



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

Docket No. DG 20-105

Liberty Utilities (EnergyNorth Natural Gas) Corp. d/b/a Liberty Utilities
Distribution Service Rate Case

DIRECT TESTIMONY

OF

JOHN COCHRANE

July 31, 2020

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1 **I. INTRODUCTION AND BACKGROUND**

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

3 A. My name is John Cochrane. I am a Senior Managing Director and head of the Power &
4 Utilities practice at FTI Consulting, Inc. (“FTI”). My business address is 200 State St, 9th
5 Floor, Boston, Massachusetts.

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

7 A. I am submitting testimony on behalf of Liberty Utilities (EnergyNorth Natural Gas) Corp.
8 d/b/a Liberty Utilities (“EnergyNorth” or “the Company”).

9 **Q. Please describe your education and professional experience.**

10 A. I have more than 30 years of experience in utility finance. Prior to joining FTI, I held
11 senior executive positions at National Grid plc (“National Grid”), where I was most
12 recently Executive Vice President of Global Mergers & Acquisitions and Business
13 Development. Prior to holding that position, I was Executive Vice President, Chief
14 Financial Officer, and Treasurer for National Grid’s U.S. business. I also serve or have
15 served as a member of the Board of Directors of several utilities and other companies in
16 the energy sector. I hold a Bachelor’s degree in Biology from Harvard University and an
17 MBA from Northeastern University. A copy of my resume is provided as Attachment
18 JC-1.

19 **Q. Please describe FTI’s Power & Utilities practice.**

20 A. FTI is a worldwide consulting firm dedicated to helping organizations manage change,
21 mitigate risk, and resolve disputes. Our Power & Utilities practice brings these services

1 to firms in regulated and competitive energy industries. The services we provide our
2 utility clients include expert testimony, regulatory advice, support for strategic decision-
3 making, and advice regarding investments and capital allocation. Our team is comprised
4 of former utility executives, regulators, investors, and financial analysts that combine for
5 hundreds of years of experience in the regulated energy space.

6 **Q. Have you previously testified before the New Hampshire Public Utilities**
7 **Commission?**

8 A. Yes, I have testified before the New Hampshire Public Utilities Commission
9 (“Commission”) in several proceedings, most recently in Liberty Utilities (Granite State
10 Electric) Corp. d/b/a Liberty Utilities distribution service rate case, Docket No. DE 19-
11 064, and EnergyNorth d/b/a Liberty Utilities distribution service rate case, Docket No.
12 DG 19-161. A list of select testimony is included in Attachment JC-1.

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

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

15 A. The purpose of my testimony is to present evidence and provide recommendations
16 regarding the Return on Equity (“ROE”) the Company should be allowed to earn on the
17 equity portion of its rate base as well as recommendations regarding the Company’s
18 capital costs and capital structure.

1 **Q. Please summarize your conclusions regarding the authorized ROE for the**
2 **Company.**

3 A. Based on the analyses that I describe in this testimony, I conclude that the reasonable
4 range within which the Commission should authorize EnergyNorth's ROE is between
5 9.94% and 11.20%. I recommend that the Commission authorize the Company to earn an
6 ROE of 10.51%, which is the "Mid ROE" from my reasonable range as discussed in
7 more detail below.

8 **Q. Please summarize how you reached those conclusions.**

9 A. My recommendations regarding the reasonable range of ROE are based on quantitative
10 and qualitative analyses I undertook utilizing analytical approaches that are widely
11 accepted for estimating a utility's cost of capital in New Hampshire and elsewhere. I
12 developed analyses using two variants of the Discounted Cash Flow ("DCF") method, the
13 Constant Growth DCF method and the Multi-Stage DCF method, and I also used the
14 Capital Asset Pricing Model ("CAPM") to arrive at my preliminary estimate of a
15 reasonable range of ROEs for EnergyNorth. I then undertook a quantitative analysis to
16 adjust that range to account for the costs that EnergyNorth will incur in the issuance of
17 new capital. Finally, I undertook quantitative and qualitative analyses of the Company's
18 risk profile, including a small size premium, and the business environment in which it
19 operates, to inform my recommendation of 10.51%. A summary of the results from these
20 analyses is presented in Attachment JC-2.

1 **Q. What are your recommendations regarding the Company’s proposed capital**
 2 **structure and cost of debt?**

3 A. I propose a capital structure that is comprised of 49.85% long-term debt as approved by
 4 the Commission in Docket No. DG 17-048 and 50.15% equity. I find this is reasonable
 5 and consistent with other utility companies in my comparable group. Regarding the cost
 6 of debt, the Company proposes to use its actual net cost of debt of 4.42% for long-term
 7 debt, which I also find reasonable.

8 **Q. What are your conclusions regarding EnergyNorth’s total rate of return?**

9 A. I conclude that a total Rate of Return (“ROR”) of 7.47% is reasonable, based on an
 10 authorized ROE of 10.51%, a long-term debt cost of 4.42%, and a capital structure that
 11 includes 50.15% equity.

12 **Table 1. ROR Summary Calculation**

Cost of Equity	10.51%	<i>a</i>
Capital structure equity weight	50.15%	<i>b</i>
Cost of long-term debt	4.42%	<i>c</i>
Capital structure long-term debt weight	49.85%	<i>d</i>
Overall rate of return	7.47%	$e = a*b + c*d$

13
 14 **Q. How is the remainder of your testimony organized?**

15 A. The remainder of my testimony is organized as follows:

- 16 • Section III describes the key regulatory principles underlying the estimation of the
- 17 cost of capital for a regulated utility;

- 1 • Section IV describes the selection and composition of a proxy group of utility
- 2 companies I used to conduct the analyses that underlie my testimony;
- 3 • Section V details the analyses I undertook to estimate EnergyNorth’s cost of
- 4 equity;
- 5 • Section VI describes the risk factors that justify establishing EnergyNorth’s ROE
- 6 in the middle of the range of reasonable ROEs;
- 7 • Section VII discusses my findings regarding the Company’s proposed capital
- 8 structure;
- 9 • Section VIII discusses my findings regarding the Company’s proposed cost of
- 10 debt; and
- 11 • Section IX summarizes my conclusions and recommendations.

12 **III. REGULATORY PRINCIPLES**

13 **Q. Please describe the guiding principles to which you adhere in estimating the ROE**

14 **for a regulated utility.**

15 A. The United States Supreme Court established the standards for determining the fairness

16 or reasonableness of a utility’s allowed ROE in *Bluefield Water Works and Improvement*

17 *Co. v. Public Service Commission of Virginia* (“Bluefield”)¹ and *Federal Power*

18 *Commission v. Hope Natural Gas Co.* (“Hope”).² In those proceedings, the Court

19 established that a regulated utility’s ROE should be sufficient to attract capital and

¹ *Bluefield Waterworks & Improvement Co. v. Public Service Commission of West Virginia*, 262 U.S. 679 (1923).

² *Federal Power Commission v. Hope Natural Gas Co.*, 320 U.S. 591 (1944).

1 support the company's credit quality, and that the ROE should be consistent with the
2 returns investors would require in making investments of similar risk.

3 **Q. Did you review any relevant precedents in New Hampshire?**

4 A. Yes, I did. Commission Order No. 24,972 supports the *Hope* and *Bluefield* standards.

5 Specifically, that Order states that the Commission is:

6 [B]ound to set a rate of return that falls within a zone of
7 reasonableness, neither so low to result in a confiscation of
8 company property, nor so high as to result in extortionate
9 charges to customers. A rate falling within the zone should,
10 at a minimum, be sufficient to yield the cost of debt and
11 equity capital necessary to provide the assets required for the
12 discharge of the company's responsibility.³

13 **Q. Please summarize what these standards require.**

14 A. Based on these standards, the return authorized in this proceeding should afford

15 EnergyNorth the opportunity to earn a return that is:

- 16 • Adequate to attract capital at reasonable rates, allowing the Company to make the
17 capital investments it requires to provide safe, reliable service;
- 18 • Sufficient to ensure the Company's financial integrity; and
- 19 • Consistent with returns provided by investments in other utilities with comparable
20 risk profiles.

³ Order No. 24,972 at 54 (May 29, 2009) (quoting *Appeal of Conservation Law Foundation*, 127 N.H. 606, 635 (1986)).

1 **IV. PROXY GROUP SELECTION**

2 **Q. Please briefly describe EnergyNorth.**

3 A. EnergyNorth provides gas distribution services to approximately 97,000 customers in
4 New Hampshire. The Company is a subsidiary of Liberty Utilities Co. (“Liberty”) and
5 Liberty is a subsidiary of Algonquin Power & Utilities Corp. (“Algonquin”). Algonquin
6 is based in Ontario, Canada and owns regulated utility companies and renewable
7 generation assets in jurisdictions throughout North America. Algonquin is traded on the
8 Toronto Stock Exchange and the New York Stock Exchange.

9 **Q. Why is it necessary to use a proxy group to estimate EnergyNorth’s ROE?**

10 A. EnergyNorth is not a publicly traded company, which makes it impossible to directly
11 observe its cost of equity. Even if it were publicly traded, anomalous or transitory events
12 may mean that its current ROE is not generally reflective of its economic and financial
13 fundamentals or indicative of investor expectations moving forward. For both reasons, it
14 is standard practice to develop a “proxy group” of comparable, publicly traded companies
15 that can be analyzed and from which inferences regarding EnergyNorth’s ROE can be
16 drawn.

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

18 A. Starting with the list of all companies categorized by Value Line as Gas Utilities, I
19 applied a set of screening guidelines. Specifically, companies were generally included in
20 the proxy group if:

- 1 • They received at least 60% of their operating income or net income from
- 2 regulated gas operations;
- 3 • They had investment-grade issuer ratings from either Standard & Poor’s (“S&P”)
- 4 or Moody’s;
- 5 • They consistently paid quarterly dividends with no cuts over the past four years;
- 6 • They were covered by at least two industry analysts;
- 7 • They had positive earnings growth estimates from at least two industry analysts;
- 8 • They had not been part of a significant transaction within the past six months.

9 **Q. Have similar criteria been used to select proxy group companies in past proceedings**
10 **before the Commission?**

11 A. Yes, these criteria are similar to those used in past proceedings before the Commission.

12 **Q. Please identify the companies in your proxy group.**

13 A. The proxy group includes the following eight companies:

14 **Table 2. Proxy Group**

Company Name	Stock Ticker
Atmos Energy	ATO
Chesapeake Utilities (“Chesapeake”)	CPK
NiSource Inc.	NI
New Jersey Resources	NJR
ONE Gas, Inc.	OGS
South Jersey Industries	SJI
Spire, Inc.	SR
Southwest Gas	SWX

15

1 **Q. Is there any company shown in Table 2 that does not meet every aspect of your**
2 **screening guidelines?**

3 A. Yes, Chesapeake is not publicly rated by either Moody's or S&P. However, it has a
4 Value Line Financial Strength rating of A, which is comparable to or higher than the rest
5 of the proxy group companies.

6 **Q. Has Chesapeake been involved in any recent transactions?**

7 A. Yes. In July 2020, the Maryland Public Service Commission approved its acquisition of
8 Elkton Gas ("Elkton"), a natural gas utility that serves approximately 7,000 residential
9 and commercial customers in Maryland. Because the transaction is very small, I decided
10 it did not merit Chesapeake's exclusion from the proxy group.

11 **Q. Why is neither EnergyNorth nor Algonquin included in your proxy group of**
12 **companies?**

13 A. It is typical to not include the firm that is the subject of a rate proceeding in the
14 composition of a proxy group in order to avoid any circularity issues that could bias
15 results. In addition, EnergyNorth is not publicly traded nor does it make up the entirety
16 of a publicly traded company. Because the cost of equity is a market-based concept and,
17 therefore, readily observable and accessible data must be used, the proxy group cannot
18 include EnergyNorth and instead consists of publicly traded companies that are similar in
19 business and financial risks to EnergyNorth.

1 **V. COST OF EQUITY ANALYSIS**

2 **Q. Please explain the relevance of a regulated utility's ROE in the context of setting**
3 **retail gas rates.**

4 A. Utilities are allowed to earn a return on the capital investments they make to provide for
5 safe and reliable operation of their natural gas systems. Those returns contribute to the
6 utility's cost of service, which are recovered through rates approved by the Commission.
7 Regulators authorize a ROR that utilities are allowed to earn on their investments based
8 on the weighted average cost of debt and cost of equity for investments made. These
9 authorized returns will reimburse investors for the capital they have provided to the
10 utility.

11 **Q. How is a regulated utility's ROE estimated?**

12 A. While a utility's cost of debt can generally be observed directly from market rates paid
13 for newly issued debt, the cost of equity must be estimated using market-based
14 information. Although methods vary, the generally accepted approach for doing so is to
15 identify a group of utility companies with similar risk and operating profiles as the utility
16 in question, apply various methodologies to determine their ROEs, and compile an
17 estimate of the utility's ROE based on the results of those analyses plus any adjustments
18 that are required to account for the specific operating and financial factors applicable to
19 the utility that is the subject of the analysis.

1 **Q. Which methods did you utilize to estimate EnergyNorth's ROE?**

2 A. I utilized three different financial models to analyze the proxy group and estimate the
3 Company's ROE. Those models are the Constant Growth DCF, the Multi-Stage DCF,
4 and the CAPM. I used the results of those models to establish a preliminary range of
5 reasonable ROEs. I then adjusted that range to account for the costs that EnergyNorth
6 incurs when issuing new common equity to fund investments in its system.

7 **Q. Why did you use three models to estimate EnergyNorth's ROE?**

8 A. It is widely accepted practice in New Hampshire and elsewhere to estimate ROE using
9 multiple models, and then synthesize a recommended range and point estimate from
10 those results, because any given model will necessarily utilize certain assumptions which,
11 under some conditions, could limit the accuracy of the model. Additionally, since the
12 models rely on different data inputs and assumptions, using more than one model reduces
13 the potential for some anomalous market result or transient market condition to have an
14 undue influence on results.

15 **Q. Has the Commission recognized the use of more than one analytical approach for
16 estimating ROE?**

17 A. Yes, it has done so on numerous occasions. In each of the gas and electric rate cases filed
18 before the Commission in the last five years, multiple analytical approaches were used to
19 estimate the filing utility's ROE.

1 **Q. Has the Commission and its Staff commented on the appropriateness of using the**
2 **Constant Growth DCF and Multi-Stage DCF models in previous proceedings?**

3 A. Yes, they have. The Constant Growth DCF model appears to have widespread support
4 from both the Commission and its Staff. Regarding the Multi-Stage DCF model, the
5 Commission indicated in 2004 that: “Staff testimony supports the view that a three-stage
6 version of the DCF represents a valuable refinement to the DCF method of estimating the
7 cost of capital looking forward over the long term. We agree.”⁴

8 **Q. Did you use the three-stage version of the DCF in your analysis?**

9 A. Yes, I did.

10 **A. Constant Growth DCF Method**

11 **Q. Please describe the Constant Growth DCF approach.**

12 A. The Constant Growth DCF method of estimating a utility’s ROE is based on the theory
13 that a company’s stock price represents the Present Value (“PV”) of all future dividend
14 payments. Dividend payments are assumed to continue at their current level into
15 perpetuity and stock prices can be observed in the market. The discount rate implied by
16 the dividends and the current stock price is equal to the company’s cost of equity. Thus,
17 the theory holds that a company’s stock price is equal to the following:

18
$$P_0 = \frac{D}{ROE - g}$$

⁴ Verizon New Hampshire, Order No. 24,265 at 65 (Jan. 16, 2004).

1 where P_0 is the current stock price, D is the current dividend, ROE is equal to the
2 discount rate required to yield the observable stock price given expected dividends, and g
3 is the expected growth rate in dividends. By restating the same equation, ROE can be
4 expressed as:

$$ROE = \frac{D}{P_0} + g$$

5
6 **Q. Please summarize your approach to estimating ROE using the Constant Growth**
7 **DCF method.**

8 A. The Constant Growth DCF method relies on the assumption that a company's dividend
9 payments, earnings, and book value will grow at a constant rate, and that its current cost
10 of equity, its dividend payout ratio, the ratio between a company's total dividend
11 payments to its net income, and its Price-Earnings Ratio ("PE Ratio"), which is the ratio
12 of its stock price to its earnings, will all remain constant. The Constant Growth DCF
13 method also requires a discount rate that is greater than the expected earnings growth
14 rate. Assuming that each of these assumptions hold true, I calculated the ROE for each of
15 the companies in the proxy group using publicly available data for stock prices and
16 analyst estimates of earnings growth. The ROE estimate for EnergyNorth is based on the
17 average of the ROE estimates for each proxy group company. Low, Mid, and High
18 estimates are developed based on which growth estimates are used, as I describe in detail
19 below.

1 **Q. Please explain the stock price data you used in your calculations.**

2 A. Rather than relying on a single stock closing price, I averaged the closing stock prices
3 over three periods: 30, 90, and 180 trading days. The periods I used for each calculation
4 are shown below:

5 **Table 3. Stock Price Averaging Periods**

Averaging Period	Start Date	End Date
30-day	May 29, 2020	July 10, 2020
90-day	March 4, 2020	July 10, 2020
180-day	October 23, 2019	July 10, 2020

6
7 **Q. Why is it necessary to use different averaging periods?**

8 A. I used the multiple averaging periods to reduce any bias that could be introduced by
9 anomalous market conditions if the stock price were based on the results of a single
10 trading day.

11 **Q. Did you make any adjustments to the dividend yield?**

12 A. Yes. To account for the fact that dividends are paid on a quarterly basis and may be
13 increased at different times, I have adjusted the dividend yield by one-half of the
14 expected long-term growth rate. This adjustment has been common practice both in New
15 Hampshire and elsewhere. In particular, the Federal Energy Regulatory Commission
16 (“FERC”) has stated:

17 For ratemaking purposes, the Commission rearranges the
18 DCF formula to solve for “k”, the discount rate, which
19 represents the rate of return that investors require to invest
20 in a company’s common stock, and then multiplies the

1 dividend yield by the express $(1 + .5g)$ to account for the fact
2 that dividends are paid on a quarterly basis. Multiplying the
3 dividend yield by $(1 + .5g)$ increases the dividend yield by
4 one half of the growth rate and produces what the
5 Commission refers to as the “adjusted dividend yield.”⁵

6 **Q. Please identify the source of the growth expectations assumptions you used in your**
7 **calculations.**

8 A. For each company in the proxy group, I used the latest earnings growth estimate as
9 reported by Yahoo Finance, Value Line, and Zacks. These sources are widely used in
10 regulatory proceedings in New Hampshire and elsewhere.

11 **Q. Please describe the results of your analysis using the Constant Growth DCF method.**

12 A. Using the stock prices from each of the three averaging periods, I developed three ROE
13 estimates, which vary by the earnings growth estimate on which it relies. My Mid ROE
14 calculation is based on average earnings growth estimates from Yahoo Finance, Value
15 Line, and Zacks. The Low ROE and High ROE calculations use the earnings growth
16 estimates that are the lowest and highest, respectively, of the three sources. My
17 calculations are provided in Attachment JC-2 and the results are shown below:

18 **Table 4. Constant Growth DCF Method Calculation Results**

Averaging Period	Low	Mid	High
30-day	8.99%	10.40%	12.03%
90-day	8.95%	10.35%	11.98%
180-day	8.70%	10.10%	11.74%

19

⁵ Opinion No. 531, 147 FERC ¶ 61,234 at p. 9.

1 I have averaged the results for each of the three averaging periods to calculate the Low,
2 Mid, and High Estimates shown below in Table 5.

3 **Table 5. Average Constant Growth DCF Results**

Low	Mid	High
8.88%	10.28%	11.92%

4
5 **B. Multi-Stage DCF**

6 **Q. What other types of DCF analysis did you utilize to estimate EnergyNorth's ROE?**

7 A. I also utilized a Multi-Stage (three stage) DCF method to estimate the ROE.

8 **Q. Please explain the Multi-Stage DCF.**

9 A. Like the Constant Growth DCF, the analytical basis for the Multi-Stage DCF is the
10 assumption that a utility's stock price is equal to the PV of the cash flows that will be
11 received by the stockholder. The Multi-Stage DCF assumes that those cash flows are
12 received in three different periods. Stage 1 includes cash flows from dividend payments
13 received in years 1 through 5 in the future. Stage 2 includes cash flows from dividend
14 payments received in years 6 through 10. Stage 3 includes cash flows received thereafter.
15 As with my calculations using the Constant Growth DCF method, I estimated
16 EnergyNorth's ROE using the stock prices from the three averaging periods (30-day, 90-
17 day, and 180-day) and developed a Low, Mid, and High ROE estimate using each
18 averaging period. As I describe earlier in my testimony, the use of Multi-Stage DCF in
19 addition to other models is standard practice in New Hampshire and elsewhere, and the

1 use of a Multi-Stage DCF that includes three stages has specifically been recommended
2 by the Commission for the estimation of utility ROEs.

3 **Q. How did you estimate the dividend payments in Stage 1?**

4 A. In Stage 1, my estimates of dividend payments are based on the earnings growth
5 estimates from Yahoo Finance, Value Line and Zacks. For the Mid ROE estimate, I used
6 the average of the three sources. For the Low and High ROE estimates, I used the lowest
7 and highest, respectively, of those three estimates.

8 **Q. How did you estimate the dividend payments in Stage 3?**

9 A. Beginning 11 years into the future, I assume that dividend payments will grow at the
10 same rate as the long-term growth of the economy, as measured by U.S. Gross Domestic
11 Product (“GDP”). My estimate of long-term GDP growth is based on historical real GDP
12 growth plus an adjustment for expected inflation.

13 **Q. How did you calculate the historical GDP?**

14 A. Using quarterly data from the U.S. Bureau of Economic Analysis as reported by the
15 Federal Reserve Bank of St. Louis, I calculated that over the period 1929 to 2019, the
16 U.S. economy grew in real terms at an average rate of 3.21% per year.

17 **Q. How did you develop your estimate of inflation?**

18 A. I averaged three sources. First, I used the average of the last 180 trading days as of July
19 10, 2020, of the 10-Year Breakeven Inflation Rate reported by the Federal Reserve Bank
20 of St. Louis. The 10-Year Breakeven Inflation Rate represents a measure of expected
21 inflation implied from 10-Year Treasury Constant Maturity Securities. Second, I used

1 the annual growth rate of the Consumer Price Index (“CPI”) from 2030–2050 for all
2 urban consumers as projected by the Energy Information Administration (“EIA”). Third,
3 I used the annual growth rate of the GDP chain-type price index from 2030–2050 as
4 reported by the EIA. The inflation measures and the average are shown in Table 6 below.

5 **Table 6. Inflation Assumption**

10-Year Breakeven Inflation Rate	1.28%
CPI	2.32%
GDP Chain-Type Price Index	<u>2.30%</u>
Average	1.96%

6
7 **Q. Please summarize your nominal GDP growth estimate.**

8 A. My nominal GDP estimate was developed by combining my estimates of real GDP
9 growth and inflation, each of which are described above. The result is shown in Table 7.

10 **Table 7. Long-Term GDP Growth Estimate**

Real GDP Growth	3.21%
Inflation	<u>1.96%</u>
Nominal GDP Growth	5.17%

11
12 **Q. How did you estimate earnings growth for Stage 2?**

13 A. Earnings growth in Stage 2 is designed to provide for a gradual transition between Stage
14 1 and Stage 3. In all cases, there are significant differences between the earnings outlook
15 for Stage 1, which is based on the analysts’ earnings outlook, and the long-term GDP
16 outlook. Since there is no reason to believe that there will be a step change in company
17 earnings between years 5 and 6 of the forward-looking period, I assumed that the Stage 2

1 earnings growth rates would provide a “bridge” between Stages 1 and 3 such that a linear
 2 transition occurs in the growth rates between years 5 and 11.

3 An illustrative example is provided below. Here, the company is assumed to have a
 4 Stage 1 growth rate of 6.00%. The Stage 3 growth rate is 5.40%, based on the calculation
 5 shown in Table 7. Growth rates for years 6-10 provide for a linear transition between
 6 Stages 1 and 3.

7 **Table 8. Stage 2 Growth Rates Calculation Illustrative Example**

<i>A</i>	$b=(g-a)/6+a$	$c=(g-a)/6+b$	$d=(g-a)/6+c$	$e=(g-a)/6+d$	$f=(g-a)/6+e$	<i>g</i>
First Stage (Year 5)	Year 6	Year 7	Year 8	Year 9	Year 10	Third Stage (Year 11)
6.00%	5.90%	5.80%	5.70%	5.60%	5.50%	5.40%

8

9 **Q. Does setting the Stage 3 growth to your GDP outlook into perpetuity imply that an**
 10 **investor holding a company’s stock would hold it into perpetuity?**

11 A. No. The PV of the Stage 3 cash flows is equal to the PV of a series of dividend payments
 12 based on the Stage 3 earnings growth rate into perpetuity. In other words, the PV of the
 13 Stage 3 cash flows is calculated using the Constant Growth DCF method. As I discuss
 14 earlier in my testimony, financial theory indicates that the stock price is equal to the
 15 discounted value of the dividend payments. As such, the PV of the Stage 3 cash flows is
 16 the same whether the investor sells the stock or holds it into perpetuity.

1 **Q. What are the results of your analysis using the Multi-Stage DCF method?**

2 A. The results of my analysis using the Multi-Stage DCF method are shown in Table 9 and
3 the calculations are provided in Attachment JC-5.

4 **Table 9. Multi-Stage DCF Method Calculation Results**

Averaging Period	Low	Mid	High
30-day	8.97%	9.30%	9.75%
90-day	8.91%	9.23%	9.68%
180-day	8.64%	8.94%	9.36%

5
6 As was the case with the Constant Growth method, these results do not vary significantly
7 based on the stock price averaging period. Therefore, I based my Low, Mid, and High
8 estimates from the simple average of the three averaging periods. The results are shown
9 below.

10 **Table 10. Multi-Stage DCF Results**

Low	Mid	High
8.84%	9.16%	9.59%

11
12 **Q. What do you conclude about your results from both the Constant Growth and**
13 **Multi-Stage DCF models?**

14 A. I conclude that the range of reasonable estimates for the Company's ROE, based on the
15 Constant Growth DCF method is 8.88% to 11.92% and the range of reasonable estimates
16 for the Company's ROE based on the Multi-Stage DCF method is 8.84% to 9.59%.

1 beyond this amount. It is typical for the risk-free rate to be estimated using yields on
2 U.S. Treasury bonds.

3 **Q. How did you estimate the risk-free rate?**

4 A. I estimated the risk-free rate by taking the average of the yields on 30-year constant
5 maturity U.S. Treasury securities as reported by the U.S. Department of the Treasury
6 over recent trading periods. Specifically, I averaged the yields on the 30-year treasuries
7 for each of 30, 90, and 180 trading days, with each period ending as of July 10, 2020.
8 The results of that analysis are shown below:

9 **Table 11. Average Yields of 30-Year U.S. Treasuries**

Period	Average
30-day Average	1.47%
90-day Average	1.39%
180-day Average	1.79%

10
11 **Q. Why did you use multiple averaging periods to estimate the treasury yields?**

12 A. I chose to utilize multiple averaging periods to estimate the treasury yield input to my
13 CAPM calculations to reduce the possibility of biasing my results by relying on outcomes
14 from what may be transitory market conditions; and I used the same averaging periods as
15 those I used for stock prices.

16 **Q. Please explain the meaning and significance of the beta coefficient.**

17 A. The beta coefficient is a measure of a security's exposure to systematic, or non-
18 diversifiable, risk. It indicates a stock's riskiness (volatility) compared to that of the

1 market as a whole. If a stock has a beta coefficient of 1.0, it is exactly as risky as the
2 market. A higher coefficient indicates that the stock is riskier than the market and,
3 conversely, a lower coefficient means that the security is less risky than the market.

4 Beta is calculated by analyzing the returns of a security and the returns of the market as a
5 whole over some historical period, and is mathematically defined as:

$$\beta_i = \frac{\text{Covariance}(R_i, R_m)}{\text{Variance}(R_m)}$$

7 where β_i is the beta coefficient of the security, R_i is the return of the security, and R_m is
8 the return of the market as a whole. Calculation of the covariance between R_i and R_m
9 measures the degree to which the returns of the security and market returns move
10 together, while the variance of R_m measures the degree of volatility in the market.

11 **Q. How did you estimate the beta coefficient?**

12 A. The beta coefficient I use in my CAPM analysis is based on the average of the beta
13 coefficients for the companies in my proxy group, which equals 0.84. The proxy group
14 betas which include market information through April 2020 are reported by Value Line.
15 These are shown below in Table 12 and included as Attachment JC-6.

1

Table 12. Proxy Group Beta Coefficients

Company	Beta
Atmos Energy	0.80
Chesapeake Utilities	0.75
NiSource Inc.	0.85
New Jersey Resources	0.90
ONE Gas, Inc.	0.80
South Jersey Industries	0.95
Spire, Inc.	0.80
Southwest Gas	<u>0.90</u>
Average	0.84

2

3 **Q. Please explain the meaning and significance of the expected market return.**

4 A. The primary relevance of the expected market return is that it is used to calculate the
5 Market Risk Premium, which is defined by the term $(R_m - R_f)$. This represents the return
6 that investors can expect from the securities market as a whole, above the return that
7 would be provided by a risk-free investment.

8 **Q. How did you calculate the expected market return?**

9 A. I calculated the expected market return by applying the Constant Growth DCF method
10 described earlier in my testimony to the companies in the S&P 500 Index as reported by
11 Value Line. Using this approach, I estimate that the expected market return is 13.66%.
12 My calculations are provided in Attachment JC-7. The expected market risk premiums
13 that result from reducing the expected market return by the risk-free rates I estimated for

1 each of the three trading-day periods of 30, 90, and 180 trading days (the same as for
 2 stock prices)⁶ is shown below:

3 **Table 13. Calculation of Market Risk Premium**

	30-day Average	90-day Average	180-day Average
Expected Market Return	13.66%	13.66%	13.66%
Risk-Free Rate	<u>1.47%</u>	<u>1.39%</u>	<u>1.79%</u>
Market Risk Premium	12.19%	12.26%	11.86%

4
 5 **Q. What were the results of your CAPM analysis?**

6 A. Based on the three risk-free rate estimates I developed, as well as the beta, and market
 7 risk premium calculations I describe above, the CAPM method indicates that
 8 EnergyNorth's ROE is between 11.74% and 11.80%, with an average ROE of 11.76%
 9 based on the three risk-free rates I used. My calculations are summarized below in Table
 10 14, and are also provided in Attachment JC-8.

11 **Table 14. CAPM Results**

		30-day Average	90-day Average	180-day Average
Risk-free rate	<i>a</i>	1.47%	1.39%	1.79%
Beta	<i>b</i>	0.84	0.84	0.84
Expected market return	<i>c</i>	<u>13.66%</u>	<u>13.66%</u>	<u>13.66%</u>
Market risk premium	$d = c - a$	<u>12.19%</u>	<u>12.26%</u>	<u>11.86%</u>
ROE	$e = a + b*d$	11.75%	11.74%	11.80%
Average ROE	<i>Average of e</i>	11.76%		

⁶ The 180 trading-day average for the Risk-Free Rate is October 22, 2019 through July 10, 2020 as this rate is not published on November 11, 2019 (Veteran's Day).

D. Analytical Results and Adjustment for Flotation Costs

Q. Briefly summarize your results using the two DCF and CAPM methods.

A. As I previously described, using the Constant Growth DCF method, I calculated estimates of EnergyNorth’s ROE that range from 8.88% to 11.92%. Using the Multi-Stage DCF method, I calculated estimates of ROE that range from 8.84% to 9.59%. Using the CAPM method, I estimate EnergyNorth’s ROE to be 11.76%.

Q. How have you aggregated the estimates you developed using the three models?

A. I aggregated them using simple averaging. As shown below in Table 15 below, I developed preliminary Low, Mid, and High ROE estimates using the three methods by averaging the results of the Constant Growth DCF, the Multi-Stage Growth DCF, and the CAPM. The averages yield a range of preliminary ROE estimates for EnergyNorth of 9.83% to 11.09%.

Table 15. Aggregation of Preliminary Analytical Results

	Low	Mid	High
Constant Growth DCF	8.88%	10.28%	11.92%
Multi-Stage DCF	8.84%	9.16%	9.59%
CAPM	<u>11.76%</u>	<u>11.76%</u>	<u>11.76%</u>
Average	9.83%	10.40%	11.09%

1 **Q. How do these results compare with the results from the prior case, Docket No. DG**
2 **19-161, which was submitted in November 2019 and withdrawn in February 2020?**

3 A. The preliminary analytical results in that docket, using the exact same methodologies,
4 resulted in a range of 8.67% to 10.20% from Low to High with a Mid ROE of 9.33%.

5 **Q. Would you compare the results?**

6 A. Yes. The range has increased by 0.89% (High ROE) to 1.16% (Low ROE) and the Mid
7 ROE has also increased by 1.07%.

8 **Q. Would you explain the reasons for these increases in your range of ROEs?**

9 A. Yes. Since DG 19-161 was filed and withdrawn, stock prices for my identical
10 comparable group of gas utilities have declined, which has increased dividend yields
11 across all averaging periods for my stock prices (30, 90, 180 days). In addition, there
12 have been increases in the earnings growth estimates for a number of the companies in
13 my comparable group which, when added to the dividend yield increases, result in the
14 higher range for both the constant growth and multi-stage DCF calculations. Lastly, for
15 my CAPM calculations, both 30-year Treasury rates and the S&P 500 estimated required
16 market return have declined, but because there has been increased volatility in the stock
17 market, which I discuss later in my testimony, the average beta for my comparable group
18 has increased. The higher beta has more than offset the declines in the 30-year Treasury
19 rate and S&P 500 required market return, resulting in a 1.39% increase in my CAPM
20 results.

1 **Q. Have you made any adjustments to your preliminary range?**

2 A. Yes, I have. I have incorporated an adder to account for security flotation costs in my
3 estimate.

4 **Q. What are security flotation costs?**

5 A. Flotation costs are expenses that companies incur when they issue new common stock or
6 other securities. Flotation costs include underwriting, legal expenses, issuance
7 preparation and other expenses.

8 **Q. Should flotation costs be recovered through ROE rather than through operating
9 expenses?**

10 A. Yes, they should. A utility's cost to issue new stock is part of its capital rather than
11 operating costs. If a company cannot recover its flotation costs through ROE, its actual
12 ROE will be less than those required by investors to own the stock. This will, in turn,
13 impair the company's ability to attract the capital required to operate a safe and reliable
14 system. This situation could become particularly problematic if other utilities with whom
15 the Company competes to attract capital are allowed recovery of their flotation costs
16 while EnergyNorth is not.

17 **Q. Are flotation costs accounted for in the DCF and CAPM models you used to develop
18 the preliminary estimates shown in Table 15?**

19 A. No, they are not. The DCF and CAPM models are designed to estimate the returns that
20 an investor would require for holding a stock based on expected dividend payments (in
21 the case of the DCF models) and/or has a certain risk profile (in the case of the CAPM).

1 For purposes of this proceeding, that required return is used as a proxy for the Company's
2 ROE since the authorized return must match investor requirements in order for
3 EnergyNorth to attract capital. Because neither the DCF nor the CAPM models are
4 primarily designed to estimate the ROE for a regulated utility, neither take flotation costs
5 into consideration.

6 **Q. How did you estimate EnergyNorth's flotation cost adjustment?**

7 A. I estimated EnergyNorth's flotation costs by examining the costs of issuing equity
8 incurred by the proxy group companies and Algonquin in their two most recent common
9 equity issuances. After calculating the average flotation costs for the proxy group and
10 Algonquin, I adjusted the Constant Growth DCF model to incorporate a dividend yield
11 that would allow investors to recover costs associated with the issuance of equity. The
12 resulting dividend yield is calculated by dividing the current dividend yield by one minus
13 the weighted average flotation costs of the proxy group companies. The difference
14 between the resulting ROE from the adjusted Constant Growth DCF and the unadjusted
15 Constant Growth DCF is the flotation cost adjustment. My calculations can be found in
16 Attachment JC-9.

17 **Q. What is your estimate of the appropriate adder to EnergyNorth's ROE estimate to**
18 **cover flotation costs?**

19 A. Using this method, I estimate that the ROE adder required to cover flotation costs is
20 0.11%.

1 **Q. Please update your preliminary ROE range to account for flotation costs.**

2 A. In Table 16, below, I add the flotation costs to the preliminary ROE estimates I
3 previously described.

4 **Table 16. ROE Range**

	Low	Mid	High
Preliminary estimate	9.83%	10.40%	11.09%
Flotation costs	<u>0.11%</u>	<u>0.11%</u>	<u>0.11%</u>
ROE estimate	9.94%	10.51%	11.20%

5

6 Based on the information shown in Table 16, I conclude that EnergyNorth's authorized
7 ROE should fall within the reasonable range of 9.94% to 11.20%.

8 **E. Revenue Decoupling**

9 **Q. Does EnergyNorth utilize a revenue decoupling mechanism?**

10 A. Yes, the Commission approved decoupling in Docket No. DG 17-048. Since then,
11 EnergyNorth adjusts customer bills monthly for weather variations through its Normal
12 Weather Adjustment ("NWA"), and annually reconciles actual and benchmark base
13 revenue per customer through the Revenue Decoupling Adjustment Factor ("RDAF")
14 included in its Local Distribution Adjustment Charge ("LDAC").⁷

⁷ Liberty Utilities, "Revenue Decoupling," at <https://new-hampshire.libertyutilities.com/concord/residential/decoupling-explained.html>.

1 **Q. Did you adjust your ROE recommendation to account for the new mechanism?**

2 A. No, I did not. Nearly all of the gas utility subsidiaries of the proxy group of companies
3 utilize decoupling mechanisms, including mechanisms that adjust for abnormal weather.
4 As such, there is no empirical basis or reason to assume that EnergyNorth is materially
5 less risky than the other proxy group companies. Because the impact of decoupling is
6 already reflected in the required returns for the proxy companies, no adjustment is
7 required. In fact, if the Company did not have a decoupling mechanism that adjusts for
8 effects of both weather and customer consumption decisions, I would recommend that an
9 upward adjustment be applied to its ROE to account for a risk not adequately reflected in
10 the proxy group.

11 **Q. Please summarize the prevalence of decoupling mechanisms among the companies
12 in your proxy group.**

13 A. My proxy group consists of eight holding companies which own 33 operating companies.
14 28 of these subsidiaries (85%) utilize revenue decoupling. I have compiled a listing of
15 the subsidiary companies in Attachment JC-10.

16 **F. COVID-19 Impacts**

17 **Q. What is the most apparent impact that the economic fallout from the COVID-19
18 pandemic is having on financial markets?**

19 A. To date, the impact on financial markets from the economic fallout caused by the
20 COVID-19 pandemic is mixed, demonstrating a high degree of volatility and uncertainty.
21 The U.S. economy reached a monthly economic peak in February 2020, but moved into

1 recession in March 2020 as the onset of the COVID-19 pandemic began to take hold.

2 The unemployment rate spiked from 3.5% in February 2020 to just under 15% in April;
3 and as of June 2020, the unemployment rate is still over 11%. Financial markets have
4 reacted to the economic downturn as interest rates have trended downward with the 30-
5 year treasury rate declining from around 2.3% at the start of 2020 to around 1.3% in early
6 July 2020, due primarily to the unprecedented efforts of the Federal Reserve to counteract
7 the impact of COVID-19. The economic downturn has resulted in a downward
8 expectation of inflationary pressure in the economy in the near term.⁸ Stock market
9 volatility increased significantly during this time period, spiking in March 2020 to more
10 than four times the level typically experienced at the start of 2020, and is currently
11 approximately two times the level of volatility existing prior to the onset of COVID-19.⁹
12 The stock market has not experienced this level of volatility since the Great Recession of
13 2008-2009.

14 **Q. How are these economic and financial market impacts affecting the ROE for utility**
15 **companies?**

16 A. The prevailing economic and financial market conditions, involving high volatility, high
17 unemployment, and high uncertainty, has affected the expected returns of the proxy
18 group, notwithstanding lower interest rates. As noted by Value Line:

⁸ See for example, Survey of Professional Forecasters, Second Quarter 2020, Release Date: May 12, 2020:
<https://www.philadelphiafed.org/-/media/research-and-data/real-time-center/survey-of-professional-forecasters/2020/spfq220.pdf?la=en>

⁹ See for example, CBOE (Chicago Board Options Exchange) S&P 500 3-Month Volatility Index:
<https://fred.stlouisfed.org/series/VXVCLS>

1 Stocks in *Value Line's* Natural Gas Utility Industry have not
2 been sheltered against the shocks experienced by the
3 financial markets these days. Indeed, investors are deeply
4 concerned about the potential damage the coronavirus will
5 inflict on the economy, given business closures, travel
6 constraints, and other measures imposed by governments to
7 contain the spread of the pandemic.¹⁰

8 These market dynamics have resulted in stock prices declining and consequently
9 dividend yields increasing as well as a general increase in the betas for natural gas
10 utilities and the betas for the proxy group of utilities. In addition, Standard and Poor's
11 ('S&P') has recently downgraded its outlook for the entire North American utilities
12 sector because S&P expects utilities to experience a reduction in usage and higher bad-
13 debt expense.¹¹

14 **Q. Have you made any adjustments to your results to account for impacts attributable**
15 **to COVID-19?**

16 A. No, I have not made any adjustments to account for these impacts because the economic
17 impact of COVID-19 has now been occurring for several months and is reflected to that
18 extent in the data used to produce the DCF and CAPM results. As described earlier in
19 my testimony, the relatively higher range of results in the DCF and CAPM results, as
20 compared to periods prior to March 2020, demonstrates that the COVID-19 impacts are

¹⁰ Value Line Investment Survey, "Natural Gas Utility", May 29, 2020.

¹¹ S&P, *COVID-19: The Outlook For North American Regulated Utilities Turns Negative*, April 2, 2020:
<https://www.spglobal.com/ratings/en/research/articles/200402-covid-19-the-outlook-for-north-american-regulated-utilities-turns-negative-11415155>

1 occurring and are reflected in current market data, causing the expected returns for
2 utilities to increase.

3 **Q. All else equal, does the impact of COVID-19 put upward or downward pressure on**
4 **your results?**

5 A. As discussed, the economic impact of COVID-19 has certainly increased risk to utility
6 investors. There is a confluence of market dynamics that is occurring and the factors
7 such as lower interest rates, high unemployment, high volatility, and uncertainty are
8 having both upward and downward influence on expected returns. I have not separately
9 identified the impact of each of these factors, nor would it be feasible to do so. However,
10 the net effect is upward pressure on the expected returns.

11 **Q. Why does it make sense that utility ROEs would increase in a period where**
12 **customers may be affected by the economic impacts of the COVID-19 pandemic?**

13 A. The data from which the DCF and CAPM results were derived reflect the impact of
14 COVID-19 to the extent that the economic impacts of the pandemic were exhibited in the
15 time period of the data used for the analysis. Therefore, the fact of the matter is that the
16 current business and financial environment, which, at the moment, is strongly
17 characterized by risk, uncertainty, and volatility, is the environment in which the
18 Company must continue to operate and to attract capital resources. To attract capital to
19 conduct operations, the Company must offer returns that are commensurate with its risk
20 profile, which is, in large part, a function of the current financial market. As always, the
21 interests of customers need to be balanced with the need to maintain financial integrity

1 and access to reasonable cost capital resources. However, the interests of customers are
2 served where the ROE set in a utility ratemaking proceeding accurately and appropriately
3 reflects the realities of the utility's operating and business environment so that access to
4 capital resources at a reasonable cost is maintained. This is the situation where we find
5 ourselves today.

6 **Q. Are the COVID-19 impacts expected to be long-lasting?**

7 A. There appears to be broad consensus among reputable forecasters that impacts from the
8 pandemic will be long-lived. The Congressional Budget Office, a federal agency that
9 provides non-partisan analytical research for Congress, released its *Interim Economic*
10 *Projections for 2020 and 2021*.¹² This outlook projects that by the end of 2021, GDP will
11 still be lower than it was at the end of 2019 (prior to the onset of COVID-19) and that the
12 unemployment rate will be 8.6%, roughly two and half times higher than it was at the
13 onset of the pandemic. More recently, in a presentation by Federal Reserve Board
14 Governor, Vice Chair, Richard Clarida, before the Foreign Policy Association in New
15 York, noted: "As I speak to you today, there is extraordinary uncertainty about both the
16 depth and the duration of the economic downturn. Because the course of the economy
17 will depend on the course of the virus and the public health policies put in place to
18 mitigate and contain it, there is an unusually wide range of scenarios for the evolution of
19 the economy that could plausibly play out over the next several years."¹³

¹² May 19, 2020: <https://www.cbo.gov/system/files/2020-05/56351-CBO-interim-projections.pdf>.

¹³ Federal Reserve, *U.S. Economic Outlook and Monetary Policy, Remarks by Richard H. Clarida, Vice Chair Board of Governors of the Federal Reserve System at the Foreign Policy Association, New York, NY* at 3 (June 16, 2020): <https://www.federalreserve.gov/newsevents/speech/files/clarida20200616a.pdf>.

1 **VI. SMALL SIZE PREMIUM AND ROE RECOMMENDATION**

2 **Q. Are there any other factors that could impact your recommendation for**
3 **EnergyNorth's ROE?**

4 A. Yes. EnergyNorth is considerably smaller than the utilities in the proxy group, a situation
5 that creates risk for the Company's investors for which they will need to be compensated
6 with a higher return.

7 **A. Small Size Premium**

8 **Q. Please explain why smaller utilities are riskier than larger ones.**

9 A. There is a broad body of evidence supporting the existence of a "firm size effect" on
10 firms in general, and utilities in particular, that requires smaller companies to provide
11 higher returns than larger companies in the same industries.¹⁴ Smaller utilities have
12 smaller customer bases, have fewer financial resources, and are less diversified in terms
13 of customers and geography.¹⁵ These challenges increase the investors' risks of owning
14 securities in small companies which, in turn, require them to pay a higher return in order
15 to attract capital.

16 **Q. How does EnergyNorth compare in size to the other utilities in the proxy group?**

17 A. The Company's operations are significantly smaller than those of the proxy group
18 companies. As shown in Attachment JC-11, EnergyNorth had slightly more than half

¹⁴ Shannon Pratt and Roger Grabowski, *Cost of Capital: Applications and Examples*, 3rd Edition, New Jersey, John Wiley & Sons, 2008 at Chapter 12; Duff & Phelps, *2018 Cost of Capital: Annual US Guidance and Examples*, 2018 at Chapter 4 pp. 1-7; Rolf W. Banz, "The Relationship between Return and Market Value of Common Stocks", *Journal of Financial Economics* (March 1981) at pp. 3-18.

¹⁵ Duff & Phelps, *2018 Cost of Capital: Annual US Guidance and Examples*, 2018 at Chapter 4 p. 2.

1 (61%) of the customers of the smallest company by customer count in the proxy group,
2 and only 5% of the median number of customers. EnergyNorth is not as well-capitalized
3 as the other proxy group companies. Attachment JC-11 shows the actual market
4 capitalization for the proxy group companies based on recent data and estimates the
5 implied market capitalization for EnergyNorth.

6 **Q. How did you estimate EnergyNorth's capitalization?**

7 A. Because the Company is not a standalone publicly-traded entity, I have estimated its
8 market capitalization by applying the median market-to-book ratio of the proxy group
9 companies to EnergyNorth's equity of \$168.8 million.¹⁶ The resulting implied market
10 capitalization for EnergyNorth is approximately \$307 million, or about 9% of the median
11 market capitalization for the proxy group companies.

12 **Q. What did you conclude regarding a small size premium for EnergyNorth's ROE?**

13 A. By calculating an implied market capitalization for the Company, I was able to evaluate
14 the impact of EnergyNorth's small size on its ROE relative to the proxy group
15 companies. In its Cost of Capital Navigator, Duff & Phelps calculates size premia
16 associated with deciles of market capitalizations, as well as categorizations of Mid Cap,
17 Low Cap, and Micro Cap.¹⁷ As shown in Attachment JC-11, the mean market

¹⁶ Shareholder equity was calculated by applying the Company's equity ratio of 50.15% to its proposed test year rate base of \$336.6 million.

¹⁷ Duff & Phelps defines Mid Cap companies as companies with market capitalizations between \$2,996 million and \$13,455.8 million, Low Cap companies as companies with market capitalizations between \$730 million and \$2,992.3 million, and Micro Cap companies as companies with market capitalizations between \$2.5 million and \$727.8 million. EnergyNorth falls in the MicroCap category, while the majority of companies in the proxy group tend to fall in the Mid Cap range.

1 capitalization of the proxy group companies of \$4.9 billion falls into the fourth decile of
2 market capitalization, corresponding to a size premium of approximately 0.85% and the
3 median market capitalization of \$3.6 billion falls into the fifth decile, corresponding to a
4 size premium of approximately 1.28%. EnergyNorth's implied market capitalization falls
5 in the tenth decile and Micro Cap category. According to the Duff & Phelps data,
6 EnergyNorth merits a size premium of 5.22%, which is 4.37% higher than the size
7 premium for the mean of the proxy group and 3.94% higher than the size premium for the
8 median of the proxy group.

9 **Q. Do you propose to adjust your reasonable range to account for the size premium?**

10 A. No, I do not. Estimating the size premium is a complex analysis that lacks the
11 transparency of the calculations on which I relied for other aspects of my testimony.

12 While it is clear that EnergyNorth is exposed to the small size premium, the magnitude of
13 the impact of this influence is a matter of debate in academic literature and limitations
14 regarding data availability make the estimation less robust. I have therefore used the
15 results of the size premium analysis as an additional input to inform my recommendation
16 that EnergyNorth's authorized ROE should be set at 10.51% which is the Mid ROE from
17 the reasonable range I previously described.

18 **B. ROE Recommendation**

19 **Q. What is your recommendation regarding EnergyNorth's authorized ROE?**

20 A. I recommend that EnergyNorth be authorized to earn an ROE of 10.51%.

1 **Q. How does this recommendation compare to your recommendation in DG 19-161?**

2 A. The 10.51% recommendation in this case is approximately 50 basis points higher than my
3 last recommendation of 10% which, as I testified to in Docket No. DG 19-161, was then
4 at the higher end of my ROE range. This higher recommendation results directly from
5 the change in financial market circumstances since the case in Docket No. DG 19-161
6 was filed in November 2019. It is important to note, however, that the range of values
7 (i.e., the span between the low and high value) generated by application of the
8 methodological models to estimate investors' expected returns has widened from 0.89%
9 to 1.16%, with the Mid ROE at 1.07%, as compared to my testimony in DG 19-161. This
10 means that the recommendation of 10.51 percent for the authorized ROE is conservative
11 from a market perspective because the upward influence of market conditions on ROE is
12 greater than implied by the ROE of 10.51 percent.

13 **VII. CAPITAL STRUCTURE**

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

15 A. As described in the joint testimony of David Simek and Kenneth Sosnick, the Company
16 has proposed a capital structure of 50.15% common equity and 49.85% long-term debt.

17 **Q. Have you compared this proposed capital structure to the other companies in the
18 proxy group?**

19 A. Yes, I have. I calculated the average capital structure for the proxy group companies
20 over the past five years and compared it to EnergyNorth's proposed capital structure. As
21 shown in Attachment JC-12, over this period, the capital structure of the proxy group

1 was, on average, comprised of approximately 54% common equity and 46% long-term
2 debt. Over that same period, the maximum average equity weight for the proxy group
3 companies was approximately 67% while the minimum was approximately 38%.

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

5 A. I conclude that the Company's proposed capital structure is reasonable.

6 **VIII. COST OF DEBT**

7 **Q. What is the Company's proposed cost of debt?**

8 A. As described by Messrs. Simek and Sosnick, the Company proposes a cost of long-term
9 debt of 4.42%.

10 **Q. What is your conclusion regarding the Company's proposed cost of debt?**

11 A. As described in the Company's testimony, the proposed cost of debt is based on
12 EnergyNorth's actual cost of debt. I conclude that it is reasonable.

13 **IX. CONCLUSIONS AND RECOMMENDATIONS**

14 **Q. Please summarize your conclusions**

15 A. I have four primary conclusions. *First*, I conclude that the Company's ROE should fall
16 between the range of 9.94% and 11.20% including a flotation cost adjustment but not one
17 for its small size relative to the peer group. *Second*, I conclude that the authorized ROE
18 should be the Mid ROE of 10.51%. *Third*, I conclude that the Company's proposed
19 capital structure is reasonable. *Fourth*, I conclude that the Company's proposed cost of
20 debt is reasonable.

1 **Q. Please summarize your recommendations.**

2 A. I recommend that the Commission authorize an ROE for EnergyNorth of 10.51%, that it
3 accept the Company's proposed capital structure and debt costs, and that it authorize a
4 total ROR of 7.47%.

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

6 A. Yes.

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Education

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Mr. Cochrane is a Senior Managing Director in FTI's Power & Utilities practice within the Economic and Financial Consulting segment, specializing in advising electric and gas utility clients in all economic, regulatory and financial areas of their business. He has more than 30 years of US and international utility sector experience, including over 20 years of experience testifying on financial issues for electric utility rate cases including capital structure and ROE in New Hampshire, Massachusetts, Rhode Island, New York and before FERC. In addition, he has testified on financing and affiliate transactions in Missouri. He has extensive experience in mergers and acquisitions, joint ventures, partnerships, restructurings, regulation and business development, both domestic and international. He has held C-suite and other senior leadership positions at major US utilities and served as a member of the Board of Directors on a variety of energy sector companies including start-ups.

PROFESSIONAL EXPERIENCE

FTI Consulting, Senior Managing Director, Boston, MA, 2013 to present, with responsibility for leading the Economic and Financial Consulting Power & Utilities team based in Boston:

- Provided cost of capital testimony supporting Liberty Utilities' (Granite State Electric and EnergyNorth Natural Gas) ongoing rate cases before the New Hampshire Public Utilities Commission, including analysis of return on equity and capital structure.
- Provided financing and affiliate transactions testimony for Empire District Electric Company before the Missouri Public Service Commission.
- Advised Trans Bay Cable, an underwater direct current transmission cable connecting San Francisco to Pittsburg (CA), on the reasonableness and methodology of its ROE calculation for the 3-year rate case reset before FERC; provided analysis and expert advice for testimony development.
- Provided expert testimony pertaining to a purchase price dispute stemming from CCI's acquisition of a portfolio of power plants located in PJM.
- Advised PPL Electric Utilities on financial modeling and rate case strategy on the development of transmission projects in PJM.
- Advised global infrastructure fund on financial modeling and rate case strategy applying to a wholly-owned portfolio company, a water utility covering three separate jurisdictions in the U.S. southwest.

National Grid PLC, Executive Vice President – Global Business Development & Mergers and Acquisitions (most recently, among other senior roles), US/UK/Europe 2006-2013

- Assisted in the development of the Cap & Floor regime for regulatory return on capital for transmission interconnectors in Great Britain.
- Led all business development, mergers, acquisitions, divestitures and joint ventures globally, including the sale of a wide range of businesses totaling \$10B, the negotiation of a 15 year, \$4.5B power supply agreement with Long Island Power Authority, and commercial and regulatory negotiations for a \$3B joint venture with six New York transmission owners.
- Led joint venture negotiations, feasibility studies, project budgets and timelines, and vendor selections for four £1B sub-sea interconnectors between the United Kingdom, Norway, Belgium, France and the Netherlands.

National Grid USA, 1999 – 2006 Executive Vice President, Chief Financial Officer and Treasurer

- Testified on behalf of National Grid with respect to capital structure in rate cases, in all National Grid state jurisdictions, including New Hampshire, Massachusetts, Rhode Island, New York and before FERC.
- Testified as a witness with respect to ROE for a rate case in New Hampshire on behalf of Granite State.
- Testified on behalf of National Grid with respect to debt and equity financings including first mortgage bonds, bank agreements, private placements, common equity issuances in all National Grid state jurisdictions, including New Hampshire, Massachusetts, Rhode Island, New York and before FERC.
- Managed ROE expert testimony preparation on behalf of National Grid in all National Grid state jurisdictions, including New Hampshire, Massachusetts, Rhode Island, New York and before FERC.
- Managed the preparation of FERC ROE filing for two DC transmission lines from Canada in New Hampshire and Massachusetts.
- Supported regulatory approval filings for several M&A deals completed by National Grid including: the sale of New England Electric to National Grid, the purchase of Eastern Utilities by National Grid, the purchase of Niagara Mohawk by National Grid, the purchase of KeySpan Corp by National Grid, The purchase of Rhode Island gas assets of Southern Union Co by National Grid, helping to create the second largest US utility with a total enterprise value of \$27B.
- Ran the sale process on behalf of National Grid for Granite State and EnergyNorth, purchased by Liberty Utilities.
- In addition to mergers & acquisitions, he was responsible for accounting, tax, pensions, insurance/claims, risk management, energy supply, property, investments, cash management, forecasting/budgeting, planning, financial analysis and all third-party financing. In this capacity, he managed a 500-

person organization with 13 reporting functions.

- Served as a U.S. board member on US/European companies involved in cross-border tax structures including Luxemburg, Ireland, Jersey, Iceland and Malta.

New England Electric Systems, Treasurer (most recently, among other senior roles), Westborough, MA, 1981-1999

BOARD OF DIRECTORS MEMBERSHIP

EMERA US Subsidiaries, Member, Board of Directors, 2015 – present

PowerOptions, Board of Directors (Audit and Strategic Planning Committees), 2013 – present

GreenerU, Inc., Member, Board of Directors, 2011 – 2013

National Grid USA, Member, Board of Directors, 2000 – 2013

SELECT TESTIMONY

Sponsor	Date	Applicant(s)	Docket/Case	Subject
Missouri Public Service Commission				
The Empire District Electric Company	03/2020	The Empire District Electric Company	ER-2019-0374	Affiliate Transactions/ Financing
New Hampshire Public Utilities Commission				
EnergyNorth Natural Gas	07/2020 (To Be Filed)	EnergyNorth Natural Gas	DG 20- ____	Cost of Capital
EnergyNorth Natural Gas	11/2019	EnergyNorth Natural Gas	DG 19-161	Cost of Capital
Granite State Electric Company	04/2019	Granite State Electric Company	DG 19-064	Cost of Capital
National Grid USA	08/2006	National Grid USA; EnergyNorth Natural Gas	DG 06-107	Merger
Granite State Electric Company	11/1992	Granite State Electric Company	DF 92-219	Financing
Massachusetts Department of Public Utilities				
New England Power Company	10/1997	USGen New England, Inc; New England Power Company; Massachusetts Electric Company; Nantucket Electric Company	DPU 97-94	Financing
New England Electric System	05/1995	New England Electric System; Nantucket Electric Company	DPU 95-67	Merger

New York Department of Public Service				
National Grid plc	10/2006	National Grid plc; KeySpan Corporation	PSC Case 06-M- 0878	Merger
Federal Energy Regulatory Commission				
New England Power Company; Massachusetts Electric Company; The Narragansett Electric Company; Granite State Electric Company	09/1997	New England Power Company; Massachusetts Electric Company; The Narragansett Electric Company; Granite State Electric Company	OA96-74-000	Capital Structure and Cost of Capital
New England Power Company	01/1997	New England Power Company	ER-97-1115	Financing
NEES Transmission Services, Inc.; New England Power Company; Massachusetts Electric Company; The Narragansett Electric Company; Granite State Electric Company	03/1996	NEES Transmission Services, Inc.; New England Power Company; Massachusetts Electric Company; The Narragansett Electric Company; Granite State Electric Company	ER96-1309-000	Capital Structure and Cost of Capital
New England Power Company	09/1995	Tennessee Gas Pipeline Co	RP95-112-000	Return on Equity
New England Power Company	12/1994	New England Power Company	Docket ER95-267	Capital Structure and Cost of Capital

Summary of Results

Constant Growth DCF - Earnings Growth			
Mean	Low ROE	Mid ROE	High ROE
30-Day Average	8.99%	10.40%	12.03%
90-Day Average	8.95%	10.35%	11.98%
180-Day Average	8.70%	10.10%	11.74%
Average	8.88%	10.28%	11.92%

Multi-Stage Growth DCF			
Mean	Low ROE	Mid ROE	High ROE
30-Day Average	8.97%	9.30%	9.75%
90-Day Average	8.91%	9.23%	9.68%
180-Day Average	8.64%	8.94%	9.36%
Average	8.84%	9.16%	9.59%

CAPM	
Current 30-Day Treasury	CAPM
30-Day Average	11.75%
90-Day Average	11.74%
180-Day Average	11.80%
Average	11.76%

Flotation Cost Adjustment	0.11%
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Zone of Reasonableness			
Method	Low ROE	Mid ROE	High ROE
Constant Growth DCF	8.88%	10.28%	11.92%
Multi-Stage DCF	8.84%	9.16%	9.59%
CAPM	11.76%	11.76%	11.76%
Mean	9.83%	10.40%	11.09%
With Flotation Costs	9.94%	10.51%	11.20%

Proxy Group Selection Criteria

	[1]	[2]	[3]	[4]	[5]	[6]	
Company Name	Stock Ticker	Consistently Paid Dividends?	Positive Earnings Growth Estimates From At Least Two Analysts?	Party to Merger or Other Significant Transaction?	S&P Long-Term Issuer Rating	Moody's Long-Term Issuer Rating	Percent of Operating Income or Net Income From Regulated Gas Operations
Atmos Energy	ATO	Yes	Yes	No	A	A1	99.1%
Chesapeake Utilities	CPK	Yes	Yes	No			85.6%
NISource Inc.	NI	Yes	Yes	No	BBB+	Baa2	65.8%
New Jersey Resources	NJR	Yes	Yes	No	BBB+	A1	70.1%
ONE Gas Inc.	OGS	Yes	Yes	No	A	A2	100.0%
South Jersey Inds.	SJI	Yes	Yes	No	BBB	A3	134.8%
Spire Inc.	SR	Yes	Yes	No	A-	Baa2	97.2%
Southwest Gas	SWX	Yes	Yes	No	BBB+	A3	80.3%

[1] Source: Value Line

[2] Source: Value Line, Zack's, Yahoo Finance

[3] Source: Company 10Ks

[4] Source: S&P Global Market Intelligence, Moody's

[5] Source: S&P Global Market Intelligence, Moody's

[6] Source: Company 10Ks

Constant Growth Discounted Cash Flow Model
Earnings Growth
30 Day Average Stock Price

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]
Company	Ticker	Indicated Annual Dividend	Weighted-Average Stock Price	Dividend Yield	Expected Dividend Yield	Zacks Earnings Growth	Yahoo Finance Earnings Growth	Value Line Earnings Growth	Average Earnings Growth	Low ROE	Mid ROE	High ROE
Atmos Energy	ATO	\$2.42	\$101.07	2.39%	2.48%	7.20%	7.15%	7.00%	7.12%	9.48%	9.60%	9.68%
Chesapeake Utilities	CPK	\$1.80	\$85.92	2.10%	2.17%	NA	4.74%	9.00%	6.87%	6.88%	9.04%	11.19%
NISource Inc.	NI	\$0.84	\$23.53	3.57%	3.71%	5.30%	4.89%	13.50%	7.90%	8.55%	11.61%	17.31%
New Jersey Resources	NJR	\$1.25	\$32.73	3.82%	3.91%	6.00%	6.00%	2.00%	4.67%	5.86%	8.57%	9.93%
ONE Gas Inc.	OGS	\$2.24	\$77.99	2.87%	2.95%	5.50%	5.00%	6.50%	5.67%	7.94%	8.62%	9.47%
South Jersey Inds.	SJI	\$1.22	\$24.97	4.89%	5.15%	10.20%	10.20%	12.50%	10.97%	15.34%	16.12%	17.69%
Spire Inc.	SR	\$2.55	\$68.28	3.73%	3.83%	4.70%	4.67%	5.50%	4.96%	8.49%	8.78%	9.34%
Southwest Gas	SWX	\$2.30	\$69.35	3.32%	3.44%	6.00%	8.20%	8.00%	7.40%	9.42%	10.84%	11.65%
Mean				3.34%	3.45%	6.41%	6.36%	8.00%	6.94%	8.99%	10.40%	12.03%
Median				3.44%	3.57%	6.00%	5.50%	7.50%	6.99%	8.52%	9.32%	10.56%

- [1] Source: Value Line
- [2] Source: Yahoo Finance, as of July 10, 2020
- [3] Equals [1] / [2]
- [4] Equals [3] x (1 + 0.5 x [8])
- [5] Source: Zacks
- [6] Source: Yahoo Finance
- [7] Source: Value Line
- [8] Equals average ([5], [6], [7])
- [9] Equals [3] x (1 + 0.5 x Minimum([5], [6], [7])) + Minimum([5], [6], [7])
- [10] Equals [4] + [8]
- [11] Equals [3] x (1 + 0.5 x Maximum([5], [6], [7])) + Maximum([5], [6], [7])

Constant Growth Discounted Cash Flow Model
Earnings Growth
90 Day Average Stock Price

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]
Company	Ticker	Indicated Annual Dividend	Weighted-Average Stock Price	Dividend Yield	Expected Dividend Yield	Zacks Earnings Growth	Yahoo Finance Earnings Growth	Value Line Earnings Growth	Average Earnings Growth	Low ROE	Mid ROE	High ROE
Atmos Energy	ATO	\$2.42	\$100.25	2.41%	2.50%	7.20%	7.15%	7.00%	7.12%	9.50%	9.62%	9.70%
Chesapeake Utilities	CPK	\$1.80	\$86.53	2.08%	2.15%	NA	4.74%	9.00%	6.87%	6.87%	9.02%	11.17%
NISource Inc.	NI	\$0.84	\$24.27	3.46%	3.60%	5.30%	4.89%	13.50%	7.90%	8.44%	11.49%	17.19%
New Jersey Resources	NJR	\$1.25	\$32.38	3.86%	3.95%	6.00%	6.00%	2.00%	4.67%	5.90%	8.62%	9.98%
ONE Gas Inc.	OGS	\$2.24	\$79.19	2.83%	2.91%	5.50%	5.00%	6.50%	5.67%	7.90%	8.58%	9.42%
South Jersey Inds.	SJI	\$1.22	\$25.61	4.76%	5.02%	10.20%	10.20%	12.50%	10.97%	15.21%	15.99%	17.56%
Spire Inc.	SR	\$2.55	\$70.96	3.59%	3.68%	4.70%	4.67%	5.50%	4.96%	8.35%	8.64%	9.19%
Southwest Gas	SWX	\$2.30	\$69.56	3.31%	3.43%	6.00%	8.20%	8.00%	7.40%	9.41%	10.83%	11.64%
Mean				3.29%	3.41%	6.41%	6.36%	8.00%	6.94%	8.95%	10.35%	11.98%
Median				3.38%	3.51%	6.00%	5.50%	7.50%	6.99%	8.39%	9.32%	10.58%

- [1] Source: Value Line
- [2] Source: Yahoo Finance, as of July 10, 2020
- [3] Equals [1] / [2]
- [4] Equals [3] x (1 + 0.5 x [8])
- [5] Source: Zacks
- [6] Source: Yahoo Finance
- [7] Source: Value Line
- [8] Equals average ([5], [6], [7])
- [9] Equals [3] x (1 + 0.5 x Minimum([5], [6], [7])) + Minimum([5], [6], [7])
- [10] Equals [4] + [8]
- [11] Equals [3] x (1 + 0.5 x Maximum([5], [6], [7])) + Maximum([5], [6], [7])

Constant Growth Discounted Cash Flow Model
Earnings Growth
180 Day Average Stock Price

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]
Company	Ticker	Indicated Annual Dividend	Weighted-Average Stock Price	Dividend Yield	Expected Dividend Yield	Zacks Earnings Growth	Yahoo Finance Earnings Growth	Value Line Earnings Growth	Average Earnings Growth	Low ROE	Mid ROE	High ROE
Atmos Energy	ATO	\$2.42	\$105.45	2.29%	2.38%	7.20%	7.15%	7.00%	7.12%	9.38%	9.49%	9.58%
Chesapeake Utilities	CPK	\$1.80	\$89.37	2.01%	2.08%	NA	4.74%	9.00%	6.87%	6.80%	8.95%	11.10%
NISource Inc.	NI	\$0.84	\$26.00	3.23%	3.36%	5.30%	4.89%	13.50%	7.90%	8.20%	11.25%	16.95%
New Jersey Resources	NJR	\$1.25	\$37.21	3.36%	3.44%	6.00%	6.00%	2.00%	4.67%	5.39%	8.10%	9.46%
ONE Gas Inc.	OGS	\$2.24	\$84.64	2.65%	2.72%	5.50%	5.00%	6.50%	5.67%	7.71%	8.39%	9.23%
South Jersey Inds.	SJI	\$1.22	\$28.13	4.34%	4.57%	10.20%	10.20%	12.50%	10.97%	14.76%	15.54%	17.11%
Spire Inc.	SR	\$2.55	\$75.59	3.37%	3.46%	4.70%	4.67%	5.50%	4.96%	8.12%	8.41%	8.97%
Southwest Gas	SWX	\$2.30	\$72.50	3.17%	3.29%	6.00%	8.20%	8.00%	7.40%	9.27%	10.69%	11.50%
Mean				3.05%	3.16%	6.41%	6.36%	8.00%	6.94%	8.70%	10.10%	11.74%
Median				3.20%	3.32%	6.00%	5.50%	7.50%	6.99%	8.16%	9.22%	10.34%

- [1] Source: Value Line
- [2] Source: Yahoo Finance, as of July 10, 2020
- [3] Equals [1] / [2]
- [4] Equals [3] x (1 + 0.5 x [8])
- [5] Source: Zacks
- [6] Source: Yahoo Finance
- [7] Source: Value Line
- [8] Equals average ([5], [6], [7])
- [9] Equals [3] x (1 + 0.5 x Minimum([5], [6], [7])) + Minimum([5], [6], [7])
- [10] Equals [4] + [8]
- [11] Equals [3] x (1 + 0.5 x Maximum([5], [6], [7])) + Maximum([5], [6], [7])

Multi-Stage Discounted Cash Flow Model
30 Day Average Stock Price
Low Growth Rate

Company	Ticker	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8] Second Stage Growth					[11]	[12]	[13]
		Indicated Annual Dividend	Weighted-Average Stock Price	Zacks Earnings Growth	Yahoo Finance Earnings Growth	Value Line Earnings Growth	Value Line Earnings Growth	First Stage Growth	Year 6	Year 7	Year 8	Year 9	Year 10	Third Stage Growth	ROE	
Atmos Energy	ATO	\$2.42	\$101.07	7.20%	7.15%	7.00%	7.00%	6.70%	6.39%	6.09%	5.78%	5.48%	5.17%	8.08%		
Chesapeake Utilities	CPK	\$1.80	\$85.92	NA	4.74%	9.00%	4.74%	4.81%	4.88%	4.96%	5.03%	5.10%	5.17%	7.36%		
NiSource Inc.	NI	\$0.84	\$23.53	5.30%	4.89%	13.50%	4.89%	4.94%	4.98%	5.03%	5.08%	5.13%	5.17%	9.00%		
New Jersey Resources	NJR	\$1.25	\$32.73	6.00%	6.00%	2.00%	2.00%	2.53%	3.06%	3.59%	4.12%	4.65%	5.17%	8.58%		
ONE Gas Inc.	OGS	\$2.24	\$77.99	5.50%	5.00%	6.50%	5.00%	5.03%	5.06%	5.09%	5.12%	5.15%	5.17%	8.25%		
South Jersey Inds.	SJI	\$1.22	\$24.97	10.20%	10.20%	12.50%	10.20%	9.36%	8.52%	7.69%	6.85%	6.01%	5.17%	12.38%		
Spire Inc.	SR	\$2.55	\$68.28	4.70%	4.67%	5.50%	4.67%	4.75%	4.84%	4.92%	5.01%	5.09%	5.17%	9.13%		
Southwest Gas	SWX	\$2.30	\$69.35	6.00%	8.20%	8.00%	6.00%	5.86%	5.72%	5.59%	5.45%	5.31%	5.17%	8.98%		
														Mean	8.97%	
														Median	8.78%	
														Max	12.38%	
														Min	7.36%	

[1] Source: Value Line
 [2] Source: Yahoo Finance, as of July 10, 2020
 [3] Source: Zacks
 [4] Source: Yahoo Finance
 [5] Source: Value Line
 [6] Equals minimum ([3], [4], [5])
 [7] Equals [6] + ([12] - [6]) / 6
 [8] Equals [6] + ([12] - [6]) / 6
 [9] Equals [6] + ([12] - [6]) / 6
 [10] Equals [6] + ([12] - [6]) / 6
 [11] Equals [6] + ([12] - [6]) / 6
 [12] Source: Federal Reserve Bank of St. Louis; Energy Information Administration
 [13] Equals internal rate of return of cash flows resulting from Excel's goal seek function

Multi-Stage Discounted Cash Flow Model
30 Day Average Stock Price
Average Growth Rate

Company	Ticker	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]					[11]	[12]	[13]
		Indicated Annual Dividend	Weighted-Average Stock Price	Zacks Earnings Growth	Yahoo Finance Earnings Growth	Value Line Earnings Growth	First Stage Growth	Year 6	Year 7	Year 8	Year 9	Year 10	Third Stage Growth	ROE		
Atmos Energy	ATO	\$2.42	\$101.07	7.20%	7.15%	7.00%	7.12%	6.79%	6.47%	6.15%	5.82%	5.50%	5.17%	8.10%		
Chesapeake Utilities	CPK	\$1.80	\$85.92	NA	4.74%	9.00%	6.87%	6.59%	6.30%	6.02%	5.74%	5.46%	5.17%	7.69%		
NiSource Inc.	NI	\$0.84	\$23.53	5.30%	4.89%	13.50%	7.90%	7.44%	6.99%	6.54%	6.08%	5.63%	5.17%	9.78%		
New Jersey Resources	NJR	\$1.25	\$32.73	6.00%	6.00%	2.00%	4.67%	4.75%	4.84%	4.92%	5.01%	5.09%	5.17%	9.22%		
ONE Gas Inc.	OGS	\$2.24	\$77.99	5.50%	5.00%	6.50%	5.67%	5.58%	5.50%	5.42%	5.34%	5.26%	5.17%	8.38%		
South Jersey Inds.	SJI	\$1.22	\$24.97	10.20%	10.20%	12.50%	10.97%	10.00%	9.04%	8.07%	7.11%	6.14%	5.17%	12.68%		
Spire Inc.	SR	\$2.55	\$68.28	4.70%	4.67%	5.50%	4.96%	4.99%	5.03%	5.07%	5.10%	5.14%	5.17%	9.20%		
Southwest Gas	SWX	\$2.30	\$69.35	6.00%	8.20%	8.00%	7.40%	7.03%	6.66%	6.29%	5.92%	5.55%	5.17%	9.32%		
														Mean	9.30%	
														Median	9.21%	
														Max	12.68%	
														Min	7.69%	

[1] Source: Value Line
 [2] Source: Yahoo Finance, as of July 10, 2020
 [3] Source: Zacks
 [4] Source: Yahoo Finance
 [5] Source: Value Line
 [6] Equals average ([3], [4], [5])
 [7] Equals [6] + ([12] - [6]) / 6
 [8] Equals [6] + ([12] - [6]) / 6
 [9] Equals [6] + ([12] - [6]) / 6
 [10] Equals [6] + ([12] - [6]) / 6
 [11] Equals [6] + ([12] - [6]) / 6
 [12] Source: Federal Reserve Bank of St. Louis; Energy Information Administration
 [13] Equals internal rate of return of cash flows resulting from Excel's goal seek function

Multi-Stage Discounted Cash Flow Model
30 Day Average Stock Price
High Growth Rate

Company	Ticker	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
		Indicated Annual Dividend	Weighted-Average Stock Price	Zacks Earnings Growth	Yahoo Finance Earnings Growth	Value Line Earnings Growth	First Stage Growth	Second Stage Growth	Year 6	Year 7	Year 8	Year 9	Year 10	Third Stage Growth
Atmos Energy	ATO	\$2.42	\$101.07	7.20%	7.15%	7.00%	7.20%	6.86%	6.52%	6.19%	5.85%	5.51%	5.17%	8.12%
Chesapeake Utilities	CPK	\$1.80	\$85.92	NA	4.74%	9.00%	9.00%	8.36%	7.72%	7.09%	6.45%	5.81%	5.17%	8.05%
NiSource Inc.	NI	\$0.84	\$23.53	5.30%	4.89%	13.50%	13.50%	12.11%	10.72%	9.34%	7.95%	6.56%	5.17%	11.50%
New Jersey Resources	NJR	\$1.25	\$32.73	6.00%	6.00%	2.00%	6.00%	5.86%	5.72%	5.59%	5.45%	5.31%	5.17%	9.57%
ONE Gas Inc.	OGS	\$2.24	\$77.99	5.50%	5.00%	6.50%	6.50%	6.28%	6.06%	5.84%	5.62%	5.40%	5.17%	8.56%
South Jersey Inds.	SJI	\$1.22	\$24.97	10.20%	10.20%	12.50%	12.50%	11.28%	10.06%	8.84%	7.62%	6.40%	5.17%	13.31%
Spire Inc.	SR	\$2.55	\$68.28	4.70%	4.67%	5.50%	5.50%	5.45%	5.39%	5.34%	5.28%	5.23%	5.17%	9.34%
Southwest Gas	SWX	\$2.30	\$69.35	6.00%	8.20%	8.00%	8.20%	7.70%	7.19%	6.69%	6.18%	5.68%	5.17%	9.53%
													Mean	9.75%
													Median	9.43%
													Max	13.31%
													Min	8.05%

[1] Source: Value Line
 [2] Source: Yahoo Finance, as of July 10, 2020
 [3] Source: Zacks
 [4] Source: Yahoo Finance
 [5] Source: Value Line
 [6] Equals maximum ([3], [4], [5])
 [7] Equals $[6] + ([12] - [6]) / 6$
 [8] Equals $[6] + ([12] - [6]) / 6$
 [9] Equals $[6] + ([12] - [6]) / 6$
 [10] Equals $[6] + ([12] - [6]) / 6$
 [11] Equals $[6] + ([12] - [6]) / 6$
 [12] Source: Federal Reserve Bank of St. Louis; Energy Information Administration
 [13] Equals internal rate of return of cash flows resulting from Excel's goal seek function

Multi-Stage Discounted Cash Flow Model
90 Day Average Stock Price
Low Growth Rate

Company	Ticker	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
		Indicated Annual Dividend	Weighted-Average Stock Price	Zacks Earnings Growth	Yahoo Finance Earnings Growth	Value Line Earnings Growth	Value Line Earnings Growth	First Stage Growth	Second Stage Growth					Third Stage Growth
								Year 6	Year 7	Year 8	Year 9	Year 10		
Atmos Energy	ATO	\$2.42	\$100.25	7.20%	7.15%	7.00%	7.00%	6.70%	6.39%	6.09%	5.78%	5.48%	5.17%	8.10%
Chesapeake Utilities	CPK	\$1.80	\$86.53	NA	4.74%	9.00%	4.74%	4.81%	4.88%	4.96%	5.03%	5.10%	5.17%	7.34%
NiSource Inc.	NI	\$0.84	\$24.27	5.30%	4.89%	13.50%	4.89%	4.94%	4.98%	5.03%	5.08%	5.13%	5.17%	8.88%
New Jersey Resources	NJR	\$1.25	\$32.38	6.00%	6.00%	2.00%	2.00%	2.53%	3.06%	3.59%	4.12%	4.65%	5.17%	8.62%
ONE Gas Inc.	OGS	\$2.24	\$79.19	5.50%	5.00%	6.50%	5.00%	5.03%	5.06%	5.09%	5.12%	5.15%	5.17%	8.20%
South Jersey Inds.	SJI	\$1.22	\$25.61	10.20%	10.20%	12.50%	10.20%	9.36%	8.52%	7.69%	6.85%	6.01%	5.17%	12.20%
Spire Inc.	SR	\$2.55	\$70.96	4.70%	4.67%	5.50%	4.67%	4.75%	4.84%	4.92%	5.01%	5.09%	5.17%	8.97%
Southwest Gas	SWX	\$2.30	\$69.56	6.00%	8.20%	8.00%	6.00%	5.86%	5.72%	5.59%	5.45%	5.31%	5.17%	8.96%
														Mean
														Median
														Max
														Min

[1] Source: Value Line
 [2] Source: Yahoo Finance, as of July 10, 2020
 [3] Source: Zacks
 [4] Source: Yahoo Finance
 [5] Source: Value Line
 [6] Equals minimum ([3], [4], [5])
 [7] Equals [6] + ([12] - [6]) / 6
 [8] Equals [6] + ([12] - [6]) / 6
 [9] Equals [6] + ([12] - [6]) / 6
 [10] Equals [6] + ([12] - [6]) / 6
 [11] Equals [6] + ([12] - [6]) / 6
 [12] Source: Federal Reserve Bank of St. Louis; Energy Information Administration
 [13] Equals internal rate of return of cash flows resulting from Excel's goal seek function

Multi-Stage Discounted Cash Flow Model
90 Day Average Stock Price
Average Growth Rate

Company	Ticker	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]					[11]	[12]	[13]
		Indicated Annual Dividend	Weighted-Average Stock Price	Zacks Earnings Growth	Yahoo Finance Earnings Growth	Value Line Earnings Growth	First Stage Growth	Year 6	Year 7	Year 8	Year 9	Year 10	Third Stage Growth	ROE		
Atmos Energy	ATO	\$2.42	\$100.25	7.20%	7.15%	7.00%	7.12%	6.79%	6.47%	6.15%	5.82%	5.50%	5.17%	8.12%		
Chesapeake Utilities	CPK	\$1.80	\$86.53	NA	4.74%	9.00%	6.87%	6.59%	6.30%	6.02%	5.74%	5.46%	5.17%	7.67%		
NiSource Inc.	NI	\$0.84	\$24.27	5.30%	4.89%	13.50%	7.90%	7.44%	6.99%	6.54%	6.08%	5.63%	5.17%	9.64%		
New Jersey Resources	NJR	\$1.25	\$32.38	6.00%	6.00%	2.00%	4.67%	4.75%	4.84%	4.92%	5.01%	5.09%	5.17%	9.26%		
ONE Gas Inc.	OGS	\$2.24	\$79.19	5.50%	5.00%	6.50%	5.67%	5.58%	5.50%	5.42%	5.34%	5.26%	5.17%	8.33%		
South Jersey Inds.	SJI	\$1.22	\$25.61	10.20%	10.20%	12.50%	10.97%	10.00%	9.04%	8.07%	7.11%	6.14%	5.17%	12.50%		
Spire Inc.	SR	\$2.55	\$70.96	4.70%	4.67%	5.50%	4.96%	4.99%	5.03%	5.07%	5.10%	5.14%	5.17%	9.04%		
Southwest Gas	SWX	\$2.30	\$69.56	6.00%	8.20%	8.00%	7.40%	7.03%	6.66%	6.29%	5.92%	5.55%	5.17%	9.31%		
														Mean	9.23%	
														Median	9.15%	
														Max	12.50%	
														Min	7.67%	

[1] Source: Value Line
 [2] Source: Yahoo Finance, as of July 10, 2020
 [3] Source: Zacks
 [4] Source: Yahoo Finance
 [5] Source: Value Line
 [6] Equals average ([3], [4], [5])
 [7] Equals [6] + ([12] - [6]) / 6
 [8] Equals [6] + ([12] - [6]) / 6
 [9] Equals [6] + ([12] - [6]) / 6
 [10] Equals [6] + ([12] - [6]) / 6
 [11] Equals [6] + ([12] - [6]) / 6
 [12] Source: Federal Reserve Bank of St. Louis; Energy Information Administration
 [13] Equals internal rate of return of cash flows resulting from Excel's goal seek function

Multi-Stage Discounted Cash Flow Model
90 Day Average Stock Price
High Growth Rate

Company	Ticker	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
		Indicated Annual Dividend	Weighted-Average Stock Price	Zacks Earnings Growth	Yahoo Finance Earnings Growth	Value Line Earnings Growth	First Stage Growth	Second Stage Growth	Year 6	Year 7	Year 8	Year 9	Year 10	Third Stage Growth
Atmos Energy	ATO	\$2.42	\$100.25	7.20%	7.15%	7.00%	7.20%	6.86%	6.52%	6.19%	5.85%	5.51%	5.17%	8.14%
Chesapeake Utilities	CPK	\$1.80	\$86.53	NA	4.74%	9.00%	9.00%	8.36%	7.72%	7.09%	6.45%	5.81%	5.17%	8.03%
NiSource Inc.	NI	\$0.84	\$24.27	5.30%	4.89%	13.50%	13.50%	12.11%	10.72%	9.34%	7.95%	6.56%	5.17%	11.32%
New Jersey Resources	NJR	\$1.25	\$32.38	6.00%	6.00%	2.00%	6.00%	5.86%	5.72%	5.59%	5.45%	5.31%	5.17%	9.62%
ONE Gas Inc.	OGS	\$2.24	\$79.19	5.50%	5.00%	6.50%	6.50%	6.28%	6.06%	5.84%	5.62%	5.40%	5.17%	8.51%
South Jersey Inds.	SJI	\$1.22	\$25.61	10.20%	10.20%	12.50%	12.50%	11.28%	10.06%	8.84%	7.62%	6.40%	5.17%	13.11%
Spire Inc.	SR	\$2.55	\$70.96	4.70%	4.67%	5.50%	5.50%	5.45%	5.39%	5.34%	5.28%	5.23%	5.17%	9.18%
Southwest Gas	SWX	\$2.30	\$69.56	6.00%	8.20%	8.00%	8.20%	7.70%	7.19%	6.69%	6.18%	5.68%	5.17%	9.51%
													Mean	9.68%
													Median	9.34%
													Max	13.11%
													Min	8.03%

[1] Source: Value Line
 [2] Source: Yahoo Finance, as of July 10, 2020
 [3] Source: Zacks
 [4] Source: Yahoo Finance
 [5] Source: Value Line
 [6] Equals maximum ([3], [4], [5])
 [7] Equals [6] + ([12] - [6]) / 6
 [8] Equals [6] + ([12] - [6]) / 6
 [9] Equals [6] + ([12] - [6]) / 6
 [10] Equals [6] + ([12] - [6]) / 6
 [11] Equals [6] + ([12] - [6]) / 6
 [12] Source: Federal Reserve Bank of St. Louis; Energy Information Administration
 [13] Equals internal rate of return of cash flows resulting from Excel's goal seek function

Multi-Stage Discounted Cash Flow Model
180 Day Average Stock Price
Low Growth Rate

Company	Ticker	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8] [9] [10] [11]					[12]	[13]
		Indicated Annual Dividend	Weighted-Average Stock Price	Zacks Earnings Growth	Yahoo Finance Earnings Growth	Value Line Earnings Growth	First Stage Growth	Year 6	Year 7	Year 8	Year 9	Year 10	Third Stage Growth	ROE	
Atmos Energy	ATO	\$2.42	\$105.45	7.20%	7.15%	7.00%	7.00%	6.70%	6.39%	6.09%	5.78%	5.48%	5.17%	7.96%	
Chesapeake Utilities	CPK	\$1.80	\$89.37	NA	4.74%	9.00%	4.74%	4.81%	4.88%	4.96%	5.03%	5.10%	5.17%	7.27%	
NiSource Inc.	NI	\$0.84	\$26.00	5.30%	4.89%	13.50%	4.89%	4.94%	4.98%	5.03%	5.08%	5.13%	5.17%	8.62%	
New Jersey Resources	NJR	\$1.25	\$37.21	6.00%	6.00%	2.00%	2.00%	2.53%	3.06%	3.59%	4.12%	4.65%	5.17%	8.14%	
ONE Gas Inc.	OGS	\$2.24	\$84.64	5.50%	5.00%	6.50%	5.00%	5.03%	5.06%	5.09%	5.12%	5.15%	5.17%	8.00%	
South Jersey Inds.	SJI	\$1.22	\$28.13	10.20%	10.20%	12.50%	10.20%	9.36%	8.52%	7.69%	6.85%	6.01%	5.17%	11.57%	
Spire Inc.	SR	\$2.55	\$75.59	4.70%	4.67%	5.50%	4.67%	4.75%	4.84%	4.92%	5.01%	5.09%	5.17%	8.73%	
Southwest Gas	SWX	\$2.30	\$72.50	6.00%	8.20%	8.00%	6.00%	5.86%	5.72%	5.59%	5.45%	5.31%	5.17%	8.81%	
													Mean	8.64%	
													Median	8.38%	
													Max	11.57%	
													Min	7.27%	

[1] Source: Value Line
 [2] Source: Yahoo Finance, as of July 10, 2020
 [3] Source: Zacks
 [4] Source: Yahoo Finance
 [5] Source: Value Line
 [6] Equals minimum ([3], [4], [5])
 [7] Equals $[6] + ([12] - [6]) / 6$
 [8] Equals $[6] + ([12] - [6]) / 6$
 [9] Equals $[6] + ([12] - [6]) / 6$
 [10] Equals $[6] + ([12] - [6]) / 6$
 [11] Equals $[6] + ([12] - [6]) / 6$
 [12] Source: Federal Reserve Bank of St. Louis; Energy Information Administration
 [13] Equals internal rate of return of cash flows resulting from Excel's goal seek function

Multi-Stage Discounted Cash Flow Model
180 Day Average Stock Price
Average Growth Rate

Company	Ticker	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]					[11]	[12]	[13]
		Indicated Annual Dividend	Weighted-Average Stock Price	Zacks Earnings Growth	Yahoo Finance Earnings Growth	Value Line Earnings Growth	First Stage Growth	Year 6	Year 7	Year 8	Year 9	Year 10	Third Stage Growth	ROE		
Atmos Energy	ATO	\$2.42	\$105.45	7.20%	7.15%	7.00%	7.12%	6.79%	6.47%	6.15%	5.82%	5.50%	5.17%	7.98%		
Chesapeake Utilities	CPK	\$1.80	\$89.37	NA	4.74%	9.00%	6.87%	6.59%	6.30%	6.02%	5.74%	5.46%	5.17%	7.59%		
NiSource Inc.	NI	\$0.84	\$26.00	5.30%	4.89%	13.50%	7.90%	7.44%	6.99%	6.54%	6.08%	5.63%	5.17%	9.33%		
New Jersey Resources	NJR	\$1.25	\$37.21	6.00%	6.00%	2.00%	4.67%	4.75%	4.84%	4.92%	5.01%	5.09%	5.17%	8.71%		
ONE Gas Inc.	OGS	\$2.24	\$84.64	5.50%	5.00%	6.50%	5.67%	5.58%	5.50%	5.42%	5.34%	5.26%	5.17%	8.13%		
South Jersey Inds.	SJI	\$1.22	\$28.13	10.20%	10.20%	12.50%	10.97%	10.00%	9.04%	8.07%	7.11%	6.14%	5.17%	11.85%		
Spire Inc.	SR	\$2.55	\$75.59	4.70%	4.67%	5.50%	4.96%	4.99%	5.03%	5.07%	5.10%	5.14%	5.17%	8.80%		
Southwest Gas	SWX	\$2.30	\$72.50	6.00%	8.20%	8.00%	7.40%	7.03%	6.66%	6.29%	5.92%	5.55%	5.17%	9.14%		
														Mean	8.94%	
														Median	8.75%	
														Max	11.85%	
														Min	7.59%	

[1] Source: Value Line
 [2] Source: Yahoo Finance, as of July 10, 2020
 [3] Source: Zacks
 [4] Source: Yahoo Finance
 [5] Source: Value Line
 [6] Equals average ([3], [4], [5])
 [7] Equals [6] + ([12] - [6]) / 6
 [8] Equals [6] + ([12] - [6]) / 6
 [9] Equals [6] + ([12] - [6]) / 6
 [10] Equals [6] + ([12] - [6]) / 6
 [11] Equals [6] + ([12] - [6]) / 6
 [12] Source: Federal Reserve Bank of St. Louis; Energy Information Administration
 [13] Equals internal rate of return of cash flows resulting from Excel's goal seek function

Multi-Stage Discounted Cash Flow Model
180 Day Average Stock Price
High Growth Rate

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	
				Yahoo	Value Line			Second Stage Growth						
Company	Ticker	Indicated Annual Dividend	Weighted-Average Stock Price	Zacks Earnings Growth	Yahoo Finance Earnings Growth	Value Line Earnings Growth	First Stage Growth	Year 6	Year 7	Year 8	Year 9	Year 10	Third Stage Growth	ROE
Atmos Energy	ATO	\$2.42	\$105.45	7.20%	7.15%	7.00%	7.20%	6.86%	6.52%	6.19%	5.85%	5.51%	5.17%	7.99%
Chesapeake Utilities	CPK	\$1.80	\$89.37	NA	4.74%	9.00%	9.00%	8.36%	7.72%	7.09%	6.45%	5.81%	5.17%	7.94%
NiSource Inc.	NI	\$0.84	\$26.00	5.30%	4.89%	13.50%	13.50%	12.11%	10.72%	9.34%	7.95%	6.56%	5.17%	10.92%
New Jersey Resources	NJR	\$1.25	\$37.21	6.00%	6.00%	2.00%	6.00%	5.86%	5.72%	5.59%	5.45%	5.31%	5.17%	9.03%
ONE Gas Inc.	OGS	\$2.24	\$84.64	5.50%	5.00%	6.50%	6.50%	6.28%	6.06%	5.84%	5.62%	5.40%	5.17%	8.29%
South Jersey Inds.	SJI	\$1.22	\$28.13	10.20%	10.20%	12.50%	12.50%	11.28%	10.06%	8.84%	7.62%	6.40%	5.17%	12.42%
Spire Inc.	SR	\$2.55	\$75.59	4.70%	4.67%	5.50%	5.50%	5.45%	5.39%	5.34%	5.28%	5.23%	5.17%	8.92%
Southwest Gas	SWX	\$2.30	\$72.50	6.00%	8.20%	8.00%	8.20%	7.70%	7.19%	6.69%	6.18%	5.68%	5.17%	9.34%
													Mean	9.36%
													Median	8.97%
													Max	12.42%
													Min	7.94%

[1] Source: Value Line
 [2] Source: Yahoo Finance, as of July 10, 2020
 [3] Source: Zacks
 [4] Source: Yahoo Finance
 [5] Source: Value Line
 [6] Equals maximum ([3], [4], [5])
 [7] Equals [6] + ([12] - [6]) / 6
 [8] Equals [6] + ([12] - [6]) / 6
 [9] Equals [6] + ([12] - [6]) / 6
 [10] Equals [6] + ([12] - [6]) / 6
 [11] Equals [6] + ([12] - [6]) / 6
 [12] Source: Federal Reserve Bank of St. Louis; Energy Information Administration
 [13] Equals internal rate of return of cash flows resulting from Excel's goal seek function

Proxy Group Betas

[1]

Company Name	Stock Ticker	Beta
Atmos Energy	ATO	0.80
Chesapeake Utilities	CPK	0.75
NiSource Inc.	NI	0.85
New Jersey Resources	NJR	0.90
ONE Gas Inc.	OGS	0.80
South Jersey Inds.	SJI	0.95
Spire Inc.	SR	0.80
Southwest Gas	SWX	0.90
Mean		0.84

[1] Source: Value Line

Market Risk Premium Derived from Value Line Long-Term Growth Estimates

[1] S&P 500 Estimated Required Market Return	13.66%
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		S&P 500 Index					
Company	Ticker	[2] Market Capitalization	[3] Weight in Index	[4] Dividend Yield	[5] Long-Term EPS Growth	[6] DCF Result	[7] Weighted DCF Result
Agilent Technologies	A	27,176.90	0.10%	0.82%	10.50%	11.36%	0.0111%
Amer. Airlines	AAL	5,417.20	0.02%	0.00%	2.00%	2.00%	0.0004%
Advance Auto Parts	AAP	9,808.90	0.04%	0.70%	11.00%	11.74%	0.0041%
Apple Inc.	AAPL	1,574,406.90	5.64%	0.92%	14.00%	14.98%	0.8456%
AbbVie Inc.	ABBV	146,397.60	0.52%	4.76%	10.50%	15.51%	0.0814%
AmerisourceBergen	ABC	20,223.40	0.07%	1.69%	7.00%	8.75%	0.0063%
ABIOMED Inc.	ABMD	11,513.70	0.04%	0.00%	10.50%	10.50%	0.0043%
Abbott Labs.	ABT	162,097.00	0.58%	1.57%	9.50%	11.14%	0.0648%
Accenture Plc	ACN	136,597.70	0.49%	1.52%	7.50%	9.08%	0.0444%
Adobe Inc.	ADBE	211,108.80	0.76%	0.00%	19.50%	19.50%	0.1476%
Analog Devices	ADI	44,347.30	0.16%	2.06%	7.00%	9.13%	0.0145%
Archer Daniels Mid'd	ADM	21,872.60	0.08%	3.65%	9.00%	12.81%	0.0100%
Automatic Data Proc.	ADP	64,087.50	0.23%	2.54%	12.00%	14.69%	0.0338%
Alliance Data Sys.	ADS	2,082.00	0.01%	1.92%	7.50%	9.49%	0.0007%
Autodesk Inc.	ADSK	52,875.40	0.19%	0.00%	0.00%	0.00%	0.0000%
Ameren Corp.	AEE	17,897.80	0.06%	2.84%	6.00%	8.93%	0.0057%
Amer. Elec. Power	AEP	40,607.10	0.15%	3.56%	5.00%	8.65%	0.0126%
AES Corp.	AES	9,581.30	0.03%	3.96%	24.00%	28.44%	0.0098%
Aflac Inc.	AFL	25,423.50	0.09%	3.22%	7.00%	10.33%	0.0094%
Amer. Int'l Group	AIG	25,477.00	0.09%	4.33%	28.50%	33.45%	0.0305%
Apartment Investment	AIV	5,922.40	0.02%	4.23%	-1.50%	2.70%	0.0006%
Assurant Inc.	AIZ	6,034.70	0.02%	2.49%	11.50%	14.13%	0.0031%
Gallagher (Arthur J.)	AJG	18,457.60	0.07%	1.85%	13.50%	15.47%	0.0102%
Akamai Technologies	AKAM	17,244.30	0.06%	0.00%	14.50%	14.50%	0.0090%
Albemarle Corp.	ALB	8,086.60	0.03%	2.03%	4.00%	6.07%	0.0018%
Align Techn.	ALGN	21,567.40	0.08%	0.00%	19.50%	19.50%	0.0151%
Alaska Air Group	ALK	4,376.30	0.02%	0.00%	2.00%	2.00%	0.0003%
Allstate Corp.	ALL	30,091.90	0.11%	2.26%	6.00%	8.33%	0.0090%
Allegion plc	ALLE	9,396.10	0.03%	1.26%	9.00%	10.32%	0.0035%
Alexion Pharmac.	ALXN	24,849.40	0.09%	0.00%	19.50%	19.50%	0.0174%
Applied Materials	AMAT	54,695.50	0.20%	1.48%	7.50%	9.04%	0.0177%
Amcpr plc	AMCR	16,724.30	0.06%	4.65%	0.00%	4.65%	0.0028%
Advanced Micro Dev.	AMD	61,571.20	0.22%	0.00%	20.00%	20.00%	0.0441%
AMETEK Inc.	AME	20,095.90	0.07%	0.82%	12.50%	13.37%	0.0096%
Amgen	AMGN	150,010.60	0.54%	2.63%	6.50%	9.22%	0.0496%
Ameriprise Fin'l	AMP	17,840.10	0.06%	2.85%	11.00%	14.01%	0.0090%
Amer. Tower 'A'	AMT	117,655.90	0.42%	1.80%	9.00%	10.88%	0.0459%
Amazon.com	AMZN	1,502,681.50	5.39%	0.00%	33.50%	33.50%	1.8044%
Arista Networks	ANET	15,845.20	0.06%	0.00%	5.50%	5.50%	0.0031%
ANSYS Inc.	ANSS	25,189.70	0.09%	0.00%	9.50%	9.50%	0.0086%
Anthem Inc.	ANTM	67,712.70	0.24%	1.41%	14.00%	15.51%	0.0376%
Aon plc	AON	44,172.50	0.16%	0.94%	7.50%	8.48%	0.0134%
Smith (A.O.)	AOS	7,460.80	0.03%	2.07%	5.00%	7.12%	0.0019%
Apache Corp.	APA	4,902.70	0.02%	0.77%	13.50%	14.32%	0.0025%
Air Products & Chem.	APD	53,726.20	0.19%	2.20%	12.00%	14.33%	0.0276%
Amphenol Corp.	APH	28,134.20	0.10%	1.05%	9.00%	10.10%	0.0102%
Aptiv PLC	APTIV	19,221.10	0.07%	0.00%	9.50%	9.50%	0.0065%
Alexandria Real Estate	ARE	18,362.50	0.07%	2.56%	16.50%	19.27%	0.0127%
Atmos Energy	ATO	12,315.30	0.04%	2.40%	7.00%	9.48%	0.0042%
Activision Blizzard	ATVI	60,110.00	0.22%	0.52%	8.00%	8.54%	0.0184%
AvalonBay Communities	AVB	22,369.40	0.08%	4.09%	4.50%	8.68%	0.0070%
Broadcom Inc.	AVGO	125,717.50	0.45%	4.16%	17.00%	21.51%	0.0969%
Avery Dennison	AVY	9,500.30	0.03%	2.08%	11.00%	13.19%	0.0045%
Amer. Water Works	AWK	23,645.00	0.08%	1.72%	8.50%	10.29%	0.0087%
Amer. Express	AXP	75,710.30	0.27%	1.83%	7.50%	9.40%	0.0255%
AutoZone Inc.	AZO	26,394.40	0.09%	0.00%	13.00%	13.00%	0.0123%
Boeing	BA	101,756.90	0.36%	0.00%	-1.50%	-1.50%	-0.0055%
Bank of America	BAC	201,791.80	0.72%	3.10%	5.00%	8.18%	0.0591%
Baxter Int'l Inc.	BAX	44,387.40	0.16%	1.12%	9.00%	10.17%	0.0162%
Best Buy Co.	BBY	22,449.00	0.08%	2.52%	9.00%	11.63%	0.0094%
Becton Dickinson	BDX	65,642.10	0.24%	1.33%	9.00%	10.39%	0.0244%
Franklin Resources	BEN	10,004.80	0.04%	5.45%	6.50%	12.13%	0.0043%
Brown-Forman 'B'	BF/B	30,854.00	0.11%	1.09%	11.00%	12.15%	0.0134%
Biogen	BIIB	50,597.60	0.18%	0.00%	7.00%	7.00%	0.0127%

Bank of New York Mello	BK	33,283.80	0.12%	3.30%	3.00%	6.35%	0.0076%
Booking Holdings	BKNG	67,894.30	0.24%	0.00%	7.00%	7.00%	0.0170%
Baker Hughes	BKR	10,078.10	0.04%	4.67%	45.50%	51.23%	0.0185%
BlackRock Inc.	BLK	83,968.40	0.30%	2.67%	7.00%	9.76%	0.0294%
Ball Corp.	BLL	23,036.00	0.08%	0.85%	19.00%	19.93%	0.0165%
Bristol-Myers Squibb	BMY	134,471.70	0.48%	3.03%	12.50%	15.72%	0.0758%
Broadridge Fin'l	BR	14,572.40	0.05%	1.70%	9.00%	10.78%	0.0056%
Berkshire Hathaway 'B'	BRK/	0.00	0.00%	0.00%	0.00%	0.00%	0.0000%
Boston Scientific	BSX	49,367.70	0.18%	0.00%	13.50%	13.50%	0.0239%
BorgWarner	BWA	7,098.30	0.03%	1.99%	3.50%	5.52%	0.0014%
Boston Properties	BXP	13,938.80	0.05%	4.35%	4.00%	8.44%	0.0042%
Citigroup Inc.	C	106,447.60	0.38%	4.05%	3.50%	7.62%	0.0291%
Conagra Brands	CAG	17,374.00	0.06%	2.44%	5.00%	7.50%	0.0047%
Cardinal Health	CAH	15,090.60	0.05%	3.75%	12.50%	16.48%	0.0089%
Caterpillar Inc.	CAT	68,318.50	0.24%	3.27%	4.00%	7.34%	0.0180%
Chubb Ltd.	CB	56,718.90	0.20%	2.48%	9.50%	12.10%	0.0246%
Cboe Global Markets	CBOE	10,674.00	0.04%	1.49%	12.50%	14.08%	0.0054%
CBRE Group	CBRE	15,031.30	0.05%	0.00%	7.50%	7.50%	0.0040%
Crown Castle Int'l	CCI	71,678.10	0.26%	2.95%	14.00%	17.16%	0.0441%
Carnival Corp.	CCL	12,188.20	0.04%	0.00%	-2.50%	-2.50%	-0.0011%
Cadence Design Sys.	CDNS	27,100.70	0.10%	0.00%	10.00%	10.00%	0.0097%
CDW Corp.	CDW	16,439.90	0.06%	1.32%	11.00%	12.39%	0.0073%
Celanese Corp.	CE	10,135.80	0.04%	2.89%	7.00%	9.99%	0.0036%
Cerner Corp.	CERN	21,143.00	0.08%	1.04%	9.00%	10.09%	0.0076%
CF Industries	CF	6,182.10	0.02%	4.38%	26.50%	31.46%	0.0070%
Citizens Fin'l Group	CFG	10,336.20	0.04%	6.44%	1.50%	7.99%	0.0030%
Church & Dwight	CHD	19,144.40	0.07%	1.23%	8.00%	9.28%	0.0064%
C.H. Robinson	CHRW	10,644.40	0.04%	2.58%	8.00%	10.68%	0.0041%
Charter Communic.	CHTR	107,752.50	0.39%	0.00%	33.50%	33.50%	0.1294%
Cigna Corp.	CI	70,290.70	0.25%	0.03%	11.50%	11.53%	0.0291%
Cincinnati Financial	CINF	10,307.30	0.04%	3.74%	10.50%	14.44%	0.0053%
Colgate-Palmolive	CL	62,552.20	0.22%	2.41%	5.00%	7.47%	0.0167%
Clorox Co.	CLX	27,648.90	0.10%	2.02%	4.50%	6.57%	0.0065%
Comerica Inc.	CMA	4,997.00	0.02%	7.57%	0.50%	8.09%	0.0014%
Comcast Corp.	CMCS	180,819.50	0.65%	2.32%	9.50%	11.93%	0.0773%
CME Group	CME	60,412.10	0.22%	2.01%	2.50%	4.54%	0.0098%
Chipotle Mex. Grill	CMG	29,716.40	0.11%	0.00%	14.50%	14.50%	0.0154%
Cummins Inc.	CMI	25,215.10	0.09%	3.07%	4.00%	7.13%	0.0064%
CMS Energy Corp.	CMS	17,160.60	0.06%	2.82%	7.50%	10.43%	0.0064%
Centene Corp.	CNC	37,880.40	0.14%	0.00%	13.00%	13.00%	0.0177%
CenterPoint Energy	CNP	9,686.00	0.03%	3.11%	4.50%	7.68%	0.0027%
Capital One Fin'l	COF	27,637.30	0.10%	2.64%	-0.50%	2.13%	0.0021%
Cabot Oil & Gas 'A'	COG	6,775.80	0.02%	2.53%	11.50%	14.18%	0.0034%
Cooper Cos.	COO	14,116.70	0.05%	0.02%	11.00%	11.02%	0.0056%
ConocoPhillips	COP	43,690.60	0.16%	4.12%	10.50%	14.84%	0.0232%
Costco Wholesale	COST	134,554.10	0.48%	0.93%	10.00%	10.98%	0.0529%
Coty Inc.	COTY	3,296.60	0.01%	0.00%	10.50%	10.50%	0.0012%
Campbell Soup	CPB	15,927.10	0.06%	2.84%	1.50%	4.36%	0.0025%
Copart Inc.	CPRT	19,853.40	0.07%	0.00%	14.00%	14.00%	0.0100%
salesforce.com	CRM	172,509.10	0.62%	0.00%	31.50%	31.50%	0.1948%
Cisco Systems	CSCO	194,373.20	0.70%	3.13%	7.00%	10.24%	0.0713%
CSX Corp.	CSX	52,235.40	0.19%	1.52%	9.50%	11.09%	0.0208%
Cintas Corp.	CTAS	27,876.10	0.10%	1.08%	14.00%	15.16%	0.0151%
CenturyLink Inc.	CTL	10,834.40	0.04%	10.13%	2.50%	12.76%	0.0050%
Cognizant Technology	CTSH	30,523.20	0.11%	1.56%	4.00%	5.59%	0.0061%
Corteva Inc.	CTVA	20,235.90	0.07%	2.07%	0.00%	2.07%	0.0015%
Citrix Sys.	CTXS	18,373.90	0.07%	0.94%	9.00%	9.98%	0.0066%
CVS Health	CVS	84,250.80	0.30%	3.10%	6.00%	9.19%	0.0278%
Chevron Corp.	CVX	163,584.70	0.59%	5.89%	10.50%	16.70%	0.0979%
Concho Resources	CXO	10,006.40	0.04%	1.57%	6.00%	7.62%	0.0027%
Dominion Energy	D	69,091.70	0.25%	4.60%	10.50%	15.34%	0.0380%
Delta Air Lines	DAL	17,668.10	0.06%	0.00%	6.00%	6.00%	0.0038%
DuPont de Nemours	DD	38,392.10	0.14%	2.37%	0.00%	2.37%	0.0033%
Deere & Co.	DE	49,071.90	0.18%	1.94%	5.00%	6.99%	0.0123%
Discover Fin'l Svcs.	DFS	14,769.90	0.05%	3.65%	4.50%	8.23%	0.0044%
Dollar General	DG	48,053.70	0.17%	0.75%	11.50%	12.29%	0.0212%
Quest Diagnostics	DGX	15,282.70	0.05%	1.96%	9.00%	11.05%	0.0061%
Horton D.R.	DHI	19,580.20	0.07%	1.30%	6.50%	7.84%	0.0055%
Danaher Corp.	DHR	123,480.50	0.44%	0.41%	14.50%	14.94%	0.0661%
Disney (Walt)	DIS	201,270.80	0.72%	0.00%	5.50%	5.50%	0.0397%
Discovery Inc.	DISC	10,682.50	0.04%	0.00%	15.00%	15.00%	0.0057%
Discovery Communic. 'C	DISC	10,051.30	0.04%	0.00%	0.00%	0.00%	0.0000%
Dish Network 'A'	DISH	18,123.70	0.06%	0.00%	-1.00%	-1.00%	-0.0006%
Digital Realty Trust	DLR	30,789.90	0.11%	3.09%	8.50%	11.72%	0.0129%
Dollar Tree Inc.	DLTR	22,152.10	0.08%	0.00%	8.00%	8.00%	0.0064%
Dover Corp.	DOV	13,761.30	0.05%	2.05%	5.50%	7.61%	0.0038%
Dow Inc.	DOW	30,184.80	0.11%	7.12%	0.00%	7.12%	0.0077%
Domino's Pizza	DPZ	14,667.70	0.05%	0.83%	13.00%	13.88%	0.0073%
Duke Realty Corp.	DRE	13,290.40	0.05%	2.60%	-3.00%	-0.44%	-0.0002%

Darden Restaurants	DRI	9,195.80	0.03%	0.00%	4.00%	4.00%	0.0013%
DTE Energy	DTE	21,187.30	0.08%	3.88%	5.00%	8.98%	0.0068%
Duke Energy	DUK	60,218.50	0.22%	4.68%	5.00%	9.80%	0.0211%
DaVita Inc.	DVA	9,822.40	0.04%	0.00%	11.50%	11.50%	0.0040%
Devon Energy	DVN	4,251.30	0.02%	4.32%	2.50%	6.87%	0.0010%
DXC Technology	DXC	4,091.10	0.01%	5.20%	7.50%	12.90%	0.0019%
DexCom Inc.	DXCM	37,259.60	0.13%	0.00%	51.50%	51.50%	0.0688%
Electronic Arts	EA	38,999.20	0.14%	0.00%	10.50%	10.50%	0.0147%
eBay Inc.	EBAY	37,125.00	0.13%	1.23%	7.00%	8.27%	0.0110%
Ecolab Inc.	ECL	57,909.80	0.21%	0.94%	8.50%	9.48%	0.0197%
Consol. Edison	ED	24,415.40	0.09%	4.23%	3.00%	7.29%	0.0064%
Equifax Inc.	EFX	21,071.40	0.08%	0.90%	7.00%	7.93%	0.0060%
Edison Int'l	EIX	20,111.10	0.07%	4.70%	12.00%	16.98%	0.0122%
Lauder (Estee)	EL	68,156.10	0.24%	0.00%	11.50%	11.50%	0.0281%
Eastman Chemical	EMN	9,332.40	0.03%	3.84%	5.00%	8.94%	0.0030%
Emerson Electric	EMR	36,573.00	0.13%	3.27%	8.50%	11.91%	0.0156%
EOG Resources	EOG	29,020.40	0.10%	3.05%	10.50%	13.71%	0.0143%
Equinix Inc.	EQIX	62,569.50	0.22%	1.50%	16.00%	17.62%	0.0395%
Equity Residential	EQR	22,608.70	0.08%	3.96%	1.00%	4.98%	0.0040%
Eversource Energy	ES	28,631.90	0.10%	2.70%	6.50%	9.29%	0.0095%
Essex Property Trust	ESS	15,820.40	0.06%	3.52%	1.00%	4.54%	0.0026%
E*Trade Fin'l	ETFC	10,846.00	0.04%	1.14%	5.50%	6.67%	0.0026%
Eaton Corp. plc	ETN	34,840.00	0.12%	3.35%	4.00%	7.42%	0.0093%
Entergy Corp.	ETR	19,359.60	0.07%	3.91%	3.00%	6.97%	0.0048%
Energy Inc.	EVERG	13,833.30	0.05%	3.46%	0.00%	3.46%	0.0017%
Edwards Lifesciences	EW	42,745.50	0.15%	0.00%	13.50%	13.50%	0.0207%
Exelon Corp.	EXC	36,403.90	0.13%	4.15%	5.00%	9.25%	0.0121%
Expeditors Int'l	EXPD	12,662.20	0.05%	1.37%	5.50%	6.91%	0.0031%
Expedia Group	EXPE	11,904.10	0.04%	0.00%	12.00%	12.00%	0.0051%
Extra Space Storage	EXR	12,559.60	0.05%	3.71%	3.00%	6.77%	0.0030%
Ford Motor	F	23,359.00	0.08%	0.00%	11.00%	11.00%	0.0092%
Diamondback Energy	FANG	6,249.50	0.02%	3.79%	4.50%	8.38%	0.0019%
Fastenal Co.	FAST	24,636.90	0.09%	2.33%	8.00%	10.42%	0.0092%
Facebook Inc.	FB	677,255.00	2.43%	0.00%	14.00%	14.00%	0.3399%
Fortune Brands Home	FBHS	8,606.50	0.03%	1.54%	5.00%	6.58%	0.0020%
Freep't-McMoRan Inc.	FCX	18,188.70	0.07%	0.00%	17.00%	17.00%	0.0111%
FedEx Corp.	FDX	40,927.30	0.15%	1.66%	3.00%	4.68%	0.0069%
FirstEnergy Corp.	FE	21,605.10	0.08%	3.96%	8.50%	12.63%	0.0098%
F5 Networks	FFIV	8,325.00	0.03%	0.00%	6.50%	6.50%	0.0019%
Fidelity Nat'l Info.	FIS	84,305.80	0.30%	1.02%	28.50%	29.67%	0.0896%
Fiserv Inc.	FISV	66,389.00	0.24%	0.00%	14.00%	14.00%	0.0333%
Fifth Third Bancorp	FITB	13,109.40	0.05%	5.86%	3.00%	8.95%	0.0042%
FLIR Systems	FLIR	5,327.00	0.02%	1.66%	7.50%	9.22%	0.0018%
Flowerserve Corp.	FLS	3,586.10	0.01%	2.89%	9.50%	12.53%	0.0016%
FleetCor Technologies	FLT	21,335.60	0.08%	0.00%	14.00%	14.00%	0.0107%
FMC Corp.	FMC	12,861.90	0.05%	1.85%	11.00%	12.95%	0.0060%
Fox Corp. 'B'	FOX	0.00	0.00%	0.00%	0.00%	0.00%	0.0000%
Fox Corp. 'A'	FOXA	16,258.20	0.06%	1.71%	0.00%	1.71%	0.0010%
First Republic Bank	FRC	18,001.60	0.06%	0.76%	9.00%	9.79%	0.0063%
Federal Rlty. Inv. Tru	FRT	6,606.80	0.02%	4.87%	1.50%	6.41%	0.0015%
TechnipFMC	FTI	3,097.80	0.01%	7.53%	22.40%	30.77%	0.0034%
Fortinet Inc.	FTNT	22,637.20	0.08%	0.00%	21.00%	21.00%	0.0170%
Fortive Corp.	FTV	22,720.50	0.08%	0.41%	8.00%	8.43%	0.0069%
Gen'l Dynamics	GD	42,209.30	0.15%	2.99%	6.00%	9.08%	0.0137%
Gen'l Electric	GE	58,955.40	0.21%	0.59%	4.00%	4.60%	0.0097%
Gilead Sciences	GILD	95,379.20	0.34%	3.58%	3.50%	7.14%	0.0244%
Gen'l Mills	GIS	36,608.50	0.13%	3.29%	4.00%	7.36%	0.0097%
Globe Life Inc.	GL	7,748.40	0.03%	1.03%	8.00%	9.07%	0.0025%
Corning Inc.	GLW	19,475.90	0.07%	3.43%	13.50%	17.16%	0.0120%
Gen'l Motors	GM	35,719.70	0.13%	0.00%	3.50%	3.50%	0.0045%
Alphabet Inc. 'A'	GOOG	986,287.60	3.54%	0.00%	16.08%	16.08%	0.5685%
Alphabet Inc.	GOOG	983,579.10	3.53%	0.00%	14.50%	14.50%	0.5112%
Genuine Parts	GPC	12,391.00	0.04%	3.68%	6.50%	10.30%	0.0046%
Global Payments	GPN	51,277.20	0.18%	0.46%	11.50%	11.99%	0.0220%
Gap (The) Inc.	GPS	4,651.30	0.02%	0.00%	2.50%	2.50%	0.0004%
Garmin Ltd.	GRMN	18,553.50	0.07%	2.51%	7.00%	9.60%	0.0064%
Goldman Sachs	GS	67,935.60	0.24%	2.53%	6.50%	9.11%	0.0222%
Grainger (W.W.)	GWV	16,466.00	0.06%	1.87%	7.00%	8.94%	0.0053%
Halliburton Co.	HAL	10,898.80	0.04%	1.44%	4.50%	5.97%	0.0023%
Hasbro Inc.	HAS	10,233.10	0.04%	3.64%	8.50%	12.29%	0.0045%
Huntington Bancshs.	HBAN	8,782.30	0.03%	6.95%	4.00%	11.09%	0.0035%
Hanesbrands Inc.	HBI	3,849.30	0.01%	5.43%	2.50%	8.00%	0.0011%
HCA Healthcare	HCA	33,112.60	0.12%	0.00%	10.50%	10.50%	0.0125%
Home Depot	HD	267,009.40	0.96%	2.42%	7.00%	9.50%	0.0910%
Hess Corp.	HES	15,311.80	0.05%	2.01%	0.00%	2.01%	0.0011%
HollyFrontier Corp.	HFC	4,485.80	0.02%	5.13%	8.50%	13.85%	0.0022%
Hartford Fin'l Svcs.	HIG	13,494.10	0.05%	3.45%	11.50%	15.15%	0.0073%
Huntington Ingalls	HII	7,036.10	0.03%	2.37%	7.50%	9.96%	0.0025%
Hilton Worldwide Hldgs	HLT	20,631.30	0.07%	0.00%	14.00%	14.00%	0.0104%

Harley-Davidson	HOG	3,546.00	0.01%	0.35%	10.50%	10.87%	0.0014%
Hologic Inc.	HOLX	14,709.70	0.05%	0.00%	9.50%	9.50%	0.0050%
Honeywell Int'l	HON	101,143.30	0.36%	2.50%	7.50%	10.09%	0.0366%
Hewlett Packard Ent.	HPE	12,078.80	0.04%	5.10%	5.00%	10.23%	0.0044%
HP Inc.	HPQ	24,310.00	0.09%	4.12%	8.00%	12.28%	0.0107%
Block (H&R)	HRB	2,694.60	0.01%	7.43%	6.00%	13.65%	0.0013%
Hormel Foods	HRL	25,567.70	0.09%	2.07%	8.50%	10.66%	0.0098%
Schein (Henry)	HSIC	8,383.60	0.03%	0.00%	5.00%	5.00%	0.0015%
Host Hotels & Resorts	HST	7,768.90	0.03%	0.00%	-9.00%	-9.00%	-0.0025%
Hershey Co.	HSY	27,086.00	0.10%	2.50%	4.50%	7.06%	0.0069%
Humana Inc.	HUM	51,765.30	0.19%	0.66%	10.50%	11.19%	0.0208%
Howmet Aerospace	HWM	6,663.70	0.02%	0.00%	10.00%	10.00%	0.0024%
Int'l Business Mach.	IBM	105,250.70	0.38%	5.50%	0.50%	6.01%	0.0227%
Intercontinental Exch.	ICE	51,128.40	0.18%	1.29%	9.50%	10.85%	0.0199%
IDEXX Labs.	IDXX	28,412.10	0.10%	0.00%	10.50%	10.50%	0.0107%
IDEX Corp.	IEX	11,737.10	0.04%	1.28%	6.50%	7.82%	0.0033%
Int'l Flavors & Frag.	IFF	13,262.80	0.05%	2.51%	8.00%	10.61%	0.0050%
Illumina Inc.	ILMN	71,498.70	0.26%	0.00%	9.50%	9.50%	0.0243%
Incyte Corp.	INCY	22,270.10	0.08%	0.00%	66.00%	66.00%	0.0527%
IHS Markit	INFO	30,252.60	0.11%	0.90%	11.50%	12.45%	0.0135%
Intel Corp.	INTC	249,001.50	0.89%	2.24%	7.00%	9.32%	0.0832%
Intuit Inc.	INTU	78,897.40	0.28%	0.71%	12.50%	13.25%	0.0375%
Int'l Paper	IP	13,673.40	0.05%	5.89%	6.00%	12.07%	0.0059%
Interpublic Group	IPG	6,646.80	0.02%	5.98%	10.00%	16.28%	0.0039%
IPG Photonics	IPGP	8,276.10	0.03%	0.00%	8.50%	8.50%	0.0025%
IQVIA Holdings	IQV	27,032.20	0.10%	0.00%	9.50%	9.50%	0.0092%
Iron Mountain	IRM	7,556.80	0.03%	9.45%	8.50%	18.35%	0.0050%
Intuitive Surgical	ISRG	67,108.00	0.24%	0.00%	11.50%	11.50%	0.0277%
Gartner Inc.	IT	10,718.00	0.04%	0.00%	12.00%	12.00%	0.0046%
Illinois Tool Works	ITW	54,473.80	0.20%	2.48%	7.00%	9.57%	0.0187%
Invesco Ltd.	IVZ	4,708.30	0.02%	6.04%	4.50%	10.68%	0.0018%
Jacobs Engineering	J	10,905.70	0.04%	0.91%	14.00%	14.97%	0.0059%
Hunt (J.B.)	JBHT	12,407.50	0.04%	0.93%	6.50%	7.46%	0.0033%
Johnson Ctrls. Int'l p	JCI	25,209.50	0.09%	3.07%	8.00%	11.19%	0.0101%
Henry (Jack) & Assoc.	JKHY	14,082.70	0.05%	0.94%	10.00%	10.99%	0.0055%
Johnson & Johnson	JNJ	369,535.20	1.32%	2.88%	10.00%	13.02%	0.1725%
Juniper Networks	JNPR	7,464.00	0.03%	3.55%	5.50%	9.15%	0.0024%
JPMorgan Chase	JPM	284,165.30	1.02%	3.86%	3.50%	7.43%	0.0757%
Nordstrom Inc.	JWN	2,378.60	0.01%	0.00%	4.00%	4.00%	0.0003%
Kellogg	K	22,592.20	0.08%	3.49%	3.00%	6.54%	0.0053%
KeyCorp	KEY	11,401.50	0.04%	6.33%	3.00%	9.42%	0.0039%
Keysight Technologies	KEYS	18,606.10	0.07%	0.00%	17.00%	17.00%	0.0113%
Kraft Heinz Co.	KHC	38,700.70	0.14%	5.05%	-0.50%	4.54%	0.0063%
Kimco Realty	KIM	5,574.70	0.02%	0.00%	5.00%	5.00%	0.0010%
KLA Corp.	KLAC	29,947.70	0.11%	1.76%	11.50%	13.36%	0.0143%
Kimberly-Clark	KMB	48,361.20	0.17%	3.02%	6.50%	9.62%	0.0167%
Kinder Morgan Inc.	KMI	33,717.90	0.12%	7.04%	22.00%	29.81%	0.0360%
CarMax Inc.	KMX	14,488.50	0.05%	0.00%	7.50%	7.50%	0.0039%
Coca-Cola	KO	192,457.10	0.69%	3.66%	6.50%	10.28%	0.0709%
Kroger Co.	KR	26,117.50	0.09%	2.14%	5.50%	7.70%	0.0072%
Kohl's Corp.	KSS	3,175.80	0.01%	0.00%	2.00%	2.00%	0.0002%
Kansas City South'n	KSU	13,739.20	0.05%	1.11%	11.50%	12.67%	0.0062%
Loews Corp.	L	9,439.20	0.03%	0.75%	12.00%	12.80%	0.0043%
L Brands	LB	4,197.80	0.02%	0.00%	-2.50%	-2.50%	-0.0004%
Leidos Hldgs.	LDOS	13,250.00	0.05%	1.46%	10.00%	11.53%	0.0055%
Leggett & Platt	LEG	4,547.70	0.02%	4.65%	8.00%	12.84%	0.0021%
Lennar Corp.	LEN	18,665.80	0.07%	0.84%	7.00%	7.87%	0.0053%
Laboratory Corp.	LH	16,218.60	0.06%	0.00%	8.00%	8.00%	0.0047%
L3Harris Technologies	LHX	36,978.60	0.13%	1.99%	0.00%	1.99%	0.0026%
Linde plc	LIN	112,790.30	0.40%	1.89%	0.00%	1.89%	0.0076%
LKQ Corp.	LKQ	7,622.90	0.03%	0.00%	8.00%	8.00%	0.0022%
Lilly (Eli)	LLY	156,266.50	0.56%	1.81%	10.00%	11.90%	0.0667%
Lockheed Martin	LMT	101,074.40	0.36%	2.78%	8.50%	11.40%	0.0413%
Lincoln Nat'l Corp.	LNC	6,698.50	0.02%	4.85%	9.50%	14.58%	0.0035%
Alliant Energy	LNT	12,165.80	0.04%	3.12%	5.50%	8.71%	0.0038%
Lowe's Cos.	LOW	102,400.70	0.37%	1.62%	10.00%	11.70%	0.0429%
Lam Research	LRCX	47,585.80	0.17%	1.48%	10.00%	11.55%	0.0197%
Southwest Airlines	LUV	17,205.40	0.06%	0.00%	2.00%	2.00%	0.0012%
Las Vegas Sands	LVS	34,410.60	0.12%	0.00%	5.50%	5.50%	0.0068%
Lamb Weston Holdings	LW	9,261.80	0.03%	1.50%	9.50%	11.07%	0.0037%
LyondellBasell Inds.	LYB	21,894.30	0.08%	6.40%	-1.50%	4.85%	0.0038%
Live Nation Entertain.	LYV	9,731.80	0.03%	0.00%	0.00%	0.00%	0.0000%
MasterCard Inc.	MA	302,374.70	1.08%	0.53%	13.50%	14.07%	0.1525%
Mid-America Apartment	MAA	13,396.00	0.05%	3.40%	0.50%	3.91%	0.0019%
Marriott Int'l	MAR	28,087.10	0.10%	0.00%	8.00%	8.00%	0.0081%
Masco Corp.	MAS	13,038.10	0.05%	1.11%	6.00%	7.14%	0.0033%
McDonald's Corp.	MCD	137,294.70	0.49%	2.71%	7.50%	10.31%	0.0507%
Microchip Technology	MCHP	25,298.00	0.09%	1.43%	8.00%	9.49%	0.0086%
McKesson Corp.	MCK	26,711.10	0.10%	1.09%	9.00%	10.14%	0.0097%

Moody's Corp.	MCO	52,202.60	0.19%	0.81%	8.00%	8.84%	0.0165%
Mondelez Int'l	MDLZ	72,909.20	0.26%	2.35%	8.00%	10.44%	0.0273%
Medtronic plc	MDT	123,781.40	0.44%	2.51%	7.50%	10.10%	0.0448%
MetLife Inc.	MET	32,227.80	0.12%	5.18%	7.00%	12.36%	0.0143%
MGM Resorts Int'l	MGM	8,270.20	0.03%	0.06%	34.00%	34.07%	0.0101%
Mohawk Inds.	MHK	6,941.20	0.02%	0.00%	-3.00%	-3.00%	-0.0007%
McCormick & Co.	MKC	23,913.50	0.09%	1.38%	6.50%	7.92%	0.0068%
MarketAxess Holdings	MKTX	19,185.40	0.07%	0.47%	15.50%	16.01%	0.0110%
Martin Marietta	MLM	12,997.90	0.05%	1.06%	9.50%	10.61%	0.0049%
Marsh & McLennan	MMC	54,404.50	0.20%	1.72%	10.00%	11.81%	0.0230%
3M Company	MMM	89,402.70	0.32%	3.78%	4.50%	8.37%	0.0268%
Monster Beverage	MNST	36,367.70	0.13%	0.00%	11.50%	11.50%	0.0150%
Altria Group	MO	72,922.40	0.26%	8.56%	6.00%	14.82%	0.0387%
Mosaic Company	MOS	4,688.50	0.02%	1.86%	18.50%	20.53%	0.0035%
Marathon Petroleum	MPC	23,192.00	0.08%	6.50%	3.00%	9.60%	0.0080%
Merck & Co.	MRK	197,175.90	0.71%	3.12%	9.00%	12.26%	0.0867%
Marathon Oil Corp.	MRO	4,706.50	0.02%	0.00%	9.00%	9.00%	0.0015%
Morgan Stanley	MS	75,009.60	0.27%	2.94%	5.00%	8.01%	0.0215%
MSCI Inc.	MSCI	28,538.90	0.10%	0.86%	17.00%	17.93%	0.0183%
Microsoft Corp.	MSFT	1,553,673.10	5.57%	1.00%	14.50%	15.57%	0.8673%
Motorola Solutions	MSI	23,114.90	0.08%	1.91%	8.00%	9.99%	0.0083%
M&T Bank Corp.	MTB	12,996.20	0.05%	4.34%	4.00%	8.43%	0.0039%
Mettler-Toledo Int'l	MTD	19,240.90	0.07%	0.00%	9.50%	9.50%	0.0066%
Micron Technology	MU	55,266.40	0.20%	0.00%	13.50%	13.50%	0.0267%
Maxim Integrated	MXIM	15,970.80	0.06%	3.22%	3.50%	6.78%	0.0039%
Mylan N.V.	MYL	8,147.00	0.03%	0.00%	10.00%	10.00%	0.0029%
Noble Energy	NBL	4,297.10	0.02%	0.90%	0.00%	0.90%	0.0001%
Norwegian Cruise Line	NCLH	3,522.50	0.01%	0.00%	-1.50%	-1.50%	-0.0002%
Nasdaq Inc.	NDAQ	19,845.50	0.07%	1.62%	6.50%	8.17%	0.0058%
NextEra Energy	NEE	120,532.00	0.43%	2.33%	10.00%	12.45%	0.0538%
Newmont Corp.	NEM	49,246.60	0.18%	1.63%	13.00%	14.74%	0.0260%
Netflix Inc.	NFLX	213,575.30	0.77%	0.00%	24.00%	24.00%	0.1837%
NiSource Inc.	NI	8,978.00	0.03%	3.58%	13.50%	17.32%	0.0056%
NIKE Inc. 'B'	NKE	151,457.00	0.54%	1.01%	16.00%	17.09%	0.0928%
NortonLifeLock Inc.	NLOK	12,138.80	0.04%	2.53%	4.50%	7.09%	0.0031%
Nielsen Hldgs. plc	NLSN	5,215.20	0.02%	1.64%	0.00%	1.64%	0.0003%
Northrop Grumman	NOC	51,489.90	0.18%	1.88%	10.50%	12.48%	0.0230%
National Oilwell Varco	NOV	4,584.90	0.02%	0.00%	0.00%	0.00%	0.0000%
ServiceNow Inc.	NOW	79,481.90	0.28%	0.00%	46.00%	46.00%	0.1311%
NRG Energy	NRG	8,142.40	0.03%	3.62%	-1.50%	2.09%	0.0006%
Norfolk Southern	NSC	43,939.80	0.16%	2.19%	11.50%	13.82%	0.0218%
NetApp Inc.	NTAP	9,528.70	0.03%	4.60%	7.00%	11.76%	0.0040%
Northern Trust Corp.	NTRS	16,007.50	0.06%	3.64%	4.50%	8.22%	0.0047%
Nucor Corp.	NUE	12,159.80	0.04%	3.99%	3.00%	7.05%	0.0031%
NVIDIA Corp.	NVDA	234,438.00	0.84%	0.17%	9.50%	9.68%	0.0813%
NVR Inc.	NVR	11,705.00	0.04%	0.00%	9.00%	9.00%	0.0038%
Newell Brands	NWL	6,692.30	0.02%	5.83%	4.50%	10.46%	0.0025%
News Corp. 'B'	NWS	7,066.10	0.03%	1.65%	0.00%	1.65%	0.0004%
News Corp. 'A'	NWSA	7,108.80	0.03%	1.66%	0.00%	1.66%	0.0004%
Realty Income Corp.	O	20,380.80	0.07%	4.66%	6.50%	11.31%	0.0083%
Old Dominion Freight	ODFL	19,889.00	0.07%	0.36%	6.50%	6.87%	0.0049%
ONEOK Inc.	OKE	13,318.80	0.05%	12.74%	12.50%	26.04%	0.0124%
Omnicom Group	OMC	11,687.00	0.04%	4.77%	5.50%	10.40%	0.0044%
Oracle Corp.	ORCL	175,403.90	0.63%	1.73%	9.00%	10.81%	0.0680%
O'Reilly Automotive	ORLY	31,614.70	0.11%	0.00%	10.00%	10.00%	0.0113%
Otis Worldwide	OTIS	24,157.10	0.09%	1.43%	0.00%	1.43%	0.0012%
Occidental Petroleum	OXY	15,669.20	0.06%	0.23%	14.50%	14.75%	0.0083%
Paycom Software	PAYC	18,454.00	0.07%	0.00%	23.00%	23.00%	0.0152%
Paychex Inc.	PAYX	27,368.80	0.10%	3.36%	9.00%	12.51%	0.0123%
People's United Fin'l	PBCT	4,758.60	0.02%	6.42%	3.00%	9.52%	0.0016%
PACCAR Inc.	PCAR	25,668.20	0.09%	3.10%	3.50%	6.65%	0.0061%
Healthpeak Properties	PEAK	14,560.50	0.05%	5.14%	-15.00%	-10.25%	-0.0053%
Public Serv. Enterpris	PEG	25,074.00	0.09%	3.98%	5.00%	9.08%	0.0082%
PepsiCo Inc.	PEP	183,848.00	0.66%	3.09%	6.00%	9.18%	0.0605%
Pfizer Inc.	PFE	187,324.50	0.67%	4.51%	8.50%	13.20%	0.0886%
Principal Fin'l Group	PFGB	10,979.70	0.04%	5.58%	4.50%	10.21%	0.0040%
Procter & Gamble	PG	297,027.60	1.06%	2.63%	8.50%	11.24%	0.1197%
Progressive Corp.	PGR	46,706.90	0.17%	0.50%	9.50%	10.02%	0.0168%
Parker-Hannifin	PH	23,154.70	0.08%	1.95%	9.00%	11.04%	0.0092%
PulteGroup Inc.	PHM	8,843.60	0.03%	1.49%	5.50%	7.03%	0.0022%
Packaging Corp.	PKG	9,425.00	0.03%	3.27%	4.00%	7.34%	0.0025%
PerkinElmer Inc.	PKI	10,806.70	0.04%	0.29%	9.00%	9.30%	0.0036%
Prologis	PLD	60,115.50	0.22%	2.52%	6.00%	8.60%	0.0185%
Philip Morris Int'l	PM	108,981.90	0.39%	6.69%	5.50%	12.37%	0.0483%
PNC Financial Serv.	PNC	43,599.90	0.16%	4.47%	3.00%	7.54%	0.0118%
Pentair plc	PNR	6,116.00	0.02%	2.06%	4.00%	6.10%	0.0013%
Pinnacle West Capital	PNW	8,480.70	0.03%	4.27%	4.50%	8.87%	0.0027%
PPG Inds.	PPG	25,090.40	0.09%	1.92%	4.00%	5.96%	0.0054%
PPL Corp.	PPL	20,128.60	0.07%	6.34%	2.50%	8.92%	0.0064%

Perrigo Co. plc	PRGO	7,473.30	0.03%	1.73%	3.50%	5.26%	0.0014%
Prudential Fin'l	PRU	23,209.50	0.08%	7.47%	5.50%	13.18%	0.0110%
Public Storage	PSA	34,737.30	0.12%	4.02%	4.00%	8.10%	0.0101%
Phillips 66	PSX	30,178.60	0.11%	5.28%	4.00%	9.39%	0.0102%
PVH Corp.	PVH	3,316.30	0.01%	0.00%	6.50%	6.50%	0.0008%
Quanta Services	PWR	5,277.30	0.02%	0.52%	11.50%	12.05%	0.0023%
Pioneer Natural Res.	PXD	15,744.40	0.06%	2.30%	14.00%	16.46%	0.0093%
PayPal Holdings	PYPL	208,125.40	0.75%	0.00%	15.50%	15.50%	0.1156%
Qualcomm Inc.	QCOM	101,182.10	0.36%	2.90%	12.50%	15.58%	0.0565%
Qorvo Inc.	QRVO	12,529.80	0.04%	0.00%	53.00%	53.00%	0.0238%
Royal Caribbean	RCL	10,642.20	0.04%	6.14%	-0.50%	5.62%	0.0021%
Everest Re Group Ltd.	RE	8,153.00	0.03%	3.04%	9.50%	12.68%	0.0037%
Regency Centers Corp.	REG	7,736.80	0.03%	5.16%	14.50%	20.03%	0.0056%
Regeneron Pharmac.	REGN	68,343.40	0.24%	0.00%	6.50%	6.50%	0.0159%
Regions Financial	RF	10,177.90	0.04%	5.83%	5.00%	10.98%	0.0040%
Robert Half Int'l	RHI	5,900.90	0.02%	2.72%	7.00%	9.82%	0.0021%
Raymond James Fin'l	RJF	9,178.40	0.03%	2.21%	6.50%	8.78%	0.0029%
Ralph Lauren	RL	5,123.60	0.02%	3.89%	7.00%	11.03%	0.0020%
ResMed Inc.	RMD	27,610.20	0.10%	0.82%	14.50%	15.38%	0.0152%
Rockwell Automation	ROK	24,381.00	0.09%	1.94%	7.00%	9.01%	0.0079%
Rollins Inc.	ROL	14,018.60	0.05%	0.75%	12.00%	12.80%	0.0064%
Roper Tech.	ROP	40,682.50	0.15%	0.53%	8.00%	8.55%	0.0125%
Ross Stores	ROST	31,032.80	0.11%	0.00%	9.00%	9.00%	0.0100%
Republic Services	RSG	25,890.20	0.09%	2.10%	9.00%	11.19%	0.0104%
Raytheon Technologies	RTX	53,364.20	0.19%	3.12%	3.00%	6.17%	0.0118%
SBA Communications	SBAC	33,618.30	0.12%	0.65%	31.00%	31.75%	0.0383%
Starbucks Corp.	SBUX	86,474.40	0.31%	2.42%	13.50%	16.08%	0.0499%
Schwab (Charles)	SCHW	42,507.30	0.15%	2.24%	6.50%	8.81%	0.0134%
Sealed Air	SEE	5,043.40	0.02%	1.98%	26.00%	28.24%	0.0051%
Sherwin-Williams	SHW	52,442.50	0.19%	0.93%	8.50%	9.47%	0.0178%
SVB Fin'l Group	SIVB	10,621.40	0.04%	0.00%	4.50%	4.50%	0.0017%
Smucker (J.M.)	SJM	12,002.70	0.04%	3.37%	3.00%	6.42%	0.0028%
Slumberland Ltd.	SLB	24,592.00	0.09%	2.82%	5.00%	7.89%	0.0070%
SL Green Realty	SLG	3,895.70	0.01%	7.29%	-1.50%	5.74%	0.0008%
Snap-on Inc.	SNA	7,287.90	0.03%	3.53%	5.00%	8.62%	0.0023%
Synopsys Inc.	SNPS	29,713.80	0.11%	0.00%	11.00%	11.00%	0.0117%
Southern Co.	SO	55,828.40	0.20%	4.88%	3.00%	7.95%	0.0159%
Simon Property Group	SPG	21,422.00	0.08%	7.45%	-1.00%	6.41%	0.0049%
S&P Global	SPGI	80,585.90	0.29%	0.80%	11.00%	11.84%	0.0342%
Sempra Energy	SRE	35,434.20	0.13%	3.51%	10.00%	13.69%	0.0174%
STERIS plc	STE	13,081.60	0.05%	0.96%	9.50%	10.51%	0.0049%
State Street Corp.	STT	21,866.30	0.08%	3.35%	3.50%	6.91%	0.0054%
Seagate Technology	STX	13,102.10	0.05%	5.60%	3.00%	8.68%	0.0041%
Constellation Brands	STZ	35,841.60	0.13%	1.61%	7.50%	9.17%	0.0118%
Stanley Black & Decker	SWK	20,901.20	0.07%	2.10%	6.00%	8.16%	0.0061%
Skyworks Solutions	SWKS	21,079.90	0.08%	1.40%	10.00%	11.47%	0.0087%
Synchrony Financial	SYF	12,603.70	0.05%	4.07%	8.00%	12.23%	0.0055%
Stryker Corp.	SYK	69,009.50	0.25%	1.25%	10.50%	11.82%	0.0292%
Sysco Corp.	SYU	27,236.50	0.10%	3.35%	9.50%	13.01%	0.0127%
AT&T Inc.	T	213,043.90	0.76%	7.02%	5.50%	12.71%	0.0971%
Molson Coors Beverage	TAP	7,590.50	0.03%	0.00%	5.00%	5.00%	0.0014%
TransDigm Group	TDG	23,753.20	0.09%	0.00%	15.50%	15.50%	0.0132%
TE Connectivity	TEL	26,505.80	0.10%	2.40%	4.50%	6.95%	0.0066%
Truist Fin'l	TFC	49,061.10	0.18%	4.94%	5.00%	10.06%	0.0177%
Teleflex Inc.	TFX	17,546.30	0.06%	0.37%	14.00%	14.40%	0.0091%
Target Corp.	TGT	59,470.50	0.21%	2.29%	9.50%	11.90%	0.0254%
Tiffany & Co.	TIF	14,826.50	0.05%	1.90%	9.50%	11.49%	0.0061%
TJX Companies	TJX	61,307.30	0.22%	0.00%	12.00%	12.00%	0.0264%
Thermo Fisher Sci.	TMO	142,091.50	0.51%	0.25%	10.00%	10.26%	0.0523%
T-Mobile US	TMUS	91,391.50	0.33%	0.00%	14.00%	14.00%	0.0459%
Tapestry Inc.	TPR	3,581.00	0.01%	0.00%	5.00%	5.00%	0.0006%
Price (T. Rowe) Group	TROW	27,930.40	0.10%	2.98%	8.00%	11.10%	0.0111%
Travelers Cos.	TRV	28,440.00	0.10%	3.02%	9.50%	12.66%	0.0129%
Tractor Supply	TSCO	15,336.70	0.05%	1.05%	9.50%	10.60%	0.0058%
Tyson Foods 'A'	TSN	21,378.10	0.08%	2.94%	7.00%	10.04%	0.0077%
Take-Two Interactive	TTWO	16,357.30	0.06%	0.00%	20.50%	20.50%	0.0120%
Twitter Inc.	TWTR	24,158.10	0.09%	0.00%	25.50%	25.50%	0.0221%
Texas Instruments	TXN	115,000.80	0.41%	2.88%	2.50%	5.42%	0.0223%
Textron Inc.	TXT	7,257.90	0.03%	0.25%	8.50%	8.76%	0.0023%
Under Armour 'C'	UA	3,927.50	0.01%	0.00%	0.00%	0.00%	0.0000%
Under Armour 'A'	UAA	4,345.30	0.02%	0.00%	21.50%	21.50%	0.0033%
United Airlines Hldgs.	UAL	8,518.00	0.03%	0.00%	3.50%	3.50%	0.0011%
UDR Inc.	UDR	11,454.90	0.04%	3.70%	11.50%	15.41%	0.0063%
Universal Health 'B'	UHS	7,913.40	0.03%	0.00%	11.00%	11.00%	0.0031%
Ulta Beauty	ULTA	11,463.40	0.04%	0.00%	9.00%	9.00%	0.0037%
UnitedHealth Group	UNH	281,950.30	1.01%	1.68%	12.00%	13.78%	0.1393%
Unum Group	UNM	3,232.90	0.01%	7.17%	4.50%	11.83%	0.0014%
Union Pacific	UNP	113,237.90	0.41%	2.33%	10.50%	12.95%	0.0526%
United Parcel Serv.	UPS	98,469.90	0.35%	3.53%	6.00%	9.64%	0.0340%

United Rentals	URI	10,504.60	0.04%	0.00%	7.00%	7.00%	0.0026%
U.S. Bancorp	USB	54,188.90	0.19%	4.67%	3.50%	8.25%	0.0160%
Visa Inc.	V	377,677.20	1.35%	0.65%	14.50%	15.20%	0.2057%
Varian Medical Sys.	VAR	11,021.90	0.04%	0.00%	13.50%	13.50%	0.0053%
V.F. Corp.	VFC	23,908.40	0.09%	3.17%	6.00%	9.27%	0.0079%
ViacomCBS Inc.	VIAC	14,514.00	0.05%	4.07%	8.00%	12.23%	0.0064%
Valero Energy	VLO	23,010.60	0.08%	6.95%	8.00%	15.23%	0.0126%
Vulcan Materials	VMC	15,356.90	0.06%	1.17%	12.50%	13.74%	0.0076%
Vornado R'lty Trust	VNO	7,382.80	0.03%	6.83%	-20.00%	-13.85%	-0.0037%
Verisk Analytics	VRSK	28,017.90	0.10%	0.63%	10.50%	11.16%	0.0112%
VeriSign Inc.	VRSN	24,352.70	0.09%	0.00%	9.50%	9.50%	0.0083%
Vertex Pharmac.	VRTX	74,169.10	0.27%	0.00%	32.00%	32.00%	0.0851%
Ventas Inc.	VTR	14,286.10	0.05%	4.70%	4.50%	9.31%	0.0048%
Verizon Communic.	VZ	226,224.20	0.81%	4.55%	4.00%	8.64%	0.0701%
Wabtec Corp.	WAB	11,036.10	0.04%	0.83%	10.50%	11.37%	0.0045%
Waters Corp.	WAT	11,150.60	0.04%	0.00%	10.50%	10.50%	0.0042%
Walgreens Boots	WBA	35,990.60	0.13%	4.48%	6.00%	10.61%	0.0137%
Western Digital	WDC	12,735.00	0.05%	0.00%	0.50%	0.50%	0.0002%
WEC Energy Group	WEC	28,177.80	0.10%	2.93%	6.00%	9.02%	0.0091%
Welltower Inc.	WELL	22,006.30	0.08%	4.55%	6.00%	10.69%	0.0084%
Wells Fargo	WFC	102,778.90	0.37%	8.13%	0.00%	8.13%	0.0300%
Whirlpool Corp.	WHR	7,876.50	0.03%	3.78%	2.00%	5.82%	0.0016%
Willis Towers Wat. plc	WLTW	25,135.70	0.09%	1.39%	11.50%	12.97%	0.0117%
Waste Management	WM	44,347.50	0.16%	2.07%	5.50%	7.63%	0.0121%
Williams Cos.	WMB	22,816.50	0.08%	8.51%	12.00%	21.02%	0.0172%
Walmart Inc.	WMT	338,962.10	1.22%	1.80%	7.00%	8.86%	0.1077%
Berkley (W.R.)	WRB	10,256.10	0.04%	0.84%	10.00%	10.88%	0.0040%
WestRock Co.	WRK	7,169.50	0.03%	2.89%	5.00%	7.96%	0.0020%
West Pharmac. Svcs.	WST	16,424.30	0.06%	0.28%	14.00%	14.30%	0.0084%
Western Union	WU	8,912.40	0.03%	4.15%	5.50%	9.76%	0.0031%
Weyerhaeuser Co.	WY	16,565.80	0.06%	0.00%	17.50%	17.50%	0.0104%
Wynn Resorts	WYNN	7,960.80	0.03%	0.00%	15.50%	15.50%	0.0044%
Xcel Energy Inc.	XL	33,701.90	0.12%	2.73%	6.00%	8.81%	0.0106%
Xilinx Inc.	XLNX	23,209.00	0.08%	1.63%	8.00%	9.70%	0.0081%
Exxon Mobil Corp.	XOM	184,815.10	0.66%	7.96%	4.50%	12.64%	0.0837%
Dentsply Sirona	XRAY	9,848.50	0.04%	0.89%	8.50%	9.43%	0.0033%
Xerox Holdings	XRX	3,224.40	0.01%	6.60%	7.50%	14.35%	0.0017%
Xylem Inc.	XYL	11,450.60	0.04%	1.63%	8.50%	10.20%	0.0042%
Yum! Brands	YUM	26,021.40	0.09%	2.17%	9.50%	11.77%	0.0110%
Zimmer Biomet Hldgs.	ZBH	24,679.50	0.09%	0.80%	5.50%	6.32%	0.0056%
Zebra Techn. 'A'	ZBRA	13,331.80	0.05%	0.00%	11.00%	11.00%	0.0053%
Zions Bancorp.	ZION	5,333.40	0.02%	4.18%	4.50%	8.77%	0.0017%
Zoetis Inc.	ZTS	65,146.70	0.23%	0.58%	12.00%	12.61%	0.0295%

[1] Sum of [7]

[2] Source: Value Line

[3] Weight based on market capitalization

[4] Source: Value Line

[5] Source: Value Line

[6] Equals [4] x (1 + (0.5 x [5])) + [5]

[7] Equals [3] x [6]

Capital Asset Pricing Model

	[1]	[2]	[3]	[4]	[5]
	Risk Free Rate	Proxy Group Average Beta	S&P 500 Estimated Required Market Return	Market Risk Premium	CAPM ROE
Current 30-Year Treasury (30-day Average)	1.47%	0.84	13.66%	12.19%	11.75%
Current 30-Year Treasury (90-day Average)	1.39%	0.84	13.66%	12.26%	11.74%
Current 30-Year Treasury (180-day Average)	1.79%	0.84	13.66%	11.86%	11.80%
[6] Mean					11.76%

[1] Source: US Treasury Department

[2] Source: Attachment JC-6

[3] Source: Attachment JC-7

[4] Equals [3] - [1]

[5] Equals [1] + ([2] x [4])

[6] Equals Average of [5]

Flotation Cost Adjustment

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]		
Company	Ticker	Completion Date	Shares Issued (000)	Offering Price	Underwriting Discount	Offering Expense (\$000)	Net Proceeds Per Share	Flotation Costs (\$000)	Gross Equity Issue Before Costs (\$000)	Net Proceeds (\$000)	Flotation Cost Percentage
Algonquin Power & Utilities Corp.	AQN	10/16/2019	26,450	\$13.50	\$0.53	\$400.00	\$12.96	\$14,326	\$357,075	\$342,749	4.01%
Algonquin Power & Utilities Corp.	AQN	11/10/2017	43,470	\$10.44	\$0.42	\$393.89	\$10.01	\$18,543	\$453,740	\$435,196	4.09%
Atmos Energy Corporation	ATO	8/8/2019	8,059	\$92.75	\$0.98	\$1,000.00	\$91.65	\$8,873	\$747,500	\$738,627	1.19%
Atmos Energy Corporation	ATO	11/28/2017	4,558	\$86.79	NA	NA	\$86.65	\$8,692	\$403,692	\$395,000	2.15%
Chesapeake Utilities Corporation	CPK	9/22/2016	960	\$62.26	\$2.33	\$157.00	\$59.77	\$2,395	\$59,800	\$57,405	4.00%
Chesapeake Utilities Corporation	CPK	11/16/2006	690	\$30.10	\$1.13	\$225.00	\$28.65	\$1,002	\$20,779	\$19,778	4.82%
New Jersey Resources Corporation	NJR	12/9/2020	6,545	\$41.50	\$1.24	\$500.00	\$40.19	\$8,600	\$271,636	\$263,036	3.17%
NISource Inc.	NI	9/8/2010	24,265	\$16.50	\$0.54	\$400.00	\$15.95	\$13,411	\$400,373	\$386,962	3.35%
NISource Inc.	NI	11/6/2002	41,400	\$18.30	\$0.55	\$300.00	\$17.74	\$23,029	\$757,620	\$734,591	3.04%
South Jersey Industries	SJI	4/18/2018	12,669	\$29.50	\$1.03	\$700.00	\$28.41	\$13,781	\$373,750	\$359,969	3.69%
South Jersey Industries	SJI	5/12/2016	8,050	\$26.26	\$0.92	\$330.00	\$25.30	\$7,726	\$211,393	\$203,667	3.65%
Spire, Inc.	SR	5/7/2018	2,300	\$68.75	\$2.11	\$325.00	\$66.50	\$5,177	\$158,125	\$152,948	3.27%
Spire, Inc.	SR	5/12/2016	2,185	\$63.05	\$2.05	\$300.00	\$60.86	\$4,777	\$137,764	\$132,987	3.47%
Southwest Gas Corporation	SWX	11/27/2018	3,565	\$75.50	\$2.55	\$600.00	\$72.78	\$9,684	\$269,158	\$259,474	3.60%
Mean								\$10,001	\$330,172		

Weighted Average Flotation Costs	3.029%
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[1] Source: S&P Global
 [2] Source: S&P Global; Company Prospectus Supplements
 [3] Source: S&P Global; Company Prospectus Supplements
 [4] Source: Company Prospectus Supplements
 [5] Equals: $([1] \times ([2] - [3]) - [4]) / [1]$
 [6] Equals $([1] \times [3]) + [4]$
 [7] Equals $[1] \times [2]$
 [8] Equals $[1] \times [5]$
 [9] Equals $[6] / [7]$

Constant Growth Discounted Cash Flow Model
Earnings Growth
30 Day Average Stock Price

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]
Company	Ticker	Indicated Annual Dividend	Weighted-Average Stock Price	Dividend Yield	Expected Dividend Yield	Adjusted for Flotation Costs	Zacks Earnings Growth	Yahoo Finance Earnings Growth	Value Line Earnings Growth	Average Earnings Growth	Mid ROE	Flotation-Adjusted ROE
Atmos Energy	ATO	\$2.42	\$101.07	2.39%	2.48%	2.56%	7.20%	7.15%	7.00%	7.12%	9.60%	9.67%
Chesapeake Utilities	CPK	\$1.80	\$85.92	2.10%	2.17%	2.23%	NA	4.74%	9.00%	6.87%	9.04%	9.10%
NISource Inc.	NI	\$0.84	\$23.53	3.57%	3.71%	3.83%	5.30%	4.89%	13.50%	7.90%	11.61%	11.72%
New Jersey Resources	NJR	\$1.25	\$32.73	3.82%	3.91%	4.03%	6.00%	6.00%	2.00%	4.67%	8.57%	8.70%
ONE Gas Inc.	OGS	\$2.24	\$77.99	2.87%	2.95%	3.05%	5.50%	5.00%	6.50%	5.67%	8.62%	8.71%
South Jersey Inds.	SJI	\$1.22	\$24.97	4.89%	5.15%	5.32%	10.20%	10.20%	12.50%	10.97%	16.12%	16.28%
Spire Inc.	SR	\$2.55	\$68.28	3.73%	3.83%	3.95%	4.70%	4.67%	5.50%	4.96%	8.78%	8.90%
Southwest Gas	SWX	\$2.30	\$69.35	3.32%	3.44%	3.55%	6.00%	8.20%	8.00%	7.40%	10.84%	10.95%
Mean				3.34%	3.45%	3.56%	6.41%	6.36%	8.00%	6.94%	10.40%	10.51%
Median				3.44%	3.57%	3.69%	6.00%	5.50%	7.50%	6.99%	9.32%	9.39%

- [1] Source: Value Line
- [2] Source: Yahoo Finance, as of July 10, 2020
- [3] Equals [1] / [2]
- [4] Equals [3] x (1 + 0.5 x [9])
- [6] Source: Zacks
- [7] Source: Yahoo Finance
- [8] Source: Value Line
- [9] Equals average ([6], [7], [8])
- [10] Equals [4] + [9]
- [11] Equals [5] + [9]
- [12] Equals average of [11] - average of [10]

Weighted Average Flotation Costs	3.03%
Flotation-Adjusted ROE	10.51%
Unadjusted ROE	10.40%
Flotation Cost Adjustment	0.11%

Proxy Group Revenue Decoupling Mechanisms

[1]

Parent Company Ticker	Operating Company	State	Decoupling?
ATO	Atmos Energy	Colorado	
ATO	Atmos Energy	Kansas	✓
ATO	Atmos Energy	Kentucky	✓
ATO	Atmos Energy	Louisiana	✓
ATO	Atmos Energy	Mississippi	✓
ATO	Atmos Energy	Tennessee	✓
ATO	Atmos Energy	Texas	✓
ATO	Atmos Energy	Virginia	✓
CPK	Chesapeake Utilities	Delaware	
CPK	Chesapeake Utilities	Maryland	✓
CPK	Florida Public Utilities Company	Florida	
NI	Northern Indiana Public Service	Indiana	
NI	Columbia Gas of Kentucky	Kentucky	✓
NI	Columbia Gas of Maryland	Maryland	✓
NI	Bay State Gas	Massachusetts	✓
NI	Columbia Gas of Ohio	Ohio	
NI	Columbia Gas of Pennsylvania	Pennsylvania	✓
NI	Columbia Gas of Virginia	Virginia	✓
NJR	New Jersey Natural Gas	New Jersey	✓
OGS	Kansas Gas Service	Kansas	✓
OGS	Oklahoma Natural Gas	Oklahoma	✓
OGS	Texas Gas Service	Texas	✓
SJI	South Jersey Gas	New Jersey	✓
SJI	Elizabethtown Gas	New Jersey	✓
SJI	Elkton Gas	Maryland	✓
SR	Spire Alabama	Alabama	✓
SR	Spire Gulf	Alabama	✓
SR	Spire Mississippi	Mississippi	✓
SR	Spire Missouri East	Missouri	✓
SR	Spire Missouri West	Missouri	✓
SWX	Southwest Gas	Arizona	✓
SWX	Southwest Gas	California	✓
SWX	Southwest Gas	Nevada	✓

[1] Source: Regulatory Research Associates, "Adjustment Clauses: A State-by-State Overview," November 12, 2019; Operating company tariffs.

Small Size Premium

	EnergyNorth Natural Gas	
[1] Customers (000s)		97
[2] Implied Equity (\$ Millions)		\$168.8
[3] Implied Market Capitalization (\$ Millions)		\$307.3

Company Name	Ticker	Proxy Group		
		[4] Customers (000s)	[5] Market Cap (\$ Millions)	[6] Market-to-Book Ratio
Atmos Energy	ATO	3,124	\$12,315.3	2.05
Chesapeake Utilities	CPK	158	\$1,391.7	2.47
NiSource Inc.	NI	3,482	\$8,978.0	2.13
New Jersey Resources	NJR	539	\$3,081.6	1.78
ONE Gas, Inc.	OGS	2,179	\$4,070.3	1.86
South Jersey Industries	SJI	391	\$2,275.5	1.51
Spire, Inc.	SR	1,693	\$3,411.3	1.62
Southwest Gas	SWX	2,047	\$3,737.5	1.51
Mean		1,702	\$4,907.7	1.87
Median		1,870	\$3,574.4	1.82

Duff & Phelps Size Premia [7]

Decile	Market Capitalization (\$ Millions)			Size Premium
	Lowest in Decile	Highest in Decile	Size Premium	
1	\$29,428.9	\$1,073,390.6	-0.30%	
2	\$13,513.0	\$29,022.9	0.52%	
3	\$7,276.0	\$13,455.8	0.81%	
4	\$4,504.1	\$7,254.2	0.85%	
5	\$2,996.0	\$4,503.5	1.28%	
6	\$1,961.8	\$2,992.3	1.50%	
7	\$1,292.8	\$1,960.2	1.58%	
8	\$730.0	\$1,292.2	1.80%	
9	\$325.4	\$727.8	2.46%	
10	\$2.5	\$321.6	5.22%	

Category	Market Capitalization (\$ Millions)			Size Premium
	Lowest in Category	Highest in Category	Size Premium	
Mid Cap	\$2,996.0	\$13,455.8	0.89%	
Low Cap	\$730.0	\$2,992.3	1.58%	
Micro Cap	\$2.5	\$727.8	3.39%	

[1] Source: MCOS Attachment MCOS-3

[2] Source: RR-1 and RR-4. Proposed test year rate base multiplied by proposed common equity ratio.

[3] Equals [2] x Median of [6]

[4] Source: Company 10ks

[5] Source: Value Line, as of July 13, 2020

[6] Source: Value Line

[7] Source: Duff & Phelps Cost of Capital Navigator

Proxy Group Capital Structure

Common Equity Ratio

Company Name	Ticker	2015	2016	2017	2018	2019	Average
Atmos Energy	ATO	56.50%	61.30%	56.00%	65.70%	62.00%	60.30%
Chesapeake Utilities	CPK	70.60%	76.50%	71.10%	62.10%	56.10%	67.28%
NiSource Inc.	NI	39.30%	40.20%	36.50%	37.90%	36.90%	38.16%
New Jersey Resources	NJR	56.80%	52.30%	55.40%	54.60%	50.20%	53.86%
ONE Gas, Inc.	OGS	60.50%	61.30%	62.20%	61.40%	62.30%	61.54%
South Jersey Industries	SJI	50.80%	61.50%	51.50%	37.60%	40.80%	48.44%
Spire, Inc.	SR	47.00%	49.10%	50.00%	54.30%	55.00%	51.08%
Southwest Gas	SWX	50.70%	51.80%	50.20%	51.70%	52.10%	51.30%
Average		54.03%	56.75%	54.11%	53.16%	51.93%	54.00%

Long-Term Debt Ratio

Company Name	Ticker	2015	2016	2017	2018	2019	Average
Atmos Energy	ATO	43.50%	38.70%	44.00%	34.30%	38.00%	39.70%
Chesapeake Utilities	CPK	29.40%	23.50%	28.90%	37.90%	43.90%	32.72%
NiSource Inc.	NI	60.70%	59.80%	63.50%	55.30%	56.80%	59.22%
New Jersey Resources	NJR	43.20%	47.70%	44.60%	45.40%	49.80%	46.14%
ONE Gas, Inc.	OGS	39.50%	38.70%	37.80%	38.60%	37.70%	38.46%
South Jersey Industries	SJI	49.20%	38.50%	48.50%	62.40%	59.20%	51.56%
Spire, Inc.	SR	53.00%	50.90%	50.00%	45.70%	45.00%	48.92%
Southwest Gas	SWX	49.30%	48.20%	49.80%	48.30%	47.90%	48.70%
Average		45.98%	43.25%	45.89%	45.99%	47.29%	45.68%

Source: Value Line