11.50%	12.36%	0.0230%
Quest Diagnostics Inc	DGX	15,270.64	0.06%	1.97%	9.00%	11.06%	0.0070%
DR Horton Inc	DHI	19,049.39	0.08%	1.34%	7.00%	8.39%	0.0066%
Danaher Corp	DHR	110,816.00	0.46%	0.45%	15.00%	15.48%	0.0710%
Walt Disney Co/The	DIS	213,577.50	0.88%	0.00%	5.50%	5.50%	0.0486%
Discovery Inc	DISCA	10,733.19	0.04%	0.00%	15.00%	15.00%	0.0067%
DISH Network Corp	DISH	14,831.82	0.06%	0.00%	-1.00%	-1.00%	-0.0006%
Digital Realty Trust Inc	DLR	27,403.05	0.11%	3.38%	6.00%	9.48%	0.0107%
Dollar Tree Inc	DLTR	18,845.84	0.08%	0.00%	8.00%	8.00%	0.0062%
Dover Corp	DOV	13,104.93	0.05%	2.15%	9.50%	11.75%	0.0064%
Dow Inc	DOW	26,799.65	N/A	7.88%	N/A	N/A	N/A

Company	Ticker	[4] Market Capitalization	[5] Weight in Index	[6] Estimated Dividend Yield	[7] Long-Term Growth Est.	[8] DCF Result	[9] Weighted DCF Result
Domino's Pizza Inc	DPZ	14,727.45	0.06%	0.83%	13.00%	13.88%	0.0085%
Duke Realty Corp	DRE	12,017.25	0.05%	2.94%	-1.00%	1.93%	0.0010%
Darden Restaurants Inc	DRI	9,462.86	0.04%	0.00%	4.00%	4.00%	0.0016%
DTE Energy Co	DTE	19,887.19	0.08%	4.07%	5.00%	9.17%	0.0075%
Duke Energy Corp	DUK	61,232.85	0.25%	4.60%	5.00%	9.72%	0.0246%
DaVita Inc	DVA	9,740.75	0.04%	0.00%	11.50%	11.50%	0.0046%
Devon Energy Corp	DVN	4,756.86	0.02%	3.87%	2.50%	6.42%	0.0013%
DXC Technology Co	DXC	4,303.97	0.02%	4.95%	7.50%	12.64%	0.0023%
DexCom Inc	DXCM	37,236.28	0.15%	0.00%	51.50%	51.50%	0.0793%
Electronic Arts Inc	EA	34,742.31	0.14%	0.00%	10.50%	10.50%	0.0151%
eBay Inc	EBAY	29,939.71	0.12%	1.52%	7.00%	8.57%	0.0106%
Ecolab Inc	ECL	58,548.95	0.24%	0.93%	8.50%	9.47%	0.0229%
Consolidated Edison Inc	ED	23,627.16	0.10%	4.37%	3.00%	7.44%	0.0073%
Equifax Inc	EFX	18,150.52	0.08%	1.04%	7.00%	8.08%	0.0061%
Edison International	EIX	20,449.16	0.08%	4.62%	12.00%	16.90%	0.0143%
Estee Lauder Cos Inc/The	EL	64,707.48	0.27%	0.00%	13.00%	13.00%	0.0348%
Eastman Chemical Co	EMN	8,907.23	0.04%	4.03%	5.00%	9.13%	0.0034%
Emerson Electric Co	EMR	33,943.97	0.14%	3.52%	9.00%	12.68%	0.0178%
EOG Resources Inc	EOG	30,644.25	0.13%	2.89%	10.50%	13.54%	0.0172%
Equinix Inc	EQIX	56,323.43	0.23%	1.65%	16.00%	17.78%	0.0414%
Equity Residential	EQR	21,902.57	0.09%	4.12%	-11.50%	-7.62%	-0.0069%
Eversource Energy	ES	26,711.03	0.11%	2.90%	6.50%	9.49%	0.0105%
Essex Property Trust Inc	ESS	15,588.46	0.06%	3.55%	1.00%	4.57%	0.0029%
E*TRADE Financial Corp	ETFC	9,381.29	0.04%	1.33%	5.50%	6.87%	0.0027%
Eaton Corp PLC	ETN	31,172.00	0.13%	3.75%	6.50%	10.37%	0.0134%
Entergy Corp	ETR	19,533.71	0.08%	3.85%	3.00%	6.91%	0.0056%
Evergy Inc	EVRG	13,402.54	N/A	3.52%	N/A	N/A	N/A
Edwards Lifesciences Corp	EW	45,628.24	0.19%	0.00%	13.50%	13.50%	0.0255%
Exelon Corp	EXC	36,023.86	0.15%	4.19%	5.00%	9.29%	0.0139%
Expeditors International of Washington I	EXPD	12,088.88	0.05%	1.43%	5.50%	6.97%	0.0035%
Expedia Group Inc	EXPE	11,348.03	0.05%	0.00%	12.00%	12.00%	0.0056%
Extra Space Storage Inc	EXR	11,349.77	0.05%	4.20%	3.00%	7.26%	0.0034%
Ford Motor Co	F	21,444.97	0.09%	0.00%	11.00%	11.00%	0.0098%
Diamondback Energy Inc	FANG	6,942.03	0.03%	3.44%	4.50%	8.02%	0.0023%
Fastenal Co	FAST	22,391.45	0.09%	2.56%	9.00%	11.68%	0.0108%
Facebook Inc	FB	655,644.50	2.71%	0.00%	14.00%	14.00%	0.3798%
Fortune Brands Home & Security Inc	FBHS	8,349.93	0.03%	1.59%	7.50%	9.15%	0.0032%
Freeport-McMoRan Inc	FCX	14,436.96	0.06%	0.00%	19.50%	19.50%	0.0116%
FedEx Corp	FDX	30,568.74	0.13%	2.22%	3.00%	5.25%	0.0066%
FirstEnergy Corp	FE	21,821.85	0.09%	3.92%	8.50%	12.59%	0.0114%
F5 Networks Inc	FFIV	8,511.10	0.04%	0.00%	10.00%	10.00%	0.0035%
Fidelity National Information Services I	FIS	85,075.75	0.35%	1.01%	28.50%	29.65%	0.1044%
Fiserv Inc	FISV	71,309.20	0.30%	0.00%	14.00%	14.00%	0.0413%
Fifth Third Bancorp	FITB	12,590.12	0.05%	6.10%	6.50%	12.80%	0.0067%
FLIR Systems Inc	FLIR	5,964.47	0.02%	1.55%	9.00%	10.62%	0.0026%
Flowserve Corp	FLS	3,247.37	0.01%	3.20%	12.50%	15.90%	0.0021%
FleetCor Technologies Inc	FLT	20,154.46	0.08%	0.00%	14.00%	14.00%	0.0117%
FMC Corp	FMC	12,047.63	0.05%	1.93%	11.00%	13.04%	0.0065%
Fox Corp	FOXA	16,978.64	N/A	1.65%	N/A	N/A	N/A
First Republic Bank/CA	FRC	16,656.38	0.07%	0.81%	9.00%	9.85%	0.0068%
Federal Realty Investment Trust	FRT	5,979.07	0.02%	5.36%	1.50%	6.90%	0.0017%
TechnipFMC PLC	FTI	N/A	N/A	0.00%	N/A	N/A	N/A
Fortinet Inc	FTNT	23,677.81	0.10%	0.00%	21.00%	21.00%	0.0206%
Fortive Corp	FTV	19,904.88	0.08%	0.47%	8.00%	8.49%	0.0070%
General Dynamics Corp	GD	39,297.63	0.16%	3.21%	7.00%	10.32%	0.0168%
General Electric Co	GE	56,100.75	0.23%	0.62%	8.00%	8.64%	0.0201%
Gilead Sciences Inc	GILD	92,658.06	0.38%	3.68%	-1.50%	2.15%	0.0083%
General Mills Inc	GIS	36,911.39	0.15%	3.27%	4.00%	7.34%	0.0112%
Globe Life Inc	GL	7,820.47	0.03%	1.03%	9.00%	10.08%	0.0033%
Corning Inc	GLW	16,379.22	0.07%	4.08%	13.50%	17.86%	0.0121%
General Motors Co	GM	36,463.82	0.15%	0.00%	3.50%	3.50%	0.0053%
Alphabet Inc	GOOGL	N/A	N/A	0.00%	N/A	N/A	N/A
Genuine Parts Co	GPC	11,138.91	0.05%	4.09%	7.00%	11.23%	0.0052%
Global Payments Inc	GPN	53,962.34	0.22%	0.43%	11.50%	11.95%	0.0267%
Gap Inc/The	GPS	2,723.14	0.01%	0.00%	2.50%	2.50%	0.0003%
Garmin Ltd	GRMN	16,020.59	0.07%	2.91%	7.00%	10.01%	0.0066%
Goldman Sachs Group Inc/The	GS	63,021.91	0.26%	2.76%	6.50%	9.35%	0.0244%
WW Grainger Inc	GWW	15,830.27	0.07%	1.95%	8.00%	10.03%	0.0066%
Halliburton Co	HAL	10,444.30	0.04%	1.51%	4.50%	6.04%	0.0026%
Hasbro Inc	HAS	9,434.30	0.04%	3.95%	8.50%	12.62%	0.0049%
Huntington Bancshares Inc/OH	HBAN	8,354.85	0.03%	7.67%	9.00%	17.02%	0.0059%
Hanesbrands Inc	HBI	3,330.70	0.01%	6.27%	2.50%	8.85%	0.0012%
HCA Healthcare Inc	HCA	35,928.24	0.15%	0.00%	10.50%	10.50%	0.0156%
Home Depot Inc/The	HD	256,530.60	1.06%	2.52%	8.00%	10.62%	0.1127%
Hess Corp	HES	14,540.86	N/A	2.11%	N/A	N/A	N/A
HollyFrontier Corp	HFC	5,139.82	0.02%	4.47%	8.50%	13.16%	0.0028%

Company	Ticker	[4] Market Capitalization	[5] Weight in Index	[6] Estimated Dividend Yield	[7] Long-Term Growth Est.	[8] DCF Result	[9] Weighted DCF Result
Hartford Financial Services Group Inc/Th	HIG	12,638.02	0.05%	3.71%	11.50%	15.42%	0.0081%
Huntington Ingalls Industries Inc	HII	7,091.95	0.03%	2.35%	6.00%	8.42%	0.0025%
Hilton Worldwide Holdings Inc	HLT	21,540.33	0.09%	0.00%	14.00%	14.00%	0.0125%
Harley-Davidson Inc	HOG	3,484.69	0.01%	0.35%	10.50%	10.87%	0.0016%
Hologic Inc	HOLX	13,937.69	0.06%	0.00%	9.50%	9.50%	0.0055%
Honeywell International Inc	HON	95,472.38	0.40%	2.65%	8.00%	10.76%	0.0425%
Hewlett Packard Enterprise Co	HPE	13,292.04	0.05%	4.86%	7.50%	12.54%	0.0069%
HP Inc	HPQ	24,790.90	0.10%	4.16%	10.50%	14.88%	0.0153%
H&R Block Inc	HRB	3,210.47	0.01%	6.24%	6.00%	12.43%	0.0017%
Hormel Foods Corp	HRL	25,790.54	0.11%	2.04%	8.50%	10.63%	0.0113%
Henry Schein Inc	HSIC	8,229.78	0.03%	0.00%	5.00%	5.00%	0.0017%
Host Hotels & Resorts Inc	HST	8,544.22	0.04%	6.93%	-2.50%	4.34%	0.0015%
Hershey Co/The	HSY	27,315.02	0.11%	2.48%	4.50%	7.04%	0.0080%
Humana Inc	HUM	51,678.16	0.21%	0.64%	10.50%	11.17%	0.0239%
Howmet Aerospace Inc	HWM	5,560.31	0.02%	0.00%	12.00%	12.00%	0.0028%
International Business Machines Corp	IBM	107,677.40	0.45%	5.44%	1.50%	6.98%	0.0311%
Intercontinental Exchange Inc	ICE	51,210.60	0.21%	1.28%	9.00%	10.34%	0.0219%
IDEXX Laboratories Inc	IDXX	25,099.91	0.10%	0.00%	10.50%	10.50%	0.0109%
IDEX Corp	IEX	11,475.75	0.05%	1.31%	7.50%	8.86%	0.0042%
International Flavors & Fragrances Inc	IFF	13,915.47	0.06%	2.40%	8.00%	10.50%	0.0060%
Illumina Inc	ILMN	69,399.62	0.29%	0.00%	9.50%	9.50%	0.0273%
Incyte Corp	INCY	21,330.72	0.09%	0.00%	64.50%	64.50%	0.0569%
IHS Markit Ltd	INFO	27,204.98	0.11%	1.00%	11.50%	12.56%	0.0141%
Intel Corp	INTC	267,165.40	1.11%	2.09%	9.00%	11.18%	0.1236%
Intuit Inc	INTU	75,677.58	0.31%	0.74%	12.50%	13.29%	0.0416%
International Paper Co	IP	12,962.40	0.05%	6.21%	6.50%	12.91%	0.0069%
Interpublic Group of Cos Inc/The	IPG	6,494.87	0.03%	6.12%	10.00%	16.43%	0.0044%
IPG Photonics Corp	IPGP	8,408.94	0.03%	0.00%	9.50%	9.50%	0.0033%
IQVIA Holdings Inc	IQV	27,775.22	0.11%	0.00%	9.50%	9.50%	0.0109%
Ingersoll Rand Inc	IR	N/A	N/A	0.00%	N/A	N/A	N/A
Iron Mountain Inc	IRM	6,874.55	0.03%	10.39%	8.50%	19.33%	0.0055%
Intuitive Surgical Inc	ISRG	64,399.35	0.27%	0.00%	11.50%	11.50%	0.0306%
Gartner Inc	IT	10,555.44	0.04%	0.00%	12.00%	12.00%	0.0052%
Illinois Tool Works Inc	ITW	52,123.50	0.22%	2.59%	8.00%	10.69%	0.0231%
Invesco Ltd	IVZ	3,382.09	0.01%	8.41%	4.50%	13.10%	0.0018%
Jacobs Engineering Group Inc	J	9,932.15	0.04%	1.00%	14.00%	15.07%	0.0062%
JB Hunt Transport Services Inc	JBHT	11,074.46	0.05%	1.04%	6.50%	7.57%	0.0035%
Johnson Controls International plc	JCI	21,378.60	0.09%	3.62%	5.50%	9.22%	0.0082%
Jack Henry & Associates Inc	JKHY	14,591.33	0.06%	0.90%	10.00%	10.95%	0.0066%
Johnson & Johnson	JNJ	388,751.60	1.61%	2.74%	10.00%	12.88%	0.2071%
Juniper Networks Inc	JNPR	7,824.84	0.03%	3.38%	6.00%	9.48%	0.0031%
JPMorgan Chase & Co	JPM	281,663.70	1.17%	3.94%	3.50%	7.51%	0.0875%
Nordstrom Inc	JWN	2,349.56	0.01%	0.00%	4.00%	4.00%	0.0004%
Kellogg Co	K	21,410.02	0.09%	3.68%	3.00%	6.74%	0.0060%
KeyCorp	KEY	10,474.93	0.04%	6.89%	3.00%	9.99%	0.0043%
Keysight Technologies Inc	KEYS	19,333.42	0.08%	0.00%	17.00%	17.00%	0.0136%
Kraft Heinz Co/The	KHC	36,953.28	0.15%	5.29%	-0.50%	4.78%	0.0073%
Kimco Realty Corp	KIM	4,732.69	0.02%	0.00%	5.00%	5.00%	0.0010%
KLA Corp	KLAC	27,586.32	0.11%	1.91%	11.50%	13.52%	0.0154%
Kimberly-Clark Corp	KMB	46,643.41	0.19%	3.13%	7.00%	10.24%	0.0198%
Kinder Morgan Inc	KMI	35,391.32	0.15%	6.71%	22.00%	29.45%	0.0431%
CarMax Inc	KMX	12,777.40	0.05%	0.00%	7.50%	7.50%	0.0040%
Coca-Cola Co/The	KO	197,051.70	0.82%	3.57%	6.50%	10.19%	0.0830%
Kroger Co/The	KR	25,452.40	0.11%	2.17%	5.50%	7.73%	0.0081%
Kohl's Corp	KSS	2,621.90	0.01%	0.00%	2.00%	2.00%	0.0002%
Kansas City Southern	KSU	14,132.53	0.06%	1.08%	11.50%	12.64%	0.0074%
Loews Corp	L	9,374.05	0.04%	0.78%	12.00%	12.83%	0.0050%
L Brands Inc	LB	3,384.94	0.01%	0.00%	-2.50%	-2.50%	-0.0004%
Leidos Holdings Inc	LDOS	14,045.22	0.06%	1.38%	10.00%	11.45%	0.0067%
Leggett & Platt Inc	LEG	3,918.05	0.02%	5.40%	8.00%	13.62%	0.0022%
Lennar Corp	LEN	17,969.47	0.07%	0.87%	7.00%	7.90%	0.0059%
Laboratory Corp of America Holdings	LH	16,574.54	0.07%	0.00%	8.00%	8.00%	0.0055%
L3Harris Technologies Inc	LHX	N/A	N/A	0.00%	N/A	N/A	N/A
Linde PLC	LIN	102,927.70	N/A	2.07%	N/A	N/A	N/A
LKQ Corp	LKQ	7,756.63	0.03%	0.00%	10.00%	10.00%	0.0032%
Eli Lilly and Co	LLY	146,534.50	0.61%	1.93%	10.00%	12.03%	0.0729%
Lockheed Martin Corp	LMT	101,660.50	0.42%	2.70%	8.50%	11.31%	0.0476%
Lincoln National Corp	LNC	6,999.41	0.03%	4.72%	9.50%	14.44%	0.0042%
Alliant Energy Corp	LNT	11,641.86	0.05%	3.26%	5.50%	8.85%	0.0043%
Lowe's Cos Inc	LOW	89,263.38	0.37%	2.01%	10.50%	12.62%	0.0466%
Lam Research Corp	LRCX	40,644.59	0.17%	1.70%	10.00%	11.79%	0.0198%
Southwest Airlines Co	LUV	14,834.03	0.06%	0.00%	2.00%	2.00%	0.0012%
Las Vegas Sands Corp	LVS	38,329.88	0.16%	0.00%	5.50%	5.50%	0.0087%
Lamb Weston Holdings Inc	LW	8,217.61	0.03%	1.69%	9.50%	11.27%	0.0038%
LyondellBasell Industries NV	LYB	20,152.32	0.08%	6.96%	-1.50%	5.41%	0.0045%
Live Nation Entertainment Inc	LYV	10,093.37	N/A	0.00%	N/A	N/A	N/A

Company	Ticker	[4] Market Capitalization	[5] Weight in Index	[6] Estimated Dividend Yield	[7] Long-Term Growth Est.	[8] DCF Result	[9] Weighted DCF Result
Mastercard Inc	MA	299,995.20	1.24%	0.54%	13.50%	14.08%	0.1747%
Mid-America Apartment Communities Inc	MAA	12,692.47	0.05%	3.59%	0.50%	4.10%	0.0022%
Marriott International Inc/MD	MAR	30,052.04	0.12%	0.00%	8.00%	8.00%	0.0099%
Masco Corp	MAS	12,058.59	0.05%	1.26%	7.00%	8.30%	0.0041%
McDonald's Corp	MCD	136,878.40	0.57%	2.72%	7.50%	10.32%	0.0585%
Microchip Technology Inc	MCHP	21,869.55	0.09%	1.64%	7.50%	9.20%	0.0083%
McKesson Corp	MCK	25,905.72	0.11%	1.12%	9.00%	10.17%	0.0109%
Moody's Corp	MCO	48,054.73	0.20%	0.87%	8.00%	8.90%	0.0177%
Mondelez International Inc	MDLZ	71,010.81	0.29%	2.41%	8.00%	10.51%	0.0309%
Medtronic PLC	MDT	131,504.30	0.54%	2.24%	7.50%	9.82%	0.0535%
MetLife Inc	MET	30,352.61	0.13%	5.55%	7.50%	13.26%	0.0166%
MGM Resorts International	MGM	8,137.06	0.03%	0.06%	34.00%	34.07%	0.0115%
Mohawk Industries Inc	MHK	5,910.49	N/A	0.00%	N/A	N/A	N/A
McCormick & Co Inc/MD	MKC	23,070.80	0.10%	1.43%	6.50%	7.98%	0.0076%
MarketAxess Holdings Inc	MKTX	18,120.72	0.07%	0.50%	13.50%	14.03%	0.0105%
Martin Marietta Materials Inc	MLM	11,140.02	0.05%	1.24%	10.50%	11.81%	0.0054%
Marsh & McLennan Cos Inc	MMC	52,608.37	0.22%	1.78%	10.00%	11.87%	0.0258%
3M Co	MMM	86,095.34	0.36%	3.93%	4.50%	8.52%	0.0303%
Monster Beverage Corp	MNST	44,221.39	0.18%	0.00%	11.50%	11.50%	0.0210%
Altria Group Inc	MO	70,190.55	0.29%	8.90%	6.00%	15.17%	0.0440%
Mosaic Co/The	MOS	4,442.11	0.02%	1.88%	22.00%	24.09%	0.0044%
Marathon Petroleum Corp	MPC	23,933.00	0.10%	6.30%	3.00%	9.39%	0.0093%
Merck & Co Inc	MRK	194,071.40	0.80%	3.17%	9.00%	12.31%	0.0989%
Marathon Oil Corp	MRO	4,706.45	0.02%	3.36%	9.00%	12.51%	0.0024%
Morgan Stanley	MS	65,448.53	0.27%	3.41%	5.00%	8.50%	0.0230%
MSCI Inc	MSCI	28,587.46	0.12%	0.86%	17.00%	17.93%	0.0212%
Microsoft Corp	MSFT	1,409,159.00	5.83%	1.10%	14.50%	15.68%	0.9142%
Motorola Solutions Inc	MSI	23,560.30	0.10%	1.93%	9.50%	11.52%	0.0112%
M&T Bank Corp	MTB	12,552.21	0.05%	4.58%	4.00%	8.67%	0.0045%
Mettler-Toledo International Inc	MTD	17,585.77	0.07%	0.00%	9.50%	9.50%	0.0069%
Micron Technology Inc	MU	51,863.68	0.21%	0.00%	13.50%	13.50%	0.0290%
Maxim Integrated Products Inc	MXIM	15,245.74	0.06%	3.37%	4.50%	7.95%	0.0050%
Mylan NV	MYL	8,436.53	0.03%	0.00%	3.00%	3.00%	0.0010%
Noble Energy Inc	NBL	4,719.05	N/A	0.82%	N/A	N/A	N/A
Norwegian Cruise Line Holdings Ltd	NCLH	2,741.63	0.01%	0.00%	-1.50%	-1.50%	-0.0002%
Nasdaq Inc	NDAQ	18,851.21	0.08%	1.71%	6.00%	7.76%	0.0061%
NextEra Energy Inc	NEE	113,939.10	0.47%	2.47%	10.00%	12.59%	0.0594%
Newmont Corp	NEM	52,745.89	0.22%	1.52%	11.00%	12.60%	0.0275%
Netflix Inc	NFLX	196,876.80	0.81%	0.00%	24.00%	24.00%	0.1955%
NiSource Inc	NI	8,832.58	0.04%	3.64%	13.50%	17.39%	0.0064%
NIKE Inc	NKE	144,537.30	0.60%	1.05%	16.00%	17.13%	0.1025%
NortonLifeLock Inc	NLOK	12,894.00	0.05%	2.38%	4.50%	6.93%	0.0037%
Nielsen Holdings PLC	NLSN	4,844.51	N/A	1.77%	N/A	N/A	N/A
Northrop Grumman Corp	NOC	53,538.52	0.22%	1.81%	10.00%	11.90%	0.0264%
National Oilwell Varco Inc	NOV	5,010.54	N/A	1.54%	N/A	N/A	N/A
ServiceNow Inc	NOW	74,403.51	0.31%	0.00%	46.00%	46.00%	0.1416%
NRG Energy Inc	NRG	8,719.65	N/A	3.38%	N/A	N/A	N/A
Norfolk Southern Corp	NSC	44,488.05	0.18%	2.17%	11.50%	13.79%	0.0254%
NetApp Inc	NTAP	10,207.56	0.04%	4.57%	10.00%	14.80%	0.0062%
Northern Trust Corp	NTRS	15,553.97	0.06%	3.75%	7.50%	11.39%	0.0073%
Nucor Corp	NUE	12,250.17	0.05%	3.96%	11.00%	15.18%	0.0077%
NVIDIA Corp	NVDA	219,585.60	0.91%	0.18%	10.00%	10.19%	0.0926%
NVR Inc	NVR	11,211.44	0.05%	0.00%	9.50%	9.50%	0.0044%
Newell Brands Inc	NWL	5,335.18	0.02%	7.31%	6.00%	13.53%	0.0030%
News Corp	NWSA	6,738.03	N/A	1.75%	N/A	N/A	N/A
Realty Income Corp	O	17,161.36	0.07%	5.50%	6.50%	12.18%	0.0086%
Old Dominion Freight Line Inc	ODFL	18,371.02	0.08%	0.39%	6.50%	6.90%	0.0052%
ONEOK Inc	OKE	15,110.87	0.06%	11.23%	12.50%	24.43%	0.0153%
Omnicom Group Inc	OMC	11,237.00	0.05%	4.96%	5.50%	10.60%	0.0049%
Oracle Corp	ORCL	167,216.90	0.69%	1.82%	9.00%	10.90%	0.0754%
O'Reilly Automotive Inc	ORLY	30,207.15	0.12%	0.00%	10.00%	10.00%	0.0125%
Otis Worldwide Corp	OTIS	N/A	N/A	0.00%	N/A	N/A	N/A
Occidental Petroleum Corp	OXY	13,402.72	0.06%	2.94%	14.50%	17.65%	0.0098%
Paycom Software Inc	PAYC	15,757.89	0.07%	0.00%	23.00%	23.00%	0.0150%
Paychex Inc	PAYX	24,323.45	0.10%	3.78%	9.00%	12.95%	0.0130%
People's United Financial Inc	PBCT	4,839.30	0.02%	6.32%	4.00%	10.45%	0.0021%
PACCAR Inc	PCAR	23,863.67	0.10%	3.33%	3.50%	6.89%	0.0068%
Healthpeak Properties Inc	PEAK	12,095.01	0.05%	6.18%	-15.50%	-9.80%	-0.0049%
Public Service Enterprise Group Inc	PEG	24,570.00	0.10%	4.06%	5.00%	9.16%	0.0093%
PepsiCo Inc	PEP	182,320.20	0.75%	3.12%	6.00%	9.21%	0.0695%
Pfizer Inc	PFE	208,921.80	0.86%	4.04%	8.50%	12.71%	0.1099%
Principal Financial Group Inc	PFG	9,990.79	0.04%	6.20%	4.50%	10.84%	0.0045%
Procter & Gamble Co/The	PG	280,440.80	1.16%	2.79%	8.50%	11.41%	0.1324%
Progressive Corp/The	PGR	43,780.70	0.18%	0.53%	13.50%	14.07%	0.0255%
Parker-Hannifin Corp	PH	21,586.61	0.09%	2.09%	9.00%	11.18%	0.0100%
PulteGroup Inc	PHM	8,427.92	0.03%	1.59%	7.50%	9.15%	0.0032%

Company	Ticker	[4] Market Capitalization	[5] Weight in Index	[6] Estimated Dividend Yield	[7] Long-Term Growth Est.	[8] DCF Result	[9] Weighted DCF Result
Packaging Corp of America	PKG	8,862.60	0.04%	3.64%	4.00%	7.71%	0.0028%
PerkinElmer Inc	PKI	10,323.63	0.04%	0.30%	9.00%	9.31%	0.0040%
Prologis Inc	PLD	55,042.15	0.23%	2.71%	6.00%	8.79%	0.0200%
Philip Morris International Inc	PM	109,729.30	0.45%	6.64%	5.50%	12.32%	0.0559%
PNC Financial Services Group Inc/The	PNC	44,265.60	0.18%	4.41%	3.00%	7.48%	0.0137%
Pentair PLC	PNR	5,950.29	0.02%	2.12%	6.00%	8.18%	0.0020%
Pinnacle West Capital Corp	PNW	8,185.97	0.03%	4.43%	4.50%	9.03%	0.0031%
PPG Industries Inc	PPG	22,646.25	0.09%	2.13%	4.00%	6.17%	0.0058%
PPL Corp	PPL	19,659.93	0.08%	6.49%	2.50%	9.07%	0.0074%
Perrigo Co PLC	PRGO	7,507.40	0.03%	1.69%	3.50%	5.22%	0.0016%
Prudential Financial Inc	PRU	22,557.94	0.09%	7.78%	7.00%	15.05%	0.0140%
Public Storage	PSA	32,079.15	0.13%	4.35%	3.50%	7.93%	0.0105%
Phillips 66	PSX	34,169.82	0.14%	4.67%	4.00%	8.76%	0.0124%
PVH Corp	PVH	3,035.58	0.01%	0.00%	6.50%	6.50%	0.0008%
Quanta Services Inc	PWR	4,616.65	0.02%	0.60%	15.00%	15.65%	0.0030%
Pioneer Natural Resources Co	PXD	15,238.29	0.06%	2.38%	14.00%	16.55%	0.0104%
PayPal Holdings Inc	PYPL	177,052.60	0.73%	0.00%	15.50%	15.50%	0.1135%
QUALCOMM Inc	QCOM	90,870.02	0.38%	3.23%	9.50%	12.88%	0.0484%
Qorvo Inc	QRVO	11,959.21	0.05%	0.00%	53.00%	53.00%	0.0262%
Royal Caribbean Cruises Ltd	RCL	8,504.47	0.04%	7.66%	-0.50%	7.14%	0.0025%
Everest Re Group Ltd	RE	8,128.39	0.03%	3.11%	9.50%	12.76%	0.0043%
Regency Centers Corp	REG	6,946.23	0.03%	5.75%	13.50%	19.64%	0.0056%
Regeneron Pharmaceuticals Inc	REGN	64,721.87	0.27%	0.00%	6.00%	6.00%	0.0161%
Regions Financial Corp	RF	9,622.61	0.04%	6.17%	5.00%	11.32%	0.0045%
Robert Half International Inc	RHI	5,614.35	0.02%	2.82%	8.00%	10.93%	0.0025%
Raymond James Financial Inc	RJF	9,001.95	0.04%	2.28%	6.50%	8.85%	0.0033%
Ralph Lauren Corp	RL	5,262.18	0.02%	3.85%	7.00%	10.98%	0.0024%
ResMed Inc	RMD	23,400.53	0.10%	0.96%	14.50%	15.53%	0.0150%
Rockwell Automation Inc	ROK	23,864.38	0.10%	1.99%	7.00%	9.06%	0.0089%
Rollins Inc	ROL	12,822.25	0.05%	0.82%	12.00%	12.87%	0.0068%
Roper Technologies Inc	ROP	38,405.57	0.16%	0.56%	8.00%	8.58%	0.0136%
Ross Stores Inc	ROST	32,427.28	0.13%	1.28%	9.00%	10.34%	0.0139%
Republic Services Inc	RSG	25,991.95	0.11%	2.09%	9.00%	11.18%	0.0120%
Raytheon Technologies Corp	RTX	50,064.11	0.21%	3.29%	8.00%	11.42%	0.0237%
SBA Communications Corp	SBAC	31,654.87	0.13%	0.69%	31.00%	31.80%	0.0416%
Starbucks Corp	SBUX	90,831.45	0.38%	2.30%	13.50%	15.96%	0.0600%
Charles Schwab Corp/The	SCHW	43,369.85	0.18%	2.14%	6.50%	8.71%	0.0156%
Sealed Air Corp	SEE	4,674.44	0.02%	2.13%	26.00%	28.41%	0.0055%
Sherwin-Williams Co/The	SHW	51,268.40	0.21%	0.95%	8.50%	9.49%	0.0201%
SVB Financial Group	SIVB	10,036.43	0.04%	0.00%	4.50%	4.50%	0.0019%
JM Smucker Co/The	SJM	12,568.46	0.05%	3.22%	3.00%	6.27%	0.0033%
Schlumberger Ltd	SLB	25,272.07	0.10%	2.75%	5.00%	7.82%	0.0082%
SL Green Realty Corp	SLG	3,054.58	0.01%	9.30%	0.50%	9.82%	0.0012%
Snap-on Inc	SNA	7,266.21	0.03%	3.23%	5.50%	8.82%	0.0027%
Synopsys Inc	SNPS	24,853.93	0.10%	0.00%	11.00%	11.00%	0.0113%
Southern Co/The	SO	57,898.07	0.24%	4.71%	3.00%	7.78%	0.0186%
Simon Property Group Inc	SPG	17,082.95	N/A	15.09%	N/A	N/A	N/A
S&P Global Inc	SPGI	75,642.60	0.31%	0.85%	11.00%	11.90%	0.0372%
Sempra Energy	SRE	35,810.88	0.15%	3.47%	10.00%	13.64%	0.0202%
STERIS PLC	STE	13,399.52	0.06%	0.94%	9.50%	10.48%	0.0058%
State Street Corp	STT	20,546.49	0.09%	3.56%	3.50%	7.12%	0.0061%
Seagate Technology PLC	STX	14,362.45	0.06%	5.11%	3.00%	8.19%	0.0049%
Constellation Brands Inc	STZ	32,910.55	0.14%	1.74%	7.50%	9.31%	0.0127%
Stanley Black & Decker Inc	SWK	19,594.17	0.08%	2.22%	8.00%	10.31%	0.0084%
Skyworks Solutions Inc	SWKS	19,661.15	0.08%	1.50%	10.00%	11.58%	0.0094%
Synchrony Financial	SYF	10,562.35	0.04%	4.86%	8.00%	13.05%	0.0057%
Stryker Corp	SYK	71,689.70	0.30%	1.20%	10.50%	11.76%	0.0349%
Sysco Corp	SYY	26,668.47	0.11%	3.42%	9.50%	13.08%	0.0144%
AT&T Inc	T	210,835.10	0.87%	7.06%	5.50%	12.75%	0.1113%
Molson Coors Beverage Co	TAP	8,203.19	0.03%	6.02%	5.00%	11.17%	0.0038%
TransDigm Group Inc	TDG	19,740.61	0.08%	0.00%	15.50%	15.50%	0.0127%
TE Connectivity Ltd	TEL	25,939.65	0.11%	2.45%	5.50%	8.02%	0.0086%
Truist Financial Corp	TFC	45,324.94	0.19%	5.33%	5.00%	10.46%	0.0196%
Teleflex Inc	TFX	16,753.96	0.07%	0.39%	14.00%	14.42%	0.0100%
Target Corp	TGT	60,317.21	0.25%	2.21%	9.50%	11.81%	0.0295%
Tiffany & Co	TIF	15,233.63	0.06%	1.85%	9.50%	11.44%	0.0072%
TJX Cos Inc/The	TJX	61,181.91	0.25%	0.45%	12.00%	12.48%	0.0316%
Thermo Fisher Scientific Inc	TMO	134,737.50	0.56%	0.26%	10.00%	10.27%	0.0573%
T-Mobile US Inc	TMUS	84,511.10	0.35%	0.00%	14.00%	14.00%	0.0490%
Tapestry Inc	TPR	3,661.09	0.02%	0.00%	5.00%	5.00%	0.0008%
T Rowe Price Group Inc	TROW	26,181.80	0.11%	3.18%	8.00%	11.31%	0.0122%
Travelers Cos Inc/The	TRV	24,410.47	0.10%	3.56%	7.50%	11.19%	0.0113%
Tractor Supply Co	TSCO	12,459.66	0.05%	1.45%	9.50%	11.02%	0.0057%
Tyson Foods Inc	TSN	22,137.25	0.09%	2.84%	7.00%	9.94%	0.0091%
Trane Technologies PLC	TT	N/A	N/A	0.00%	N/A	N/A	N/A
Take-Two Interactive Software Inc	TTWO	16,644.31	0.07%	0.00%	20.50%	20.50%	0.0141%

Company	Ticker	[4] Market Capitalization	[5] Weight in Index	[6] Estimated Dividend Yield	[7] Long-Term Growth Est.	[8] DCF Result	[9] Weighted DCF Result
Twitter Inc	TWTR	25,271.55	0.10%	0.00%	25.50%	25.50%	0.0267%
Texas Instruments Inc	TXN	108,255.60	0.45%	3.06%	4.50%	7.63%	0.0342%
Textron Inc	TXT	6,214.27	0.03%	0.29%	8.50%	8.80%	0.0023%
Under Armour Inc	UAA	3,741.38	0.02%	0.00%	21.50%	21.50%	0.0033%
United Airlines Holdings Inc	UAL	6,159.17	0.03%	0.00%	3.50%	3.50%	0.0009%
UDR Inc	UDR	9,996.81	0.04%	3.78%	5.00%	8.87%	0.0037%
Universal Health Services Inc	UHS	8,771.16	0.04%	0.00%	11.00%	11.00%	0.0040%
Ulta Beauty Inc	ULTA	12,084.89	0.05%	0.00%	9.00%	9.00%	0.0045%
UnitedHealth Group Inc	UNH	272,726.50	1.13%	1.50%	12.00%	13.59%	0.1533%
Unum Group	UNM	2,968.97	0.01%	7.79%	7.50%	15.58%	0.0019%
Union Pacific Corp	UNP	112,661.10	0.47%	2.34%	10.50%	12.96%	0.0604%
United Parcel Service Inc	UPS	83,633.10	0.35%	4.16%	6.00%	10.28%	0.0356%
United Rentals Inc	URI	9,223.58	0.04%	0.00%	9.50%	9.50%	0.0036%
US Bancorp	USB	49,791.13	0.21%	5.20%	5.00%	10.33%	0.0213%
Visa Inc	V	377,833.10	1.56%	0.65%	14.50%	15.20%	0.2376%
Varian Medical Systems Inc	VAR	10,875.84	0.04%	0.00%	13.50%	13.50%	0.0061%
VF Corp	VFC	22,085.68	0.09%	3.43%	6.00%	9.53%	0.0087%
ViacomCBS Inc	VIAC	12,072.45	0.05%	4.89%	8.00%	13.09%	0.0065%
Valero Energy Corp	VLO	27,454.58	0.11%	5.82%	8.00%	14.05%	0.0160%
Vulcan Materials Co	VMC	13,437.98	0.06%	1.34%	13.00%	14.43%	0.0080%
Vornado Realty Trust	VNO	6,997.73	0.03%	7.21%	-5.00%	2.03%	0.0006%
Verisk Analytics Inc	VRSK	25,924.93	0.11%	0.68%	10.50%	11.22%	0.0120%
VeriSign Inc	VRSN	24,969.43	0.10%	0.00%	9.50%	9.50%	0.0098%
Vertex Pharmaceuticals Inc	VRTX	73,739.06	0.31%	0.00%	46.00%	46.00%	0.1403%
Ventas Inc	VTR	11,709.82	0.05%	9.65%	1.50%	11.22%	0.0054%
Verizon Communications Inc	VZ	224,527.60	0.93%	4.55%	4.50%	9.15%	0.0850%
Westinghouse Air Brake Technologies Corp	WAB	11,003.78	0.05%	0.83%	10.50%	11.37%	0.0052%
Waters Corp	WAT	11,466.85	0.05%	0.00%	10.50%	10.50%	0.0050%
Walgreens Boots Alliance Inc	WBA	35,339.14	0.15%	4.56%	6.50%	11.21%	0.0164%
Western Digital Corp	WDC	12,894.00	0.05%	0.00%	0.50%	0.50%	0.0003%
WEC Energy Group Inc	WEC	27,537.48	0.11%	2.94%	6.00%	9.03%	0.0103%
Welltower Inc	WELL	17,553.36	0.07%	5.33%	9.50%	15.08%	0.0110%
Wells Fargo & Co	WFC	100,444.00	N/A	8.32%	N/A	N/A	N/A
Whirlpool Corp	WHR	7,369.32	0.03%	4.04%	5.00%	9.14%	0.0028%
Willis Towers Watson PLC	WLTW	26,085.78	0.11%	1.34%	11.50%	12.92%	0.0139%
Waste Management Inc	WM	41,967.40	0.17%	2.19%	5.50%	7.75%	0.0135%
Williams Cos Inc/The	WMB	23,920.36	0.10%	8.11%	12.00%	20.60%	0.0204%
Walmart Inc	WMT	356,152.50	1.47%	1.72%	7.00%	8.78%	0.1294%
WR Berkley Corp	WRB	9,796.04	0.04%	0.82%	10.00%	10.86%	0.0044%
Westrock Co	WRK	6,591.46	0.03%	3.15%	6.50%	9.75%	0.0027%
West Pharmaceutical Services Inc	WST	15,336.57	0.06%	0.31%	14.00%	14.33%	0.0091%
Western Union Co/The	WU	7,860.52	0.03%	4.71%	5.50%	10.34%	0.0034%
Weyerhaeuser Co	WY	14,536.09	0.06%	0.00%	10.50%	10.50%	0.0063%
Wynn Resorts Ltd	WYNN	9,370.80	0.04%	0.00%	15.50%	15.50%	0.0060%
Xcel Energy Inc	XEL	31,633.30	0.13%	2.91%	6.00%	9.00%	0.0118%
Xilinx Inc	XLNX	22,275.89	0.09%	1.70%	6.00%	7.75%	0.0071%
Exxon Mobil Corp	XOM	191,833.90	0.79%	7.67%	4.50%	12.34%	0.0980%
DENTSPLY SIRONA Inc	XRAY	9,136.47	0.04%	0.96%	8.50%	9.50%	0.0036%
Xerox Holdings Corp	XRX	3,669.21	0.02%	5.80%	9.50%	15.58%	0.0024%
Xylem Inc/NY	XYL	11,168.19	0.05%	1.68%	8.50%	10.25%	0.0047%
Yum! Brands Inc	YUM	26,515.09	0.11%	2.13%	9.50%	11.73%	0.0129%
Zimmer Biomet Holdings Inc	ZBH	26,180.88	0.11%	0.76%	5.50%	6.28%	0.0068%
Zebra Technologies Corp	ZBRA	12,814.91	0.05%	0.00%	11.00%	11.00%	0.0058%
Zions Bancorp NA	ZION	5,099.07	0.02%	4.37%	4.50%	8.97%	0.0019%
Zoetis Inc	ZTS	63,318.50	0.26%	0.60%	12.00%	12.64%	0.0331%
Total Market Capitalization:		24,169,470.77					13.86%

Notes:
[1] Equals sum of Col. [9]
[2] Source: Bloomberg Professional
[3] Equals [1] − [2]
[4] Source: Value Line
[5] Equals weight in S&P 500 based on market capitalization
[6] Source: Value Line
[7] Source: Value Line
[8] Equals ([6] x (1 + (0.5 x [7]))) + [7]
[9] Equals Col. [5] x Col. [8]

Exhibit (DWD-4)

Bloomberg and Value Line Beta Coefficients

Company	Ticker	[1] Bloomberg	[2] Value Line
Atmos Energy Corporation	ATO	0.859	0.800
New Jersey Resources Corporation	NJR	0.898	0.900
Northwest Natural Holding Company	NWN	0.823	0.800
ONE Gas, Inc.	OGS	0.940	0.800
South Jersey Industries, Inc.	SJI	0.954	0.950
Southwest Gas Holdings, Inc.	SWX	1.046	0.900
Spire Inc.	SR	0.908	0.800
Mean		0.918	0.850

Notes:
[1] Source: Bloomberg Professional
[2] Source: Value Line

Exhibit (DWD-5)

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	
	Risk-Free Rate	Average Beta Coefficient	Bloomberg Market DCF Derived	Value Line Market DCF Derived	Bloomberg Market DCF Derived	Value Line Market DCF Derived	Bloomberg Market DCF Derived	Value Line Market DCF Derived
PROXY GROUP AVERAGE BLOOMBERG BETA COEFFICIENT								
Current 30-Year Treasury [9]	1.33%	0.918	12.15%	12.53%	12.48%	12.83%	12.73%	13.09%
Near Term Projected 30-Year Treasury [10]	1.63%	0.918	12.15%	12.53%	12.79%	13.14%	13.04%	13.40%
Long Term Projected 30-Year Treasury [11]	3.40%	0.918	12.15%	12.53%	14.56%	14.91%	14.80%	15.16%
Mean					13.28%	13.63%	13.52%	13.88%

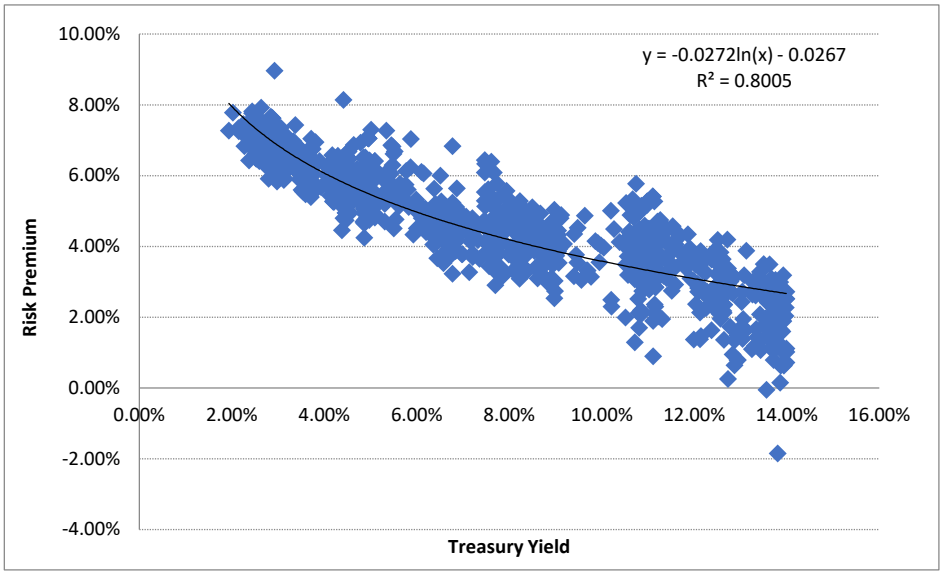
			Ex-Ante Market Risk Premium		CAPM Result		ECAPM Result	
	Risk-Free Rate	Average Beta Coefficient	Bloomberg Market DCF Derived	Value Line Market DCF Derived	Bloomberg Market DCF Derived	Value Line Market DCF Derived	Bloomberg Market DCF Derived	Value Line Market DCF Derived
PROXY GROUP AVERAGE VALUE LINE AVERAGE BETA COEFFICIENT								
Current 30-Year Treasury [9]	1.33%	0.850	12.15%	12.53%	11.65%	11.98%	12.11%	12.45%
Near Term Projected 30-Year Treasury [10]	1.63%	0.850	12.15%	12.53%	11.96%	12.29%	12.42%	12.76%
Long Term Projected 30-Year Treasury [11]	3.40%	0.850	12.15%	12.53%	13.73%	14.05%	14.18%	14.52%
Mean					12.45%	12.77%	12.90%	13.24%

Notes:
[1] *See Notes [9], [10] and, [11]*
[2] Source: Exhibit DWD-4
[3] Source: Exhibit DWD-3
[4] Source: Exhibit DWD-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. 39, No. 6, June 1, 2020, at 2.
[11] Source: Blue Chip Financial Forecasts, Vol. 39, No. 6, June 1, 2020, at 14.

Exhibit (DWD-6)

Bond Yield Plus Risk Premium

	[1]	[2]	[3]	[4]	[5]
	Constant	Slope	30-Year Treasury Yield	Risk Premium	Return on Equity
	-2.67%	-2.72%			
Current 30-Year Treasury			1.33%	9.07%	10.39%
Near Term Projected 30-Year Treasury			1.63%	8.50%	10.13%
Long Term Projected 30-Year Treasury			3.40%	6.51%	9.91%



Notes:
[1] Constant of regression equation
[2] Slope of regression equation
[3] Source: Current = Bloomberg Professional
Near Term Projected = Blue Chip Financial Forecasts, Vol. 39, No. 6, June 1, 2020, at 2.
Long Term Projected = Blue Chip Financial Forecasts, Vol. 39, No. 6, June 1 2020, at 14.
[4] Equals [1] + ln([3]) x [2]
[5] Equals [3] + [4]
[6] Source: S&P Global Market Intelligence
[7] Source: S&P Global Market Intelligence
[8] Source: Bloomberg Professional, equals 187-trading day average (i.e. lag period)
[9] Equals [7] - [8]

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
1/3/1980	12.55%	9.39%	3.16%
1/4/1980	13.75%	9.40%	4.35%
1/14/1980	13.20%	9.44%	3.76%
1/18/1980	14.00%	9.47%	4.53%
1/31/1980	12.61%	9.56%	3.05%
2/8/1980	14.50%	9.63%	4.87%
2/14/1980	13.00%	9.67%	3.33%
2/15/1980	13.00%	9.69%	3.31%
2/29/1980	14.00%	9.86%	4.14%
3/5/1980	14.00%	9.91%	4.09%
3/7/1980	13.50%	9.95%	3.55%
3/14/1980	14.00%	10.04%	3.96%
3/27/1980	12.69%	10.20%	2.49%
4/1/1980	14.75%	10.26%	4.49%
4/29/1980	12.50%	10.51%	1.99%
5/7/1980	14.27%	10.56%	3.71%
5/8/1980	13.75%	10.56%	3.19%
5/19/1980	15.50%	10.62%	4.88%
5/27/1980	14.60%	10.65%	3.95%
5/29/1980	16.00%	10.67%	5.33%
6/10/1980	13.78%	10.71%	3.07%
6/25/1980	14.25%	10.74%	3.51%
7/9/1980	14.51%	10.77%	3.74%
7/17/1980	12.90%	10.79%	2.11%
7/18/1980	13.80%	10.79%	3.01%
7/22/1980	14.10%	10.79%	3.31%
7/23/1980	14.19%	10.79%	3.40%
8/1/1980	12.50%	10.80%	1.70%
8/11/1980	14.85%	10.81%	4.04%
8/21/1980	13.03%	10.84%	2.19%
8/28/1980	13.61%	10.87%	2.74%
8/28/1980	14.00%	10.87%	3.13%
9/4/1980	14.00%	10.90%	3.10%
9/24/1980	15.00%	10.98%	4.02%
10/9/1980	14.50%	11.05%	3.45%
10/9/1980	14.50%	11.05%	3.45%
10/24/1980	14.00%	11.09%	2.91%
10/27/1980	15.20%	11.10%	4.10%
10/27/1980	15.20%	11.10%	4.10%
10/28/1980	12.00%	11.10%	0.90%
10/28/1980	13.00%	11.10%	1.90%
10/31/1980	14.50%	11.12%	3.38%
11/4/1980	15.00%	11.12%	3.88%
11/6/1980	14.35%	11.13%	3.22%
11/10/1980	13.25%	11.14%	2.11%
11/17/1980	15.50%	11.15%	4.35%
11/19/1980	13.50%	11.14%	2.36%
12/5/1980	14.60%	11.13%	3.47%
12/8/1980	16.40%	11.13%	5.27%
12/12/1980	15.45%	11.15%	4.30%
12/17/1980	14.20%	11.16%	3.04%
12/17/1980	14.40%	11.16%	3.24%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
12/18/1980	14.00%	11.16%	2.84%
12/22/1980	13.45%	11.16%	2.29%
12/26/1980	14.00%	11.15%	2.85%
12/30/1980	14.50%	11.14%	3.36%
12/31/1980	14.56%	11.14%	3.42%
1/7/1981	14.30%	11.13%	3.17%
1/12/1981	14.95%	11.14%	3.81%
1/26/1981	15.25%	11.20%	4.05%
1/30/1981	13.25%	11.23%	2.02%
2/11/1981	14.50%	11.33%	3.17%
2/20/1981	14.50%	11.40%	3.10%
3/12/1981	15.65%	11.60%	4.05%
3/25/1981	15.30%	11.74%	3.56%
4/1/1981	15.30%	11.82%	3.48%
4/9/1981	15.00%	11.91%	3.09%
4/29/1981	13.50%	12.12%	1.38%
4/29/1981	14.25%	12.12%	2.13%
4/30/1981	13.60%	12.14%	1.46%
4/30/1981	15.00%	12.14%	2.86%
5/21/1981	14.00%	12.37%	1.63%
6/3/1981	14.67%	12.46%	2.21%
6/22/1981	16.00%	12.57%	3.43%
6/25/1981	14.75%	12.60%	2.15%
7/2/1981	14.00%	12.64%	1.36%
7/10/1981	16.00%	12.69%	3.31%
7/14/1981	16.90%	12.71%	4.19%
7/21/1981	15.78%	12.78%	3.00%
7/27/1981	13.77%	12.82%	0.95%
7/27/1981	15.50%	12.82%	2.68%
7/31/1981	13.50%	12.86%	0.64%
7/31/1981	14.20%	12.86%	1.34%
8/12/1981	13.72%	12.93%	0.79%
8/12/1981	13.72%	12.93%	0.79%
8/12/1981	14.41%	12.93%	1.48%
8/25/1981	15.45%	13.02%	2.43%
8/27/1981	14.43%	13.04%	1.39%
8/28/1981	15.00%	13.05%	1.95%
9/23/1981	14.34%	13.24%	1.10%
9/24/1981	16.25%	13.26%	2.99%
9/29/1981	14.50%	13.31%	1.19%
9/30/1981	15.94%	13.32%	2.62%
10/2/1981	14.80%	13.36%	1.44%
10/12/1981	16.25%	13.43%	2.82%
10/20/1981	15.25%	13.50%	1.75%
10/20/1981	16.50%	13.50%	3.00%
10/20/1981	17.00%	13.50%	3.50%
10/23/1981	15.50%	13.54%	1.96%
10/26/1981	13.50%	13.56%	-0.06%
10/29/1981	16.50%	13.60%	2.90%
11/4/1981	15.33%	13.62%	1.71%
11/6/1981	15.17%	13.64%	1.53%
11/12/1981	15.00%	13.65%	1.35%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
11/25/1981	15.25%	13.66%	1.59%
11/25/1981	16.10%	13.66%	2.44%
11/25/1981	16.10%	13.66%	2.44%
11/30/1981	16.75%	13.66%	3.09%
12/1/1981	15.70%	13.66%	2.04%
12/1/1981	16.00%	13.66%	2.34%
12/15/1981	15.81%	13.69%	2.12%
12/17/1981	14.75%	13.70%	1.05%
12/22/1981	15.70%	13.72%	1.98%
12/22/1981	16.00%	13.72%	2.28%
12/30/1981	16.00%	13.74%	2.26%
12/30/1981	16.25%	13.74%	2.51%
1/4/1982	15.50%	13.75%	1.75%
1/14/1982	11.95%	13.80%	-1.85%
1/25/1982	16.25%	13.84%	2.41%
1/27/1982	16.84%	13.85%	2.99%
1/31/1982	14.00%	13.86%	0.14%
2/2/1982	16.24%	13.86%	2.38%
2/8/1982	15.50%	13.87%	1.63%
2/9/1982	14.95%	13.88%	1.07%
2/9/1982	15.75%	13.88%	1.87%
2/11/1982	16.00%	13.89%	2.11%
3/1/1982	15.96%	13.91%	2.05%
3/3/1982	15.00%	13.91%	1.09%
3/8/1982	17.10%	13.92%	3.18%
3/26/1982	16.00%	13.97%	2.03%
3/31/1982	16.25%	13.98%	2.27%
4/1/1982	16.50%	13.98%	2.52%
4/6/1982	15.00%	13.99%	1.01%
4/9/1982	16.50%	13.99%	2.51%
4/12/1982	15.10%	13.99%	1.11%
4/12/1982	16.70%	13.99%	2.71%
4/18/1982	14.70%	13.99%	0.71%
4/27/1982	15.00%	13.97%	1.03%
5/10/1982	14.57%	13.94%	0.63%
5/14/1982	15.80%	13.92%	1.88%
5/20/1982	15.82%	13.91%	1.91%
5/21/1982	15.50%	13.90%	1.60%
5/25/1982	16.25%	13.90%	2.35%
6/2/1982	14.50%	13.87%	0.63%
6/7/1982	16.00%	13.85%	2.15%
6/23/1982	15.50%	13.81%	1.69%
6/25/1982	16.50%	13.81%	2.69%
7/1/1982	15.55%	13.79%	1.76%
7/1/1982	16.00%	13.79%	2.21%
7/2/1982	15.10%	13.79%	1.31%
7/13/1982	16.80%	13.75%	3.05%
7/22/1982	14.50%	13.71%	0.79%
7/28/1982	16.10%	13.68%	2.42%
7/30/1982	14.82%	13.66%	1.16%
8/4/1982	15.58%	13.64%	1.94%
8/6/1982	16.50%	13.63%	2.87%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
8/11/1982	17.11%	13.62%	3.49%
8/25/1982	16.00%	13.59%	2.41%
8/30/1982	16.25%	13.58%	2.67%
9/3/1982	15.50%	13.57%	1.93%
9/9/1982	16.04%	13.55%	2.49%
9/15/1982	16.04%	13.52%	2.52%
9/17/1982	15.25%	13.51%	1.74%
9/29/1982	14.50%	13.43%	1.07%
9/30/1982	14.74%	13.42%	1.32%
9/30/1982	15.50%	13.42%	2.08%
9/30/1982	16.50%	13.42%	3.08%
9/30/1982	16.70%	13.42%	3.28%
10/1/1982	16.50%	13.41%	3.09%
10/8/1982	15.00%	13.33%	1.67%
10/15/1982	15.90%	13.26%	2.64%
10/19/1982	15.90%	13.22%	2.68%
10/27/1982	17.00%	13.12%	3.88%
10/28/1982	14.75%	13.11%	1.64%
11/2/1982	16.25%	13.07%	3.18%
11/4/1982	15.75%	13.03%	2.72%
11/5/1982	14.73%	13.01%	1.72%
11/17/1982	16.00%	12.86%	3.14%
11/23/1982	15.50%	12.79%	2.71%
11/24/1982	14.50%	12.77%	1.73%
11/24/1982	16.02%	12.77%	3.25%
11/30/1982	12.98%	12.72%	0.26%
11/30/1982	15.50%	12.72%	2.78%
11/30/1982	15.50%	12.72%	2.78%
11/30/1982	15.65%	12.72%	2.93%
11/30/1982	16.00%	12.72%	3.28%
11/30/1982	16.10%	12.72%	3.38%
12/3/1982	15.33%	12.68%	2.65%
12/8/1982	15.75%	12.63%	3.12%
12/13/1982	16.00%	12.58%	3.42%
12/14/1982	16.40%	12.57%	3.83%
12/17/1982	16.25%	12.52%	3.73%
12/20/1982	15.00%	12.51%	2.49%
12/21/1982	15.70%	12.49%	3.21%
12/28/1982	15.25%	12.42%	2.83%
12/28/1982	15.25%	12.42%	2.83%
12/29/1982	16.25%	12.41%	3.84%
12/29/1982	16.25%	12.41%	3.84%
1/11/1983	15.90%	12.26%	3.64%
1/12/1983	15.50%	12.24%	3.26%
1/18/1983	15.00%	12.18%	2.82%
1/24/1983	15.50%	12.13%	3.37%
1/24/1983	16.00%	12.13%	3.87%
1/28/1983	14.90%	12.08%	2.82%
1/31/1983	15.00%	12.07%	2.93%
2/10/1983	15.00%	11.97%	3.03%
2/25/1983	15.70%	11.84%	3.86%
3/2/1983	15.25%	11.79%	3.46%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
3/16/1983	16.00%	11.62%	4.38%
3/21/1983	14.96%	11.57%	3.39%
3/23/1983	15.40%	11.53%	3.87%
3/23/1983	16.10%	11.53%	4.57%
3/24/1983	15.00%	11.51%	3.49%
4/12/1983	13.25%	11.30%	1.95%
4/29/1983	15.05%	11.09%	3.96%
5/3/1983	15.40%	11.06%	4.34%
5/9/1983	15.50%	11.00%	4.50%
5/19/1983	14.85%	10.90%	3.95%
5/31/1983	14.00%	10.84%	3.16%
6/2/1983	14.50%	10.82%	3.68%
6/7/1983	14.50%	10.80%	3.70%
6/9/1983	14.85%	10.79%	4.06%
6/20/1983	14.15%	10.74%	3.41%
6/20/1983	16.50%	10.74%	5.76%
6/27/1983	14.50%	10.71%	3.79%
6/30/1983	14.80%	10.70%	4.10%
6/30/1983	15.90%	10.70%	5.20%
7/1/1983	14.80%	10.70%	4.10%
7/5/1983	15.00%	10.69%	4.31%
7/8/1983	15.50%	10.69%	4.81%
7/19/1983	15.00%	10.70%	4.30%
7/19/1983	15.10%	10.70%	4.40%
8/18/1983	15.30%	10.81%	4.49%
8/19/1983	15.79%	10.82%	4.97%
8/29/1983	16.00%	10.85%	5.15%
8/31/1983	14.75%	10.87%	3.88%
8/31/1983	15.25%	10.87%	4.38%
9/8/1983	14.75%	10.89%	3.86%
9/16/1983	15.51%	10.93%	4.58%
9/26/1983	14.50%	10.96%	3.54%
9/28/1983	14.25%	10.97%	3.28%
9/30/1983	16.15%	10.98%	5.17%
9/30/1983	16.25%	10.98%	5.27%
10/1/1983	16.25%	10.98%	5.27%
10/13/1983	15.52%	11.02%	4.50%
10/19/1983	15.20%	11.04%	4.16%
10/26/1983	14.75%	11.06%	3.69%
10/27/1983	14.88%	11.07%	3.81%
10/27/1983	15.33%	11.07%	4.26%
11/9/1983	14.82%	11.10%	3.72%
11/9/1983	16.51%	11.10%	5.41%
11/9/1983	16.51%	11.10%	5.41%
12/1/1983	14.50%	11.17%	3.33%
12/8/1983	15.90%	11.20%	4.70%
12/9/1983	15.30%	11.21%	4.09%
12/12/1983	14.50%	11.22%	3.28%
12/12/1983	15.50%	11.22%	4.28%
12/20/1983	15.40%	11.26%	4.14%
12/20/1983	16.00%	11.26%	4.74%
12/22/1983	15.75%	11.27%	4.48%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
12/29/1983	15.00%	11.30%	3.70%
12/30/1983	15.00%	11.30%	3.70%
1/10/1984	15.90%	11.34%	4.56%
1/13/1984	15.50%	11.36%	4.14%
1/18/1984	15.53%	11.38%	4.15%
1/26/1984	15.90%	11.42%	4.48%
2/14/1984	14.25%	11.51%	2.74%
2/28/1984	14.50%	11.58%	2.92%
3/20/1984	16.00%	11.70%	4.30%
3/23/1984	15.50%	11.72%	3.78%
4/9/1984	15.20%	11.81%	3.39%
4/18/1984	16.20%	11.86%	4.34%
4/27/1984	15.85%	11.90%	3.95%
5/15/1984	13.35%	11.99%	1.36%
5/16/1984	15.00%	12.00%	3.00%
5/22/1984	14.40%	12.04%	2.36%
6/13/1984	15.50%	12.18%	3.32%
7/10/1984	16.00%	12.37%	3.63%
8/7/1984	16.69%	12.51%	4.18%
8/9/1984	15.33%	12.51%	2.82%
8/17/1984	14.82%	12.54%	2.28%
8/21/1984	14.64%	12.54%	2.10%
8/27/1984	14.52%	12.56%	1.96%
8/28/1984	14.75%	12.57%	2.18%
8/30/1984	15.60%	12.58%	3.02%
9/12/1984	15.60%	12.60%	3.00%
9/12/1984	15.90%	12.60%	3.30%
9/25/1984	16.25%	12.61%	3.64%
10/2/1984	14.80%	12.62%	2.18%
10/9/1984	14.75%	12.63%	2.12%
10/10/1984	15.50%	12.63%	2.87%
10/18/1984	15.00%	12.65%	2.35%
10/24/1984	15.50%	12.65%	2.85%
11/7/1984	15.00%	12.64%	2.36%
11/20/1984	15.92%	12.63%	3.29%
11/30/1984	15.50%	12.60%	2.90%
12/18/1984	15.00%	12.55%	2.45%
12/20/1984	15.00%	12.54%	2.46%
12/28/1984	15.75%	12.51%	3.24%
12/28/1984	16.25%	12.51%	3.74%
1/2/1985	16.00%	12.50%	3.50%
1/31/1985	14.75%	12.37%	2.38%
2/7/1985	14.85%	12.33%	2.52%
2/15/1985	15.00%	12.27%	2.73%
2/20/1985	14.50%	12.25%	2.25%
2/22/1985	14.86%	12.25%	2.61%
3/14/1985	15.50%	12.16%	3.34%
3/28/1985	14.80%	12.08%	2.72%
4/9/1985	15.50%	12.02%	3.48%
4/16/1985	15.70%	11.96%	3.74%
6/10/1985	15.75%	11.58%	4.17%
6/26/1985	14.82%	11.46%	3.36%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
7/9/1985	15.00%	11.38%	3.62%
7/26/1985	14.50%	11.26%	3.24%
8/29/1985	14.50%	11.11%	3.39%
8/30/1985	14.38%	11.11%	3.27%
9/12/1985	15.25%	11.07%	4.18%
9/23/1985	15.30%	11.03%	4.27%
9/25/1985	14.50%	11.02%	3.48%
9/26/1985	13.80%	11.02%	2.78%
9/26/1985	14.50%	11.02%	3.48%
10/25/1985	15.25%	10.91%	4.34%
11/8/1985	12.94%	10.85%	2.09%
11/20/1985	14.90%	10.81%	4.09%
11/25/1985	13.30%	10.79%	2.51%
12/6/1985	12.00%	10.71%	1.29%
12/11/1985	14.90%	10.68%	4.22%
12/20/1985	14.88%	10.59%	4.29%
12/20/1985	15.00%	10.59%	4.41%
12/20/1985	15.00%	10.59%	4.41%
12/30/1985	15.75%	10.53%	5.22%
12/31/1985	14.00%	10.51%	3.49%
12/31/1985	14.50%	10.51%	3.99%
1/17/1986	14.50%	10.38%	4.12%
2/11/1986	12.50%	10.20%	2.30%
2/12/1986	15.20%	10.19%	5.01%
3/11/1986	14.00%	9.98%	4.02%
4/2/1986	12.90%	9.76%	3.14%
4/28/1986	13.01%	9.47%	3.54%
5/21/1986	13.25%	9.18%	4.07%
5/28/1986	14.00%	9.12%	4.88%
5/29/1986	13.90%	9.10%	4.80%
6/2/1986	13.00%	9.08%	3.92%
6/11/1986	14.00%	8.97%	5.03%
6/13/1986	13.55%	8.94%	4.61%
6/27/1986	11.88%	8.77%	3.11%
7/14/1986	12.60%	8.59%	4.01%
7/30/1986	13.30%	8.38%	4.92%
8/14/1986	13.50%	8.22%	5.28%
9/5/1986	13.30%	8.02%	5.28%
9/23/1986	12.75%	7.91%	4.84%
10/30/1986	13.00%	7.67%	5.33%
10/31/1986	13.75%	7.66%	6.09%
11/10/1986	14.00%	7.61%	6.39%
11/19/1986	13.75%	7.56%	6.19%
11/25/1986	13.15%	7.54%	5.61%
12/22/1986	13.80%	7.47%	6.33%
12/30/1986	13.90%	7.47%	6.43%
1/20/1987	12.75%	7.47%	5.28%
1/23/1987	13.55%	7.47%	6.08%
1/27/1987	12.16%	7.47%	4.69%
2/13/1987	12.60%	7.47%	5.13%
2/24/1987	12.00%	7.47%	4.53%
3/30/1987	12.20%	7.46%	4.74%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
3/31/1987	13.00%	7.47%	5.53%
5/5/1987	12.85%	7.60%	5.25%
5/28/1987	13.50%	7.73%	5.77%
6/15/1987	13.20%	7.80%	5.40%
6/30/1987	12.60%	7.85%	4.75%
7/10/1987	12.90%	7.88%	5.02%
7/27/1987	13.50%	7.93%	5.57%
8/25/1987	11.40%	8.09%	3.31%
9/18/1987	13.00%	8.27%	4.73%
10/20/1987	12.60%	8.55%	4.05%
10/20/1987	12.98%	8.55%	4.43%
11/12/1987	12.75%	8.68%	4.07%
11/13/1987	12.75%	8.68%	4.07%
11/24/1987	12.50%	8.73%	3.77%
12/8/1987	12.50%	8.81%	3.69%
12/22/1987	12.00%	8.90%	3.10%
12/31/1987	12.85%	8.94%	3.91%
12/31/1987	13.25%	8.94%	4.31%
1/15/1988	13.15%	8.99%	4.16%
1/20/1988	12.75%	8.99%	3.76%
1/29/1988	13.20%	8.99%	4.21%
2/4/1988	12.60%	8.99%	3.61%
3/23/1988	13.00%	8.95%	4.05%
5/27/1988	13.18%	9.02%	4.16%
6/14/1988	13.50%	9.00%	4.50%
6/17/1988	11.72%	8.99%	2.73%
6/24/1988	11.50%	8.97%	2.53%
7/1/1988	12.75%	8.95%	3.80%
7/8/1988	12.00%	8.93%	3.07%
7/18/1988	12.00%	8.91%	3.09%
7/20/1988	13.40%	8.90%	4.50%
8/8/1988	12.74%	8.90%	3.84%
9/20/1988	12.90%	8.93%	3.97%
9/26/1988	12.40%	8.93%	3.47%
9/27/1988	13.65%	8.93%	4.72%
9/30/1988	13.25%	8.94%	4.31%
10/13/1988	13.10%	8.93%	4.17%
10/21/1988	12.80%	8.94%	3.86%
10/25/1988	13.25%	8.94%	4.31%
10/26/1988	13.50%	8.94%	4.56%
10/27/1988	12.95%	8.94%	4.01%
10/28/1988	13.00%	8.95%	4.05%
11/15/1988	12.00%	8.98%	3.02%
11/29/1988	12.75%	9.01%	3.74%
12/19/1988	13.00%	9.05%	3.95%
12/21/1988	12.90%	9.05%	3.85%
12/22/1988	13.50%	9.05%	4.45%
1/26/1989	12.60%	9.06%	3.54%
1/27/1989	13.00%	9.06%	3.94%
2/8/1989	13.37%	9.05%	4.32%
3/8/1989	13.00%	9.04%	3.96%
5/4/1989	13.00%	9.04%	3.96%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
6/8/1989	13.50%	8.96%	4.54%
7/19/1989	11.80%	8.84%	2.96%
7/25/1989	12.80%	8.82%	3.98%
7/31/1989	13.00%	8.81%	4.19%
8/14/1989	12.50%	8.76%	3.74%
8/22/1989	12.80%	8.73%	4.07%
8/23/1989	12.90%	8.72%	4.18%
9/21/1989	12.10%	8.62%	3.48%
10/6/1989	13.00%	8.58%	4.42%
10/17/1989	12.41%	8.54%	3.87%
10/18/1989	13.25%	8.54%	4.71%
10/20/1989	12.90%	8.53%	4.37%
10/31/1989	13.60%	8.50%	5.10%
11/3/1989	12.93%	8.48%	4.45%
11/5/1989	13.20%	8.48%	4.72%
11/9/1989	12.60%	8.45%	4.15%
11/9/1989	13.00%	8.45%	4.55%
11/28/1989	12.75%	8.37%	4.38%
12/7/1989	13.25%	8.32%	4.93%
12/15/1989	13.00%	8.28%	4.72%
12/20/1989	12.90%	8.26%	4.64%
12/21/1989	12.80%	8.25%	4.55%
12/21/1989	12.90%	8.25%	4.65%
12/27/1989	12.50%	8.23%	4.27%
1/9/1990	13.00%	8.19%	4.81%
1/18/1990	12.50%	8.16%	4.34%
1/26/1990	12.10%	8.14%	3.96%
3/21/1990	12.80%	8.15%	4.65%
3/28/1990	13.00%	8.16%	4.84%
4/5/1990	12.20%	8.17%	4.03%
4/12/1990	13.25%	8.19%	5.06%
4/30/1990	12.45%	8.24%	4.21%
5/31/1990	12.40%	8.31%	4.09%
6/15/1990	13.20%	8.33%	4.87%
6/27/1990	12.90%	8.34%	4.56%
6/29/1990	13.25%	8.35%	4.90%
7/6/1990	12.10%	8.36%	3.74%
7/19/1990	11.70%	8.38%	3.32%
8/31/1990	12.50%	8.53%	3.97%
8/31/1990	12.50%	8.53%	3.97%
9/13/1990	12.50%	8.58%	3.92%
9/18/1990	12.75%	8.60%	4.15%
9/20/1990	12.50%	8.61%	3.89%
10/2/1990	13.00%	8.65%	4.35%
10/17/1990	11.90%	8.68%	3.22%
10/31/1990	12.95%	8.70%	4.25%
11/9/1990	13.25%	8.70%	4.55%
11/19/1990	13.00%	8.70%	4.30%
11/21/1990	12.10%	8.70%	3.40%
11/21/1990	12.50%	8.70%	3.80%
11/28/1990	12.75%	8.70%	4.05%
11/29/1990	12.75%	8.70%	4.05%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
12/18/1990	13.10%	8.68%	4.42%
12/20/1990	12.50%	8.67%	3.83%
12/21/1990	12.50%	8.67%	3.83%
12/21/1990	13.00%	8.67%	4.33%
12/21/1990	13.60%	8.67%	4.93%
1/3/1991	13.02%	8.66%	4.36%
1/16/1991	13.25%	8.63%	4.62%
1/25/1991	11.70%	8.61%	3.09%
2/15/1991	12.70%	8.56%	4.14%
2/15/1991	12.80%	8.56%	4.24%
4/3/1991	13.00%	8.51%	4.49%
4/30/1991	12.45%	8.48%	3.97%
4/30/1991	13.00%	8.48%	4.52%
6/25/1991	11.70%	8.34%	3.36%
6/28/1991	12.50%	8.34%	4.16%
7/1/1991	11.70%	8.34%	3.36%
7/19/1991	12.10%	8.31%	3.79%
7/19/1991	12.30%	8.31%	3.99%
7/22/1991	12.90%	8.30%	4.60%
8/15/1991	12.25%	8.28%	3.97%
8/29/1991	13.30%	8.26%	5.04%
9/27/1991	12.50%	8.23%	4.27%
9/30/1991	12.40%	8.23%	4.17%
10/3/1991	11.30%	8.22%	3.08%
10/9/1991	11.70%	8.21%	3.49%
10/15/1991	13.40%	8.20%	5.20%
11/1/1991	12.90%	8.20%	4.70%
11/8/1991	12.75%	8.20%	4.55%
11/26/1991	11.60%	8.18%	3.42%
11/26/1991	12.00%	8.18%	3.82%
11/27/1991	12.70%	8.18%	4.52%
12/6/1991	12.70%	8.16%	4.54%
12/10/1991	11.75%	8.15%	3.60%
12/19/1991	12.60%	8.14%	4.46%
12/19/1991	12.80%	8.14%	4.66%
12/30/1991	12.10%	8.11%	3.99%
1/22/1992	12.84%	8.05%	4.79%
1/31/1992	12.00%	8.03%	3.97%
2/20/1992	13.00%	8.00%	5.00%
2/27/1992	11.75%	7.98%	3.77%
3/18/1992	12.50%	7.94%	4.56%
5/15/1992	12.75%	7.86%	4.89%
6/24/1992	12.20%	7.85%	4.35%
6/29/1992	11.00%	7.85%	3.15%
7/14/1992	12.00%	7.83%	4.17%
7/22/1992	11.20%	7.82%	3.38%
8/10/1992	12.10%	7.79%	4.31%
8/26/1992	12.43%	7.75%	4.68%
9/30/1992	11.60%	7.72%	3.88%
10/6/1992	12.25%	7.72%	4.53%
10/13/1992	12.75%	7.71%	5.04%
10/23/1992	11.65%	7.71%	3.94%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
10/28/1992	12.25%	7.71%	4.54%
10/29/1992	12.75%	7.70%	5.05%
10/30/1992	11.40%	7.70%	3.70%
11/9/1992	10.60%	7.70%	2.90%
11/25/1992	11.00%	7.68%	3.32%
11/25/1992	12.00%	7.68%	4.32%
12/3/1992	11.85%	7.66%	4.19%
12/16/1992	11.90%	7.64%	4.26%
12/22/1992	12.30%	7.62%	4.68%
12/22/1992	12.40%	7.62%	4.78%
12/30/1992	12.00%	7.61%	4.39%
12/31/1992	12.00%	7.61%	4.39%
1/12/1993	12.00%	7.59%	4.41%
1/12/1993	12.00%	7.59%	4.41%
2/2/1993	11.40%	7.53%	3.87%
2/22/1993	11.60%	7.48%	4.12%
4/23/1993	11.75%	7.27%	4.48%
5/3/1993	11.50%	7.25%	4.25%
5/3/1993	11.75%	7.25%	4.50%
6/3/1993	12.00%	7.20%	4.80%
6/7/1993	11.50%	7.20%	4.30%
6/22/1993	11.75%	7.16%	4.59%
7/21/1993	11.78%	7.06%	4.72%
7/21/1993	11.90%	7.06%	4.84%
7/23/1993	11.50%	7.05%	4.45%
7/29/1993	11.50%	7.03%	4.47%
8/12/1993	10.75%	6.97%	3.78%
8/24/1993	11.50%	6.92%	4.58%
8/31/1993	11.90%	6.88%	5.02%
9/1/1993	11.25%	6.87%	4.38%
9/1/1993	11.47%	6.87%	4.60%
9/27/1993	10.50%	6.74%	3.76%
9/29/1993	11.00%	6.72%	4.28%
9/30/1993	11.60%	6.72%	4.88%
10/8/1993	11.50%	6.67%	4.83%
10/14/1993	11.20%	6.65%	4.55%
10/15/1993	11.75%	6.64%	5.11%
10/25/1993	11.55%	6.60%	4.95%
10/28/1993	11.50%	6.58%	4.92%
10/29/1993	10.10%	6.57%	3.53%
10/29/1993	10.20%	6.57%	3.63%
10/29/1993	11.25%	6.57%	4.68%
11/2/1993	10.80%	6.56%	4.24%
11/12/1993	11.80%	6.53%	5.27%
11/23/1993	12.50%	6.51%	5.99%
11/26/1993	11.00%	6.50%	4.50%
12/1/1993	11.45%	6.49%	4.96%
12/16/1993	10.60%	6.45%	4.15%
12/16/1993	11.20%	6.45%	4.75%
12/21/1993	11.30%	6.44%	4.86%
12/22/1993	11.00%	6.44%	4.56%
12/23/1993	10.10%	6.44%	3.66%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
1/5/1994	11.50%	6.41%	5.09%
1/10/1994	11.00%	6.40%	4.60%
1/25/1994	12.00%	6.37%	5.63%
2/2/1994	10.40%	6.35%	4.05%
2/9/1994	10.70%	6.34%	4.36%
4/6/1994	11.24%	6.35%	4.89%
4/25/1994	11.00%	6.39%	4.61%
6/16/1994	10.50%	6.63%	3.87%
6/23/1994	10.60%	6.67%	3.93%
7/19/1994	10.70%	6.83%	3.87%
9/29/1994	10.90%	7.20%	3.70%
9/29/1994	11.00%	7.20%	3.80%
10/7/1994	11.87%	7.26%	4.61%
10/18/1994	11.50%	7.32%	4.18%
10/18/1994	11.50%	7.32%	4.18%
10/24/1994	11.00%	7.35%	3.65%
11/22/1994	12.12%	7.52%	4.60%
11/29/1994	11.30%	7.55%	3.75%
12/1/1994	11.00%	7.56%	3.44%
12/8/1994	11.50%	7.59%	3.91%
12/8/1994	11.70%	7.59%	4.11%
12/12/1994	11.82%	7.60%	4.22%
12/14/1994	11.50%	7.61%	3.89%
12/19/1994	11.50%	7.62%	3.88%
4/19/1995	11.00%	7.72%	3.28%
9/11/1995	11.30%	7.16%	4.14%
9/15/1995	10.40%	7.13%	3.27%
9/29/1995	11.50%	7.06%	4.44%
10/13/1995	10.76%	6.98%	3.78%
11/7/1995	12.50%	6.86%	5.64%
11/8/1995	11.10%	6.85%	4.25%
11/8/1995	11.30%	6.85%	4.45%
11/17/1995	10.90%	6.81%	4.09%
11/20/1995	11.40%	6.80%	4.60%
11/27/1995	13.60%	6.77%	6.83%
12/14/1995	11.30%	6.68%	4.62%
12/20/1995	11.60%	6.65%	4.95%
1/31/1996	11.30%	6.45%	4.85%
3/11/1996	11.60%	6.40%	5.20%
4/3/1996	11.13%	6.41%	4.72%
4/15/1996	10.50%	6.41%	4.09%
4/17/1996	10.77%	6.40%	4.37%
4/26/1996	10.60%	6.40%	4.20%
5/10/1996	11.00%	6.40%	4.60%
5/13/1996	11.25%	6.41%	4.84%
7/3/1996	11.25%	6.49%	4.76%
7/22/1996	11.25%	6.54%	4.71%
10/3/1996	10.00%	6.77%	3.23%
10/29/1996	11.30%	6.84%	4.46%
11/26/1996	11.30%	6.86%	4.44%
11/27/1996	11.30%	6.86%	4.44%
11/29/1996	11.00%	6.86%	4.14%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
12/12/1996	11.96%	6.85%	5.11%
12/17/1996	11.50%	6.85%	4.65%
1/22/1997	11.30%	6.83%	4.47%
1/27/1997	11.25%	6.83%	4.42%
1/31/1997	11.25%	6.83%	4.42%
2/13/1997	11.00%	6.82%	4.18%
2/13/1997	11.80%	6.82%	4.98%
2/20/1997	11.80%	6.81%	4.99%
3/27/1997	10.75%	6.79%	3.96%
4/29/1997	11.70%	6.81%	4.89%
7/17/1997	12.00%	6.77%	5.23%
10/29/1997	10.75%	6.70%	4.05%
10/31/1997	11.25%	6.70%	4.55%
12/24/1997	10.75%	6.53%	4.22%
4/28/1998	10.90%	6.11%	4.79%
4/30/1998	12.20%	6.10%	6.10%
6/30/1998	11.00%	5.94%	5.06%
8/26/1998	10.93%	5.82%	5.11%
9/3/1998	11.40%	5.80%	5.60%
9/15/1998	11.90%	5.77%	6.13%
10/7/1998	11.06%	5.70%	5.36%
10/30/1998	11.40%	5.63%	5.77%
12/10/1998	12.20%	5.52%	6.68%
12/17/1998	12.10%	5.49%	6.61%
2/19/1999	11.15%	5.32%	5.83%
3/1/1999	10.65%	5.31%	5.34%
3/1/1999	10.65%	5.31%	5.34%
6/8/1999	11.25%	5.35%	5.90%
11/12/1999	10.25%	5.92%	4.33%
12/14/1999	10.50%	5.99%	4.51%
1/28/2000	10.71%	6.16%	4.55%
2/17/2000	10.60%	6.20%	4.40%
5/25/2000	10.80%	6.19%	4.61%
6/19/2000	11.05%	6.18%	4.87%
6/22/2000	11.25%	6.18%	5.07%
7/17/2000	11.06%	6.15%	4.91%
7/20/2000	12.20%	6.14%	6.06%
8/11/2000	11.00%	6.11%	4.89%
9/27/2000	11.25%	6.00%	5.25%
9/29/2000	11.16%	6.00%	5.16%
10/5/2000	11.30%	5.98%	5.32%
11/28/2000	12.90%	5.87%	7.03%
11/30/2000	12.10%	5.86%	6.24%
2/5/2001	11.50%	5.75%	5.75%
3/15/2001	11.25%	5.66%	5.59%
5/8/2001	10.75%	5.61%	5.14%
10/24/2001	10.30%	5.54%	4.76%
10/24/2001	11.00%	5.54%	5.46%
1/9/2002	10.00%	5.50%	4.50%
1/30/2002	11.00%	5.47%	5.53%
1/31/2002	11.00%	5.47%	5.53%
4/17/2002	11.50%	5.44%	6.06%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
4/29/2002	11.00%	5.45%	5.55%
6/11/2002	11.77%	5.48%	6.29%
6/20/2002	12.30%	5.48%	6.82%
8/28/2002	11.00%	5.49%	5.51%
9/11/2002	11.20%	5.45%	5.75%
9/12/2002	12.30%	5.45%	6.85%
10/28/2002	11.30%	5.35%	5.95%
10/30/2002	10.60%	5.34%	5.26%
11/1/2002	12.60%	5.34%	7.26%
11/7/2002	11.40%	5.33%	6.07%
11/8/2002	10.75%	5.33%	5.42%
11/20/2002	10.00%	5.30%	4.70%
11/20/2002	10.50%	5.30%	5.20%
12/4/2002	10.75%	5.27%	5.48%
12/30/2002	11.20%	5.19%	6.01%
1/6/2003	11.25%	5.16%	6.09%
2/28/2003	12.30%	5.01%	7.29%
3/7/2003	9.96%	4.99%	4.97%
3/12/2003	11.40%	4.97%	6.43%
3/20/2003	12.00%	4.95%	7.05%
4/3/2003	12.00%	4.92%	7.08%
5/2/2003	11.40%	4.88%	6.52%
5/15/2003	11.05%	4.87%	6.18%
6/26/2003	11.00%	4.80%	6.20%
7/1/2003	11.00%	4.80%	6.20%
7/29/2003	11.71%	4.78%	6.93%
8/22/2003	10.20%	4.81%	5.39%
9/17/2003	9.90%	4.85%	5.05%
9/25/2003	10.25%	4.85%	5.40%
10/17/2003	10.54%	4.87%	5.67%
10/22/2003	10.46%	4.87%	5.59%
10/22/2003	10.71%	4.87%	5.84%
10/30/2003	11.00%	4.88%	6.12%
10/31/2003	10.20%	4.88%	5.32%
10/31/2003	10.75%	4.88%	5.87%
11/10/2003	10.60%	4.89%	5.71%
12/9/2003	10.50%	4.93%	5.57%
12/18/2003	10.50%	4.94%	5.56%
12/19/2003	12.00%	4.94%	7.06%
12/19/2003	12.00%	4.94%	7.06%
1/13/2004	10.25%	4.95%	5.30%
1/13/2004	12.00%	4.95%	7.05%
2/9/2004	11.25%	4.98%	6.27%
3/16/2004	10.90%	5.05%	5.85%
3/16/2004	10.90%	5.05%	5.85%
5/25/2004	10.00%	5.06%	4.94%
6/2/2004	11.22%	5.07%	6.15%
6/30/2004	10.50%	5.10%	5.40%
7/8/2004	10.00%	5.10%	4.90%
7/22/2004	10.25%	5.10%	5.15%
8/26/2004	10.50%	5.10%	5.40%
8/26/2004	10.50%	5.10%	5.40%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
9/9/2004	10.40%	5.10%	5.30%
9/21/2004	10.50%	5.09%	5.41%
9/27/2004	10.30%	5.09%	5.21%
9/27/2004	10.50%	5.09%	5.41%
10/20/2004	10.20%	5.08%	5.12%
11/30/2004	10.60%	5.08%	5.52%
12/8/2004	9.90%	5.09%	4.81%
12/21/2004	11.50%	5.09%	6.41%
12/22/2004	11.50%	5.09%	6.41%
12/28/2004	10.25%	5.09%	5.16%
2/18/2005	10.30%	4.95%	5.35%
3/29/2005	11.00%	4.86%	6.14%
4/13/2005	10.60%	4.84%	5.76%
4/28/2005	11.00%	4.80%	6.20%
5/17/2005	10.00%	4.77%	5.23%
6/8/2005	10.18%	4.71%	5.47%
6/10/2005	10.90%	4.71%	6.19%
7/6/2005	10.50%	4.65%	5.85%
7/19/2005	11.50%	4.63%	6.87%
8/11/2005	10.40%	4.60%	5.80%
9/19/2005	9.45%	4.53%	4.92%
9/30/2005	10.51%	4.52%	5.99%
10/4/2005	9.90%	4.52%	5.38%
10/4/2005	10.75%	4.52%	6.23%
10/14/2005	10.40%	4.52%	5.88%
10/31/2005	10.25%	4.53%	5.72%
11/2/2005	9.70%	4.53%	5.17%
11/30/2005	10.00%	4.53%	5.47%
12/9/2005	9.70%	4.53%	5.17%
12/12/2005	11.00%	4.53%	6.47%
12/20/2005	10.13%	4.53%	5.60%
12/21/2005	10.40%	4.52%	5.88%
12/21/2005	11.00%	4.52%	6.48%
12/22/2005	10.20%	4.52%	5.68%
12/22/2005	11.00%	4.52%	6.48%
12/28/2005	10.00%	4.52%	5.48%
1/5/2006	11.00%	4.52%	6.48%
1/25/2006	11.20%	4.52%	6.68%
1/25/2006	11.20%	4.52%	6.68%
2/3/2006	10.50%	4.52%	5.98%
2/15/2006	9.50%	4.53%	4.97%
4/26/2006	10.60%	4.65%	5.95%
7/24/2006	9.60%	4.87%	4.73%
7/24/2006	10.00%	4.87%	5.13%
9/20/2006	11.00%	4.93%	6.07%
9/26/2006	10.75%	4.93%	5.82%
10/20/2006	9.80%	4.96%	4.84%
11/2/2006	9.71%	4.97%	4.74%
11/9/2006	10.00%	4.97%	5.03%
11/21/2006	11.00%	4.98%	6.02%
12/5/2006	10.20%	4.97%	5.23%
1/5/2007	10.40%	4.95%	5.45%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
1/9/2007	11.00%	4.94%	6.06%
1/11/2007	10.90%	4.94%	5.96%
1/19/2007	10.80%	4.93%	5.87%
1/26/2007	10.00%	4.92%	5.08%
2/8/2007	10.40%	4.91%	5.49%
3/14/2007	10.10%	4.86%	5.24%
3/20/2007	10.25%	4.84%	5.41%
3/21/2007	11.35%	4.84%	6.51%
3/22/2007	10.50%	4.84%	5.66%
3/29/2007	10.00%	4.83%	5.17%
6/13/2007	10.75%	4.81%	5.94%
6/29/2007	9.53%	4.84%	4.69%
6/29/2007	10.10%	4.84%	5.26%
7/3/2007	10.25%	4.85%	5.40%
7/13/2007	9.50%	4.86%	4.64%
7/24/2007	10.40%	4.87%	5.53%
8/1/2007	10.15%	4.88%	5.27%
8/29/2007	10.50%	4.91%	5.59%
9/10/2007	9.71%	4.91%	4.80%
9/19/2007	10.00%	4.91%	5.09%
9/25/2007	9.70%	4.92%	4.78%
10/8/2007	10.48%	4.92%	5.56%
10/19/2007	10.50%	4.91%	5.59%
10/25/2007	9.65%	4.91%	4.74%
11/15/2007	10.00%	4.89%	5.11%
11/20/2007	9.90%	4.89%	5.01%
11/27/2007	10.00%	4.88%	5.12%
11/29/2007	10.90%	4.88%	6.02%
12/14/2007	10.80%	4.87%	5.93%
12/18/2007	10.40%	4.86%	5.54%
12/19/2007	9.80%	4.86%	4.94%
12/19/2007	9.80%	4.86%	4.94%
12/19/2007	10.20%	4.86%	5.34%
12/21/2007	9.10%	4.86%	4.24%
1/8/2008	10.75%	4.83%	5.92%
1/17/2008	10.75%	4.81%	5.94%
1/17/2008	10.75%	4.81%	5.94%
2/5/2008	9.99%	4.78%	5.21%
2/5/2008	10.19%	4.78%	5.41%
2/13/2008	10.20%	4.76%	5.44%
3/31/2008	10.00%	4.63%	5.37%
5/28/2008	10.50%	4.53%	5.97%
6/24/2008	10.00%	4.52%	5.48%
6/27/2008	10.00%	4.52%	5.48%
7/31/2008	10.70%	4.50%	6.20%
7/31/2008	10.82%	4.50%	6.32%
8/27/2008	10.25%	4.50%	5.75%
9/2/2008	10.25%	4.50%	5.75%
9/19/2008	10.70%	4.48%	6.22%
9/24/2008	10.68%	4.48%	6.20%
9/24/2008	10.68%	4.48%	6.20%
9/24/2008	10.68%	4.48%	6.20%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
9/30/2008	10.20%	4.48%	5.72%
10/3/2008	10.30%	4.48%	5.82%
10/8/2008	10.15%	4.47%	5.68%
10/20/2008	10.06%	4.47%	5.59%
10/24/2008	10.60%	4.46%	6.14%
10/24/2008	10.60%	4.46%	6.14%
11/21/2008	10.50%	4.42%	6.08%
11/21/2008	10.50%	4.42%	6.08%
11/21/2008	10.50%	4.42%	6.08%
11/24/2008	10.50%	4.41%	6.09%
12/3/2008	10.39%	4.37%	6.02%
12/24/2008	10.00%	4.26%	5.74%
12/26/2008	10.10%	4.24%	5.86%
12/29/2008	10.20%	4.23%	5.97%
1/13/2009	10.45%	4.14%	6.31%
2/2/2009	10.05%	4.04%	6.01%
3/9/2009	10.30%	3.89%	6.41%
3/25/2009	10.17%	3.84%	6.33%
4/2/2009	10.75%	3.81%	6.94%
5/5/2009	10.75%	3.71%	7.04%
5/15/2009	10.20%	3.70%	6.50%
5/29/2009	9.54%	3.70%	5.84%
6/3/2009	10.10%	3.71%	6.39%
6/22/2009	10.00%	3.73%	6.27%
6/29/2009	10.21%	3.74%	6.47%
6/30/2009	9.31%	3.74%	5.57%
7/17/2009	9.26%	3.75%	5.51%
7/17/2009	10.50%	3.75%	6.75%
10/16/2009	10.40%	4.09%	6.31%
10/26/2009	10.10%	4.11%	5.99%
10/28/2009	10.15%	4.12%	6.03%
10/28/2009	10.15%	4.12%	6.03%
10/30/2009	9.95%	4.12%	5.83%
11/20/2009	9.45%	4.18%	5.27%
12/14/2009	10.50%	4.24%	6.26%
12/16/2009	10.75%	4.25%	6.50%
12/17/2009	10.30%	4.26%	6.04%
12/18/2009	10.40%	4.26%	6.14%
12/18/2009	10.40%	4.26%	6.14%
12/18/2009	10.50%	4.26%	6.24%
12/22/2009	10.20%	4.27%	5.93%
12/22/2009	10.40%	4.27%	6.13%
12/28/2009	10.85%	4.29%	6.56%
12/29/2009	10.38%	4.30%	6.08%
1/11/2010	10.24%	4.34%	5.90%
1/21/2010	10.23%	4.37%	5.86%
1/21/2010	10.33%	4.37%	5.96%
1/26/2010	10.40%	4.37%	6.03%
2/10/2010	10.00%	4.39%	5.61%
2/23/2010	10.50%	4.40%	6.10%
3/9/2010	9.60%	4.40%	5.20%
3/24/2010	10.13%	4.42%	5.71%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
3/31/2010	10.70%	4.43%	6.27%
4/1/2010	9.50%	4.43%	5.07%
4/2/2010	10.10%	4.44%	5.66%
4/8/2010	10.35%	4.44%	5.91%
4/29/2010	9.19%	4.46%	4.73%
4/29/2010	9.40%	4.46%	4.94%
4/29/2010	9.40%	4.46%	4.94%
5/17/2010	10.55%	4.46%	6.09%
5/24/2010	10.05%	4.46%	5.59%
6/3/2010	11.00%	4.46%	6.54%
6/16/2010	10.00%	4.46%	5.54%
6/18/2010	10.30%	4.46%	5.84%
8/9/2010	12.55%	4.41%	8.14%
8/17/2010	10.10%	4.40%	5.70%
9/16/2010	9.60%	4.31%	5.29%
9/16/2010	10.00%	4.31%	5.69%
9/16/2010	10.00%	4.31%	5.69%
9/16/2010	10.30%	4.31%	5.99%
10/21/2010	10.40%	4.20%	6.20%
11/2/2010	9.75%	4.17%	5.58%
11/2/2010	9.75%	4.17%	5.58%
11/3/2010	10.75%	4.17%	6.58%
11/19/2010	10.20%	4.15%	6.05%
12/1/2010	10.00%	4.13%	5.87%
12/6/2010	9.56%	4.12%	5.44%
12/6/2010	10.09%	4.12%	5.97%
12/9/2010	10.25%	4.12%	6.13%
12/14/2010	10.33%	4.11%	6.22%
12/17/2010	10.10%	4.11%	5.99%
12/20/2010	10.10%	4.11%	5.99%
12/23/2010	9.92%	4.10%	5.82%
1/6/2011	10.35%	4.09%	6.26%
1/12/2011	10.30%	4.09%	6.21%
1/13/2011	10.30%	4.09%	6.21%
3/10/2011	10.10%	4.16%	5.94%
3/31/2011	9.45%	4.20%	5.25%
4/18/2011	10.05%	4.23%	5.82%
5/26/2011	10.50%	4.32%	6.18%
6/21/2011	10.00%	4.36%	5.64%
6/29/2011	8.83%	4.38%	4.45%
8/1/2011	9.20%	4.41%	4.79%
9/1/2011	10.10%	4.33%	5.77%
11/14/2011	9.60%	3.93%	5.67%
12/13/2011	9.50%	3.76%	5.74%
12/20/2011	10.00%	3.72%	6.28%
12/22/2011	10.40%	3.70%	6.70%
1/10/2012	9.06%	3.59%	5.47%
1/10/2012	9.45%	3.59%	5.86%
1/10/2012	9.45%	3.59%	5.86%
1/23/2012	10.20%	3.53%	6.67%
1/31/2012	10.00%	3.49%	6.51%
4/24/2012	9.50%	3.16%	6.34%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
4/24/2012	9.75%	3.16%	6.59%
5/7/2012	9.80%	3.13%	6.67%
5/22/2012	9.60%	3.10%	6.50%
5/24/2012	9.70%	3.09%	6.61%
6/7/2012	10.30%	3.06%	7.24%
6/15/2012	10.40%	3.05%	7.35%
6/18/2012	9.60%	3.05%	6.55%
7/2/2012	9.75%	3.04%	6.71%
10/24/2012	10.30%	2.92%	7.38%
10/26/2012	9.50%	2.92%	6.58%
10/31/2012	9.30%	2.92%	6.38%
10/31/2012	9.90%	2.92%	6.98%
10/31/2012	10.00%	2.92%	7.08%
11/1/2012	9.45%	2.91%	6.54%
11/8/2012	10.10%	2.91%	7.19%
11/9/2012	10.30%	2.90%	7.40%
11/26/2012	10.00%	2.89%	7.11%
11/28/2012	10.40%	2.88%	7.52%
11/28/2012	10.50%	2.88%	7.62%
12/4/2012	10.00%	2.87%	7.13%
12/4/2012	10.50%	2.87%	7.63%
12/20/2012	9.50%	2.84%	6.66%
12/20/2012	10.10%	2.84%	7.26%
12/20/2012	10.25%	2.84%	7.41%
12/20/2012	10.30%	2.84%	7.46%
12/20/2012	10.40%	2.84%	7.56%
12/20/2012	10.50%	2.84%	7.66%
12/26/2012	9.80%	2.83%	6.97%
2/22/2013	9.60%	2.86%	6.74%
3/14/2013	9.30%	2.89%	6.41%
3/27/2013	9.80%	2.92%	6.88%
4/23/2013	9.80%	2.96%	6.84%
5/10/2013	9.25%	2.96%	6.29%
6/13/2013	9.40%	3.01%	6.39%
6/18/2013	9.28%	3.02%	6.26%
6/18/2013	9.28%	3.02%	6.26%
6/25/2013	9.80%	3.04%	6.76%
9/23/2013	9.60%	3.33%	6.27%
11/6/2013	10.20%	3.42%	6.78%
11/13/2013	9.84%	3.44%	6.40%
11/14/2013	10.25%	3.44%	6.81%
11/22/2013	9.50%	3.47%	6.03%
12/5/2013	10.20%	3.50%	6.70%
12/13/2013	9.60%	3.52%	6.08%
12/16/2013	9.73%	3.53%	6.20%
12/17/2013	10.00%	3.53%	6.47%
12/18/2013	9.08%	3.53%	5.55%
12/23/2013	9.72%	3.55%	6.17%
12/30/2013	10.00%	3.57%	6.43%
1/21/2014	9.65%	3.66%	5.99%
1/22/2014	9.18%	3.66%	5.52%
2/20/2014	9.30%	3.71%	5.59%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
2/21/2014	9.85%	3.72%	6.13%
2/28/2014	9.55%	3.73%	5.82%
3/16/2014	9.72%	3.74%	5.98%
4/21/2014	9.50%	3.73%	5.77%
4/22/2014	9.80%	3.73%	6.07%
5/8/2014	9.10%	3.71%	5.39%
5/8/2014	9.59%	3.71%	5.88%
6/6/2014	10.40%	3.66%	6.74%
6/12/2014	10.10%	3.66%	6.44%
6/12/2014	10.10%	3.66%	6.44%
6/12/2014	10.10%	3.66%	6.44%
7/7/2014	9.30%	3.63%	5.67%
7/25/2014	9.30%	3.60%	5.70%
7/31/2014	9.90%	3.59%	6.31%
9/4/2014	9.10%	3.50%	5.60%
9/24/2014	9.35%	3.46%	5.89%
9/30/2014	9.75%	3.44%	6.31%
10/29/2014	10.80%	3.37%	7.43%
11/6/2014	10.20%	3.35%	6.85%
11/14/2014	10.20%	3.33%	6.87%
11/14/2014	10.30%	3.33%	6.97%
11/26/2014	10.20%	3.30%	6.90%
12/3/2014	10.00%	3.29%	6.71%
1/13/2015	10.30%	3.16%	7.14%
1/21/2015	9.05%	3.13%	5.92%
1/21/2015	9.05%	3.13%	5.92%
4/9/2015	9.50%	2.88%	6.62%
5/11/2015	9.80%	2.82%	6.98%
6/17/2015	9.00%	2.79%	6.21%
8/21/2015	9.75%	2.78%	6.97%
10/7/2015	9.55%	2.82%	6.73%
10/13/2015	9.75%	2.83%	6.92%
10/15/2015	9.00%	2.84%	6.16%
10/30/2015	9.80%	2.87%	6.93%
11/19/2015	10.00%	2.89%	7.11%
12/3/2015	10.00%	2.91%	7.09%
12/9/2015	9.60%	2.92%	6.68%
12/11/2015	9.90%	2.92%	6.98%
12/18/2015	9.50%	2.94%	6.56%
1/6/2016	9.50%	2.97%	6.53%
1/6/2016	9.50%	2.97%	6.53%
1/28/2016	9.40%	2.97%	6.43%
2/10/2016	9.60%	2.95%	6.65%
2/16/2016	9.50%	2.94%	6.56%
2/29/2016	9.40%	2.92%	6.48%
4/29/2016	9.80%	2.83%	6.97%
5/5/2016	9.49%	2.82%	6.67%
6/1/2016	9.55%	2.80%	6.75%
6/3/2016	9.65%	2.79%	6.86%
6/15/2016	9.00%	2.77%	6.23%
6/15/2016	9.00%	2.77%	6.23%
9/2/2016	9.50%	2.56%	6.94%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
9/23/2016	9.75%	2.52%	7.23%
9/27/2016	9.50%	2.51%	6.99%
9/29/2016	9.11%	2.50%	6.61%
10/13/2016	10.20%	2.48%	7.72%
10/28/2016	9.70%	2.47%	7.23%
11/9/2016	9.80%	2.47%	7.33%
11/18/2016	10.00%	2.49%	7.51%
12/9/2016	10.10%	2.51%	7.59%
12/15/2016	9.00%	2.53%	6.47%
12/15/2016	9.00%	2.53%	6.47%
12/20/2016	9.75%	2.53%	7.22%
12/22/2016	9.50%	2.54%	6.96%
1/24/2017	9.00%	2.59%	6.41%
2/21/2017	10.55%	2.63%	7.92%
3/1/2017	9.25%	2.65%	6.60%
4/11/2017	9.50%	2.77%	6.73%
4/20/2017	8.70%	2.79%	5.91%
4/28/2017	9.50%	2.81%	6.69%
5/23/2017	9.60%	2.88%	6.72%
6/6/2017	9.70%	2.91%	6.79%
6/22/2017	9.70%	2.93%	6.77%
6/30/2017	9.60%	2.94%	6.66%
7/20/2017	9.55%	2.97%	6.58%
7/31/2017	10.10%	2.98%	7.12%
9/13/2017	9.40%	2.93%	6.47%
9/19/2017	9.70%	2.92%	6.78%
9/22/2017	11.88%	2.92%	8.96%
9/27/2017	10.20%	2.92%	7.28%
10/20/2017	9.60%	2.90%	6.70%
10/26/2017	10.20%	2.90%	7.30%
10/30/2017	10.05%	2.90%	7.15%
12/5/2017	9.50%	2.86%	6.64%
12/7/2017	9.80%	2.86%	6.94%
12/13/2017	9.25%	2.85%	6.40%
12/28/2017	9.50%	2.84%	6.66%
1/31/2018	9.80%	2.83%	6.97%
2/21/2018	9.80%	2.84%	6.96%
2/21/2018	9.80%	2.84%	6.96%
2/28/2018	9.50%	2.85%	6.65%
3/15/2018	9.00%	2.87%	6.13%
3/26/2018	10.19%	2.88%	7.31%
4/26/2018	9.50%	2.91%	6.59%
4/27/2018	9.30%	2.91%	6.39%
5/2/2018	9.50%	2.91%	6.59%
5/3/2018	9.70%	2.91%	6.79%
5/29/2018	9.40%	2.95%	6.45%
6/6/2018	9.80%	2.96%	6.84%
6/14/2018	8.80%	2.97%	5.83%
7/16/2018	9.60%	2.98%	6.62%
7/20/2018	9.40%	2.99%	6.41%
8/24/2018	9.28%	3.02%	6.26%
8/28/2018	10.00%	3.03%	6.97%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
9/13/2018	10.00%	3.04%	6.96%
9/14/2018	10.00%	3.05%	6.95%
9/19/2018	9.85%	3.05%	6.80%
9/20/2018	9.80%	3.05%	6.75%
9/26/2018	9.40%	3.06%	6.34%
9/26/2018	10.20%	3.06%	7.14%
9/28/2018	9.50%	3.07%	6.43%
9/28/2018	9.50%	3.07%	6.43%
10/5/2018	9.61%	3.08%	6.53%
10/15/2018	9.80%	3.09%	6.71%
10/26/2018	9.40%	3.11%	6.29%
10/29/2018	9.60%	3.11%	6.49%
11/1/2018	9.87%	3.11%	6.76%
11/8/2018	9.70%	3.12%	6.58%
11/8/2018	9.70%	3.12%	6.58%
12/11/2018	9.70%	3.14%	6.56%
12/12/2018	9.30%	3.14%	6.16%
12/13/2018	9.60%	3.14%	6.46%
12/19/2018	9.30%	3.14%	6.16%
12/21/2018	9.35%	3.14%	6.21%
12/24/2018	9.25%	3.14%	6.11%
12/24/2018	9.25%	3.14%	6.11%
1/4/2019	9.80%	3.14%	6.66%
1/18/2019	9.70%	3.14%	6.56%
3/14/2019	9.00%	3.12%	5.88%
3/27/2019	9.70%	3.12%	6.58%
4/30/2019	9.73%	3.11%	6.62%
5/7/2019	9.65%	3.10%	6.55%
5/21/2019	9.80%	3.10%	6.70%
9/4/2019	10.00%	2.76%	7.24%
9/26/2019	9.90%	2.69%	7.21%
10/2/2019	9.73%	2.67%	7.06%
10/8/2019	9.40%	2.64%	6.76%
10/15/2019	9.70%	2.62%	7.08%
10/21/2019	9.40%	2.60%	6.80%
10/31/2019	9.70%	2.57%	7.13%
10/31/2019	10.00%	2.57%	7.43%
10/31/2019	10.00%	2.57%	7.43%
10/31/2019	10.20%	2.57%	7.63%
11/7/2019	9.35%	2.55%	6.80%
11/13/2019	9.60%	2.54%	7.06%
11/13/2019	9.60%	2.54%	7.06%
12/6/2019	9.87%	2.47%	7.40%
12/11/2019	9.40%	2.46%	6.94%
12/17/2019	9.75%	2.44%	7.31%
12/18/2019	9.60%	2.44%	7.16%
12/18/2019	9.60%	2.44%	7.16%
12/19/2019	10.05%	2.44%	7.61%
12/19/2019	10.20%	2.44%	7.76%
12/19/2019	10.25%	2.44%	7.81%
12/20/2019	9.20%	2.44%	6.76%
12/26/2019	9.75%	2.42%	7.33%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
1/15/2020	9.35%	2.37%	6.98%
1/16/2020	8.80%	2.37%	6.43%
1/24/2020	9.44%	2.35%	7.09%
2/3/2020	9.40%	2.32%	7.08%
2/24/2020	9.10%	2.27%	6.83%
2/25/2020	9.50%	2.27%	7.23%
2/28/2020	9.70%	2.25%	7.45%
3/25/2020	9.40%	2.15%	7.25%
3/26/2020	9.48%	2.14%	7.34%
4/21/2020	9.80%	2.02%	7.78%
5/19/2020	9.20%	1.94%	7.26%
		Count	1,155
		Average	4.77%

Exhibit (DWD-7)

Expected Earnings Analysis

Company	Ticker	[1] Expected ROE 2023-25	[2] Shares Outstanding 2020	[3] Shares Outstanding 2023-25	[4] Shares Outstanding % Increase	[5] Adjustment Factor	[6] Adjusted ROE
Atmos Energy Corporation	ATO	9.0%	125.00	145.00	3.01%	1.015	9.13%
New Jersey Resources Corporation	NJR	9.5%	96.00	100.00	0.82%	1.004	9.54%
Northwest Natural Holding Company	NWN	11.5%	31.00	32.00	0.64%	1.003	11.54%
ONE Gas, Inc.	OGS	9.5%	53.00	55.00	0.74%	1.004	9.54%
South Jersey Industries, Inc.	SJI	12.0%	95.00	102.00	1.43%	1.007	12.09%
Southwest Gas Holdings, Inc.	SWX	9.5%	57.00	65.00	2.66%	1.013	9.62%
Spire Inc.	SR	7.0%	52.00	55.00	1.13%	1.006	7.04%
						Median	9.54%
						Average	9.78%

Notes:
[1] Source: Value Line
[2] Source: Value Line
[3] Source: Value Line
[4] Equals = ([3] / [2])^(1/5)-1
[5] Equals (2 x (1 + [4])) / (2 + [4])
[6] Equals [1] x [5]

Exhibit (DWD-8)

Summary of Adjustment Clauses & Alternative Regulation/Incentive Plans

			Adjustment Clauses					Alternative Regulation / Incentive Plans	
Company	Parent	State	Gas Commodity/Supply	Decoupling (F/P) [1]	Capital Investment [2]	Energy Efficiency [3]	Other [4]	Formula-Based Rates	Earnings Sharing/PBR
Atmos Energy	ATO	Colorado	✓		✓	✓	✓		
Atmos Energy	ATO	Kansas	✓	P	✓		✓		
Atmos Energy	ATO	Kentucky	✓	P	✓	✓			✓
Atmos Energy	ATO	Louisiana	✓	P	✓			✓	✓
Atmos Energy	ATO	Mississippi	✓	P	✓	✓	✓	✓	
Atmos Energy	ATO	Tennessee	✓	P	✓			✓	✓
Atmos Energy	ATO	Texas	✓	P	✓	✓	✓	✓	
Atmos Energy	ATO	Virginia	✓	P	✓				
New Jersey Natural Gas	NJR	New Jersey	✓	F	✓	✓	✓		
Northwest Natural Gas	NWN	Oregon	✓	P		✓	✓		
Northwest Natural Gas	NWN	Washington	✓			✓	✓		
Kansas Gas Service	OGS	Kansas	✓	P	✓		✓		
Oklahoma Natural Gas	OGS	Oklahoma	✓	P	✓	✓	✓	✓	✓
Texas Gas Service	OGS	Texas	✓	P	✓	✓	✓	✓	
Elizabethtown Gas	SJI	New Jersey	✓	P	✓	✓	✓		
South Jersey Gas	SJI	New Jersey	✓	F	✓	✓	✓		
Alabama Gas Corporation	SR	Alabama	✓	P	✓		✓	✓	
Spire Gulf Inc. (Mobile Gas Corporation)	SR	Alabama	✓	P	✓		✓	✓	
Spire Missouri East	SR	Missouri	✓	P	✓		✓		
Spire Missouri West	SR	Missouri	✓	P	✓		✓		
Southwest Gas Corporation	SWX	Arizona	✓	F	✓	✓	✓		
Southwest Gas Corporation	SWX	California	✓	F	✓	✓	✓		
Southwest Gas Corporation	SWX	Nevada	✓	F	✓	✓	✓		

Notes:

Note: A mechanism may cover one or more cost categories; therefore, designations may not indicate separate mechanisms for each category.

[1] Full or partial decoupling (such as Fixed Variable rate design, weather normalization clauses, and recovery of lost revenues as a result of Energy Efficiency programs). All full or partial decoupling mechanisms include weather normalization adjustments.

[2] Includes recovery of costs related to infrastructure replacement, system integrity/hardening, and other capital expenditures.

[3] Utility-sponsored conservation, energy efficiency, or other demand side management programs.

[4] Pension expenses, bad debt costs, storm costs, transmission/transportation costs, environmental, regulatory fee, government & franchise fees and taxes, economic development, and low income programs.

Sources: Operating company tariffs; Regulatory Research Associates, Alternative Ratemaking Plans in the US, April 16, 2020; Regulatory Research Associates, *Adjustment Clauses: A State-by-State Overview,* November 12, 2019; *Edison Electric Institute, Alternative Regulation for Emerging Utility Challenges: 2015 Update, November 11, 2015* .

Exhibit (DWD-9)

Two most recent open market common stock issuances per company, if available

Company	Date	Shares Issued	Offering Price	Underwriting Discount	Offering Expense	Net Proceeds Per Share	Total Flotation Costs	Gross Equity Issue Before Costs	Net Proceeds	Flotation Cost Percentage
Duke Energy Corporation	11/18/2019	28,750,000	$85.99	$0.0000	$592,000	$85.97	$592,000	$2,472,212,500	$2,471,620,500	0.024%
Duke Energy Corporation	3/6/2018	21,275,000	$74.07	$0.0000	$450,000	$74.05	$450,000	$1,575,881,800	$1,575,431,800	0.029%
Atmos Energy Corporation	11/28/2018	8,059,300	$92.75	$0.9769	$1,000,000	$91.65	$8,873,130	$747,500,075	$738,626,945	1.187%
Atmos Energy Corporation	11/28/2017	4,558,404	$88.56	NA	NA	NA	NA	$403,692,258	NA	NA
New Jersey Resources Corporation	12/4/2019	6,545,454	$41.25	$1.2375	$500,000	$39.94	$8,599,999	$269,999,978	$261,399,978	3.185%
Northwest Natural Holding Company	6/4/2019	1,437,500	$67.00	$2.1775	$400,000	$64.54	$3,530,156	$96,312,500	$92,782,344	3.665%
Northwest Natural Holding Company	11/10/2016	1,012,000	$54.63	$2.0500	$250,000	$52.33	$2,324,600	$55,285,560	$52,960,960	4.205%
South Jersey Industries, Inc.	4/18/2018	12,669,491	$29.50	$1.0325	$700,000	$28.41	$13,781,249	$373,749,985	$359,968,735	3.687%
South Jersey Industries, Inc.	5/12/2016	8,050,000	$26.25	$0.9188	$330,000	$25.29	$7,725,938	$211,312,500	$203,586,563	3.656%
Southwest Gas Holdings, Inc.	11/27/2018	3,565,000	$75.50	$2.5481	$600,000	$72.78	$9,683,977	$269,157,500	$259,473,524	3.598%
Spire Inc.	5/7/2018	2,300,000	$68.75	$2.1094	$325,000	$66.50	$5,176,574	$158,125,000	$152,948,426	3.274%
Spire Inc.	5/12/2016	2,185,000	$63.05	$2.0491	$300,000	$60.86	$4,777,284	$137,764,250	$132,986,967	3.468%
Mean							$5,955,901	$564,249,492		
								WEIGHTED AVERAGE FLOTATION COSTS:		1.056%

Constant Growth Discounted Cash Flow Model Adjusted for Flotation Costs - 30 Day Average Stock Price

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
					Expected Dividend Yield								
Company	Ticker	Annualized Dividend	Average Stock Price	Dividend Yield	Current	Adjusted for Flot. Costs	Zacks Earnings Growth	First Call Earnings Growth	Value Line Earnings Growth	Value Line Retention Growth	Average Earnings Growth	DCF k(e)	Flotation Adjusted DCF k(e)
Atmos Energy Corporation	ATO	$2.30	$100.19	2.30%	2.38%	2.41%	7.20%	7.50%	7.00%	8.97%	7.67%	10.05%	10.08%
New Jersey Resources Corporation	NJR	$1.25	$33.28	3.76%	3.84%	3.88%	6.00%	6.00%	2.00%	4.06%	4.51%	8.36%	8.40%
Northwest Natural Holding Company	NWN	$1.91	$62.94	3.03%	3.22%	3.25%	NA	3.75%	26.50%	6.34%	12.20%	15.42%	15.45%
ONE Gas, Inc.	OGS	$2.16	$81.08	2.66%	2.74%	2.77%	5.50%	5.00%	6.50%	5.05%	5.51%	8.25%	8.28%
South Jersey Industries, Inc.	SJI	$1.18	$27.25	4.33%	4.54%	4.59%	10.20%	10.20%	12.50%	6.70%	9.90%	14.44%	14.49%
Southwest Gas Holdings, Inc.	SWX	$2.28	$74.52	3.06%	3.17%	3.20%	6.00%	8.20%	8.00%	7.00%	7.30%	10.47%	10.50%
Spire Inc.	SR	$2.49	$71.83	3.47%	3.55%	3.58%	4.70%	4.65%	5.50%	3.63%	4.62%	8.17%	8.21%
Proxy Group Mean												10.74%	10.77%

Notes:
The proxy group DCF result is adjusted for flotation costs by dividing each company's expected dividend yield by (1 - flotation cost). The flotation cost adjustment is derived as the difference between the unadjusted DCF result and the DCF result adjusted for flotation costs.

DCF Result Adjusted For Flotation Costs: 10.77%
DCF Result Unadjusted For Flotation Costs: 10.74%
Difference (Flotation Cost Adjustment): 0.04% [13]

[1] Source: Bloomberg Professional
[2] Source: Bloomberg Professional
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.5 x [10])
[5] Equals [4] / (1 - 1.056%)
[6] Source: Zacks
[7] Source: Yahoo! Finance
[8] Source: Value Line
[9] Source: Exhibit DWD-2, Value Line
[10] Equals Average([6], [7], [8], [9])
[11] Equals [4] + [10]
[12] Equals [5] + [10]
[13] Equals Average [12] - Average [11]