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Sponsoring Party: Liberty Utilities
(Midstates Natural Gas) Corp.
d/b/a Liberty Utilities
Case No. GR-2018-0013
Date Testimony Prepared: April 2018

**Before the Public Service Commission
of the State of Missouri**

Rebuttal Testimony

of

Keith Magee

ScottMadden, Inc.

On Behalf Of

**Liberty Utilities (Midstates Natural Gas) Corp.
d/b/a Liberty Utilities**

April 2018



REBUTTAL TESTIMONY
OF
KEITH MAGEE
LIBERTY UTILITIES
BEFORE THE
MISSOURI PUBLIC SERVICE COMMISSION
CASE NO. GR-2018-0013

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SCOTTMADDEN, INC
ON BEHALF OF
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1 **I. WITNESS IDENTIFICATION**

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

3 A. My name is Keith Magee. I am a Director at ScottMadden, Inc. (“ScottMadden”). My
4 business address is 1900 West Park Drive, Suite 250, Westborough, MA 01581.

5 **Q. ARE YOU THE SAME KEITH MAGEE WHO PREVIOUSLY SPONSORED**
6 **DIRECT TESTIMONY IN THIS PROCEEDING ON BEHALF OF LIBERTY**
7 **UTILITIES?¹**

8 A. Yes, I am.

9 **II. PURPOSE OF REBUTTAL TESTIMONY**

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

11 A. The purpose of my rebuttal testimony (“Rebuttal Testimony”) is to respond to the Cost of
12 Service Report submitted in this proceeding by Staff of the Missouri Public Service
13 Commission as it relates to the Company’s Return on Equity (“ROE”), cost of debt and
14 capital structure. Mr. Dave Murray presents Staff’s ROE, cost of debt and capital structure

¹ I refer to Liberty Utilities (Midstates Natural Gas) Corp. as “Liberty Midstates” or the “Company”.

1 recommendation. My Rebuttal Testimony also provides an updated set of calculations and
2 analytical results with respect to the Company's cost of equity.² My analyses and
3 conclusions are supported by the data presented in Schedules KM-R1 through Schedule
4 KM-R15, which have been prepared by me or under my direction.

5 **Q. HOW IS THE REMAINDER OF YOUR REBUTTAL TESTIMONY**
6 **ORGANIZED?**

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

8 Section II – Provides a summary and overview of my Rebuttal Testimony, including
9 a summary of my updated analyses;

10 Section III – Provides my response to Mr. Murray regarding the Company's cost of
11 capital and capital structure;

12 Section IV – Provides my updated analyses; and

13 Section V – Summarizes my conclusions and recommendations.

14 **III. SUMMARY AND OVERVIEW OF REBUTTAL TESTIMONY**

15 **Q. PLEASE SUMMARIZE THE KEY RECOMMENDATIONS AND CONCLUSIONS**
16 **ADDRESSED IN YOUR REBUTTAL TESTIMONY.**

17 A. My principal recommendations and conclusions are:

- 18 • Updated ROE and capital structure analyses continue to support an ROE in the range
19 of 9.90 percent to 10.35 percent, with a point estimate of 10.25 percent, and an equity
20 ratio of 53.00 percent (*see* Table 2 below).
- 21 • DCF model results have increased by approximately 30 basis points, on average, since

² Throughout my Direct Testimony, I interchangeably use the terms "ROE" and "cost of equity."

- 1 the date of the analysis in my Direct Testimony, largely due to an increase in proxy
2 company dividend yields resulting from a decline in gas utility company stock prices.
- 3 • CAPM results have increased by approximately 100 basis points, on average, since the
4 date of the analysis in my Direct Testimony, largely due to an increase in the risk-free
5 rate (*i.e.*, the 30-year Treasury yield) and expected market return.
 - 6 • Mr. Murray’s recommended 40.94 percent equity ratio is unreasonably low and does
7 not reflect the relatively higher business risk faced by Liberty Midstates, and would
8 serve to increase the Company’s total risk by increasing financial risk (through
9 additional debt leverage) and reducing investor confidence in the regulatory support
10 for the Company’s operations.³
 - 11 • Mr. Murray’s analysis of the capital structures in place at his proxy group companies
12 produces results similar to mine, and supports my recommended 53.00 equity ratio (*see*
13 Table 1 below).

Table 1: Comparison of Proxy Group Equity Ratio Estimates⁴

	Murray	Magee
Mean	53.59%	53.70%
Median	52.07%	53.63%

- 15
- 16 • The unreasonableness of Mr. Murray’s 40.94 percent recommended equity ratio is also
17 demonstrated by the fact that the mean of the proxy group’s current authorized equity

³ Note, Mr. Murray’s direct testimony also references a 40.43 percent equity ratio, however his recommended overall rate of return of 6.76 percent is based on a 40.94 percent equity ratio as shown in his Schedules 6-1 and 13.

⁴ See Staff Report - Cost of Service, Appendix 2, at Schedule 9 (results excluding short-term debt). See also Schedule KM-R9.

1 ratios is 53.37 percent.⁵ Looking at the wider universe of regulated natural gas utilities
2 covered by Regulatory Research Associates, the mean of authorized equity ratio since
3 January 2017 was 51.07 percent.⁶

- 4 • The 20 basis point upward ROE adjustment Mr. Murray recommends to account for an
5 equity ratio 13.26 percentage points lower than Spire Missouri's recently authorized
6 54.20 percent equity ratio does not sufficiently compensate equity holders for the
7 increased risk they face from a significant increase in financial leverage.
- 8 • The methods and inputs used in Mr. Murray's ROE analyses produce results that are
9 unduly low relative to authorized returns for regulated natural gas utilities over the past
10 year. My concerns with his analytical approaches are discussed in Section III below.
11 His recommended ROE, however, is not based on the results of his own analysis.

12 **Q. WHAT ARE THE RESULTS OF YOUR UPDATED ANALYSES?**

13 A. I have updated the constant and quarterly growth DCF models, CAPM, and bond yield plus
14 risk premium analysis based on data through March 29, 2018 and applied those analyses
15 to the proxy group discussed in my Direct Testimony. I have also updated the expected
16 earnings analyses which I use as a corroborating methodology in arriving at my ROE
17 recommendation. Taken together, the analyses discussed throughout my Rebuttal
18 Testimony continue to support my recommended range of 9.90 percent to 10.35 percent,
19 and my ROE recommendation of 10.25 percent. The results of my analyses are
20 summarized in Table 2 (below).

⁵ See Schedule KM-R12.

⁶ See Schedule KM-R13. Excludes Arkansas and Michigan rate cases that include non-investor supplied capital (such as deferred taxes) in the reported capital structure.

1

Table 2: Summary of ROE Model Results

DCF Analyses	<i>Proxy Group</i>		
	<i>Low</i>	<i>Mean</i>	<i>High</i>
Constant Growth, 30-day Stock Prices	8.01%	9.35%	11.56%
Constant Growth, 90-day Stock Prices	7.86%	9.20%	11.41%
Constant Growth, 180-day Stock Prices	7.74%	9.08%	11.29%
Quarterly Growth, 30-day Stock Prices	8.17%	9.45%	11.82%
Quarterly Growth, 90-day Stock Prices	8.01%	9.29%	11.65%
Quarterly Growth, 180-day Stock Prices	7.88%	9.17%	11.52%
CAPM	<i>Bloomberg MRP</i>		<i>Value Line MRP</i>
Value Line Beta, Current Risk-Free Rate (3.11%)	11.47%		12.22%
Value Line Beta, Projected Risk-Free Rate (3.52%)	11.58%		12.33%
Bloomberg Beta, Current Risk-Free Rate (3.11%)	10.63%		11.31%
Bloomberg Beta, Projected Risk-Free Rate (3.52%)	10.77%		11.45%
Bond Yield Plus Risk Premium	<i>Low</i>	<i>Mean</i>	<i>High</i>
Current and Projected Baa Utility Bond Yields	9.63%	9.95%	10.39%
Expected Earnings Analysis	<i>Low</i>	<i>Mean</i>	<i>High</i>
Value Line Projected Return on Book Equity	11.04%	11.17%	11.37%

2

3 **Q. WHY HAVE YOU USED MULTIPLE ROE MODELS TO DEVELOP YOUR ROE**
 4 **RECOMMENDATION?**

5 A. It is important to keep in mind that all financial models are based on simplifying
 6 assumptions and no one financial model is more reliable than others at all times and under
 7 all market conditions. At times, certain model results simply do not make sense.
 8 Determining the cost of equity therefore is not always a strict mathematical exercise.
 9 Rather, it requires reasoned judgment in evaluating the models and assumptions used by
 10 various analysts, and in assessing the reasonableness of their recommendations. That
 11 judgment may lead to the conclusion that the emphasis applied to a particular method in a
 12 prior proceeding or under prior market conditions is not appropriate in the current instance.

1 **Q. WHAT ARE YOUR CONCLUSIONS REGARDING THE APPROPRIATE COST**
2 **OF EQUITY, COST OF DEBT AND CAPITAL STRUCTURE FOR LIBERTY**
3 **MIDSTATES?**

4 A. Considering my updated ROE analyses and the results of additional analysis I have
5 provided in response to Mr. Murray, I continue to recommend a return on equity of 10.25
6 percent within a range of 9.90 percent to 10.35 percent. As discussed in my Direct
7 Testimony, my ROE recommendation and the analytical results on which it is based also
8 consider a variety of factors, including prevailing capital market conditions and certain
9 risks and costs faced by Liberty Midstates such as its relatively small size, regulatory
10 environment, and direct costs associated with equity issuances.

11 Regarding the cost of long-term debt, I continue to recommend 4.70 percent which
12 reflects LUCo's consolidated cost of debt.

13 As to the capital structure, I continue to recommend a capital structure of 53.00
14 percent common equity and 47.00 percent long-term debt based on the average of the
15 capital structures in place at comparable operating natural gas utilities within the proxy
16 group. A reasonable equity ratio provides a level of financial support that helps offset the
17 increased risk that Liberty Midstates faces from its small size and the regulatory
18 environment in which it operates. My recommended equity ratio is significantly lower
19 than Liberty Midstates' stand-alone equity ratio as of December 31, 2017.⁷

⁷ Liberty Midstates balance sheet provided in response to DR 0171.1.

1 **IV. RESPONSE TO STAFF WITNESS MR. MURRAY**

2 **Q. PLEASE SUMMARIZE MR. MURRAY’S COST OF CAPITAL AND CAPITAL**
3 **STRUCTURE RECOMMENDATIONS.**

4 A. Mr. Murray recommends an ROE of 10.00 percent (within a range of 9.50 percent to 10.00
5 percent), a long-term cost of debt of 4.51 percent, and an equity ratio of 40.94 percent.⁸ If
6 the Commission adopts an equity ratio closer to the 54.20 percent recently authorized for
7 Spire Missouri Inc. (“Spire Missouri”) in Case No. GR-2017-0216, he recommends an
8 ROE of 9.80 percent.⁹

9 Mr. Murray arrives at his 10.00 percent ROE recommendation by adding a 20 basis
10 point upward ROE adjustment to the 9.80 percent ROE recently authorized for Spire
11 Missouri in Case No. GR-2017-0216.¹⁰ The 20 basis point adjustment is meant to reflect
12 the higher financial leverage implied by his proposed equity ratio.¹¹ Mr. Murray notes
13 “utility capital markets have tightened” since the Commission determined an allowed ROE
14 of 9.80 percent for Spire Missouri, but he does not recommend a corresponding increase
15 in the ROE because he believes there is a “sizable spread” between the authorized ROE
16 and the cost of equity.¹² While Mr. Murray conducts DCF, CAPM and risk premium
17 analyses, his recommendation does not directly rely on them.¹³

18 Mr. Murray’s cost of debt and capital structure recommendations are based on his

8 Staff Report - Cost of Service, Appendix 2, at 1.

9 Staff Report - Cost of Service, Appendix 2, at 2.

10 Staff Report - Cost of Service, Appendix 2, at 2.

11 Staff Report - Cost of Service, Appendix 2, at Schedule 13.

12 Staff Report - Cost of Service, Appendix 2, at 31.

13 Mr. Murray’s “Rule of Thumb” approach is a form of risk premium analysis (*i.e.*, it estimates the ROE by adding a risk premium to a specified bond yield). *See* Staff Report - Cost of Service, Appendix 2, at 46.

1 calculation of an “adjusted” consolidated capital structure for Liberty Utilities Company
2 (“LUCo”), the parent company of Liberty Midstates.¹⁴ LUCo is an intermediate utility
3 holding company that owns and operates more than 30 water, natural gas, and electric
4 distribution utilities, including Liberty Midstates in 12 jurisdictions.¹⁵

5 **Q. ARE THERE IMPORTANT AREAS IN WHICH YOU AND MR. MURRAY ARE**
6 **IN AGREEMENT?**

7 A. Yes, there are several important areas in which Mr. Murray and I agree.

8 1. We agree that the allowed return should: (1) be consistent with the returns available
9 to businesses with similar risk; (2) be sufficient to maintain the Company’s
10 financial integrity; and (3) be adequate to support the Company’s access to
11 capital.¹⁶

12 2. Although we use different inputs and assumptions, we both believe it is reasonable
13 to consider the results of DCF, CAPM and risk premium analyses when estimating
14 ROE.

15 3. We both believe it is reasonable to develop our ROE analyses using proxy groups
16 of publicly traded, risk-comparable utilities.

17 **Q. PLEASE SUMMARIZE THE KEY AREAS IN WHICH YOU DISAGREE WITH**
18 **MR. MURRAY’S ANALYSES AND CONCLUSIONS?**

19 A. The principal areas in which I disagree with Mr. Murray include: (1) the appropriate
20 ratemaking capital structure, and the size of increase in ROE required to offset Mr.

¹⁴ Staff Report - Cost of Service, Appendix 2, at 1.

¹⁵ Algonquin Power & Utilities Corp., Investor Presentation, March 2018 at 6.

¹⁶ Staff Report – Cost of Service, at 3; Direct Testimony of Keith Magee, at 8.

1 Murray's proposed increase in financial leverage; (2) the appropriate cost of debt; (3) the
2 growth rates used in the DCF analysis; (4) the Market Risk Premium ("MRP") estimates
3 used in the CAPM; and (5) Mr. Murray's application of his "Rule of Thumb" approach. I
4 note that Mr. Murray did not address flotation costs or business risks in his direct testimony.
5 Accordingly, I reserve the right to address these issues further should Mr. Murray discuss
6 them in his rebuttal testimony.

7 ***CAPITAL STRUCTURE***

8 **Q. PLEASE BRIEFLY SUMMARIZE MR. MURRAY'S ANALYSIS AND**
9 **RECOMMENDATION REGARDING THE COMPANY'S CAPITAL**
10 **STRUCTURE?**

11 A. Mr. Murray recommends a capital structure with 40.94 percent equity and 59.06 percent
12 long-term debt based on his estimate of an "adjusted" consolidated capital structure for
13 LUCo.¹⁷ Mr. Murray's adjustments include imputing \$395 million in additional debt to
14 LUCo from other Algonquin Power & Utilities Corporation subsidiaries.

15 **Q. IS IT REASONABLE TO ASSUME, AS STAFF HAS DONE, THAT LUCO'S**
16 **CONSOLIDATED CAPITAL STRUCTURE REFLECTS AN APPROPRIATE**
17 **REGULATORY CAPITAL STRUCTURE FOR LIBERTY MIDSTATES?**

18 A. No, it is not. LUCo is an intermediate holding company, and its capital structure will
19 change over time as it pursues its own strategic corporate initiatives and priorities. LUCo's
20 consolidated capital structure has, and likely will continue to, reflect business activities,
21 such as mergers and acquisitions, that are not directly germane to Liberty Midstates'

¹⁷ Staff Report - Cost of Service, Appendix 2, at 24-26 and Schedule 6-1.

1 operations or financing. Even if LUCo's business focus were solely on operating its
2 existing diverse regulated utility portfolio, its capital structure will not necessarily be an
3 appropriate benchmark for Liberty Midstates' capital structure.

4 **Q. WHY DO YOU SAY THAT?**

5 A. LUCo is composed of over 30 water, gas and electric utilities that are regulated by 12
6 different regulatory commissions. Liberty Midstates' Missouri customers make up only
7 about 7.00 percent of the 762,000 customers served by LUCo.¹⁸ Over time, Liberty
8 Midstates regulatory capital structure should not be driven by the decisions of other
9 commissions for other utilities, which may have been made under significantly different
10 capital market circumstances or regulatory constructs. That is, using LUCo's capital
11 structure would potentially remove the capital structure from Missouri regulators' hands.
12 This was a concern that led in part to the Commission's decision to adopt an operating
13 company capital structure in Spire's recent rate cases and I think it is equally applicable in
14 this instance.¹⁹

15 **Q. NOTWITHSTANDING YOUR OBJECTION TO STAFF'S PROPOSAL TO USE**
16 **LUCO'S CAPITAL STRUCTURE AS LIBERTY MIDSTATES' RATEMAKING**
17 **CAPITAL STRUCTURE, DO YOU HAVE ANY CONCERNS WITH STAFF'S**
18 **ADJUSTMENTS TO THE LUCO CAPITAL STRUCTURE?**

19 A. Yes. Mr. Murray imputes debt to LUCo's reported book capital structure based on the

¹⁸ Liberty Midstates has approximately 55,000 Missouri customers (*See* Direct Testimony of David Swain, at 3.) LUCo customer counts from Algonquin Power & Utilities Corp., Investor Presentation, March 2018, at 6. The company reports 265,000 electric, 337,000 gas and 160,000 water customers.

¹⁹ *See*, Missouri Public Service Commission, Report and Order, Case Nos. GR-2017-0215 and GR-2017-0216, at 42 (Issued February 21, 2018).

1 originating source of funds. However, cash is fungible, which is to say it is not possible to
2 trace a dollar of capital from source to ultimate use. Moreover, it is the use of funds – not
3 the source of funds – that determines the cost of capital.²⁰ The equity held at LUCo should
4 be treated as equity.

5 Setting aside the fungible nature of capital, if Mr. Murray’s adjustments are an
6 attempt to identify a consolidated capital structure that reflects the funds being used to
7 finance Liberty Midstates’ assets and operations, his approach is misplaced. Liberty
8 Midstates has an identified capital structure that includes \$55,000,000 in debt financing.²¹
9 As noted in the response to Staff DR 0238, none of the proceeds from LUCo’s debt
10 issuance since the July 1, 2012 acquisition of Liberty Midstates were directly invested in
11 Liberty Midstates. The disconnect is plainly illustrated by the fact that the consolidated
12 capital structure used by Mr. Murray includes debt such as Empire District Electric
13 (“EDE”) First Mortgage bonds which were issued prior to the merger and specifically
14 related to the financing of legacy Empire District Electric assets. A sizeable portion of the
15 debt in Murray’s “adjusted” consolidated LUCo capital structure is therefore not related to
16 Liberty Midstates, and should not be used to set the Company’s regulatory capital structure.

17 Lastly, I note Mr. Murray’s approach would assign variable rate term facility debt
18 as long-term debt financing. The use of variable rate debt to finance long-term assets would
19 introduce customers to interest rate risk and refinancing risk over time.

²⁰ See, for example, Brealey Myers and Allen, *Principles of Corporate Finance*, 8th Edition, at 204-205. See also, CFA Level II Curriculum, Volume 4, page 45 and 48.

²¹ Source: Company. Liberty Midstates’ balance sheet was provided in response to DR 0117.1.

1 **Q. IS MR. MURRAY’S RECOMMENDED 40.94 PERCENT EQUITY RATIO**
2 **CONSISTENT WITH THE CAPITAL STRUCTURES IN PLACE AT HIS PROXY**
3 **COMPANIES?**

4 A. No, it is not. Mr. Murray calculates his proxy companies’ equity ratios (excluding short-
5 term debt) to range from 48.73 percent to 61.82 percent, with a mean of 53.59 percent.
6 That is, Mr. Murray’s recommended equity ratio is 779 basis points below the lowest of
7 the actual equity ratios in place at his proxy group companies.

8 **Q. WHAT IS THE AVERAGE EQUITY RATIO IN PLACE AT THE REGULATED**
9 **UTILITY OPERATING SUBSIDIARIES OF MR. MURRAY’S PROXY**
10 **COMPANIES?**

11 A. Excluding utilities financed with 100.00 percent equity, the underlying natural gas and
12 diversified operating utilities had mean and median equity ratios of 57.97 percent and 55.63
13 percent, respectively, over the five years ending December 2016 (*see* Schedule KM-R11).
14 The individual operating utility 5-year average equity ratios ranged from 52.51 percent to
15 71.31 percent. Again, Mr. Murray’s recommended equity ratio is unreasonably low
16 relative to these operating utility benchmarks.

17 **Q. HOW DOES MR. MURRAY’S RECOMMENDATION COMPARE TO THE**
18 **AUTHORIZED EQUITY RATIOS FOR THE NATURAL GAS UTILITIES**
19 **WITHIN HIS PROXY GROUP?**

20 A. As shown in Schedule KM-R12, the mean and median equity ratios authorized for the gas
21 utilities owned by Mr. Murray’s proxy group companies are 53.37 percent and 53.00

1 percent, respectively.²² Looking at the wider universe of all natural gas operating utilities
2 covered by Regulatory Research Associates, since January 2017 the mean and median of
3 authorized equity ratios were 51.07 percent and 51.70 percent, respectively.²³ Mr.
4 Murray's 40.94 percent recommended equity ratio is more than 10.00 percentage points
5 below those industry comparisons.

6 **Q. WHAT WOULD BE THE EFFECT OF INCLUDING A COMPARATIVELY HIGH**
7 **LEVEL OF FINANCIAL LEVERAGE IN THE COMPANY'S RATEMAKING**
8 **CAPITAL STRUCTURE?**

9 A. As discussed in my Direct Testimony, increasing financial leverage (*i.e.*, the percentage of
10 debt) increases financial risk which effects the cost of, and access to, capital.²⁴ Authorizing
11 a capital structure with significantly less equity than industry benchmarks (such as the
12 equity ratios in place at the proxy companies) would also likely be seen as a negative
13 regulatory outcome and therefore a sign of higher regulatory risk, which is a key
14 component of investors' perception of business risk.²⁵ Ultimately, an increase in risk
15 perception and a deterioration in financial strength can impair the utility's ability to attract
16 capital and fulfill its service obligations at a reasonable cost.²⁶

22 Source: Regulatory Research Associates and most recent company SEC Form 10-K filings.

23 See Schedule K-R13. Excludes Arkansas and Michigan rate cases that include non-investor supplied capital in reported capital structure.

24 Direct Testimony of Keith Magee, at 48-49.

25 Moody's, for example, notes that the regulatory environment "is the most important consideration for this sector." See Moody's Investor Service, Rating Methodology: Regulated Electric and Gas Utilities, December 23, 2013 at 3 and 9.

26 *Ibid.*, at 22.

1 **Q. PLEASE SUMMARIZE MR. MURRAY’S CONCERNS REGARDING THE USE**
2 **OF THE PROXY GROUP AVERAGE EQUITY RATIO, AS YOU PROPOSED.**

3 A. Mr. Murray notes there is intuitive appeal to using the natural gas industry average equity
4 ratio because it should reflect the needs and financing practices of the industry.²⁷ However,
5 he provides two primary objections: (1) that the hypothetical approach “does not recognize
6 the actual strategic corporate financing structure in which the assets are funded”; and (2)
7 that the utility will be financially incented to pursue a more leverage capital structure.

8 **Q. WHAT IS YOUR RESPONSE TO MR. MURRAY’S FIRST OBJECTION?**

9 A. Staff’s concern is misplaced. It is important to recognize that the cost of capital is a
10 function of the risks and characteristics of the investment, in this case Liberty Midstates,
11 not the source of the capital funding the investment.²⁸ As stated by Morningstar:

12 It should also be noted that the cost of capital is a function of the
13 investment, not the investor.

14
15 The cost of capital is an opportunity cost. Some people consider the
16 phrase ‘opportunity cost of capital’ to be more correct. The
17 opportunity cost of an investment is the expected return that would
18 be earned on the next best investment. In a competitive world with
19 many investment choices, a given investment and the next best
20 alternative have practically identical expected returns.²⁹

21 The Company’s cost of capital, therefore, should be assessed on a stand-alone basis, and
22 reflect the risk and operational needs of Liberty Midstates’ natural gas utility business. The
23 proxy group’s mean equity ratio is a reasonable benchmark of industry-established
24 financing practices for natural gas utilities.

²⁷ Staff Report - Cost of Service, Appendix 2, at 29-30.

²⁸ See, Brealey Myers and Allen, *Principles of Corporate Finance*, 8th Edition, at 204-205.

²⁹ Morningstar, Inc., *Ibbotson SBBI 2013 Valuation Yearbook*, at 21-22.

1 The adjusted consolidated LUCo capital structure proposed by Mr. Murray, on the
2 other hand, reflects the financing practices of an intermediate diversified utility holding
3 company with strategic corporate initiatives, some of which may be unrelated to stand-
4 alone utility operations (such as pursuing mergers and acquisitions).

5 **Q. WHAT IS YOUR RESPONSE TO MR. MURRAY’S SECOND OBJECTION?**

6 A. His position assumes that the Company would be able to create value by taking on more
7 debt than authorized in its regulatory capital structure and presumably lowering its overall
8 cost of capital. That position, however, ignores the fact that an increase in leverage at the
9 Company increases financial risk and therefore also increases the cost of equity, putting
10 upward pressure on the overall cost of capital. As discussed in my Direct Testimony,³⁰ the
11 use of debt in the capital structure must be balanced with the incremental financial risk it
12 causes. The proxy group average equity ratio provides a market-based estimate of industry
13 financing practices that reflect the financial incentives to lower the cost of capital.³¹
14 Consequently, I disagree that LUCo would be “incented” to take on more leverage.

15 ***COST OF DEBT***

16 **Q. PLEASE BRIEFLY SUMMARIZE MR. MURRAY’S ANALYSIS AND**
17 **RECOMMENDATION REGARDING THE COMPANY’S COST OF DEBT?**

18 A. Mr. Murray calculates a weighted average cost of debt of 4.51 percent using the “adjusted”
19 consolidated LUCo capital structure discussed above.³² As noted in my response to Mr.

³⁰ Direct Testimony of Keith Magee, at 48-49.

³¹ Note, LUCo’s capital structure is not market-based because LUCo does not issue its own equity.

³² Staff Report - Cost of Service, Appendix 2, at 1.

1 Murray's proposed capital structure, his adjustments include imputing an additional \$395
2 million in debt. The imputed debt reduces his cost of debt estimate by 20 basis points.³³

3 **Q. WHAT IS YOUR RESPONSE TO MR. MURRAY ON THOSE ISSUES?**

4 A. As discussed in my response to Mr. Murray's proposed capital structure (above), I do not
5 agree with Mr. Murray's adjustments to LUCo's consolidated capital structure. Excluding
6 those adjustments would increase Mr. Murray's cost of debt estimate to approximately 4.71
7 percent.

8 I also note that Mr. Murray's cost of debt calculation does not account for debt
9 issuance costs (*i.e.*, amortization of debt issuance premiums or discounts, and transaction
10 expenses). Debt issuance expenses are a real and necessary cost of acquiring debt capital
11 and should be recovered through the allowed rate of return. Inclusion of those costs would
12 increase the cost of debt estimate by 10 basis points.

13 **Q. IS THE COMPANY'S PROPOSED 4.70 PERCENT COST OF DEBT**
14 **REASONABLE RELATIVE TO OTHER UTILITIES' COST OF DEBT?**

15 A. Yes. Using cost of capital information reported by Regulatory Research Associates, the
16 average approved cost of debt has been 4.91 percent since January 2017 (*see* Schedule
17 KM-R13).³⁴ Liberty Midstates cost of debt is consistent with that benchmark.

³³ As determined by excluding the highlighted debt issuances from Mr. Murray's cost of debt calculation provided in his Schedule 6-2.

³⁴ Excludes rate cases from Arkansas and Michigan. Inclusion of non-investor supplied capital in the ratemaking capital structure in those jurisdictions prevents the calculation on an implied cost of debt from RRA rate case data.

1 ***COST OF EQUITY***

2 **Q. PLEASE BRIEFLY SUMMARIZE MR. MURRAY’S ANALYSIS AND**
3 **RECOMMENDATION REGARDING THE COMPANY’S COST OF EQUITY?**

4 A. Mr. Murray’s DCF and CAPM analyses result in ROE estimates ranging from 5.89 percent
5 to 7.70 percent.³⁵ While Mr. Murray finds the cost of equity is “most likely” in the range
6 of 6.00 to 7.00 percent,³⁶ he ultimately recommends a 10.00 percent cost of equity (within
7 a range of 9.50 percent to 10.00 percent). His 10.00 percent ROE estimate was derived by
8 adding a 20 basis point ROE adjustment to the 9.80 percent cost of equity approved for
9 Spire Missouri in February 2017, and assumes an approved common equity ratio of 40.94
10 percent.³⁷ In the event the Commission authorizes Liberty Midstates an equity ratio similar
11 to the 54.20 percent recently approved for Spire Missouri, Mr. Murray recommends a 9.80
12 percent ROE.³⁸

13 **A. Proposed Financial Leverage Adjustment**

14 **Q. HOW DID MR. MURRAY DETERMINE HIS RECOMMENDED 20 BASIS POINT**
15 **ROE ADJUSTMENT?**

16 A. Mr. Murray observes that LUCo is rated “BBB (high)” by DBRS,³⁹ which is equivalent to
17 a “BBB+” rating from S&P.⁴⁰ He also concludes that Spire Missouri would have an “A”
18 credit rating from S&P if it were rated on a stand-alone basis solely based on its financial

35 Staff Report - Cost of Service, Appendix 2 at 43, 45 and Schedules 11 and 12.

36 Staff Report - Cost of Service, Appendix 2 at 1.

37 Staff Report - Cost of Service, Appendix 2 at 47-48.

38 Staff Report – Cost of Service, Appendix 2 at 1.

39 Liberty Midstates does not have a stand-alone credit rating.

40 See, for example, https://www.tdsecurities.com/tds/content/CMkt_RatingsCorrelation.

1 and business risk ratings.⁴¹ Based on those observations he argues that two-thirds of the
2 recent 30 basis point spread between Moody’s “A” and “Baa” rated utility bonds
3 (equivalent to S&P’s “A” and “BBB” ratings, respectively) should be used as a measure of
4 the incremental cost of equity. Presumably, Mr. Murray recommends taking two-thirds of
5 the credit spread because there are three notches between S&P rating letter grades, and a
6 “BBB+” rating would be two notches removed from an “A” rating.

7 **Q. DO VARIATIONS IN CREDIT RATINGS TRANSLATE DIRECTLY INTO**
8 **VARIATIONS IN THE COST OF EQUITY?**

9 A. No, they do not. While I agree that, in general, credit ratings are directionally related to
10 the cost of equity, and certainly agree that the amount of debt included in or attributed to a
11 utility’s capital structure will impact its cost of equity, I do not agree that variations in one
12 are directly related to variations in the other. Credit ratings are opinions about credit risk
13 and are used to inform investment decisions regarding bonds and other fixed income
14 investments.⁴² Debt and equity are different securities with different risk/return
15 characteristics, different lives, and different investors. Although both debt and equity have
16 required costs, they differ in certain fundamental ways. Most noticeably, debt payments
17 are contractually defined and debt holders have priority claim on assets in the event cash
18 flows are insufficient to meet financial obligations. Equity holders, on the other hand, do
19 not have guaranteed returns and bear “residual risk.” Therefore, equity holders take greater
20 risks and require higher returns than debt holders. Because their risk/return profiles differ,
21 changes in risk cannot be assumed to affect their required rate of return equally.

⁴¹ Staff Report – Cost of Service, Appendix 2 at 47-48.

⁴² See http://www.spratings.com/en_US/understandingratings

1 **Q. DO YOU AGREE WITH MR. MURRAY'S CONCLUSION THAT A 13.26**
2 **PERCENTAGE POINT REDUCTION IN THE EQUITY RATIO IS EQUIVALENT**
3 **TO A TWO NOTCH DECREASE IN CREDIT RATING?**

4 A. No, I do not. Moody's rating guidelines indicate that increasing the debt ratio by 10.00
5 percentage points (*i.e.*, lowering the equity ratio by 10.00 percentage points) is generally
6 associated with a letter grade change in credit rating.⁴³ Because there are three notches
7 between each letter grade, Mr. Murray's 13.26 percentage point lower equity ratio (higher
8 debt ratio) would be equivalent to four ratings notches. Importantly, credit rating agencies
9 consider qualitative factors, such as business risk, in addition in to quantitative credit
10 metrics like the debt ratio. As discussed above, an authorized equity ratio that falls
11 significantly below industry norms would potentially increase investors' perception of
12 regulatory risk and put further pressure on credit ratings.

13 **Q. HAVE YOU CONDUCTED ANY ANALYSIS TO DETERMINE THE**
14 **INCREMENTAL RETURN ON EQUITY REQUIRED TO OFFSET THE HIGHER**
15 **FINANCIAL RISK IMPLIED BY MR. MURRAY'S 40.94 PERCENT ROE**
16 **RECOMMENDATION RELATIVE TO THE 54.20 PERCENT RATIO**
17 **RECENTLY APPROVED FOR SPIRE MISSOURI?**

18 A. Yes, I have. First, I used the Hamada Equation to determine the difference in cost of equity
19 implied by the CAPM.⁴⁴ Importantly, the CAPM is a model that both Mr. Murray and I
20 use to directly measure the cost of equity and therefore avoids the complicating factor of

⁴³ See, Rating Methodology, *Regulated Electric and Gas Utilities*, Moody's Investors Service, December 23, 2013, at 24.

⁴⁴ Shannon P. Pratt, Robert F. Reilly, and Robert P. Schweihs, *Valuing a Business*, Fourth Edition, at 169.

1 translating a return premium associated with the cost of debt to a return premium applicable
2 to the cost of equity. The Hamada Equation reflects the increased risk from additional
3 financial leverage by adjusting the beta component of the model. Using Mr. Murray's risk-
4 free rate and beta coefficient assumptions, the Hamada Equation indicates a 13.26
5 percentage point reduction in equity ratio results in a 198 basis point increase in the
6 required ROE (*see* Schedule KM-R14).

7 My second approach simply adjusts Mr. Murray's estimate of the ROE risk adder
8 (which is based on the yield differential between bonds of different ratings) to reflect the
9 significantly higher cost of equity compared to the cost of debt, and to reflect a wider four
10 notch change in credit rating as noted above.⁴⁵ I started with the 33 basis point spread
11 between the A-rated and Baa-rated utility debt yields reported by Mr. Murray for January
12 2018.⁴⁶ Because Mr. Murray's recommended investor-required rate of return on common
13 equity (9.80 percent) is 2.55 times higher than his estimate of the cost of A rated utility
14 debt (3.83 percent),⁴⁷ I multiplied the 33 basis point debt yield spread by 2.55 to reflect the
15 incremental risk faced by equity holders for a one letter-grade change in credit rating. I
16 then multiplied that result (84 basis points) by 4/3 to account for the four credit rating notch
17 differential discussed above. The lower equity ratio recommended by Mr. Murray would
18 then require an upward ROE adjustment of 112 basis points.

19 Averaging together the two measures (112 basis points and 198 basis points) results

⁴⁵ In general, I do not agree with the assumption that cost of equity is directly related to differentials in credit ratings, but have conducted this analysis in response to Mr. Murray's analysis.

⁴⁶ Based on yields of 3.83 percent and 4.16 percent on A-rated and Baa-rated utility bonds, respectively.

⁴⁷ Staff Report - Cost of Service, Appendix 2, at 4-5 and 46. 9.80% is the ROE assumption Mr. Murray starts with before making an adjustment for assumed incremental financial risk.

1 in a 155 basis point ROE adjustment.

2 **B. DCF Growth Rates**

3 **Q. PLEASE SUMMARIZE THE GROWTH RATES THAT MR. MURRAY RELIES**
4 **ON IN HIS DCF ANALYSIS.**

5 A. Mr. Murray reviews a number of growth rate measures including: (1) 5-year and 10-year
6 historical average growth in dividends per share (“DPS”), book value per share (“BVPS”),
7 and earnings per share (“EPS”); (2) 3-year projected DPS, BVPS and EPS growth from
8 Value Line; (3) consensus analyst 5-year EPS growth projections reported by S&P Global
9 Market Intelligence; and (4) Gross Domestic Product (“GDP”) growth projections ranging
10 from 5 to 22 years.⁴⁸ Although he concludes a growth rate close to 4.00 percent would be
11 “more logical” considering projected growth rates for the U.S. economy, Mr. Murray
12 selects a growth rate range of 4.20 percent to 5.00 percent giving “some consideration” to
13 analysts’ expected growth rates.⁴⁹

14 **Q. AS A PRELIMINARY MATTER, DO MR. MURRAY’S DCF RESULTS PROVIDE**
15 **A REASONABLE ESTIMATE OF THE COMPANY’S COST OF EQUITY?**

16 A. No, they do not. As Mr. Murray notes, his DCF cost of equity results are “much lower
17 than the average allowed ROEs for gas utility companies in the country.”⁵⁰ The high end
18 of Mr. Murray’s range of DCF estimates (7.70 percent) is approximately 200 basis points
19 below the average authorized ROE for natural gas utilities over the past year.

⁴⁸ Staff Report - Cost of Service, Appendix 2, at 34-36; *see also* Schedules 10-1 to 10-4.

⁴⁹ Staff Report - Cost of Service, Appendix 2, at 34 and 43; *see also* Schedule 11.

⁵⁰ Staff Report - Cost of Service, Appendix 2, at 43.

1 **Q. PLEASE SUMMARIZE THE DIFFERENCES BETWEEN YOU AND MR.**
2 **MURRAY REGARDING THE GROWTH RATES IN YOUR RESPECTIVE**
3 **CONSTANT GROWTH DCF ANALYSES.**

4 A. It is my view that earnings growth projections are the relevant measure of growth. Mr.
5 Murray's analysis, on the other hand, reflects his review of both historical and projected
6 growth in DPS, BVPS, and EPS. Mr. Murray also finds that projected GDP growth should
7 be considered an upper limit on gas utility growth in the constant growth DCF model. For
8 the reasons discussed below, I disagree with Mr. Murray's use of historical data, his use of
9 projected DPS and BVPS growth rates and his assumptions regarding GDP growth as an
10 upper bound on gas utility growth.

11 **Q. WHY DO YOU DISAGREE WITH MR. MURRAY'S ASSUMPTION THAT**
12 **HISTORICAL GROWTH RATES ARE APPROPRIATE MEASURES OF**
13 **EXPECTED GROWTH FOR THE DCF MODEL?**

14 A. The growth component of the constant growth DCF model is a *forward-looking* measure.
15 To the extent historical growth influences investors' expectations of future growth, it
16 already will be reflected in analysts' consensus earnings estimates. Carleton and Vander
17 Weide, for example, found "overwhelming evidence that consensus analysts' forecast of
18 future growth is superior to historically oriented growth measures in predicting the firm's
19 stock price."⁵¹ Carleton and Vander Weide noted that their results "are consistent with the
20 hypothesis that investors use analysts' forecasts, rather than historically oriented growth

⁵¹ Vander Weide and Carleton, *Investor Growth Expectations: Analysts vs. History*, The Journal of Portfolio Management (Spring 1988). The Vander Weide and Carleton study was updated in 2004 under the direction of Dr. Vander Weide. The results of the updated study were consistent with the original study's conclusions.

1 calculations, in making stock buy-and-sell decisions.”⁵² Similarly, Brigham, Shome, and
2 Vinson noted that “evidence in the current literature indicates that (i) analysts’ forecasts
3 are superior to forecasts based solely on time series data, and (ii) investors do rely on
4 analysts’ forecasts.”⁵³ Consequently, I do not agree with Mr. Murray’s reliance on
5 historical growth rates to set the low end of his selected growth rate range.

6 **Q. WHY DO YOU DISAGREE WITH MR. MURRAY’S USE OF PROJECTED BOOK**
7 **VALUE AND DIVIDEND PER SHARE GROWTH RATES?**

8 A. Earnings growth enables both dividend and book value growth. That is, book value of
9 equity can increase only through increases to retained earnings, or through the issuance of
10 new equity. Both of those factors are derived from earnings: retained earnings increase
11 with the amount of earnings not distributed as dividends, and the price at which new equity
12 is issued is a function of the earnings per share and the then-current P/E ratio. Academic
13 research has clearly indicated that measures of earnings and cash flow are strongly related
14 to returns.⁵⁴ The importance of earnings projections to investors is evidenced by the fact
15 common financial data sources such as Zacks and Yahoo! Financial provide long-term
16 earnings growth projections, but not dividend or book value growth projections.

⁵² Vander Weide and Carleton, *Investor Growth Expectations: Analysts vs. History*, The Journal of Portfolio Management (Spring 1988).

⁵³ Eugene F. Brigham, Dilip K. Shome, and Steve R. Vinson, *The Risk Premium Approach to Measuring a Utility’s Cost of Equity*, Financial Management (Spring 1985).

⁵⁴ See, e.g., Lori Christofi and Moliver, Evaluating Common Stocks Using Value Line’s Projected Cash Flows and Implied Growth Rate, *Journal of Investing* (Spring 1999); Harris and Marston, Estimating Shareholder Risk Premia Using Analysts’ Growth Forecasts, *Financial Management*, 21 (Summer 1992); and Vander Weide and Carleton, *Investor Growth Expectations: Analysts vs. History*, The Journal of Portfolio Management (Spring 1988).

1 **Q. HAVE YOU CONDUCTED ANY ANALYSES TO DETERMINE WHICH**
2 **MEASURES OF GROWTH ARE STATISTICALLY RELATED TO THE PROXY**
3 **COMPANIES' STOCK VALUATION LEVELS?**

4 A. Yes, I have. My analysis is based on the approach developed by Professors Carleton and
5 Vander Weide, who performed a comparison of the predictive capability of historical
6 growth estimates and analysts' consensus forecasts of five-year earnings growth for the
7 stock prices of sixty-five utility companies.⁵⁵ I structured the analysis to determine whether
8 investors use historical or projected earnings, dividend or book value growth rates when
9 valuing utility stocks. In particular, my analysis examined the statistical relationship
10 between the P/E ratios of the universe of Value Line electric and gas utility companies and
11 the EPS, DPS and BVPS growth rates reported by Value Line (including projected, 5-year
12 historical and 10-year historical growth rates). To determine which, if any, of those growth
13 rates are statistically related to utility stock valuations, I performed a series of regression
14 analyses in which the growth rates were explanatory variables and the P/E ratio was the
15 dependent variable. The results of those analyses are presented in Table 3 below.

⁵⁵ Vander Weide and Carleton, *Investor Growth Expectations: Analysts vs. History*, The Journal of Portfolio Management (Spring 1988), at 81.

1 **Table 3: Regression Results - Price to Earnings and Growth Rates⁵⁶**

Growth Variable	Intercept	Coefficient	T-Statistic	F-Statistic
Projected EPS	14.184	30.968	3.353	11.242
Projected DPS	15.667	6.610	0.579	0.335
Projected BVPS	15.986	1.683	0.113	0.013
Past 10-yr EPS	16.383	-11.762	-1.581	2.500
Past 10-yr DPS	16.281	-7.030	-0.925	0.856
Past 10-yr BVPS	16.607	-17.109	-2.004	4.017
Past 5-yr EPS	15.743	7.179	1.421	2.018
Past 5-yr DPS	16.128	-3.309	-0.489	0.239
Past 5-yr BVPS	16.615	-13.120	-1.515	2.294

2 As shown in Table 3 (*see* also Schedule KM-R15), the results demonstrate that the
 3 only statistically significant, meaningful growth rate was projected EPS growth. That is,
 4 neither historical growth rates nor projected DPS or BVPS growth rates were related to
 5 valuation levels. Consequently, I continue to believe projected EPS growth rates are the
 6 appropriate measure of growth for the purpose of the DCF model.

7 **Q. WHAT ARE YOUR CONCERNS WITH MR. MURRAY’S SUGGESTION THAT**
 8 **GROSS DOMESTIC PRODUCT (GDP) GROWTH ESTIMATES IN THE RANGE**
 9 **OF 3.84 PERCENT TO 4.35 PERCENT SHOULD BE CONSIDERED UPPER**
 10 **CONSTRAINTS ON THE GROWTH RATES USED IN THE DCF MODEL?⁵⁷**

11 A. There is no reason to believe natural gas utility growth will be strictly limited by GDP
 12 growth. In the near to medium-term, natural gas utility growth may be driven by a number

⁵⁶ See also Schedule KM-R15.

⁵⁷ Staff Report - Cost of Service, Appendix 2, at 35-36.

1 of factors that are independent of average GDP growth including: the need for replacing
2 aging pipelines, investment in modern infrastructure and safety and security enhancements,
3 territory expansion, industrial revitalization, changes in authorized ROE levels, changes in
4 tax law, and other industry specific considerations. As Mr. Murray notes, “natural gas
5 distribution utility growth was not highly correlated to GDP” over the period of his
6 analysis. To that point, as illustrated on page 38 of Mr. Murray’s testimony, rolling 10-
7 year gas utility industry growth has exceeded GDP growth in recent years. While GDP
8 growth may have some effect on industry growth, it is reasonable to assume that the effect
9 is already taken into account in analysts’ earnings growth rate estimates.

10 From a longer-term perspective, the GDP forecasts cited by Mr. Murray, which
11 range from 10 to 22 years, are simply too short to be considered perpetual growth estimates.
12 Moreover, it is not clear that the assumptions those forecasts are based on reflect investors’
13 long-term expectations. For example, EIA (one of the sources cited by Mr. Murray) notes
14 they must make assumptions about regulations, monetary and fiscal policy:

15 The Reference case generally assumes that current laws and regulations
16 affecting the energy sector, including sunset dates for laws that have them,
17 are unchanged throughout the projection period.

18
19 The potential impacts of proposed legislation, regulations, and standards are
20 not included.⁵⁸

21
22 Lastly, I note U.S. nominal GDP growth has averaged 6.34 percent since 1929.⁵⁹ Mr.
23 Murray’s long-term growth assumptions are unduly low relative to that benchmark.

⁵⁸ Energy Information Administration, *Annual Energy Outlook 2018*, February 2018, at 9. See, www.eia.gov/outlooks/aeo/pdf/AEO2018.pdf.

⁵⁹ Source: U.S. Bureau of Economic Analysis (www.bea.gov/national/). Arithmetic average. The geometric average has been 6.11 percent.

1 **Q. DO YOU AGREE WITH MR. MURRAY’S ASSERTION THAT BECAUSE THEIR**
2 **PAYOUT RATIOS ARE RELATIVELY HIGHER THAN THE AVERAGE**
3 **PAYOUT RATIO FOR THE S&P 500, UTILITIES WILL LIKELY GROW AT A**
4 **SLOWER RATE THAN THE OVERALL ECONOMY?**

5 A. No, I do not. Mr. Murray states:

6 In fact, considering that companies in the S&P 500 in recent years have
7 retained approximately 65% of their earnings for reinvestment, while
8 natural gas utilities’ retention ratio has been approximately 35% over the
9 same period, it follows that utilities will grow at a rate less than that of
10 nominal GDP growth.⁶⁰

11
12 However, in 2006, two articles appeared in Financial Analysts Journal, addressing
13 the theory that high dividend payouts (*i.e.*, low retention ratios) are associated with low
14 future earnings growth.⁶¹ Both of those articles cite a 2003 study by Arnott and Asness,
15 which found that, over the course of 130 years future earnings growth was associated with
16 high, rather than low, payout ratios.⁶² Consequently, a general observation regarding the
17 relative size of the average payout ratio of utility companies compared to the S&P 500
18 index does not provide sufficient information to determine the extent to which the two
19 growth rates may (or may not) diverge.

⁶⁰ Staff Report - Cost of Service, Appendix 2, at 35. Citation omitted.

⁶¹ See, Ping Zhou, William Ruland, *Dividend Payout and Future Earnings Growth*, Financial Analysts Journal, Vol. 62, No. 3, 2006. See also Owain ap Gwilym, James Seaton, Karina Suddason, Stephen Thomas, *International Evidence on the Payout Ratio, Earnings, Dividends and Returns*, Financial Analysts Journal, Vol. 62, No. 1, 2006.

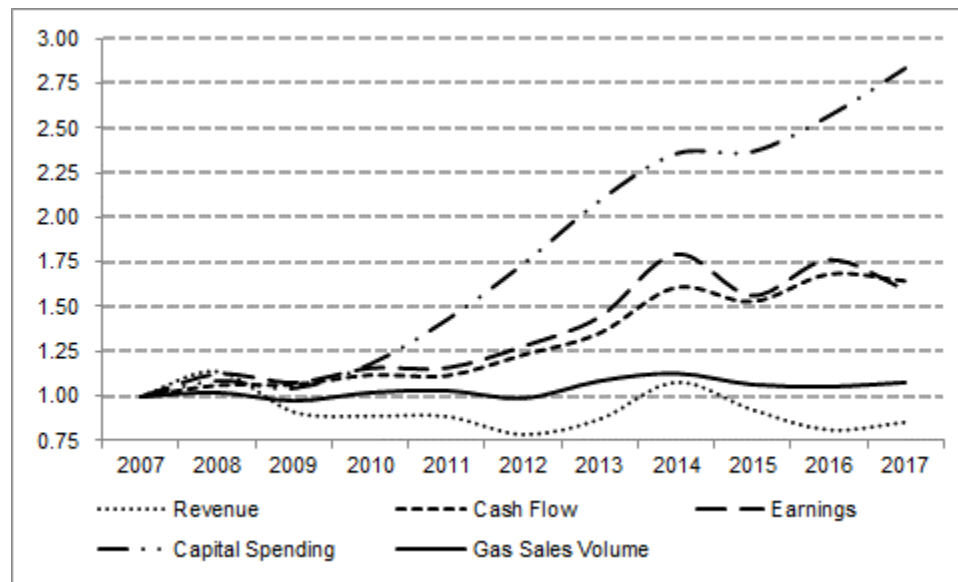
⁶² See, Robert Arnott, Clifford Asness, *Surprise: Higher Dividends = Higher Earnings Growth*, Financial Analysts Journal, Vol. 59, No. 1, 2003.

1 **Q. MR. MURRAY NOTES ENERGY CONSUMPTION HAS BEEN DECLINING.**
2 **DOES THAT FACT NECESSARILY LIMIT INDUSTRY GROWTH TO A RATE**
3 **AT OR BELOW GDP GROWTH?**

4 A. No, it does not. The assumption that declining demand would limit natural gas utility
5 growth presumes that there is a direct relationship between natural gas sales volumes and
6 utility revenue, capital expenditures and earnings. As a practical matter, however, many
7 variables enter into that relationship. A move in rate design toward decoupling and higher
8 fixed charges, for example, will affect the relationship between sales volume and revenues.
9 The relationship between revenue and earnings likewise depends on operating margins,
10 which in turn, are influenced by a variety of operating factors, such as productivity
11 improvements. Moreover, utility growth can be driven by a number of other factors such
12 as those discussed above.

13 Based on data from RRA and Value Line, it is clear that from 2007 through 2017
14 (the range of data available from RRA and Value Line) the proxy group's average growth
15 in revenues, earnings, cash flow and capital expenditures far exceeded the growth in gas
16 sales volume (*see* Chart 1, below). Consequently, I strongly disagree with Mr. Murray's
17 suggestion that declining demand should be viewed as indicative of below-average growth
18 potential.

1 **Chart 1: Annual Growth in Sales Volume, Revenue, Earnings,**
2 **Cash Flow and Capital Spending 2007 - 2017⁶³**



3
4
5 Lastly, I note that trends in demand and customer growth are certainly known to analysts
6 and any affect they may have on earnings growth would already be reflected in their
7 published forecasts.

8 **Q. ANOTHER FACTOR MR. MURRAY POINTS TO AS A DRIVER OF NATURAL**
9 **GAS UTILITY GROWTH IS INVESTMENT.⁶⁴ HAVE YOU TAKEN CAPITAL**
10 **INVESTMENT INTO CONSIDERATION WHEN ESTIMATING GROWTH?**

11 A. Yes, I have. The retention growth formula discussed in my Direct Testimony directly
12 addresses the ability of the proxy companies to grow earnings by investment of retained
13 earnings as well as investment of incremental capital raised through new stock issuances.⁶⁵

14 As shown in Schedule KM-3 of my Direct Testimony, using data from Value Line the

63 Sources: Value Line and EIA.

64 Staff Report - Cost of Service, Appendix 2, at 39.

65 Direct Testimony of Keith Magee, at 19-20.

1 proxy group mean retention growth rate was 6.22 percent (updated to 6.94 percent in
2 Schedule KM-R3). That growth rate estimate is highly consistent with the average analyst
3 earnings growth estimate for the proxy group companies.

4 **Q. ARE THERE OTHER BENCHMARKS THAT CAN BE USED TO ASSESS THE**
5 **REASONABLENESS OF THE GROWTH PROJECTIONS USED BY MR.**
6 **MURRAY?**

7 A. Yes, the reasonableness of Mr. Murray's growth assumptions can be compared to the long-
8 term growth implied by recently authorized returns. That is, under the constant growth
9 DCF methodology the required return is composed of an income component (dividend
10 yield) and a capital appreciation component (growth). We can therefore rearrange the
11 constant growth DCF formula to solve for the implied growth rate.⁶⁶ Assuming Mr.
12 Murray's average proxy group dividend yield of 2.70 percent and the 9.89 percent average
13 authorized gas utility ROE he cites for fully-litigated rate cases in 2017, the implied growth
14 rate is approximately 7.00 percent.⁶⁷ In light of that comparison, Mr. Murray's growth rate
15 estimate of 4.20 percent to 5.00 percent is unduly low.

16 **Q. SETTING ASIDE YOUR CONCERNS WITH MR. MURRAY'S APPLICATION**
17 **OF DCF ANALYSES, DO YOU BELIEVE MEAN DCF RESULTS SHOULD BE**
18 **GIVEN SIGNIFICANT WEIGHT UNDER CURRENT MARKET CONDITIONS?**

19 A. No, I do not. As noted in my Direct Testimony, one of the principal underlying premises
20 of the constant growth DCF model is that capital market conditions (including P/E ratios)

⁶⁶ The constant growth DCF formula was provided on page 16 of my Direct Testimony.

⁶⁷ $2.70\% \times (1 + 7.00\%) + 7.00\% = 9.89\%$. Staff Report - Cost of Service, Appendix 2, at 47.

1 will remain in place in perpetuity.⁶⁸ However, the reasonableness of that assumption in
2 the current capital market environment is questionable given that utility P/E ratios have
3 been relatively high compared to their historical average levels,⁶⁹ and that the Federal
4 Reserve continues to move toward monetary policy normalization.⁷⁰

5 The comparatively high valuation of utility stocks has also been accompanied by
6 comparatively high stock price volatility (a measure of risk), with Standard & Poor's
7 reporting the S&P 500 Utilities Index's annualized standard deviation exceeding that of
8 the S&P 500 Index by nearly 30.00 percent over the past 3-years.⁷¹ The relatively high
9 level of volatility in utility stocks suggests elevated utility industry valuations may not be
10 sustainable. Other indicators also suggest the industry's current valuation levels may not
11 persist as rates rise. For example, the proxy group (measured as an index) lost as much as
12 16.95 percent of its value since the end of November 2017.⁷² As of the end of March 2018,
13 the proxy group price level remained 11.90 percent lower than at its November 2017 peak.
14 Over the same period, the S&P 500 index's value fluctuated but ended essentially
15 unchanged.⁷³ Looking forward, Value Line expects a decline in the P/E ratio for all but
16 one of the companies in my proxy group.

⁶⁸ See, for example, Direct Testimony of Keith Magee, at 5-6.

⁶⁹ Mr. Murray, for example, notes recent utility P/E ratios are well above their historical averages.

⁷⁰ Recent FOMC minutes note that the Federal Reserve has "continued to execute the FOMC's balance sheet normalization plan initiated in October of last year". See, Minutes of the Federal Open Market Committee, March 20-21, 2018, at 2.

⁷¹ For example, Standard & Poor's notes the S&P 500 Utilities Index annualized risk (*i.e.*, standard deviation of total returns) has been 13.25% compared to the S&P 500's 10.26% over the past 3 years. See the S&P 500 Utilities Index fact sheet at: <http://www.spindices.com/indices/equity/sp-500-utilities-sector>.

⁷² Source: S&P Global Market Intelligence

⁷³ *Ibid.* The S&P 500 price change was negative 0.25% from November 30, 2017 to March 29, 2018.

1 The utility sector’s recent underperformance and expected valuation compression
2 may, in part, be related to reports noted by the Federal Open Market Committee suggesting
3 that recently elevated volatility was related to “the unwinding of trading positions based
4 on various types of volatility trading strategies.”⁷⁴ That is, as equity market volatility
5 increases, the “reach for yield” in equities with higher dividend payouts may become less
6 attractive.

7 Every model used to estimate the cost of equity relies on specific assumptions that
8 may become more or less relevant as market conditions change. Given elevated valuation
9 levels and volatility in utility stocks, I believe it is important the DCF model results be
10 viewed with caution at the current time. As noted by Dr. Roger A. Morin “by relying solely
11 on the DCF model at a time when the fundamental assumptions underlying the DCF model
12 are tenuous, a regulatory body greatly limits its flexibility and increases the risk of
13 authorizing unreasonable rates of return.”⁷⁵

14 **C. CAPM**

15 **Q. PLEASE SUMMARIZE MR. MURRAY’S CAPM ANALYSIS AND RESULTS.**

16 A. Mr. Murray performs CAPM calculations using: (1) a risk-free rate of 2.82 percent based
17 on the three-month average of the 30-year Treasury yield as of January 31, 2018; (2) a 0.69
18 beta coefficient calculated using Value Line’s methodology; and (3) historical market risk
19 premium (“MRP”) estimates of 4.50 percent (using the geometric mean) and 6.00 percent

⁷⁴ Minutes of the Federal Open Market Committee, March 20-21, 2018, at 2.

⁷⁵ Roger A. Morin, New Regulatory Finance, Public Utility Reports, Inc., 2006, at 28.

1 (using the arithmetic mean).⁷⁶ Mr. Murray's CAPM analyses produce results of 5.89
2 percent and 6.91 percent.⁷⁷

3 **Q. WHAT ARE YOUR PRINCIPAL CONCERNS WITH MR. MURRAY'S**
4 **APPLICATION OF THE CAPM?**

5 A. My principal concerns relate to the MRP estimates used by Mr. Murray. In particular, I
6 disagree with Mr. Murray's assumption that the historical average MRP is appropriate in
7 the current capital market environment. Setting aside the issue of the reasonableness of
8 using historical MRP estimates, I also disagree with Mr. Murray's use of: (1) total returns
9 rather than income-only returns to calculate the historical risk-free rate; and (2) geometric
10 averages in the calculation of historical returns.

11 **Q. DO YOU AGREE WITH MR. MURRAY'S USE OF THE AVERAGE 30-YEAR**
12 **TREASURY YIELD TO ESTIMATE THE RISK-FREE RATE COMPONENT OF**
13 **THE CAPM?**

14 A. While I agree with Mr. Murray that it is appropriate to use the current average 30-year
15 Treasury yield, I also believe that since the purpose of this proceeding is to establish the
16 cost of equity for Liberty Midstates' gas distribution utility operations on a going-forward
17 basis, it is important to develop a CAPM analysis that reflects investor expectations
18 concerning the risk-free rate and, as discussed in more detail below, the MRP. For that
19 reason, as discussed in my Direct Testimony, my CAPM analyses rely on both the current
20 30-year Treasury yield and the consensus near-term projected 30-year Treasury yield

⁷⁶ Cost of Service Report, Appendix 2, at 44-45.

⁷⁷ Cost of Service Report, Appendix 2, at 45.

1 reported by *Blue Chip Financial Forecast*.⁷⁸

2 **Q. HOW DID MR. MURRAY CALCULATE HIS MRP ESTIMATES?**

3 A. Mr. Murray's MRP estimates are calculated by taking the difference between stock market
4 returns and long-term government bond total returns over the 1926 -2016 period.⁷⁹ His
5 first estimate (6.00 percent) is calculated using arithmetic average returns, and his second
6 estimate (4.50 percent) is calculated using geometric average returns.

7 **Q. IS IT APPROPRIATE TO RELY EXCLUSIVELY ON A HISTORICAL**
8 **ESTIMATE OF THE MRP, AS MR. MURRAY HAS DONE?**

9 A. No, it is not. The MRP represents the additional return required by equity investors to
10 assume the risks of owning the "market portfolio" of equity relative to long-term Treasury
11 securities. As with other elements of cost of equity analyses, the MRP is meant to be a
12 forward-looking parameter. As Morningstar observes:

13 It is important to note that the expected equity risk premium, as it is used in
14 discount rates and cost of capital analysis, is a forward-looking concept.
15 That is, the equity risk premium that is used in the discount rate should be
16 reflective of what investors think the risk premium will be going forward.⁸⁰

17
18 Simply relying on the historical MRP may produce results that are inconsistent with
19 investor sentiment and current capital market conditions. For example, the arithmetic
20 average of the observed MRP over the five-year period ending 2017 (using income-only
21 portion of bond returns, as discussed below) was 13.50 percent.⁸¹ That more recent

78 Direct Testimony of Keith Magee at 24-25; and Schedule KM-6.

79 Staff Report - Cost of Service, Appendix 2 at 45.

80 Morningstar, Inc., *Ibbotson SBBi 2013 Valuation Yearbook* at 53.

81 Duff & Phelps, *2018 SBBi Yearbook*, Appendix A-1, and A-7. The income return on long-term Treasury bonds averaged 2.75 percent over this period (similar to Mr. Murray's 2.82 percent estimate of the current risk-free rate).

1 estimate is approximately twice the 6.00 percent long-term historical measure relied on by
2 Mr. Murray.

3 As discussed in my Direct Testimony, there is a well-documented inverse
4 relationship between interest rates and equity risk premiums.⁸² It is, therefore, reasonable
5 for the current MRP to be above its long-term average since current Treasury yields are
6 below their long-term average. Because the relevant analytical issue in applying the
7 CAPM is to ensure that all three components of the model (*i.e.*, the risk-free rate, Beta, and
8 the MRP) are consistent with market conditions and investor expectations, I believe an *ex-*
9 *ante* MRP estimate should be used in the current market.

10 **Q. WHAT IS YOUR CONCERN WITH MR. MURRAY'S USE OF GEOMETRIC**
11 **AVERAGES WHEN ESTIMATING THE MRP?**

12 A. The arithmetic average is more appropriate to use in the CAPM because it best
13 approximates the uncertainty associated with returns from year to year. The important
14 distinction between the arithmetic and geometric averages is that the arithmetic mean
15 assumes that each periodic return is an independent observation and, therefore,
16 incorporates uncertainty into the calculation of the long-term average. The geometric
17 mean, by contrast, is a backward-looking calculation that essentially equates a beginning
18 value to an ending value over a specific period of time. Geometric averages, therefore,
19 provide a standardized basis of review of historical performance across investments or
20 investment managers; they do not, however, reflect forward-looking uncertainty.

21 Since there is no uncertainty with respect to past returns, the use of geometric

⁸² Direct Testimony of Keith Magee at 28-29.

1 averages is appropriate when comparing investment performance on a retrospective basis.
2 On a prospective basis, however, uncertainty exists and should be taken into consideration
3 when developing return expectations and requirements.⁸³ That is why investors and
4 researchers commonly use the arithmetic mean when estimating the risk premium over
5 historical periods for the purpose of estimating equity cost rates. In that regard,
6 Morningstar notes that:

7 The arithmetic average equity risk premium can be demonstrated to be the
8 most appropriate when discounting future cash flows. For use as the
9 expected equity risk premium in either the CAPM or the building block
10 approach, the arithmetic mean or the simple difference of the arithmetic
11 means of the stock market returns and the riskless rates is the relevant
12 number.⁸⁴

13
14 Similarly, an article reviewing literature on the topic noted the following rationale for using
15 the arithmetic mean:

16 Note that the arithmetic mean, not the geometric mean is the relevant value
17 for this purpose. The quantity desired is the rate of return that investors
18 expect over the next year for the random annual rate of return on the market.
19 The arithmetic mean, or simple average, is the unbiased measure of the
20 expected value of repeated observations of a random variable, not the
21 geometric mean....[The] geometric mean underestimates the expected
22 annual rate of return.⁸⁵

23
24 **Q. WHAT IS YOUR CONCERN WITH MR. MURRAY'S USE OF TOTAL BOND**
25 **RETURNS RATHER THAN INCOME-ONLY RETURNS TO MEASURE THE**
26 **HISTORICAL RISK-FREE RATE?**

27 **A.** As Duff & Phelps (the source of Mr. Murray's data) explains, the total return on a security

⁸³ See, for example, CFA Institute, CFA Curriculum Level III 2014, Volume 3, at 190.

⁸⁴ Morningstar, Inc., *Ibbotson SBBi 2015 Classic Yearbook*, at 153.

⁸⁵ Ian Cooper, Arithmetic versus geometric mean estimators: Setting discount rates for capital budgeting, *European Financial Management* 2.2, (1996): 158.

1 is composed of three components: (1) the income return; (2) capital gains (or capital losses,
2 if the value of the bond falls); and (3) reinvestment return.⁸⁶ The income return is generally
3 defined as the coupon, or interest rate on the security, which does not change over the life
4 of the security. In contrast, the value of the security rises or falls as interest rates change,
5 resulting in uncertain capital gains. As such, the income return is the only “riskless”
6 component of the total return. Consequently, it is the income-only portion of the return (as
7 opposed to the total return), that should be used as the risk-free rate. The historical
8 arithmetic average income-only return on long-term government bond yields was 5.00
9 percent from 1926-2016.⁸⁷

10 **D. Risk Premium Analysis**

11 **Q. PLEASE BRIEFLY SUMMARIZE MR. MURRAY’S “RULE OF THUMB”**
12 **CALCULATION.**

13 A. Mr. Murray’s calculation adds a premium of 3.00 percent to 5.00 percent to the corporate
14 bond yield, as measured by the average interest rate on Moody’s A and Baa-rated utility
15 debt.⁸⁸ Based on that approach, Mr. Murray develops an ROE range of 6.83 percent to
16 9.16 percent. Mr. Murray reasons that the cost of equity for utilities is toward the lower
17 end of that range, since regulated utilities are on the low end of the risk spectrum.⁸⁹

18 **Q. IS MR. MURRAY’S RULE OF THUMB APPROACH REASONABLE?**

19 A. No. His “rule of thumb” approach ignores the inverse relationship between the equity risk

⁸⁶ Duff & Phelps, *2017 SBBI Yearbook*, at 10-22.

⁸⁷ Duff & Phelps, *2017 Valuation Handbook*, at 2-4.

⁸⁸ Staff Report - Cost of Service, Appendix 2, at 46.

⁸⁹ Staff Report - Cost of Service, Appendix 2, at 46.

1 premium and interest rates demonstrated in my Direct Testimony,⁹⁰ and recognized in
2 published research.⁹¹ Mr. Murray's suggested 3.00 percent to 5.00 percent equity risk
3 premium range is simply too low for the current interest rate environment. The 9.89
4 percent average authorized return referenced by Mr. Murray for fully litigated gas utility
5 rate cases in 2017 represents 5.51 percent and 5.89 percent equity risk premiums relative
6 to Baa-rated and A-rated utility bond yields, respectively.⁹² Those observed equity risk
7 premiums are between 51 and 289 basis points higher than the equity risk premium Mr.
8 Murray's relies on.

9 Lastly, Mr. Murray's analysis does not take into consideration expected increases
10 in Treasury yields over time. Those expectations can be seen in consensus projections for
11 rising rates from publications such as *Blue Chip Financial Forecasts*, *The Value Line*
12 *Investment Survey* and *EIA's Annual Energy Outlook 2018*. In addition, futures prices on
13 the 30-day Federal Funds rate suggest investors see a greater than 95.00 percent probability
14 that the Federal Reserve will continue to normalize interest rates over the coming year. If
15 Mr. Murray reflected the expected near-term increases of 94 and 107 basis points in A-
16 rated and Baa-rated debt, respectively, reported by *Blue Chip Financial Forecast* in his

⁹⁰ Direct Testimony of Keith Magee, at 29, Chart 1.

⁹¹ See, e.g., Robert S. Harris and Felicia C. Marston, *Estimating Shareholder Risk Premia Using Analysts' Growth Forecasts*, Financial Management, Summer 1992, at 63-70; Eugene F. Brigham, Dilip K. Shome, and Steve R. Vinson, *The Risk Premium Approach to Measuring a Utility's Cost of Equity*, Financial Management, Spring 1985, at 33-45; and Farris M. Maddox, Donna T. Pippert, and Rodney N. Sullivan, *An Empirical Study of Ex Ante Risk Premiums for the Electric Utility Industry*, Financial Management, Autumn 1995, at 89-95.

⁹² Staff Report - Cost of Service, Appendix 2, at 47. In 2017, the average yield of A-rated utility bonds was 4.00 percent, and the average yield on Baa-rated utility bonds was 4.38 percent. Source: Bloomberg Professional.

1 rule of thumb approach,⁹³ his ROE estimates would increase accordingly. Using the high
2 end of Mr. Murray's risk premium range (5.00 percent) would result in ROE estimates of
3 9.77 percent to 10.23 percent, which substantially overlap my recommendation.

4 **V. SUMMARY OF UPDATED ANALYSES**

5 **Q. HAVE YOU UPDATED THE ROE ANALYSES PRESENTED IN YOUR DIRECT**
6 **TESTIMONY?**

7 A. Yes. I have updated my DCF (both constant growth and quarterly forms), CAPM, bond
8 yield plus risk premium, and expected earnings analyses using data as of March 29, 2018.

9 **Q. HAVE YOU MADE ANY CHANGES TO THE PROXY GROUP INCLUDED IN**
10 **YOUR DIRECT TESTIMONY?**

11 A. Yes. I have excluded Sempra Energy due to its pending acquisition of Oncor Electric
12 Delivery Company, LLC announced on August 21, 2017.⁹⁴ In addition, I now include New
13 Jersey Resources ("NJR"). NJR was originally excluded from my proxy group because of
14 industry news reports suggesting a potential merger with South Jersey Industries ("SJI").
15 However, a merger did not occur and SJI announced a merger with (Pivotal Utility
16 Holdings) on October 16, 2017 which makes a potential merger with NJR unlikely.⁹⁵

⁹³ Blue Chip Financial Forecasts, Vol. 37, No. 4, April 1, 2018, at 2. Consensus estimates call for A-rated corporate debt yields to increase from 3.86% in Q1 2018 to 4.80% in Q3 2019, and Baa-rated yields to increase from 4.43% in Q1 2018 to 5.50% in Q3 2019.

⁹⁴ *Sempra Energy Announces Proposed Acquisition of Energy Future Holding's Ownership in Oncor*, Press Release, August 21, 2017.

⁹⁵ *South Jersey Industries Announces Acquisition of Elizabethtown Gas and Elkton Gas from Southern Company Gas*, Press Release, October 16, 2017. I note that NJR's stock price has generally moved in line with the SNL industry index over the past year, suggesting no concerns regarding potential skew in stock price as a result of merger activity.

1 **Q. PLEASE SUMMARIZE YOUR UPDATED DCF MODEL RESULTS.**

2 A. I have continued to use projected earnings growth rates from Zacks, First Call and Value
3 Line and an estimate of Retention Growth in developing my constant growth and quarterly
4 constant growth DCF models. Stock prices, analyst projections, and dividend payment
5 data are as of March 29, 2018.

6 **Table 4: DCF Model Results⁹⁶**

	<i>Mean Low</i>	<i>Mean</i>	<i>Mean High</i>
Constant Growth, 30-day Stock Prices	8.01%	9.35%	11.56%
Constant Growth, 90-day Stock Prices	7.86%	9.20%	11.41%
Constant Growth, 180-day Stock Prices	7.74%	9.08%	11.29%
Quarterly Growth, 30-day Stock Prices	8.17%	9.45%	11.82%
Quarterly Growth, 90-day Stock Prices	8.01%	9.29%	11.65%
Quarterly Growth, 180-day Stock Prices	7.88%	9.17%	11.52%

7
8 **Q. PLEASE SUMMARIZE YOUR UPDATED CAPM RESULTS.**

9 A. I have continued to use the same inputs used in my Direct Testimony, updated through
10 March 29, 2018. For the risk-free rate component, I continue to refer alternatively to: (1)
11 the 30-day average of the 30-year Treasury yield; and (2) a consensus forecast of the
12 average 30-year Treasury yield for the coming six quarters. Likewise, I continue to rely
13 on published beta coefficients from Bloomberg and Value Line, and the *ex-ante* market
14 risk premia described in my Direct Testimony (*i.e.*, the expected return on the S&P 500
15 Index less the current 30-year Treasury yield). As shown in Table 5 (below; *see also*,
16 Schedule KM-R6), based upon updated market information, my CAPM analyses produce
17 a range of ROE estimates from 10.63 percent to 12.33 percent.

⁹⁶ DCF results presented in Table 4 are unadjusted (*i.e.*, prior to any adjustment for flotation costs).

1

Table 5: Summary of CAPM Results

	<i>Bloomberg MRP</i>	<i>Value Line MRP</i>
Value Line Beta, Current Risk-Free Rate (3.11%)	11.47%	12.22%
Value Line Beta, Projected Risk-Free Rate (3.52%)	11.58%	12.33%
Bloomberg Beta, Current Risk-Free Rate (3.11%)	10.63%	11.31%
Bloomberg Beta, Projected Risk-Free Rate (3.52%)	10.77%	11.45%

2

3 **Q. PLEASE SUMMARIZE YOUR UPDATED BOND YIELD PLUS RISK PREMIUM**
 4 **MODEL RESULTS.**

5 A. My updated risk premium analysis includes authorized ROEs as reported by Regulatory
 6 Research Associates through March 29, 2018. For the purpose of calculating the expected
 7 risk premium and ROE, I have used current and projected long-term utility bond yields.
 8 As shown in Table 6 (below; *see also*, Schedule KM-R7), my updated results range from
 9 9.63 percent to 10.39 percent.

10

Table 6: Summary of CAPM Results

	<i>Return on Equity</i>
Current Baa Utility Yield (4.51%)	9.63%
Near-Term Projected Baa Utility Yield (5.26%)	9.95%
Long-Term Projected Baa Utility Yield (6.28%)	10.39%

11

12 **Q. PLEASE SUMMARIZE YOUR UPDATED EXPECTED EARNINGS ANALYSIS**
 13 **RESULTS.**

14 A. I have updated my expected earnings analysis using Value Line’s projections for return on
 15 common equity, common share growth and book value per share for the gas utility industry.
 16 Based on data as of March 29, 2018, the proxy company results range from 9.06 percent to

1 13.63 percent, with mean and median results of 11.08 percent to 11.04 percent (*see*
2 Schedule KM-R8).

3 **Q. HAVE YOU CONSIDERED WHETHER YOUR RECOMMENDED RETURNS**
4 **MEET THE STANDARD OF A FAIR RATE OF RETURN?**

5 A. Yes. As I noted in my Direct Testimony, my recommendation is based upon my
6 understanding of the *Hope* and *Bluefield* cases, wherein those decisions established the
7 standards for determining a fair and reasonable allowed return on equity including:
8 consistency of the allowed return with other businesses having similar risk; adequacy of
9 the return to provide access to capital and support credit quality; and that the end result
10 must lead to just and reasonable rates.⁹⁷

11 **VI. CONCLUSIONS AND RECOMMENDATION**

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

14 A. Based on the analyses discussed throughout my Rebuttal Testimony, I conclude that my
15 recommended ROE range of 9.90 percent to 10.35 percent remains a reasonable estimate
16 of Liberty Midstates' cost of equity. Within that range, it is my view that an ROE of 10.25
17 percent remains appropriate. The results of the updated DCF, CAPM, bond yield plus risk
18 premium and expected earnings analyses, along with my analyses of capital market data,
19 authorized returns in other regulatory jurisdictions, and assessment of the Company's risk
20 factors further support the reasonableness of my range of ROE estimates and my
21 recommendation.

⁹⁷ See Direct Testimony of Keith Magee, at 8.

1 Although I continue to use the DCF model as one of my analytical approaches to
2 estimating ROE, the period over which my analyses were performed included market data
3 that were highly unusual and inconsistent with that model's fundamental assumptions.
4 Equally important, the increasingly unstable market environment indicates that the cost of
5 equity likely is increasing in ways not fully captured by the DCF method. In my view,
6 therefore, risk premium-based methods should be given more weight than the DCF method.
7 Doing so supports my recommended range of 9.90 percent to 10.35 percent, and my ROE
8 recommendation of 10.25 percent.

9 I also continue to conclude that a capital structure with 53.00 percent common
10 equity and 46.00 percent long-term debt is consistent with industry practice and, therefore,
11 reasonable and appropriate. Lastly, I conclude that the Company's 4.70 percent cost of
12 debt, which is somewhat lower than the average cost of debt reflected in the overall rate of
13 return for other gas utilities, also is reasonable and appropriate.

14 **Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?**

15 **A. Yes, it does.**

Constant Growth Discounted Cash Flow Model
30 Day Average Stock Price

Company	Ticker	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
		Annualized Dividend	Average Stock Price	Dividend Yield	Expected Dividend Yield	Zacks Earnings Growth	First Call Earnings Growth	Value Line Earnings Growth	Retention Growth Estimate	Average Earnings Growth	Low ROE	Mean ROE	High ROE
Atmos Energy Corporation	ATO	\$1.94	\$81.36	2.38%	2.48%	7.00%	7.15%	7.50%	9.27%	7.73%	9.47%	10.21%	11.76%
Black Hills Corporation	BKH	\$1.90	\$52.26	3.64%	3.73%	4.60%	4.07%	7.50%	5.36%	5.38%	7.78%	9.12%	11.27%
Chesapeake Utilities	CPK	\$1.30	\$69.73	1.86%	1.94%	6.00%	6.00%	6.50%	12.53%	7.76%	7.92%	9.69%	14.51%
New Jersey Resources Corporation	NJR	\$1.09	\$39.08	2.79%	2.89%	6.00%	6.00%	9.50%	7.82%	7.33%	8.87%	10.22%	12.42%
Northwest Natural Gas Company	NWN	\$1.89	\$55.34	3.42%	3.50%	4.00%	4.00%	7.00%	4.65%	4.91%	7.48%	8.41%	10.53%
One Gas Inc	OGS	\$1.84	\$65.24	2.82%	2.90%	5.60%	5.50%	8.00%	4.45%	5.89%	7.34%	8.79%	10.93%
Southwest Gas	SWX	\$2.08	\$68.06	3.06%	3.15%	NA	4.00%	7.50%	6.43%	5.98%	7.12%	9.12%	10.67%
Spire Inc	SR	\$2.25	\$68.50	3.28%	3.38%	4.00%	4.43%	9.00%	6.23%	5.92%	7.35%	9.30%	12.43%
Vectren Corporation	VVC	\$1.80	\$62.22	2.89%	2.98%	6.30%	6.50%	6.50%	5.74%	6.26%	8.72%	9.24%	9.49%
Proxy Group Mean				2.90%	2.99%	5.44%	5.29%	7.67%	6.94%	6.35%	8.01%	9.35%	11.56%
Proxy Group Median				2.89%	2.98%	5.80%	5.50%	7.50%	6.23%	5.98%	7.78%	9.24%	11.27%

Notes:

[1] Source: Bloomberg Professional

[2] Source: Bloomberg Professional, equals indicated number of trading day average as of March 29, 2018

[3] Equals [1] / [2]

[4] Equals [3] x (1 + 0.5 x [9])

[5] Source: Zacks

[6] Source: Yahoo! Finance

[7] Source: Value Line

[8] Source: Schedule KM-R3, Value Line

[9] Equals Average([5], [6], [7], [8])

[10] Equals [3] x (1 + 0.5 x Minimum([5], [6], [7], [8])) + Minimum([5], [6], [7], [8])

[11] Equals [4] + [9]

[12] Equals [3] x (1 + 0.5 x Maximum([5], [6], [7], [8])) + Maximum([5], [6], [7], [8])

Constant Growth Discounted Cash Flow Model
90 Day Average Stock Price

Company	Ticker	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
		Annualized Dividend	Average Stock Price	Dividend Yield	Expected Dividend Yield	Zacks Earnings Growth	First Call Earnings Growth	Value Line Earnings Growth	Retention Growth Estimate	Average Earnings Growth	Low ROE	Mean ROE	High ROE
Atmos Energy Corporation	ATO	\$1.94	\$83.87	2.31%	2.40%	7.00%	7.15%	7.50%	9.27%	7.73%	9.39%	10.13%	11.69%
Black Hills Corporation	BKH	\$1.90	\$55.23	3.44%	3.53%	4.60%	4.07%	7.50%	5.36%	5.38%	7.58%	8.92%	11.07%
Chesapeake Utilities	CPK	\$1.30	\$74.40	1.75%	1.82%	6.00%	6.00%	6.50%	12.53%	7.76%	7.80%	9.57%	14.39%
New Jersey Resources Corporation	NJR	\$1.09	\$39.96	2.73%	2.83%	6.00%	6.00%	9.50%	7.82%	7.33%	8.81%	10.16%	12.36%
Northwest Natural Gas Company	NWN	\$1.89	\$58.89	3.21%	3.29%	4.00%	4.00%	7.00%	4.65%	4.91%	7.27%	8.20%	10.32%
One Gas Inc	OGS	\$1.84	\$70.12	2.62%	2.70%	5.60%	5.50%	8.00%	4.45%	5.89%	7.14%	8.59%	10.73%
Southwest Gas	SWX	\$2.08	\$74.63	2.79%	2.87%	NA	4.00%	7.50%	6.43%	5.98%	6.84%	8.85%	10.39%
Spire Inc	SR	\$2.25	\$71.30	3.16%	3.25%	4.00%	4.43%	9.00%	6.23%	5.92%	7.22%	9.17%	12.30%
Vectren Corporation	VVC	\$1.80	\$63.57	2.83%	2.92%	6.30%	6.50%	6.50%	5.74%	6.26%	8.66%	9.18%	9.42%
Proxy Group Mean				2.76%	2.85%	5.44%	5.29%	7.67%	6.94%	6.35%	7.86%	9.20%	11.41%
Proxy Group Median				2.79%	2.87%	5.80%	5.50%	7.50%	6.23%	5.98%	7.58%	9.17%	11.07%

Notes:

[1] Source: Bloomberg Professional

[2] Source: Bloomberg Professional, equals indicated number of trading day average as of March 29, 2018

[3] Equals [1] / [2]

[4] Equals [3] x (1 + 0.5 x [9])

[5] Source: Zacks

[6] Source: Yahoo! Finance

[7] Source: Value Line

[8] Source: Schedule KM-R3, Value Line

[9] Equals Average([5], [6], [7], [8])

[10] Equals [3] x (1 + 0.5 x Minimum([5], [6], [7], [8])) + Minimum([5], [6], [7], [8])

[11] Equals [4] + [9]

[12] Equals [3] x (1 + 0.5 x Maximum([5], [6], [7], [8])) + Maximum([5], [6], [7], [8])

Constant Growth Discounted Cash Flow Model
180 Day Average Stock Price

Company	Ticker	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
		Annualized Dividend	Average Stock Price	Dividend Yield	Expected Dividend Yield	Zacks Earnings Growth	First Call Earnings Growth	Value Line Earnings Growth	Retention Growth Estimate	Average Earnings Growth	Low ROE	Mean ROE	High ROE
Atmos Energy Corporation	ATO	\$1.94	\$85.33	2.27%	2.36%	7.00%	7.15%	7.50%	9.27%	7.73%	9.35%	10.09%	11.65%
Black Hills Corporation	BKH	\$1.90	\$61.47	3.09%	3.17%	4.60%	4.07%	7.50%	5.36%	5.38%	7.22%	8.56%	10.71%
Chesapeake Utilities	CPK	\$1.30	\$76.83	1.69%	1.76%	6.00%	6.00%	6.50%	12.53%	7.76%	7.74%	9.52%	14.33%
New Jersey Resources Corporation	NJR	\$1.09	\$41.48	2.63%	2.72%	6.00%	6.00%	9.50%	7.82%	7.33%	8.71%	10.05%	12.25%
Northwest Natural Gas Company	NWN	\$1.89	\$62.05	3.05%	3.12%	4.00%	4.00%	7.00%	4.65%	4.91%	7.11%	8.03%	10.15%
One Gas Inc	OGS	\$1.84	\$72.31	2.54%	2.62%	5.60%	5.50%	8.00%	4.45%	5.89%	7.06%	8.51%	10.65%
Southwest Gas	SWX	\$2.08	\$77.30	2.69%	2.77%	NA	4.00%	7.50%	6.43%	5.98%	6.74%	8.75%	10.29%
Spire Inc	SR	\$2.25	\$73.49	3.06%	3.15%	4.00%	4.43%	9.00%	6.23%	5.92%	7.12%	9.07%	12.20%
Vectren Corporation	VVC	\$1.80	\$64.11	2.81%	2.90%	6.30%	6.50%	6.50%	5.74%	6.26%	8.63%	9.16%	9.40%
Proxy Group Mean				2.65%	2.73%	5.44%	5.29%	7.67%	6.94%	6.35%	7.74%	9.08%	11.29%
Proxy Group Median				2.69%	2.77%	5.80%	5.50%	7.50%	6.23%	5.98%	7.22%	9.07%	10.71%

Notes:

[1] Source: Bloomberg Professional

[2] Source: Bloomberg Professional, equals indicated number of trading day average as of March 29, 2018

[3] Equals [1] / [2]

[4] Equals [3] x (1 + 0.5 x [9])

[5] Source: Zacks

[6] Source: Yahoo! Finance

[7] Source: Value Line

[8] Source: Schedule KM-R3, Value Line

[9] Equals Average([5], [6], [7], [8])

[10] Equals [3] x (1 + 0.5 x Minimum([5], [6], [7], [8])) + Minimum([5], [6], [7], [8])

[11] Equals [4] + [9]

[12] Equals [3] x (1 + 0.5 x Maximum([5], [6], [7], [8])) + Maximum([5], [6], [7], [8])

Quarterly Discounted Cash Flow Model
30 Day Average Stock Price

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	
Company	Ticker	Dividend 1	Dividend 2	Dividend 3	Dividend 4	Expected Dividend 1	Expected Dividend 2	Expected Dividend 3	Expected Dividend 4	Stock Price	Zacks Earnings Growth	First Call Earnings Growth	Value Line Earnings Growth	Retention Growth Estimate	Average Earnings Growth	Low ROE	Mean ROE	High ROE
Atmos Energy Corporation	ATO	\$0.45	\$0.45	\$0.49	\$0.49	\$0.48	\$0.48	\$0.52	\$0.52	\$81.36	7.00%	7.15%	7.50%	9.27%	7.73%	9.61%	10.30%	11.95%
Black Hills Corporation	BKH	\$0.45	\$0.45	\$0.48	\$0.48	\$0.47	\$0.47	\$0.50	\$0.50	\$52.26	4.60%	4.07%	7.50%	5.36%	5.38%	7.98%	9.22%	11.59%
Chesapeake Utilities	CPK	\$0.33	\$0.33	\$0.33	\$0.33	\$0.35	\$0.35	\$0.35	\$0.35	\$69.73	6.00%	6.00%	6.50%	12.53%	7.76%	8.07%	9.84%	14.79%
New Jersey Resources Corporation	NJR	\$0.26	\$0.27	\$0.27	\$0.27	\$0.27	\$0.29	\$0.29	\$0.29	\$39.08	6.00%	6.00%	9.50%	7.82%	7.33%	9.09%	10.39%	12.74%
Northwest Natural Gas Company	NWN	\$0.47	\$0.47	\$0.47	\$0.47	\$0.49	\$0.49	\$0.50	\$0.50	\$55.34	4.00%	4.00%	7.00%	4.65%	4.91%	7.77%	8.60%	10.93%
One Gas Inc	OGS	\$0.42	\$0.42	\$0.42	\$0.46	\$0.44	\$0.44	\$0.44	\$0.49	\$65.24	5.60%	5.50%	8.00%	4.45%	5.89%	7.36%	8.77%	11.04%
Southwest Gas	SWX	\$0.50	\$0.50	\$0.50	\$0.52	\$0.52	\$0.52	\$0.52	\$0.55	\$68.06	NA	4.00%	7.50%	6.43%	5.98%	7.24%	9.20%	10.89%
Spire Inc	SR	\$0.53	\$0.53	\$0.56	\$0.56	\$0.56	\$0.56	\$0.60	\$0.60	\$68.50	4.00%	4.43%	9.00%	6.23%	5.92%	7.51%	9.39%	12.74%
Vectren Corporation	VVC	\$0.42	\$0.42	\$0.45	\$0.45	\$0.45	\$0.45	\$0.48	\$0.48	\$62.22	6.30%	6.50%	6.50%	5.74%	6.26%	8.89%	9.33%	9.68%
Proxy Group Mean											5.44%	5.29%	7.67%	6.94%	6.35%	8.17%	9.45%	11.82%
Proxy Group Median											5.80%	5.50%	7.50%	6.23%	5.98%	7.98%	9.33%	11.59%

Notes:

- [1] Source: Bloomberg Professional Service
- [2] Source: Bloomberg Professional, equals indicated number of trading day average as of March 29, 2018
- [3] Source: Bloomberg Professional Service
- [4] Source: Bloomberg Professional Service
- [5] Equals Col. [1] x (1 + Col. [14])
- [6] Equals Col. [2] x (1 + Col. [14])
- [7] Equals Col. [3] x (1 + Col. [14])
- [8] Equals Col. [4] x (1 + Col. [14])
- [9] Source: Bloomberg Professional Service
- [10] Source: Zacks
- [11] Source: Yahoo! Finance
- [12] Source: Value Line
- [13] Source: Schedule KM-R3, Value Line
- [14] Equals Average (Cols. [10], [11], [12], [13])
- [15] Implied Low DCF
- [16] Implied Mean DCF
- [17] Implied High DCF

Quarterly Discounted Cash Flow Model
90 Day Average Stock Price

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	
Company	Ticker	Dividend 1	Dividend 2	Dividend 3	Dividend 4	Expected Dividend 1	Expected Dividend 2	Expected Dividend 3	Expected Dividend 4	Stock Price	Zacks Earnings Growth	First Call Earnings Growth	Value Line Earnings Growth	Retention Growth Estimate	Average Earnings Growth	Low ROE	Mean ROE	High ROE
Atmos Energy Corporation	ATO	\$0.45	\$0.45	\$0.49	\$0.49	\$0.48	\$0.48	\$0.52	\$0.52	\$83.87	7.00%	7.15%	7.50%	9.27%	7.73%	9.52%	10.22%	11.87%
Black Hills Corporation	BKH	\$0.45	\$0.45	\$0.48	\$0.48	\$0.47	\$0.47	\$0.50	\$0.50	\$55.23	4.60%	4.07%	7.50%	5.36%	5.38%	7.76%	9.01%	11.36%
Chesapeake Utilities	CPK	\$0.33	\$0.33	\$0.33	\$0.33	\$0.35	\$0.35	\$0.35	\$0.35	\$74.40	6.00%	6.00%	6.50%	12.53%	7.76%	7.94%	9.71%	14.64%
New Jersey Resources Corporation	NJR	\$0.26	\$0.27	\$0.27	\$0.27	\$0.27	\$0.29	\$0.29	\$0.29	\$39.96	6.00%	6.00%	9.50%	7.82%	7.33%	9.02%	10.32%	12.66%
Northwest Natural Gas Company	NWN	\$0.47	\$0.47	\$0.47	\$0.47	\$0.49	\$0.49	\$0.50	\$0.50	\$58.89	4.00%	4.00%	7.00%	4.65%	4.91%	7.53%	8.37%	10.68%
One Gas Inc	OGS	\$0.42	\$0.42	\$0.42	\$0.46	\$0.44	\$0.44	\$0.44	\$0.49	\$70.12	5.60%	5.50%	8.00%	4.45%	5.89%	7.15%	8.57%	10.82%
Southwest Gas	SWX	\$0.50	\$0.50	\$0.50	\$0.52	\$0.52	\$0.52	\$0.52	\$0.55	\$74.63	NA	4.00%	7.50%	6.43%	5.98%	6.94%	8.91%	10.58%
Spire Inc	SR	\$0.53	\$0.53	\$0.56	\$0.56	\$0.56	\$0.56	\$0.60	\$0.60	\$71.30	4.00%	4.43%	9.00%	6.23%	5.92%	7.36%	9.25%	12.59%
Vectren Corporation	VVC	\$0.42	\$0.42	\$0.45	\$0.45	\$0.45	\$0.45	\$0.48	\$0.48	\$63.57	6.30%	6.50%	6.50%	5.74%	6.26%	8.82%	9.27%	9.60%
Proxy Group Mean											5.44%	5.29%	7.67%	6.94%	6.35%	8.01%	9.29%	11.65%
Proxy Group Median											5.80%	5.50%	7.50%	6.23%	5.98%	7.76%	9.25%	11.36%

Notes:

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- [4] Source: Bloomberg Professional Service
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- [6] Equals Col. [2] x (1 + Col. [14])
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- [8] Equals Col. [4] x (1 + Col. [14])
- [9] Source: Bloomberg Professional Service
- [10] Source: Zacks
- [11] Source: Yahoo! Finance
- [12] Source: Value Line
- [13] Source: Schedule KM-R3, Value Line
- [14] Equals Average (Cols. [10], [11], [12], [13])
- [15] Implied Low DCF
- [16] Implied Mean DCF
- [17] Implied High DCF

Quarterly Discounted Cash Flow Model
180 Day Average Stock Price

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	
Company	Ticker	Dividend 1	Dividend 2	Dividend 3	Dividend 4	Expected Dividend 1	Expected Dividend 2	Expected Dividend 3	Expected Dividend 4	Stock Price	Zacks Earnings Growth	First Call Earnings Growth	Value Line Earnings Growth	Retention Growth Estimate	Average Earnings Growth	Low ROE	Mean ROE	High ROE
Atmos Energy Corporation	ATO	\$0.45	\$0.45	\$0.49	\$0.49	\$0.48	\$0.48	\$0.52	\$0.52	\$85.33	7.00%	7.15%	7.50%	9.27%	7.73%	9.48%	10.18%	11.82%
Black Hills Corporation	BKH	\$0.45	\$0.45	\$0.48	\$0.48	\$0.47	\$0.47	\$0.50	\$0.50	\$61.47	4.60%	4.07%	7.50%	5.36%	5.38%	7.37%	8.64%	10.95%
Chesapeake Utilities	CPK	\$0.33	\$0.33	\$0.33	\$0.33	\$0.35	\$0.35	\$0.35	\$0.35	\$76.83	6.00%	6.00%	6.50%	12.53%	7.76%	7.88%	9.65%	14.57%
New Jersey Resources Corporation	NJR	\$0.26	\$0.27	\$0.27	\$0.27	\$0.27	\$0.29	\$0.29	\$0.29	\$41.48	6.00%	6.00%	9.50%	7.82%	7.33%	8.91%	10.21%	12.54%
Northwest Natural Gas Company	NWN	\$0.47	\$0.47	\$0.47	\$0.47	\$0.49	\$0.49	\$0.50	\$0.50	\$62.05	4.00%	4.00%	7.00%	4.65%	4.91%	7.35%	8.19%	10.48%
One Gas Inc	OGS	\$0.42	\$0.42	\$0.42	\$0.46	\$0.44	\$0.44	\$0.44	\$0.49	\$72.31	5.60%	5.50%	8.00%	4.45%	5.89%	7.06%	8.48%	10.73%
Southwest Gas	SWX	\$0.50	\$0.50	\$0.50	\$0.52	\$0.52	\$0.52	\$0.52	\$0.55	\$77.30	NA	4.00%	7.50%	6.43%	5.98%	6.84%	8.81%	10.47%
Spire Inc	SR	\$0.53	\$0.53	\$0.56	\$0.56	\$0.56	\$0.56	\$0.60	\$0.60	\$73.49	4.00%	4.43%	9.00%	6.23%	5.92%	7.26%	9.15%	12.48%
Vectren Corporation	VVC	\$0.42	\$0.42	\$0.45	\$0.45	\$0.45	\$0.45	\$0.48	\$0.48	\$64.11	6.30%	6.50%	6.50%	5.74%	6.26%	8.79%	9.24%	9.58%
Proxy Group Mean											5.44%	5.29%	7.67%	6.94%	6.35%	7.88%	9.17%	11.52%
Proxy Group Median											5.80%	5.50%	7.50%	6.23%	5.98%	7.37%	9.15%	10.95%

Notes:

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- [4] Source: Bloomberg Professional Service
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- [12] Source: Value Line
- [13] Source: Schedule KM-R3, Value Line
- [14] Equals Average (Cols. [10], [11], [12], [13])
- [15] Implied Low DCF
- [16] Implied Mean DCF
- [17] Implied High DCF

Retention Growth Estimate

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]
Company	Ticker	Five-Year Projected Earnings per share	Five-Year Projected Dividend Declared per share	Retention Ratio (B)	Projected Book Value per Share 2018	Five-Year Projected Book Value per Share	Return on Average Book Value (R)	B x R	Projected Common Shares 2018	Five-Year Projected Common Shares	Common Shares Growth Rate	2017 High Price	2017 Low Price	2017 Price Midpoint	Book Value per Share 2017
Atmos Energy Corporation	ATO	5.15	2.50	51.46%	42.10	46.55	11.20%	5.76%	114.00	130.00	3.34%	93.60	72.50	\$ 83.05	36.74
Black Hills Corporation	BKH	4.25	2.30	45.88%	35.00	40.00	10.85%	4.98%	60.25	61.00	0.41%	72.00	57.00	\$ 64.50	31.75
Chesapeake Utilities	CPK	4.20	1.60	61.90%	30.70	36.75	11.67%	7.22%	17.00	20.00	4.15%	86.40	63.00	\$ 74.70	28.65
New Jersey Resources Corporation	NJR	2.95	1.24	57.97%	15.95	22.70	13.50%	7.82%	86.50	86.50	0.00%	45.40	33.70	\$ 39.55	14.33
Northwest Natural Gas Company	NWN	3.50	2.20	37.14%	30.45	30.85	11.36%	4.22%	29.50	30.00	0.42%	69.50	56.50	\$ 63.00	29.90
One Gas Inc	OGS	4.00	2.50	37.50%	38.40	43.40	9.35%	3.51%	52.50	55.00	1.17%	79.50	61.40	\$ 70.45	37.20
Southwest Gas	SWX	5.10	2.60	49.02%	39.80	58.50	9.08%	4.45%	49.00	53.00	1.98%	86.90	72.30	\$ 79.60	37.30
Spire Inc	SR	5.50	2.50	54.55%	43.75	53.50	10.52%	5.74%	48.50	50.00	0.76%	82.90	62.30	\$ 72.60	41.26
Vectren Corporation	VVC	3.65	2.35	35.62%	23.60	29.05	12.87%	4.58%	83.50	86.00	0.74%	69.90	51.50	\$ 60.70	22.28

		[15]	[16]	[17]	[18]	[19]
Company	Ticker	Market/ Book Ratio	"S"	"V"	S x V	BR + SV
Atmos Energy Corporation	ATO	2.26	7.55%	55.76%	4.21%	9.27%
Black Hills Corporation	BKH	2.03	0.84%	50.78%	0.43%	5.36%
Chesapeake Utilities	CPK	2.61	10.81%	61.65%	6.67%	12.53%
New Jersey Resources Corporation	NJR	2.76	0.00%	63.77%	0.00%	7.82%
Northwest Natural Gas Company	NWN	2.11	0.89%	52.54%	0.47%	4.65%
One Gas Inc	OGS	1.89	2.22%	47.20%	1.05%	4.45%
Southwest Gas	SWX	2.13	4.23%	53.14%	2.25%	6.43%
Spire Inc	SR	1.76	1.34%	43.17%	0.58%	6.23%
Vectren Corporation	VVC	2.72	2.02%	63.29%	1.28%	5.74%

Mean: 6.94%
Median: 6.23%

Notes:

[1] Source: Value Line '20-22 or '21-23

[2] Source: Value Line '20-22 or '21-23

[3] Equals 1 - [2] / [1]

[4] Source: Value Line

[5] Source: Value Line '20-22 or '21-23

[6] Equals [1] / (([4] + (2.5/3) x ([5] - [4])) for '20-22
Equals [1] / (([4] + (3.5/4) x ([5] - [4])) for '21-23

[7] Equals [3] x [6]

[8] Source: Value Line

[9] Source: Value Line '20-22 or '21-23

[10] Equals ([9] / [8]) ^{1/3} - 1 for '20-22
Equals ([9] / [8]) ^{1/4} - 1 for '21-23

[11] Source: Value Line

[12] Source: Value Line

[13] Equals Average ([11], [12])

[14] Source: Value Line

[15] Equals [13] / [14]

[16] Equals [10] x [15]

[17] Equals 1 - (1 / [15])

[18] Equals [16] x [17]

[19] Equals ([7] + [18]) / (1 + [16])

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

	Bloomberg	Value Line
Est. S&P 500 Return [1]:	14.59%	15.63%
Current Risk-Free Rate [2]:	3.11%	3.11%
Near-Term Projected Risk-Free Rate [3]:	3.52%	3.52%
Current Market Risk Premium [4]:	11.48%	12.51%
Near-Term Projected Market Risk Premium [5]:	11.08%	12.11%

Company	Ticker	[6] Market Capitalization (\$MM)	[7] Dividend Yield	[8] Bloomberg			[9] Value Line		
				[10] Growth Rate	[11] DCF Result	[12] Weight in Index	[13] Growth Rate	[14] DCF Result	[15] Weight in Index
AGILENT TECHNOLOGIES INC	A	21,573.68	0.90%	6.85%	7.78%	0.09%	10.00%	10.95%	0.10%
AMERICAN AIRLINES GROUP INC	AAL	24,584.29	0.77%	18.86%	19.70%	0.10%	2.00%	2.78%	0.11%
ADVANCE AUTO PARTS INC	AAP	8,770.11	0.20%	16.43%	16.65%	0.04%	9.50%	9.71%	0.04%
APPLE INC	AAPL	851,317.90	1.61%	12.26%	13.96%	3.58%	13.00%	14.71%	3.96%
ABBVIE INC	ABBV	150,179.95	3.59%	13.06%	16.88%	0.63%	12.50%	16.31%	0.70%
AMERISOURCEBERGEN CORP	ABC	18,937.67	1.77%	9.76%	11.61%	0.08%	7.00%	8.83%	0.09%
ABBOTT LABORATORIES	ABT	104,640.33	1.88%	12.67%	14.66%	0.44%	8.50%	10.46%	0.49%
ACCENTURE PLC-CL A	ACN	102,849.41	1.73%	11.10%	12.93%	0.43%	10.00%	11.82%	0.48%
ADOBE SYSTEMS INC	ADBE	106,412.99	0.00%	18.66%	18.66%	0.45%	34.50%	34.50%	0.49%
ANALOG DEVICES INC	ADI	33,700.20	2.06%	9.68%	11.84%	0.14%	13.00%	15.20%	0.16%
ARCHER-DANIELS-MIDLAND CO	ADM	24,238.30	3.09%	7.40%	10.61%	0.10%	2.50%	5.63%	0.11%
AUTOMATIC DATA PROCESSING	ADP	50,302.24	2.14%	12.23%	14.49%	0.21%	11.00%	13.25%	0.23%
ALLIANCE DATA SYSTEMS CORP	ADS	11,805.50	1.07%	15.13%	16.28%	0.05%	15.00%	16.15%	0.05%
AUTODESK INC	ADSK	27,417.61	0.00%	48.90%	48.90%	0.12%	N/A	N/A	N/A
AMEREN CORPORATION	AEE	13,740.41	3.30%	8.45%	11.88%	0.06%	6.00%	9.39%	0.06%
AMERICAN ELECTRIC POWER	AEP	33,766.45	3.68%	5.34%	9.11%	0.14%	4.50%	8.26%	0.16%
AES CORP	AES	7,509.80	4.66%	7.82%	12.66%	0.03%	N/A	N/A	N/A
AETNA INC	AET	55,253.29	1.20%	11.51%	12.77%	0.23%	10.50%	11.76%	0.26%
AFLAC INC	AFL	34,105.05	2.60%	6.52%	9.20%	0.14%	4.00%	6.65%	0.16%
ALLERGAN PLC	AGN	58,183.31	1.73%	8.46%	10.26%	0.24%	9.00%	10.81%	0.27%
AMERICAN INTERNATIONAL GROUP	AIG	49,144.75	2.62%	11.00%	13.77%	0.21%	27.00%	29.98%	0.23%
APARTMENT INVT & MGMT CO -A	AIV	6,411.21	3.70%	5.78%	9.58%	0.03%	N/A	N/A	N/A
ASSURANT INC	AIZ	4,802.90	2.48%	N/A	N/A	N/A	4.00%	6.53%	0.02%
ARTHUR J GALLAGHER & CO	AJG	12,512.01	2.35%	11.67%	14.16%	0.05%	15.50%	18.04%	0.06%
AKAMAI TECHNOLOGIES INC	AKAM	12,068.84	0.00%	11.50%	11.50%	0.05%	13.00%	13.00%	0.06%
ALBEMARLE CORP	ALB	10,269.01	1.43%	11.70%	13.21%	0.04%	14.00%	15.53%	0.05%
ALIGN TECHNOLOGY INC	ALGN	20,124.36	0.00%	38.00%	38.00%	0.08%	25.50%	25.50%	0.09%
ALASKA AIR GROUP INC	ALK	7,645.52	2.05%	11.40%	13.56%	0.03%	6.00%	8.11%	0.04%
ALLSTATE CORP	ALL	33,477.62	1.84%	6.87%	8.77%	0.14%	11.50%	13.44%	0.16%
ALLEGION PLC	ALLE	8,118.36	0.90%	11.55%	12.50%	0.03%	9.50%	10.44%	0.04%
ALEXION PHARMACEUTICALS INC	ALXN	24,784.06	0.00%	19.46%	19.46%	0.10%	19.00%	19.00%	0.12%
APPLIED MATERIALS INC	AMAT	58,428.73	1.26%	13.16%	14.50%	0.25%	21.00%	22.39%	0.27%
ADVANCED MICRO DEVICES	AMD	9,739.77	0.00%	23.55%	23.55%	0.04%	N/A	N/A	N/A
AMETEK INC	AME	17,590.00	0.74%	11.85%	12.63%	0.07%	7.00%	7.76%	0.08%
AFFILIATED MANAGERS GROUP	AMG	10,331.39	0.59%	14.72%	15.35%	0.04%	7.00%	7.61%	0.05%
AMGEN INC	AMGN	122,841.45	2.97%	5.25%	8.30%	0.52%	6.50%	9.57%	0.57%
AMERIPRISE FINANCIAL INC	AMP	21,612.94	2.46%	7.20%	9.75%	0.09%	13.50%	16.13%	0.10%
AMERICAN TOWER CORP	AMT	64,073.40	2.16%	17.44%	19.79%	0.27%	11.50%	13.78%	0.30%
AMAZON.COM INC	AMZN	700,667.69	0.00%	31.97%	31.97%	2.95%	60.00%	60.00%	3.26%
ANDEAVOR	ANDV	15,385.96	2.44%	16.71%	19.35%	0.06%	5.50%	8.01%	0.07%
ANSYS INC	ANSS	13,141.80	0.00%	12.20%	12.20%	0.06%	11.00%	11.00%	0.06%
ANTHEM INC	ANTM	56,182.10	1.36%	11.47%	12.90%	0.24%	11.50%	12.93%	0.26%
AON PLC	AON	34,546.51	1.10%	10.29%	11.44%	0.15%	10.50%	11.66%	0.16%
SMITH (A.O.) CORP	AOS	10,907.79	1.11%	15.00%	16.20%	0.05%	14.00%	15.19%	0.05%
APACHE CORP	APA	14,678.11	2.60%	-19.13%	-16.78%	0.06%	21.00%	23.87%	0.07%
ANADARKO PETROLEUM CORP	APC	31,130.96	0.93%	1.27%	2.21%	0.13%	N/A	N/A	N/A
AIR PRODUCTS & CHEMICALS INC	APD	34,817.92	2.64%	13.90%	16.72%	0.15%	9.00%	11.76%	0.16%
AMPHENOL CORP-CL A	APH	26,311.32	0.89%	10.54%	11.48%	0.11%	9.00%	9.93%	0.12%
APTIV PLC	APTIV	22,517.05	1.22%	10.69%	11.98%	0.09%	9.50%	10.78%	0.10%
ALEXANDRIA REAL ESTATE EQUIT	ARE	12,643.72	2.93%	6.78%	9.81%	0.05%	N/A	N/A	N/A
ARCONIC INC	ARNC	11,123.88	1.03%	17.30%	18.42%	0.05%	N/A	N/A	N/A
ACTIVISION BLIZZARD INC	ATVI	51,177.29	0.50%	14.61%	15.15%	0.22%	9.00%	9.53%	0.24%
AVALONBAY COMMUNITIES INC	AVB	22,711.19	3.59%	6.20%	9.90%	0.10%	N/A	N/A	N/A
BROADCOM LTD	AVGO	96,793.71	2.97%	13.25%	16.42%	0.41%	38.00%	41.53%	0.45%

AVERY DENNISON CORP	AVY	9,360.79	1.71%	6.15%	7.92%	0.04%	12.50%	14.32%	0.04%
AMERICAN WATER WORKS CO INC	AWK	14,622.32	2.19%	7.85%	10.13%	0.06%	8.50%	10.78%	0.07%
AMERICAN EXPRESS CO	AXP	80,234.29	1.55%	17.30%	18.99%	0.34%	8.50%	10.12%	0.37%
ACUITY BRANDS INC	AYI	5,868.01	0.37%	11.00%	11.39%	0.02%	13.00%	13.40%	0.03%
AUTOZONE INC	AZO	17,450.33	0.00%	15.54%	15.54%	0.07%	14.00%	14.00%	0.08%
BOEING CO/THE	BA	192,539.14	2.08%	15.03%	17.27%	0.81%	16.00%	18.24%	0.90%
BANK OF AMERICA CORP	BAC	306,618.44	1.99%	15.65%	17.80%	1.29%	18.00%	20.17%	1.43%
BAXTER INTERNATIONAL INC	BAX	34,978.97	1.10%	12.90%	14.08%	0.15%	5.50%	6.63%	0.16%
BB&T CORP	BBT	40,453.85	2.82%	14.24%	17.27%	0.17%	9.00%	11.95%	0.19%
BEST BUY CO INC	BBY	20,459.93	2.56%	9.22%	11.90%	0.09%	10.00%	12.69%	0.10%
BECTON DICKINSON AND CO	BDX	57,694.74	1.38%	13.50%	14.97%	0.24%	10.00%	11.44%	0.27%
FRANKLIN RESOURCES INC	BEN	19,133.08	3.72%	10.00%	13.91%	0.08%	8.00%	11.87%	0.09%
BROWN-FORMAN CORP-CLASS B	BF/B	25,954.12	1.99%	13.83%	15.95%	0.11%	11.50%	13.60%	0.12%
BRIGHTHOUSE FINANCIAL INC	BHF	6,156.34	0.00%	8.00%	8.00%	0.03%	N/A	N/A	N/A
BAKER HUGHES A GE CO	BHGE	31,280.17	2.47%	45.93%	48.98%	0.13%	N/A	N/A	N/A
BIOGEN INC	BIIB	57,930.09	0.00%	4.92%	4.92%	0.24%	5.50%	5.50%	0.27%
BANK OF NEW YORK MELLON CORP	BK	51,918.88	2.02%	8.80%	10.91%	0.22%	9.00%	11.11%	0.24%
BOOKING HOLDINGS INC	BKNG	100,459.10	0.00%	15.88%	15.88%	0.42%	15.00%	15.00%	0.47%
BLACKROCK INC	BLK	87,924.17	2.14%	12.02%	14.29%	0.37%	12.00%	14.27%	0.41%
BALL CORP	BLL	13,920.44	1.03%	5.40%	6.46%	0.06%	21.00%	22.14%	0.06%
BRISTOL-MYERS SQUIBB CO	BMJ	103,415.29	2.53%	9.38%	12.03%	0.44%	14.50%	17.22%	0.48%
BERKSHIRE HATHAWAY INC-CL B	BRK/B	492,125.14	0.00%	6.70%	6.70%	2.07%	N/A	N/A	N/A
BOSTON SCIENTIFIC CORP	BSX	37,687.81	0.00%	9.12%	9.12%	0.16%	16.50%	16.50%	0.18%
BORGWARNER INC	BWA	10,586.01	1.32%	5.81%	7.16%	0.04%	8.50%	9.87%	0.05%
BOSTON PROPERTIES INC	BXP	19,017.73	2.64%	6.12%	8.84%	0.08%	N/A	N/A	N/A
CITIGROUP INC	C	172,821.97	2.19%	14.04%	16.38%	0.73%	11.00%	13.31%	0.80%
CA INC	CA	14,133.73	3.03%	2.80%	5.87%	0.06%	6.00%	9.12%	0.07%
CONAGRA BRANDS INC	CAG	14,776.37	2.28%	10.35%	12.75%	0.06%	5.00%	7.34%	0.07%
CARDINAL HEALTH INC	CAH	19,725.83	2.95%	13.72%	16.88%	0.08%	11.00%	14.11%	0.09%
CATERPILLAR INC	CAT	88,078.09	2.17%	20.40%	22.79%	0.37%	13.50%	15.82%	0.41%
CHUBB LTD	CB	63,473.76	2.16%	9.05%	11.30%	0.27%	7.00%	9.23%	0.30%
CBOE GLOBAL MARKETS INC	CBOE	12,859.63	1.02%	22.34%	23.47%	0.05%	16.50%	17.61%	0.06%
CBRE GROUP INC - A	CBRE	16,042.40	0.00%	13.00%	13.00%	0.07%	12.00%	12.00%	0.07%
CBS CORP-CLASS B NON VOTING	CBS	19,669.86	1.51%	13.54%	15.15%	0.08%	13.50%	15.11%	0.09%
CROWN CASTLE INTL CORP	CCI	45,452.22	3.90%	16.53%	20.75%	0.19%	9.50%	13.59%	0.21%
CARNIVAL CORP	CCL	46,656.79	2.81%	14.20%	17.21%	0.20%	14.00%	17.00%	0.22%
CADENCE DESIGN SYS INC	CDNS	10,414.58	0.00%	12.00%	12.00%	0.04%	11.00%	11.00%	0.05%
CELGENE CORP	CELG	67,101.59	0.00%	17.80%	17.80%	0.28%	25.00%	25.00%	0.31%
CERNER CORP	CERN	19,290.64	0.00%	12.04%	12.04%	0.08%	9.00%	9.00%	0.09%
CF INDUSTRIES HOLDINGS INC	CF	8,804.63	3.18%	12.70%	16.08%	0.04%	8.50%	11.81%	0.04%
CITIZENS FINANCIAL GROUP	CFG	20,474.36	2.28%	17.91%	20.40%	0.09%	11.50%	13.91%	0.10%
CHURCH & DWIGHT CO INC	CHD	12,294.22	1.73%	11.31%	13.14%	0.05%	9.00%	10.81%	0.06%
C.H. ROBINSON WORLDWIDE INC	CHRW	13,152.59	2.05%	9.95%	12.10%	0.06%	9.50%	11.64%	0.06%
CHARTER COMMUNICATIONS INC-A	CHTR	82,037.16	0.00%	6.52%	6.52%	0.35%	19.50%	19.50%	0.38%
CIGNA CORP	CI	40,800.65	0.02%	12.30%	12.33%	0.17%	12.50%	12.53%	0.19%
CINCINNATI FINANCIAL CORP	CINF	12,185.30	2.79%	N/A	N/A	N/A	6.50%	9.38%	0.06%
COLGATE-PALMOLIVE CO	CL	62,607.26	2.34%	8.47%	10.91%	0.26%	11.00%	13.47%	0.29%
CLOROX COMPANY	CLX	17,224.97	2.58%	7.66%	10.34%	0.07%	8.00%	10.68%	0.08%
COMERICA INC	CMA	16,561.83	1.46%	22.57%	24.20%	0.07%	17.00%	18.59%	0.08%
COMCAST CORP-CLASS A	CMCSA	158,702.84	2.20%	10.00%	12.31%	0.67%	12.50%	14.84%	0.74%
CME GROUP INC	CME	55,078.16	3.92%	9.00%	13.09%	0.23%	8.50%	12.58%	0.26%
CHIPOTLE MEXICAN GRILL INC	CMG	9,024.55	0.00%	25.05%	25.05%	0.04%	18.00%	18.00%	0.04%
CUMMINS INC	CMI	26,757.29	2.69%	10.24%	13.07%	0.11%	8.00%	10.80%	0.12%
CMS ENERGY CORP	CMS	12,793.12	3.14%	6.57%	9.82%	0.05%	7.00%	10.25%	0.06%
CENTENE CORP	CNC	18,703.50	0.00%	16.49%	16.49%	0.08%	14.00%	14.00%	0.09%
CENTERPOINT ENERGY INC	CNP	11,822.30	4.08%	6.34%	10.55%	0.05%	8.50%	12.75%	0.05%
CAPITAL ONE FINANCIAL CORP	COF	46,605.41	1.75%	16.46%	18.35%	0.20%	5.00%	6.80%	0.22%
CABOT OIL & GAS CORP	COG	11,058.25	1.01%	36.74%	37.94%	0.05%	N/A	N/A	N/A
ROCKWELL COLLINS INC	COL	22,077.95	0.98%	10.55%	11.58%	0.09%	12.50%	13.54%	0.10%
COOPER COS INC/THE	COO	11,216.80	0.03%	10.73%	10.77%	0.05%	16.50%	16.53%	0.05%
CONOCOPHILLIPS	COP	69,640.70	1.93%	6.00%	7.98%	0.29%	62.00%	64.52%	0.32%
COSTCO WHOLESALE CORP	COST	82,686.90	1.06%	11.47%	12.59%	0.35%	10.00%	11.11%	0.38%
COTY INC-CL A	COTY	13,722.52	2.73%	16.71%	19.67%	0.06%	7.00%	9.83%	0.06%
CAMPBELL SOUP CO	CPB	13,020.46	3.35%	5.57%	9.01%	0.05%	4.00%	7.42%	0.06%
SALESFORCE.COM INC	CRM	85,176.11	0.00%	25.55%	25.55%	0.36%	N/A	N/A	N/A
CISCO SYSTEMS INC	CSCO	206,623.32	2.91%	6.24%	9.24%	0.87%	7.50%	10.52%	0.96%
CSRA INC	CSRA	6,758.67	0.97%	7.70%	8.71%	0.03%	N/A	N/A	N/A
CSX CORP	CSX	49,427.92	1.57%	15.28%	16.97%	0.21%	13.50%	15.17%	0.23%
CINTAS CORP	CTAS	18,197.72	0.95%	11.78%	12.79%	0.08%	14.00%	15.02%	0.08%
CENTURYLINK INC	CTL	17,577.83	13.15%	-4.70%	8.13%	0.07%	5.50%	19.01%	0.08%
COGNIZANT TECH SOLUTIONS-A	CTSH	47,338.13	0.93%	14.25%	15.24%	0.20%	13.50%	14.49%	0.22%
CITRIX SYSTEMS INC	CTXS	12,634.80	0.00%	10.85%	10.85%	0.05%	6.50%	6.50%	0.06%

CVS HEALTH CORP	CVS	63,114.05	3.50%	12.04%	15.76%	0.27%	9.00%	12.66%	0.29%
CHEVRON CORP	CVX	217,845.28	3.92%	27.68%	32.15%	0.92%	12.50%	16.67%	1.01%
CONCHO RESOURCES INC	CXO	22,409.37	0.00%	N/A	N/A	N/A	20.50%	20.50%	0.10%
DOMINION ENERGY INC	D	45,344.07	4.93%	5.78%	10.85%	0.19%	7.00%	12.11%	0.21%
DELTA AIR LINES INC	DAL	38,745.92	2.37%	19.40%	22.00%	0.16%	10.50%	13.00%	0.18%
DEERE & CO	DE	50,290.73	1.63%	7.67%	9.36%	0.21%	15.00%	16.75%	0.23%
DISCOVER FINANCIAL SERVICES	DFS	25,430.88	2.07%	7.98%	10.14%	0.11%	7.50%	9.65%	0.12%
DOLLAR GENERAL CORP	DG	25,140.76	1.22%	13.41%	14.71%	0.11%	11.00%	12.28%	0.12%
QUEST DIAGNOSTICS INC	DGX	13,619.09	1.93%	9.70%	11.72%	0.06%	10.00%	12.03%	0.06%
DR HORTON INC	DHI	16,480.36	1.11%	20.24%	21.46%	0.07%	12.00%	13.18%	0.08%
DANAHER CORP	DHR	68,384.52	0.60%	9.32%	9.95%	0.29%	9.00%	9.63%	0.32%
WALT DISNEY CO/THE	DIS	151,029.17	1.67%	5.00%	6.71%	0.64%	8.50%	10.24%	0.70%
DISCOVERY COMMUNICATIONS-A	DISCA	15,437.25	0.00%	12.00%	12.00%	0.06%	13.50%	13.50%	0.07%
DISH NETWORK CORP-A	DISH	17,681.54	0.00%	-8.23%	-8.23%	0.07%	1.00%	1.00%	0.08%
DIGITAL REALTY TRUST INC	DLR	22,595.18	3.82%	7.15%	11.11%	0.10%	N/A	N/A	N/A
DOLLAR TREE INC	DLTR	22,523.19	0.00%	13.27%	13.27%	0.09%	21.00%	21.00%	0.10%
DOVER CORP	DOV	15,182.54	1.97%	13.53%	15.63%	0.06%	8.00%	10.04%	0.07%
DR PEPPER SNAPPLE GROUP INC	DPS	21,278.10	2.06%	7.40%	9.54%	0.09%	7.50%	9.64%	0.10%
DUKE REALTY CORP	DRE	9,453.11	3.02%	-4.14%	-1.17%	0.04%	33.50%	37.03%	0.04%
DARDEN RESTAURANTS INC	DRI	10,531.26	2.97%	10.84%	13.97%	0.04%	13.00%	16.16%	0.05%
DTE ENERGY COMPANY	DTE	18,759.90	3.43%	5.67%	9.19%	0.08%	7.00%	10.55%	0.09%
DUKE ENERGY CORP	DUK	54,275.89	4.72%	4.26%	9.08%	0.23%	4.50%	9.33%	0.25%
DAVITA INC	DVA	12,031.56	0.00%	18.33%	18.33%	0.05%	9.00%	9.00%	0.06%
DEVON ENERGY CORP	DVN	16,724.72	0.87%	18.22%	19.16%	0.07%	14.00%	14.93%	0.08%
DOWDUPONT INC	DWDP	148,185.97	2.57%	7.52%	10.19%	0.62%	N/A	N/A	N/A
DXC TECHNOLOGY CO	DXC	28,720.20	0.72%	14.95%	15.72%	0.12%	19.00%	19.78%	0.13%
ELECTRONIC ARTS INC	EA	37,187.70	0.00%	13.57%	13.57%	0.16%	13.00%	13.00%	0.17%
EBAY INC	EBAY	40,726.09	0.00%	10.15%	10.15%	0.17%	10.00%	10.00%	0.19%
ECOLAB INC	ECL	39,523.88	1.21%	12.38%	13.65%	0.17%	8.00%	9.25%	0.18%
CONSOLIDATED EDISON INC	ED	24,192.35	3.66%	3.57%	7.30%	0.10%	3.00%	6.72%	0.11%
EQUIFAX INC	EFX	14,151.79	1.37%	9.00%	10.43%	0.06%	8.50%	9.93%	0.07%
EDISON INTERNATIONAL	EIX	20,741.14	3.77%	4.97%	8.83%	0.09%	4.00%	7.85%	0.10%
ESTEE LAUDER COMPANIES-CL A	EL	55,063.60	0.99%	12.57%	13.62%	0.23%	13.50%	14.56%	0.26%
EASTMAN CHEMICAL CO	EMN	15,072.47	2.16%	9.40%	11.66%	0.06%	10.50%	12.78%	0.07%
EMERSON ELECTRIC CO	EMR	43,359.41	2.86%	11.73%	14.75%	0.18%	11.50%	14.52%	0.20%
EOG RESOURCES INC	EOG	60,913.21	0.67%	7.30%	7.99%	0.26%	27.50%	28.26%	0.28%
EQUINIX INC	EQIX	33,128.43	2.17%	23.62%	26.04%	0.14%	23.00%	25.41%	0.15%
EQUITY RESIDENTIAL	EQR	22,686.61	3.47%	7.00%	10.59%	0.10%	N/A	N/A	N/A
EQT CORP	EQT	12,565.11	0.25%	17.50%	17.77%	0.05%	20.50%	20.77%	0.06%
EVERSOURCE ENERGY	ES	18,670.91	3.44%	5.68%	9.21%	0.08%	6.50%	10.05%	0.09%
EXPRESS SCRIPTS HOLDING CO	ESRX	38,790.57	0.00%	7.99%	7.99%	0.16%	16.00%	16.00%	0.18%
ESSEX PROPERTY TRUST INC	ESS	15,894.70	3.07%	6.25%	9.42%	0.07%	N/A	N/A	N/A
E*TRADE FINANCIAL CORP	ETFC	14,691.75	0.00%	31.52%	31.52%	0.06%	15.50%	15.50%	0.07%
EATON CORP PLC	ETN	35,008.82	3.19%	9.20%	12.54%	0.15%	7.00%	10.31%	0.16%
ENTERGY CORP	ETR	14,297.55	4.59%	3.15%	7.81%	0.06%	2.00%	6.63%	0.07%
ENVISION HEALTHCARE CORP	EVHC	4,647.19	0.00%	2.74%	2.74%	0.02%	N/A	N/A	N/A
EDWARDS LIFESCIENCES CORP	EW	29,371.85	0.00%	16.60%	16.60%	0.12%	16.50%	16.50%	0.14%
EXELON CORP	EXC	37,644.14	3.54%	3.67%	7.28%	0.16%	6.00%	9.65%	0.18%
EXPEDITORS INTL WASH INC	EXPD	11,086.92	1.40%	8.00%	9.46%	0.05%	9.00%	10.47%	0.05%
EXPEDIA GROUP INC	EXPE	16,763.93	1.11%	18.78%	19.99%	0.07%	19.00%	20.21%	0.08%
EXTRA SPACE STORAGE INC	EXR	11,010.64	3.76%	5.85%	9.72%	0.05%	N/A	N/A	N/A
FORD MOTOR CO	F	44,244.34	6.00%	-8.36%	-2.61%	0.19%	3.00%	9.09%	0.21%
FASTENAL CO	FAST	15,702.68	2.67%	17.55%	20.46%	0.07%	7.50%	10.27%	0.07%
FACEBOOK INC-A	FB	464,190.07	0.00%	24.31%	24.31%	1.95%	31.50%	31.50%	2.16%
FORTUNE BRANDS HOME & SECURI	FBHS	8,716.78	1.32%	11.76%	13.15%	0.04%	14.00%	15.41%	0.04%
FREEMPORT-MCMORAN INC	FCX	25,438.63	1.18%	-0.11%	1.06%	0.11%	N/A	N/A	N/A
FEDEX CORP	FDX	64,161.04	0.83%	14.60%	15.50%	0.27%	11.00%	11.88%	0.30%
FIRSTENERGY CORP	FE	16,217.13	4.24%	-2.83%	1.35%	0.07%	9.00%	13.43%	0.08%
F5 NETWORKS INC	FFIV	8,943.32	0.00%	10.03%	10.03%	0.04%	10.00%	10.00%	0.04%
FIDELITY NATIONAL INFO SERV	FIS	31,892.57	1.33%	12.00%	13.41%	0.13%	7.50%	8.88%	0.15%
FISERV INC	FISV	29,466.41	0.00%	7.65%	7.65%	0.12%	9.00%	9.00%	0.14%
FIFTH THIRD BANCORP	FITB	21,811.68	2.31%	5.65%	8.02%	0.09%	8.50%	10.90%	0.10%
FOOT LOCKER INC	FL	5,378.99	2.96%	5.42%	8.46%	0.02%	7.00%	10.06%	0.03%
FLIR SYSTEMS INC	FLIR	6,947.37	1.25%	N/A	N/A	N/A	11.50%	12.83%	0.03%
FLUOR CORP	FLR	8,005.86	1.51%	20.61%	22.27%	0.03%	4.00%	5.54%	0.04%
FLOWSERVE CORP	FLS	5,667.47	1.83%	15.89%	17.86%	0.02%	N/A	N/A	N/A
FMC CORP	FMC	10,297.39	0.97%	13.48%	14.51%	0.04%	13.50%	14.53%	0.05%
TWENTY-FIRST CENTURY FOX-A	FOXA	67,713.79	1.01%	8.75%	9.80%	0.28%	11.50%	12.57%	0.31%
FEDERAL REALTY INVS TRUST	FRT	8,497.67	3.53%	4.33%	7.94%	0.04%	N/A	N/A	N/A
TECHNIPFMC PLC	FTI	13,669.08	1.84%	4.55%	6.43%	0.06%	N/A	N/A	N/A
FORTIVE CORP	FTV	26,979.41	0.38%	10.64%	11.03%	0.11%	N/A	N/A	N/A
GENERAL DYNAMICS CORP	GD	65,845.39	1.61%	10.55%	12.25%	0.28%	8.50%	10.18%	0.31%

GENERAL ELECTRIC CO	GE	117,053.75	3.98%	4.03%	8.10%	0.49%	8.50%	12.65%	0.54%
GGP INC	GGP	19,580.58	4.47%	4.60%	9.17%	0.08%	N/A	N/A	N/A
GILEAD SCIENCES INC	GILD	98,297.26	2.98%	2.79%	5.81%	0.41%	-1.00%	1.96%	0.46%
GENERAL MILLS INC	GIS	26,715.62	4.39%	7.33%	11.89%	0.11%	5.50%	10.01%	0.12%
CORNING INC	GLW	23,676.55	2.48%	6.95%	9.52%	0.10%	13.00%	15.64%	0.11%
GENERAL MOTORS CO	GM	50,895.06	4.20%	5.28%	9.58%	0.21%	5.50%	9.81%	0.24%
ALPHABET INC-CL A	GOOGL	719,123.59	0.00%	19.89%	19.89%	3.03%	N/A	N/A	N/A
GENUINE PARTS CO	GPC	13,182.64	3.18%	8.29%	11.61%	0.06%	7.50%	10.80%	0.06%
GLOBAL PAYMENTS INC	GPN	17,789.40	0.04%	22.05%	22.09%	0.07%	12.00%	12.04%	0.08%
GAP INC/THE	GPS	12,146.75	3.11%	8.80%	12.05%	0.05%	4.00%	7.17%	0.06%
GARMIN LTD	GRMN	11,089.98	3.56%	6.30%	9.97%	0.05%	7.00%	10.69%	0.05%
GOLDMAN SACHS GROUP INC	GS	99,139.96	1.26%	12.88%	14.22%	0.42%	9.50%	10.82%	0.46%
GOODYEAR TIRE & RUBBER CO	GT	6,391.93	2.01%	N/A	N/A	N/A	12.50%	14.63%	0.03%
WW GRAINGER INC	GWV	15,823.24	1.93%	13.03%	15.09%	0.07%	8.50%	10.51%	0.07%
HALLIBURTON CO	HAL	41,068.27	1.56%	75.82%	77.97%	0.17%	23.00%	24.74%	0.19%
HASBRO INC	HAS	10,468.18	2.97%	8.53%	11.63%	0.04%	11.00%	14.13%	0.05%
HUNTINGTON BANCSHARES INC	HBAN	16,208.97	3.05%	11.82%	15.05%	0.07%	9.00%	12.18%	0.08%
HANESBRANDS INC	HBI	6,637.71	3.26%	8.40%	11.80%	0.03%	9.50%	12.92%	0.03%
HCA HEALTHCARE INC	HCA	34,165.11	0.41%	11.75%	12.19%	0.14%	13.00%	13.44%	0.16%
HCP INC	HCP	10,909.73	6.41%	-2.24%	4.10%	0.05%	N/A	N/A	N/A
HOME DEPOT INC	HD	206,271.72	2.26%	14.58%	17.01%	0.87%	12.00%	14.40%	0.96%
HESS CORP	HES	15,948.01	2.04%	-11.08%	-9.15%	0.07%	N/A	N/A	N/A
HARTFORD FINANCIAL SVCS GRP	HIG	18,391.68	2.01%	9.50%	11.60%	0.08%	12.50%	14.63%	0.09%
HUNTINGTON INGALLS INDUSTRIE	HII	11,539.17	1.11%	27.50%	28.76%	0.05%	9.50%	10.60%	0.05%
HILTON WORLDWIDE HOLDINGS IN	HLT	24,957.23	0.83%	2.18%	3.02%	0.11%	8.50%	9.37%	0.12%
HARLEY-DAVIDSON INC	HOG	7,197.99	3.50%	9.60%	13.27%	0.03%	8.00%	11.64%	0.03%
HOLOGIC INC	HOLX	10,327.33	0.00%	6.14%	6.14%	0.04%	22.00%	22.00%	0.05%
HONEYWELL INTERNATIONAL INC	HON	108,148.51	2.09%	9.83%	12.03%	0.46%	8.50%	10.68%	0.50%
HELMERICH & PAYNE	HP	7,246.18	4.21%	N/A	N/A	N/A	62.00%	67.51%	0.03%
HEWLETT PACKARD ENTERPRISE	HPE	27,243.21	2.10%	5.12%	7.28%	0.11%	-0.50%	1.60%	0.13%
HP INC	HPQ	35,893.26	2.57%	7.19%	9.85%	0.15%	5.50%	8.14%	0.17%
H&R BLOCK INC	HRB	5,315.83	3.78%	11.00%	14.99%	0.02%	9.00%	12.95%	0.02%
HORMEL FOODS CORP	HRL	18,173.61	2.17%	8.00%	10.26%	0.08%	10.50%	12.79%	0.08%
HARRIS CORP	HRS	19,148.74	1.41%	N/A	N/A	N/A	11.50%	12.99%	0.09%
HENRY SCHEIN INC	HSIC	10,329.79	0.00%	9.88%	9.88%	0.04%	9.00%	9.00%	0.05%
HOST HOTELS & RESORTS INC	HST	13,683.82	4.41%	4.13%	8.63%	0.06%	N/A	N/A	N/A
HERSHEY CO/THE	HSY	20,773.79	2.76%	9.33%	12.22%	0.09%	7.50%	10.36%	0.10%
HUMANA INC	HUM	37,121.98	0.70%	12.76%	13.50%	0.16%	13.00%	13.74%	0.17%
INTL BUSINESS MACHINES CORP	IBM	141,334.79	4.03%	1.28%	5.33%	0.59%	1.00%	5.05%	0.66%
INTERCONTINENTAL EXCHANGE IN	ICE	42,132.39	1.32%	11.15%	12.55%	0.18%	12.00%	13.40%	0.20%
IDEXX LABORATORIES INC	IDXX	16,662.78	0.00%	16.66%	16.66%	0.07%	17.00%	17.00%	0.08%
INTL FLAVORS & FRAGRANCES	IFF	10,803.89	2.08%	8.20%	10.36%	0.05%	8.00%	10.16%	0.05%
ILLUMINA INC	ILMN	34,753.74	0.00%	15.51%	15.51%	0.15%	16.00%	16.00%	0.16%
INCYTE CORP	INCY	17,649.19	0.00%	44.67%	44.67%	0.07%	N/A	N/A	N/A
IHS MARKIT LTD	INFO	19,287.56	0.00%	12.37%	12.37%	0.08%	19.50%	19.50%	0.09%
INTEL CORP	INTC	243,109.44	2.24%	8.16%	10.49%	1.02%	13.00%	15.38%	1.13%
INTUIT INC	INTU	44,396.85	0.89%	16.03%	16.99%	0.19%	15.00%	15.96%	0.21%
INTERNATIONAL PAPER CO	IP	22,063.41	3.64%	7.85%	11.63%	0.09%	15.50%	19.42%	0.10%
INTERPUBLIC GROUP OF COS INC	IPG	8,854.34	3.65%	4.85%	8.59%	0.04%	10.00%	13.83%	0.04%
IPG PHOTONICS CORP	IPGP	12,615.62	0.00%	23.50%	23.50%	0.05%	13.50%	13.50%	0.06%
IQVIA HOLDINGS INC	IQV	20,433.38	0.00%	14.84%	14.84%	0.09%	14.50%	14.50%	0.10%
INGERSOLL-RAND PLC	IR	21,368.03	2.10%	10.60%	12.81%	0.09%	11.00%	13.21%	0.10%
IRON MOUNTAIN INC	IRM	9,375.34	7.07%	9.90%	17.32%	0.04%	9.50%	16.91%	0.04%
INTUITIVE SURGICAL INC	ISRG	46,675.43	0.00%	10.00%	10.00%	0.20%	15.00%	15.00%	0.22%
GARTNER INC	IT	10,683.87	0.00%	15.00%	15.00%	0.04%	13.50%	13.50%	0.05%
ILLINOIS TOOL WORKS	ITW	53,141.62	2.21%	9.67%	11.99%	0.22%	11.50%	13.84%	0.25%
INVESCO LTD	IVZ	13,150.19	3.83%	12.31%	16.37%	0.06%	7.00%	10.96%	0.06%
HUNT (JB) TRANSPRT SVCS INC	JBHT	12,857.74	0.82%	12.17%	13.03%	0.05%	12.00%	12.87%	0.06%
JOHNSON CONTROLS INTERNATION	JCI	32,635.95	2.95%	10.40%	13.50%	0.14%	-0.50%	2.44%	0.15%
JACOBS ENGINEERING GROUP INC	JEC	8,379.86	0.99%	15.97%	17.03%	0.04%	11.00%	12.04%	0.04%
JOHNSON & JOHNSON	JNJ	343,780.27	2.82%	7.17%	10.09%	1.45%	9.00%	11.95%	1.60%
JUNIPER NETWORKS INC	JNPR	8,363.60	2.68%	7.10%	9.87%	0.04%	4.50%	7.24%	0.04%
JPMORGAN CHASE & CO	JPM	375,042.89	2.23%	9.40%	11.73%	1.58%	8.00%	10.32%	1.74%
NORDSTROM INC	JWN	8,122.74	3.21%	8.05%	11.39%	0.03%	3.50%	6.77%	0.04%
KELLOGG CO	K	22,531.86	3.42%	7.64%	11.19%	0.09%	8.00%	11.56%	0.10%
KEYCORP	KEY	20,570.27	2.59%	15.75%	18.55%	0.09%	12.50%	15.26%	0.10%
KRAFT HEINZ CO/THE	KHC	75,919.94	4.13%	6.62%	10.89%	0.32%	N/A	N/A	N/A
KIMCO REALTY CORP	KIM	6,118.57	7.86%	16.44%	24.95%	0.03%	N/A	N/A	N/A
KLA-TENCOR CORP	KLAC	16,991.62	2.29%	11.86%	14.29%	0.07%	15.50%	17.97%	0.08%
KIMBERLY-CLARK CORP	KMB	38,552.68	3.63%	16.91%	20.84%	0.16%	9.50%	13.30%	0.18%
KINDER MORGAN INC	KMI	33,223.43	5.24%	18.00%	23.71%	0.14%	57.00%	63.73%	0.15%
CARMAX INC	KMX	11,201.72	0.00%	13.77%	13.77%	0.05%	13.50%	13.50%	0.05%

COCA-COLA CO/THE	KO	185,207.21	3.59%	8.42%	12.16%	0.78%	5.00%	8.68%	0.86%
MICHAEL KORS HOLDINGS LTD	KORS	9,447.62	0.00%	6.06%	6.06%	0.04%	3.00%	3.00%	0.04%
KROGER CO	KR	21,099.80	2.64%	5.62%	8.33%	0.09%	4.50%	7.20%	0.10%
KOHL'S CORP	KSS	11,021.20	3.69%	7.00%	10.82%	0.05%	7.00%	10.82%	0.05%
KANSAS CITY SOUTHERN	KSU	11,320.44	1.32%	13.00%	14.41%	0.05%	12.50%	13.91%	0.05%
LOEWS CORP	L	16,134.33	0.50%	N/A	N/A	N/A	14.00%	14.54%	0.08%
L BRANDS INC	LB	10,655.17	6.46%	11.66%	18.50%	0.04%	0.50%	6.98%	0.05%
LEGETT & PLATT INC	LEG	5,842.05	3.35%	11.00%	14.53%	0.02%	9.00%	12.50%	0.03%
LENNAR CORP-A	LEN	18,738.16	0.27%	18.95%	19.24%	0.08%	12.00%	12.29%	0.09%
LABORATORY CRP OF AMER HLDGS	LH	16,482.33	0.00%	9.93%	9.93%	0.07%	9.50%	9.50%	0.08%
LKQ CORP	LKQ	11,750.10	0.00%	13.00%	13.00%	0.05%	11.50%	11.50%	0.05%
L3 TECHNOLOGIES INC	LLL	16,283.27	1.57%	10.72%	12.37%	0.07%	11.00%	12.66%	0.08%
ELI LILLY & CO	LLY	84,542.23	2.95%	9.91%	13.01%	0.36%	11.00%	14.11%	0.39%
LOCKHEED MARTIN CORP	LMT	96,588.57	2.43%	21.24%	23.92%	0.41%	12.50%	15.08%	0.45%
LINCOLN NATIONAL CORP	LNC	15,945.90	1.84%	8.00%	9.92%	0.07%	8.00%	9.92%	0.07%
ALLIANT ENERGY CORP	LNT	9,453.22	3.28%	5.66%	9.04%	0.04%	6.50%	9.89%	0.04%
LOWE'S COS INC	LOW	72,811.49	2.05%	16.60%	18.83%	0.31%	13.50%	15.69%	0.34%
LAM RESEARCH CORP	LRCX	33,105.43	1.15%	12.86%	14.08%	0.14%	19.50%	20.76%	0.15%
LEUCADIA NATIONAL CORP	LUK	8,097.63	1.76%	18.00%	19.92%	0.03%	31.00%	33.03%	0.04%
SOUTHWEST AIRLINES CO	LUV	33,677.83	0.95%	14.98%	16.01%	0.14%	11.50%	12.51%	0.16%
LYONDELLBASELL INDU-CL A	LYB	41,696.71	3.52%	6.90%	10.54%	0.18%	3.50%	7.08%	0.19%
MACY'S INC	M	9,064.75	5.40%	4.50%	10.03%	0.04%	2.50%	7.97%	0.04%
MASTERCARD INC - A	MA	184,160.59	0.57%	20.55%	21.18%	0.78%	13.50%	14.11%	0.86%
MID-AMERICA APARTMENT COMM	MAA	10,372.98	4.09%	7.00%	11.24%	0.04%	N/A	N/A	N/A
MACERICH CO/THE	MAC	7,890.54	5.35%	5.08%	10.57%	0.03%	N/A	N/A	N/A
MARRIOTT INTERNATIONAL -CL A	MAR	48,531.23	1.04%	15.18%	16.30%	0.20%	17.50%	18.63%	0.23%
MASCO CORP	MAS	12,589.97	1.07%	16.79%	17.95%	0.05%	16.00%	17.15%	0.06%
MATTEL INC	MAT	4,522.59	0.00%	9.73%	9.73%	0.02%	1.50%	1.50%	0.02%
MCDONALD'S CORP	MCD	124,243.58	2.62%	8.48%	11.21%	0.52%	10.00%	12.75%	0.58%
MICROCHIP TECHNOLOGY INC	MCHP	21,409.58	1.59%	14.29%	15.99%	0.09%	13.50%	15.19%	0.10%
MCKESSON CORP	MCK	29,067.02	0.92%	14.73%	15.72%	0.12%	9.50%	10.47%	0.14%
MOODY'S CORP	MCO	30,825.81	1.08%	8.00%	9.13%	0.13%	12.00%	13.15%	0.14%
MONDELEZ INTERNATIONAL INC-A	MDLZ	62,066.22	2.20%	11.42%	13.75%	0.26%	10.00%	12.31%	0.29%
MEDTRONIC PLC	MDT	108,728.06	2.31%	6.70%	9.09%	0.46%	6.00%	8.38%	0.51%
METLIFE INC	MET	47,571.53	3.58%	29.37%	33.48%	0.20%	5.50%	9.18%	0.22%
MGM RESORTS INTERNATIONAL	MGM	19,844.29	1.35%	10.99%	12.41%	0.08%	44.50%	46.15%	0.09%
MOHAWK INDUSTRIES INC	MHK	17,283.08	0.00%	10.05%	10.05%	0.07%	10.00%	10.00%	0.08%
MCCORMICK & CO-NON VTG SHRS	MKC	13,958.68	1.96%	9.00%	11.04%	0.06%	10.50%	12.56%	0.06%
MARTIN MARIETTA MATERIALS	MLM	13,019.06	0.86%	14.57%	15.50%	0.05%	12.00%	12.91%	0.06%
MARSH & MCLENNAN COS	MMC	41,924.45	1.91%	13.29%	15.32%	0.18%	10.50%	12.51%	0.19%
3M CO	MMM	130,550.29	2.48%	8.80%	11.39%	0.55%	9.50%	12.10%	0.61%
MONSTER BEVERAGE CORP	MNST	32,403.90	0.00%	18.25%	18.25%	0.14%	13.50%	13.50%	0.15%
ALTRIA GROUP INC	MO	118,436.00	4.73%	2.57%	7.36%	0.50%	10.00%	14.97%	0.55%
MONSANTO CO	MON	51,437.05	1.85%	8.25%	10.18%	0.22%	7.50%	9.42%	0.24%
MOSAIC CO/THE	MOS	9,357.94	0.41%	13.65%	14.09%	0.04%	3.00%	3.42%	0.04%
MARATHON PETROLEUM CORP	MPC	34,682.71	2.53%	7.94%	10.57%	0.15%	8.50%	11.14%	0.16%
MERCK & CO. INC.	MRK	146,861.50	3.55%	5.82%	9.47%	0.62%	5.50%	9.14%	0.68%
MARATHON OIL CORP	MRO	13,706.56	1.24%	5.00%	6.27%	0.06%	N/A	N/A	N/A
MORGAN STANLEY	MS	96,688.03	2.04%	14.78%	16.97%	0.41%	10.50%	12.65%	0.45%
MICROSOFT CORP	MSFT	702,760.09	1.84%	11.08%	13.03%	2.96%	9.50%	11.43%	3.27%
MOTOROLA SOLUTIONS INC	MSI	17,026.53	2.01%	4.07%	6.11%	0.07%	14.00%	16.15%	0.08%
M & T BANK CORP	MTB	27,379.18	1.78%	-5.16%	-3.43%	0.12%	9.50%	11.37%	0.13%
METTLER-TOLEDO INTERNATIONAL	MTD	14,634.77	0.00%	12.53%	12.53%	0.06%	11.50%	11.50%	0.07%
MICRON TECHNOLOGY INC	MU	60,470.12	0.00%	0.45%	0.45%	0.25%	24.00%	24.00%	0.28%
MYLAN NV	MYL	21,193.56	0.00%	4.19%	4.19%	0.09%	10.00%	10.00%	0.10%
NAVIENT CORP	NAVI	3,455.66	4.95%	-6.00%	-1.19%	0.01%	6.00%	11.10%	0.02%
NOBLE ENERGY INC	NBL	14,913.42	1.32%	9.95%	11.34%	0.06%	N/A	N/A	N/A
NORWEGIAN CRUISE LINE HOLDIN	NCLH	11,862.12	0.36%	19.77%	20.17%	0.05%	21.50%	21.90%	0.06%
NASDAQ INC	NDAQ	14,360.77	1.91%	10.78%	12.79%	0.06%	9.50%	11.50%	0.07%
NEXTERA ENERGY INC	NEE	76,894.77	2.73%	8.20%	11.05%	0.32%	8.50%	11.35%	0.36%
NEWMONT MINING CORP	NEM	20,852.56	1.45%	-3.00%	-1.58%	0.09%	9.00%	10.51%	0.10%
NETFLIX INC	NFLX	128,166.68	0.00%	46.79%	46.79%	0.54%	44.50%	44.50%	0.60%
NEWFIELD EXPLORATION CO	NFX	4,877.72	0.00%	17.19%	17.19%	0.02%	19.00%	19.00%	0.02%
NISOURCE INC	NI	8,067.49	3.19%	5.61%	8.89%	0.03%	18.00%	21.48%	0.04%
NIKE INC -CL B	NKE	108,093.94	1.16%	11.72%	12.95%	0.45%	14.00%	15.24%	0.50%
NEKTAR THERAPEUTICS	NKTR	17,099.67	0.00%	N/A	N/A	N/A	N/A	N/A	N/A
NIELSEN HOLDINGS PLC	NLSN	11,337.72	4.45%	9.75%	14.42%	0.05%	9.00%	13.65%	0.05%
NORTHROP GRUMMAN CORP	NOC	60,777.46	1.34%	13.68%	15.11%	0.26%	8.50%	9.90%	0.28%
NATIONAL OILWELL VARCO INC	NOV	13,993.09	0.51%	N/A	N/A	N/A	3.00%	3.51%	0.07%
NRG ENERGY INC	NRG	9,698.35	0.39%	44.19%	44.67%	0.04%	N/A	N/A	N/A
NORFOLK SOUTHERN CORP	NSC	38,467.03	2.12%	14.33%	16.60%	0.16%	11.50%	13.74%	0.18%
NETAPP INC	NTAP	16,528.15	1.29%	9.83%	11.18%	0.07%	14.00%	15.38%	0.08%

NORTHERN TRUST CORP	NTRS	23,264.25	1.75%	14.77%	16.65%	0.10%	11.00%	12.84%	0.11%
NUCOR CORP	NUE	19,423.06	2.48%	5.00%	7.54%	0.08%	20.00%	22.73%	0.09%
NVIDIA CORP	NVDA	140,111.95	0.26%	9.68%	9.95%	0.59%	24.00%	24.30%	0.65%
NEWELL BRANDS INC	NWL	12,362.90	3.70%	4.41%	8.20%	0.05%	9.00%	12.87%	0.06%
NEWS CORP - CLASS A	NWSA	9,267.16	1.39%	13.33%	14.81%	0.04%	N/A	N/A	N/A
REALTY INCOME CORP	O	14,704.02	5.08%	4.33%	9.51%	0.06%	N/A	N/A	N/A
ONEOK INC	OKE	23,373.30	5.61%	26.19%	32.54%	0.10%	17.50%	23.61%	0.11%
OMNICOM GROUP	OMC	16,733.55	3.33%	5.80%	9.23%	0.07%	7.50%	10.96%	0.08%
ORACLE CORP	ORCL	186,765.82	1.62%	8.71%	10.40%	0.79%	8.00%	9.68%	0.87%
O'REILLY AUTOMOTIVE INC	ORLY	20,606.80	0.00%	15.95%	15.95%	0.09%	13.50%	13.50%	0.10%
OCCIDENTAL PETROLEUM CORP	OXY	49,737.85	4.76%	8.05%	13.01%	0.21%	21.00%	26.26%	0.23%
PAYCHEX INC	PAYX	22,129.29	3.23%	8.63%	11.99%	0.09%	12.00%	15.42%	0.10%
PEOPLE'S UNITED FINANCIAL	PBCT	6,483.21	3.72%	2.00%	5.76%	0.03%	13.50%	17.47%	0.03%
PACCAR INC	PCAR	23,297.51	3.38%	7.63%	11.14%	0.10%	6.50%	9.99%	0.11%
P G & E CORP	PCG	22,663.85	4.45%	3.40%	7.93%	0.10%	8.50%	13.14%	0.11%
PUBLIC SERVICE ENTERPRISE GP	PEG	25,359.38	3.58%	4.06%	7.71%	0.11%	2.00%	5.62%	0.12%
PEPSICO INC	PEP	154,932.45	3.28%	6.92%	10.32%	0.65%	7.50%	10.90%	0.72%
PFIZER INC	PFE	211,267.17	3.87%	6.92%	10.93%	0.89%	12.00%	16.11%	0.98%
PRINCIPAL FINANCIAL GROUP	PFG	17,643.00	3.43%	9.53%	13.12%	0.07%	5.00%	8.52%	0.08%
PROCTER & GAMBLE CO/THE	PG	199,864.88	3.55%	7.53%	11.21%	0.84%	9.00%	12.71%	0.93%
PROGRESSIVE CORP	PGR	35,484.69	2.07%	9.33%	11.50%	0.15%	15.00%	17.23%	0.17%
PARKER HANNIFIN CORP	PH	22,755.29	1.57%	10.12%	11.76%	0.10%	13.00%	14.67%	0.11%
PULTEGROUP INC	PHM	8,439.18	1.24%	19.58%	20.95%	0.04%	15.50%	16.84%	0.04%
PACKAGING CORP OF AMERICA	PKG	10,633.22	2.31%	8.50%	10.91%	0.04%	10.00%	12.43%	0.05%
PERKINELMER INC	PKI	8,367.39	0.38%	54.76%	55.23%	0.04%	11.00%	11.40%	0.04%
PROLOGIS INC	PLD	33,356.97	2.93%	6.41%	9.43%	0.14%	N/A	N/A	N/A
PHILIP MORRIS INTERNATIONAL	PM	154,513.82	4.39%	11.46%	16.10%	0.65%	8.00%	12.56%	0.72%
PNC FINANCIAL SERVICES GROUP	PNC	71,323.33	2.20%	10.40%	12.71%	0.30%	8.00%	10.29%	0.33%
PENTAIR PLC	PNR	12,150.61	2.07%	10.34%	12.51%	0.05%	12.00%	14.19%	0.06%
PINNACLE WEST CAPITAL	PNW	8,931.90	3.54%	3.22%	6.81%	0.04%	5.50%	9.14%	0.04%
PPG INDUSTRIES INC	PPG	27,824.42	1.65%	9.09%	10.82%	0.12%	10.50%	12.23%	0.13%
PPL CORP	PPL	19,616.23	5.80%	5.47%	11.43%	0.08%	1.50%	7.34%	0.09%
PERRIGO CO PLC	PRGO	11,740.51	0.80%	6.62%	7.44%	0.05%	0.50%	1.30%	0.05%
PRUDENTIAL FINANCIAL INC	PRU	43,685.79	3.30%	8.50%	11.94%	0.18%	5.50%	8.89%	0.20%
PUBLIC STORAGE	PSA	34,884.81	4.13%	4.30%	8.52%	0.15%	N/A	N/A	N/A
PHILLIPS 66	PSX	44,729.91	3.10%	5.05%	8.23%	0.19%	4.50%	7.67%	0.21%
PVH CORP	PVH	11,658.87	0.10%	11.34%	11.45%	0.05%	8.50%	8.61%	0.05%
QUANTA SERVICES INC	PWR	5,297.83	0.00%	N/A	N/A	N/A	17.50%	17.50%	0.02%
PRAXAIR INC	PX	41,433.81	2.39%	11.00%	13.53%	0.17%	8.50%	11.00%	0.19%
PIONEER NATURAL RESOURCES CO	PXD	29,254.28	0.13%	15.00%	15.14%	0.12%	41.50%	41.66%	0.14%
PAYPAL HOLDINGS INC	PYPL	91,056.17	0.00%	17.87%	17.87%	0.38%	N/A	N/A	N/A
QUALCOMM INC	QCOM	82,026.93	4.24%	6.01%	10.38%	0.35%	4.50%	8.83%	0.38%
QORVO INC	QRVO	8,911.47	0.00%	13.35%	13.35%	0.04%	21.00%	21.00%	0.04%
ROYAL CARIBBEAN CRUISES LTD	RCL	25,166.81	2.11%	18.83%	21.14%	0.11%	13.50%	15.75%	0.12%
EVEREST RE GROUP LTD	RE	10,488.47	2.07%	10.00%	12.17%	0.04%	3.50%	5.60%	0.05%
REGENCY CENTERS CORP	REG	10,019.93	3.79%	8.58%	12.53%	0.04%	N/A	N/A	N/A
REGENERON PHARMACEUTICALS	REGN	37,086.47	0.00%	14.37%	14.37%	0.16%	14.00%	14.00%	0.17%
REGIONS FINANCIAL CORP	RF	20,860.60	2.23%	15.10%	17.50%	0.09%	12.00%	14.37%	0.10%
ROBERT HALF INTL INC	RHI	7,193.50	1.82%	10.03%	11.94%	0.03%	5.50%	7.37%	0.03%
RED HAT INC	RHT	26,463.91	0.00%	17.16%	17.16%	0.11%	20.50%	20.50%	0.12%
RAYMOND JAMES FINANCIAL INC	RJF	13,019.43	1.15%	17.00%	18.24%	0.05%	12.50%	13.72%	0.06%
RALPH LAUREN CORP	RL	9,088.19	1.81%	5.16%	7.02%	0.04%	3.50%	5.35%	0.04%
RESMD INC	RMD	14,074.03	1.46%	15.20%	16.77%	0.06%	10.00%	11.53%	0.07%
ROCKWELL AUTOMATION INC	ROK	22,260.11	1.92%	10.92%	12.94%	0.09%	5.50%	7.47%	0.10%
ROPER TECHNOLOGIES INC	ROP	28,862.36	0.58%	13.37%	13.99%	0.12%	9.00%	9.61%	0.13%
ROSS STORES INC	ROST	29,799.74	1.00%	13.75%	14.82%	0.13%	9.50%	10.55%	0.14%
RANGE RESOURCES CORP	RRC	3,613.76	0.55%	22.89%	23.50%	0.02%	23.50%	24.11%	0.02%
REPUBLIC SERVICES INC	RSG	21,832.21	2.11%	10.18%	12.40%	0.09%	12.50%	14.74%	0.10%
RAYTHEON COMPANY	RTN	62,265.36	1.60%	11.21%	12.90%	0.26%	11.00%	12.69%	0.29%
SBA COMMUNICATIONS CORP	SBAC	19,913.52	0.00%	27.25%	27.25%	0.08%	88.50%	88.50%	0.09%
STARBUCKS CORP	SBUX	81,370.18	2.17%	16.00%	18.35%	0.34%	15.00%	17.33%	0.38%
SCANA CORP	SCG	5,356.07	5.49%	-3.70%	1.69%	0.02%	-0.50%	4.98%	0.02%
SCHWAB (CHARLES) CORP	SCHW	70,402.40	0.75%	25.21%	26.06%	0.30%	14.00%	14.81%	0.33%
SEALED AIR CORP	SEE	7,161.98	1.52%	4.04%	5.59%	0.03%	19.00%	20.67%	0.03%
SHERWIN-WILLIAMS CO/THE	SHW	36,898.95	0.87%	11.12%	12.04%	0.16%	12.00%	12.92%	0.17%
SVB FINANCIAL GROUP	SIVB	12,694.07	0.00%	10.75%	10.75%	0.05%	N/A	N/A	N/A
JM SMUCKER CO/THE	SJM	14,087.43	2.51%	9.00%	11.62%	0.06%	8.00%	10.61%	0.07%
SCHLUMBERGER LTD	SLB	89,782.30	3.14%	40.24%	44.01%	0.38%	17.50%	20.91%	0.42%
SL GREEN REALTY CORP	SLG	8,888.56	3.37%	4.51%	7.95%	0.04%	N/A	N/A	N/A
SNAP-ON INC	SNA	8,367.38	2.34%	9.70%	12.16%	0.04%	9.00%	11.45%	0.04%
SYNOPSIS INC	SNPS	12,379.88	0.00%	N/A	N/A	N/A	9.00%	9.00%	0.06%
SOUTHERN CO/THE	SO	45,024.40	5.34%	4.36%	9.82%	0.19%	4.00%	9.45%	0.21%

SIMON PROPERTY GROUP INC	SPG	47,860.99	5.13%	6.71%	12.01%	0.20%	N/A	N/A	N/A
S&P GLOBAL INC	SPGI	47,642.55	1.02%	11.70%	12.78%	0.20%	14.50%	15.59%	0.22%
STERICYLE INC	SRCL	5,006.91	0.00%	8.18%	8.18%	0.02%	6.50%	6.50%	0.02%
SEMPRA ENERGY	SRE	29,351.39	3.22%	20.94%	24.50%	0.12%	7.50%	10.84%	0.14%
SUNTRUST BANKS INC	STI	31,863.14	2.54%	13.21%	15.92%	0.13%	7.00%	9.63%	0.15%
STATE STREET CORP	STT	36,688.17	1.81%	16.83%	18.79%	0.15%	9.50%	11.40%	0.17%
SEAGATE TECHNOLOGY	STX	16,668.10	4.32%	10.85%	15.40%	0.07%	5.00%	9.43%	0.08%
CONSTELLATION BRANDS INC-A	STZ	44,418.90	1.21%	15.01%	16.31%	0.19%	13.50%	14.79%	0.21%
STANLEY BLACK & DECKER INC	SWK	23,609.88	1.68%	11.50%	13.28%	0.10%	9.50%	11.26%	0.11%
SKYWORKS SOLUTIONS INC	SWKS	18,263.90	1.30%	10.60%	11.97%	0.08%	14.50%	15.90%	0.08%
SYNCHRONY FINANCIAL	SYF	25,490.07	1.98%	8.40%	10.46%	0.11%	9.00%	11.07%	0.12%
STRYKER CORP	SYK	60,041.33	1.43%	8.83%	10.32%	0.25%	14.00%	15.53%	0.28%
SYMANTEC CORP	SYMC	16,066.77	1.24%	11.08%	12.39%	0.07%	8.50%	9.79%	0.07%
SYSCO CORP	SYI	31,294.25	2.31%	11.62%	14.07%	0.13%	14.00%	16.48%	0.15%
AT&T INC	T	218,945.64	5.63%	-1.60%	3.99%	0.92%	5.50%	11.29%	1.02%
MOLSON COORS BREWING CO -B	TAP	16,319.36	2.23%	6.25%	8.55%	0.07%	14.00%	16.39%	0.08%
TRANSDIGM GROUP INC	TDG	16,021.14	0.00%	11.28%	11.28%	0.07%	11.00%	11.00%	0.07%
TE CONNECTIVITY LTD	TEL	35,085.52	1.64%	10.38%	12.11%	0.15%	10.50%	12.23%	0.16%
TARGET CORP	TGT	37,408.61	3.81%	3.98%	7.86%	0.16%	5.00%	8.91%	0.17%
TIFFANY & CO	TIF	12,148.76	2.09%	10.90%	13.10%	0.05%	8.00%	10.17%	0.06%
TJX COMPANIES INC	TJX	51,570.59	1.88%	12.53%	14.52%	0.22%	12.00%	13.99%	0.24%
TORCHMARK CORP	TMK	9,582.86	0.75%	10.59%	11.38%	0.04%	7.50%	8.28%	0.04%
THERMO FISHER SCIENTIFIC INC	TMO	82,952.34	0.32%	12.25%	12.59%	0.35%	9.00%	9.33%	0.39%
TAPESTRY INC	TPR	14,987.67	2.59%	11.61%	14.36%	0.06%	14.00%	16.78%	0.07%
TRIPADVISOR INC	TRIP	5,683.05	0.00%	18.06%	18.06%	0.02%	3.50%	3.50%	0.03%
T ROWE PRICE GROUP INC	TROW	26,409.19	2.43%	14.53%	17.14%	0.11%	8.00%	10.53%	0.12%
TRAVELERS COS INC/THE	TRV	37,690.49	2.16%	20.39%	22.76%	0.16%	3.00%	5.19%	0.18%
TRACTOR SUPPLY COMPANY	TSCO	7,806.72	1.87%	13.63%	15.63%	0.03%	10.50%	12.47%	0.04%
TYSON FOODS INC-CL A	TSN	29,233.08	1.72%	8.00%	9.79%	0.12%	11.50%	13.32%	0.14%
TOTAL SYSTEM SERVICES INC	TSS	15,675.65	0.53%	12.75%	13.31%	0.07%	11.50%	12.06%	0.07%
TAKE-TWO INTERACTIVE SOFTWARE	TTWO	11,185.86	0.00%	10.65%	10.65%	0.05%	N/A	N/A	N/A
TIME WARNER INC	TWX	73,758.37	1.75%	5.00%	6.79%	0.31%	9.50%	11.33%	0.34%
TEXAS INSTRUMENTS INC	TXN	102,134.86	2.43%	11.38%	13.95%	0.43%	11.00%	13.56%	0.47%
TEXTRON INC	TXT	15,292.90	0.16%	11.89%	12.07%	0.06%	13.00%	13.18%	0.07%
UNDER ARMOUR INC-CLASS A	UAA	6,756.26	0.00%	24.62%	24.62%	0.03%	3.50%	3.50%	0.03%
UNITED CONTINENTAL HOLDINGS	UAL	19,778.15	0.00%	17.78%	17.78%	0.08%	2.50%	2.50%	0.09%
UDR INC	UDR	9,531.34	3.63%	5.66%	9.39%	0.04%	N/A	N/A	N/A
UNIVERSAL HEALTH SERVICES-B	UHS	11,157.26	0.27%	9.11%	9.40%	0.05%	10.50%	10.78%	0.05%
ULTA BEAUTY INC	ULTA	12,458.92	0.00%	18.60%	18.60%	0.05%	21.00%	21.00%	0.06%
UNITEDHEALTH GROUP INC	UNH	207,079.86	1.49%	13.45%	15.04%	0.87%	14.50%	16.10%	0.96%
UNUM GROUP	UNM	10,529.98	2.01%	7.00%	9.08%	0.04%	12.00%	14.13%	0.05%
UNION PACIFIC CORP	UNP	104,261.12	2.08%	11.95%	14.15%	0.44%	11.00%	13.19%	0.48%
UNITED PARCEL SERVICE-CL B	UPS	90,172.84	3.38%	15.04%	18.67%	0.38%	8.50%	12.02%	0.42%
UNITED RENTALS INC	URI	14,537.21	0.00%	17.76%	17.76%	0.06%	10.00%	10.00%	0.07%
US BANCORP	USB	83,366.96	2.55%	8.03%	10.69%	0.35%	7.00%	9.64%	0.39%
UNITED TECHNOLOGIES CORP	UTX	100,666.84	2.31%	10.80%	13.23%	0.42%	8.00%	10.40%	0.47%
VISA INC-CLASS A SHARES	V	246,481.58	0.69%	17.57%	18.32%	1.04%	11.50%	12.23%	1.15%
VARIAN MEDICAL SYSTEMS INC	VAR	11,197.98	0.00%	11.25%	11.25%	0.05%	10.00%	10.00%	0.05%
VF CORP	VFC	29,403.32	2.37%	7.00%	9.46%	0.12%	9.00%	11.48%	0.14%
VIACOM INC-CLASS B	VIAB	12,918.89	2.59%	6.99%	9.67%	0.05%	3.00%	5.63%	0.06%
VALERO ENERGY CORP	VLO	39,976.66	3.46%	7.46%	11.04%	0.17%	7.00%	10.58%	0.19%
VULCAN MATERIALS CO	VMC	15,110.18	0.95%	20.49%	21.54%	0.06%	18.00%	19.03%	0.07%
VORNADO REALTY TRUST	VNO	12,785.91	3.77%	6.41%	10.29%	0.05%	-0.50%	3.26%	0.06%
VERISK ANALYTICS INC	VRSK	17,162.14	0.00%	12.11%	12.11%	0.07%	9.50%	9.50%	0.08%
VERISIGN INC	VRSN	11,514.61	0.00%	9.90%	9.90%	0.05%	10.50%	10.50%	0.05%
VERTEX PHARMACEUTICALS INC	VRTX	41,379.32	0.00%	62.61%	62.61%	0.17%	N/A	N/A	N/A
VENTAS INC	VTR	17,641.89	6.41%	3.16%	9.68%	0.07%	N/A	N/A	N/A
VERIZON COMMUNICATIONS INC	VZ	197,256.33	5.00%	2.42%	7.48%	0.83%	4.00%	9.10%	0.92%
WATERS CORP	WAT	15,553.03	0.00%	9.01%	9.01%	0.07%	11.00%	11.00%	0.07%
WALGREENS BOOTS ALLIANCE INC	WBA	64,924.35	2.50%	11.17%	13.81%	0.27%	12.00%	14.65%	0.30%
WESTERN DIGITAL CORP	WDC	27,455.89	2.20%	14.08%	16.43%	0.12%	10.50%	12.81%	0.13%
WEC ENERGY GROUP INC	WEC	19,784.28	3.52%	3.09%	6.67%	0.08%	7.00%	10.64%	0.09%
WELLTOWER INC	WELL	20,246.20	6.39%	5.27%	11.83%	0.09%	N/A	N/A	N/A
WELLS FARGO & CO	WFC	255,556.03	3.13%	10.66%	13.95%	1.08%	5.00%	8.21%	1.19%
WHIRLPOOL CORP	WHR	10,823.73	3.07%	12.07%	15.32%	0.05%	8.00%	11.19%	0.05%
WILLIS TOWERS WATSON PLC	WLTW	20,121.98	1.52%	10.00%	11.60%	0.08%	N/A	N/A	N/A
WASTE MANAGEMENT INC	WM	36,371.68	2.16%	13.52%	15.82%	0.15%	9.50%	11.77%	0.17%
WILLIAMS COS INC	WMB	20,567.36	5.49%	-13.30%	-8.17%	0.09%	17.50%	23.47%	0.10%
WALMART INC	WMT	263,563.08	2.37%	5.74%	8.18%	1.11%	5.50%	7.94%	1.23%
WESTROCK CO	WRK	16,371.51	2.69%	5.20%	7.96%	0.07%	9.00%	11.81%	0.08%
WESTERN UNION CO	WU	8,857.44	3.87%	4.46%	8.41%	0.04%	6.00%	9.99%	0.04%
WEYERHAEUSER CO	WY	26,463.42	3.70%	14.05%	18.01%	0.11%	21.50%	25.60%	0.12%

WYNDHAM WORLDWIDE CORP	WYN	11,411.36	2.23%	19.50%	21.95%	0.05%	8.00%	10.32%	0.05%
WYNN RESORTS LTD	WYNN	19,778.24	1.60%	N/A	N/A	N/A	14.00%	15.71%	0.09%
CIMAREX ENERGY CO	XEC	8,923.46	0.45%	65.19%	65.78%	0.04%	27.50%	28.01%	0.04%
XCEL ENERGY INC	XEL	23,106.80	3.35%	5.81%	9.26%	0.10%	4.50%	7.93%	0.11%
XL GROUP LTD	XL	14,236.86	1.68%	20.45%	22.30%	0.06%	11.50%	13.28%	0.07%
XILINX INC	XLNX	18,407.85	1.94%	8.53%	10.56%	0.08%	7.50%	9.51%	0.09%
EXXON MOBIL CORP	XOM	316,157.05	4.25%	8.92%	13.36%	1.33%	9.00%	13.44%	1.47%
DENTSPLY SIRONA INC	XRAY	11,438.89	0.72%	10.00%	10.75%	0.05%	8.50%	9.25%	0.05%
XEROX CORP	XRX	7,329.50	3.65%	1.00%	4.67%	0.03%	4.50%	8.23%	0.03%
XYLEM INC	XYL	13,839.27	1.09%	18.00%	19.19%	0.06%	14.00%	15.17%	0.06%
YUM! BRANDS INC	YUM	28,306.84	1.58%	12.13%	13.81%	0.12%	7.50%	9.14%	0.13%
ZIMMER BIOMET HOLDINGS INC	ZBH	22,151.14	0.93%	6.58%	7.54%	0.09%	6.50%	7.46%	0.10%
ZIONS BANCORPORATION	ZION	10,362.20	1.85%	10.10%	12.04%	0.04%	15.50%	17.49%	0.05%
ZOETIS INC	ZTS	40,523.54	0.61%	14.11%	14.76%	0.17%	13.00%	13.65%	0.19%
Total Market Capitalization:		23,924,548			14.59%			15.63%	
W/ Bloomberg Growth Est.:		23,760,733							
W/ Value Line Growth Est.:		21,503,561							

Notes:

[1] Equals sumproduct of Cols. [9] x [10], and Cols. [12] x [13]

[2] Source: Bloomberg Professional

[3] Source: Blue Chip Financial Forecasts, Vol. 37, No. 4, April 1, 2018, at 2. (6 quarters ending August 2019)

[4] Equals [1] - [2]

[5] Equals [1] - [3]

[6] Source: Bloomberg Professional

[7] Source: Bloomberg Professional

[8] Source: Bloomberg Professional

[9] Equals (([7] x (1 + (0.5 x [8]))) + [8])

[10] Equals weight in S&P 500 based on market capitalization, excluding N/As

[11] Source: Value Line

[12] Equals (([7] x (1 + (0.5 x [11]))) + [11])

[13] Equals weight in S&P 500 based on market capitalization, excluding N/As

Value Line and Bloomberg Beta Coefficients

Company	Ticker	[1]	[2]
		Value Line	Bloomberg
Atmos Energy Corporation	ATO	0.70	0.60
Black Hills Corporation	BKH	0.90	0.63
Chesapeake Utilities	CPK	0.70	0.75
New Jersey Resources Corporation	NJR	0.75	0.78
Northwest Natural Gas Company	NWN	0.65	0.63
One Gas Inc	OGS	0.70	0.68
Southwest Gas	SWX	0.75	0.83
Spire Inc	SR	0.65	0.54
Vectren Corporation	VVC	0.75	0.45
Mean		0.73	0.65

Notes:

[1] Source: Value Line

[2] Source: Bloomberg Professional Service

Capital Asset Pricing Model Results

	[1]	[2]	[3]	[4]	[5]	[6]
					CAPM Result	
	Risk-Free Rate	Average Beta Coefficient	Bloomberg Market DCF Derived	Value Line Market DCF Derived	Bloomberg Market DCF Derived	Value Line Market DCF Derived
VALUE LINE BETA COEFFICIENT						
Current 30-Year Treasury (30-day average) [7]	3.11%	0.728	11.48%	12.51%	11.47%	12.22%
Near-Term Projected Treasury Yield [8]	3.52%	0.728	11.08%	12.11%	11.58%	12.33%
BLOOMBERG BETA COEFFICIENT						
Current 30-Year Treasury (30-day average) [7]	3.11%	0.655	11.48%	12.51%	10.63%	11.31%
Near-Term Projected Treasury Yield [8]	3.52%	0.655	11.08%	12.11%	10.77%	11.45%

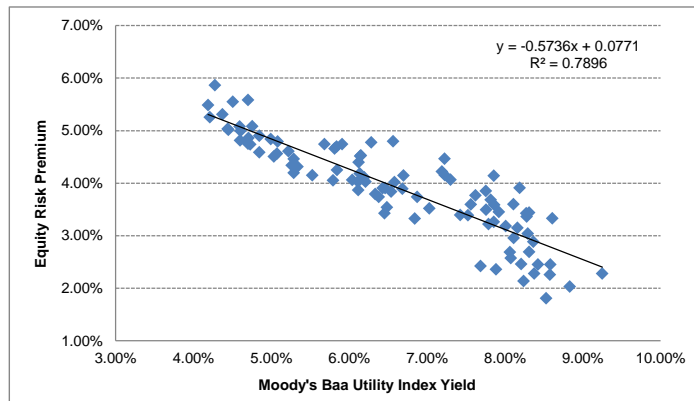
Summary of Results	
Mean:	11.47%
Minimum:	10.63%
Maximum:	12.33%

Notes:

- [1] See Notes [7], [8]
 [2] Source: Schedule KM-R5
 [3] Source: Schedule KM-R4
 [4] Source: Schedule KM-R4
 [5] Equals Col. [1] + (Col. [2] x Col. [3])
 [6] Equals Col. [1] + (Col. [2] x Col. [4])
 [7] Source: Bloomberg Professional
 [8] Source: Blue Chip Financial Forecasts, Vol. 37, No. 4, April 1, 2018, at 2. (6 quarters ending August 2019)

Bond Yield Plus Risk Premium

Scenario	[1] Moody's Baa Constant	[2] Moody's Baa Slope	[3] Baa Utility Bond Yield	[4] Risk Premium	[5] Return on Equity
Current Utility Bond Yield	7.71%	-0.574	4.51%	5.13%	9.63%
Near-Term Projected Utility Bond Yield	7.71%	-0.574	5.26%	4.69%	9.95%
Long-Term Projected Utility Bond Yield	7.71%	-0.574	6.28%	4.11%	10.39%



Notes:

- [1] Constant of regression equation
- [2] Slope of regression equation
- [3] Projected yields = Current yield + projected change in corporate Baa bond yields
Sources: Current = Bloomberg Professional (30-day average);
Near Term Projected = Blue Chip Financial Forecasts, Vol. 37, No. 4, April 1, 2018, at 2;
Long Term Projected = Blue Chip Financial Forecasts, Vol. 36, No. 12, December 1, 2017, at 14
- [4] Equals [1] + [3] x [2]
- [5] Equals [3] + [4]
- [6] Source: SNL Financial (excludes quarters without rate case activity)
- [7] Source: SNL Financial
- [8] Source: Bloomberg Professional
- [9] Equals [7] - [8]
- [10] Source: SNL Financial

	[6]	[7]	[8]	[9]	[10]	
Date of Natural Gas Rate Case	Return on Equity	Moody's Baa Utility Bond Yield	Moody's Baa Risk Premium	Moody's A Utility Bond Yield	A Risk Premium	Number of Cases
1992 Q4	11.94%	8.61%	3.33%	8.36%	3.58%	15
1993 Q1	11.75%	8.31%	3.44%	8.06%	3.69%	4
1993 Q2	11.71%	8.11%	3.60%	7.80%	3.91%	6
1993 Q3	11.39%	7.62%	3.77%	7.27%	4.12%	12
1993 Q4	11.16%	7.56%	3.59%	7.22%	3.93%	18
1994 Q1	11.12%	7.86%	3.26%	7.56%	3.56%	5
1994 Q2	10.84%	8.58%	2.26%	8.29%	2.54%	4
1994 Q3	10.87%	8.83%	2.03%	8.50%	2.37%	3
1994 Q4	11.53%	9.25%	2.28%	8.86%	2.66%	12
1995 Q2	11.00%	8.31%	2.69%	7.91%	3.09%	1
1995 Q3	11.07%	8.11%	2.95%	7.72%	3.35%	3
1995 Q4	11.61%	7.76%	3.85%	7.38%	4.22%	9
1996 Q1	11.45%	7.86%	3.59%	7.44%	4.01%	2
1996 Q2	10.88%	8.42%	2.45%	7.97%	2.90%	6
1996 Q3	11.25%	8.37%	2.88%	7.96%	3.29%	2
1996 Q4	11.19%	8.01%	3.18%	7.62%	3.57%	7
1997 Q1	11.31%	8.16%	3.15%	7.77%	3.54%	7
1997 Q2	11.70%	8.27%	3.43%	7.88%	3.82%	1
1997 Q3	12.00%	7.86%	4.14%	7.48%	4.52%	1
1997 Q4	10.92%	7.53%	3.39%	7.25%	3.66%	3
1998 Q2	11.37%	7.30%	4.07%	7.11%	4.25%	3
1998 Q3	11.41%	7.19%	4.22%	6.99%	4.42%	3
1998 Q4	11.69%	7.23%	4.46%	6.97%	4.73%	4
1999 Q1	10.82%	7.43%	3.39%	7.12%	3.70%	3
1999 Q2	11.25%	7.76%	3.49%	7.48%	3.77%	1

1999 Q4	10.38%	8.24%	2.13%	8.05%	2.33%	2
2000 Q1	10.66%	8.38%	2.28%	8.29%	2.36%	2
2000 Q2	11.03%	8.58%	2.45%	8.46%	2.58%	3
2000 Q3	11.33%	8.30%	3.04%	8.20%	3.13%	5
2000 Q4	12.10%	8.19%	3.91%	8.04%	4.06%	3
2001 Q1	11.38%	7.92%	3.45%	7.73%	3.64%	2
2001 Q2	10.75%	8.06%	2.69%	7.93%	2.82%	1
2001 Q4	10.65%	8.08%	2.57%	7.67%	2.98%	2
2002 Q1	10.67%	8.21%	2.46%	7.65%	3.01%	3
2002 Q2	11.64%	8.28%	3.36%	7.50%	4.14%	4
2002 Q3	11.50%	7.82%	3.68%	7.19%	4.31%	3
2002 Q4	11.01%	7.79%	3.22%	7.15%	3.86%	9
2003 Q1	11.38%	7.23%	4.15%	6.93%	4.45%	5
2003 Q2	11.36%	6.57%	4.80%	6.39%	4.97%	4
2003 Q3	10.61%	6.87%	3.74%	6.64%	3.98%	5
2003 Q4	10.84%	6.70%	4.14%	6.35%	4.49%	11
2004 Q1	11.06%	6.28%	4.78%	6.08%	4.98%	5
2004 Q2	10.57%	6.68%	3.89%	6.47%	4.10%	3
2004 Q3	10.37%	6.46%	3.91%	6.13%	4.24%	8
2004 Q4	10.66%	6.14%	4.52%	5.95%	4.70%	6
2005 Q1	10.65%	5.91%	4.74%	5.75%	4.90%	2
2005 Q2	10.54%	5.84%	4.70%	5.52%	5.01%	5
2005 Q3	10.47%	5.81%	4.66%	5.51%	4.96%	5
2005 Q4	10.32%	6.14%	4.18%	5.82%	4.50%	14
2006 Q1	10.68%	6.15%	4.53%	5.86%	4.82%	5
2006 Q2	10.60%	6.58%	4.02%	6.37%	4.23%	1
2006 Q3	10.34%	6.43%	3.91%	6.19%	4.15%	4
2006 Q4	10.14%	6.11%	4.03%	5.87%	4.28%	5
2007 Q1	10.52%	6.12%	4.40%	5.90%	4.62%	11
2007 Q2	10.13%	6.34%	3.79%	6.08%	4.04%	3
2007 Q3	10.03%	6.49%	3.54%	6.22%	3.80%	8
2007 Q4	10.12%	6.38%	3.74%	6.08%	4.04%	13
2008 Q1	10.38%	6.54%	3.84%	6.14%	4.23%	7
2008 Q2	10.17%	6.84%	3.32%	6.31%	3.85%	3
2008 Q3	10.55%	7.03%	3.52%	6.42%	4.13%	9
2008 Q4	10.34%	8.53%	1.81%	7.21%	3.13%	13
2009 Q1	10.24%	7.88%	2.36%	6.37%	3.87%	4
2009 Q2	10.11%	7.69%	2.42%	6.39%	3.72%	8
2009 Q3	9.88%	6.45%	3.43%	5.74%	4.14%	2
2009 Q4	10.31%	6.19%	4.11%	5.66%	4.65%	16
2010 Q1	10.24%	6.21%	4.03%	5.83%	4.41%	9
2010 Q2	9.99%	6.12%	3.87%	5.59%	4.39%	11
2010 Q3	10.43%	5.68%	4.74%	5.09%	5.33%	6
2010 Q4	10.09%	5.84%	4.25%	5.35%	4.74%	13
2011 Q1	10.10%	6.04%	4.06%	5.60%	4.50%	5
2011 Q2	9.85%	5.79%	4.05%	5.37%	4.47%	4
2011 Q3	9.65%	5.34%	4.31%	4.80%	4.85%	2
2011 Q4	9.88%	5.08%	4.79%	4.37%	5.51%	4
2012 Q1	9.63%	5.07%	4.56%	4.39%	5.24%	5
2012 Q2	9.83%	4.99%	4.84%	4.23%	5.60%	8
2012 Q3	9.75%	4.85%	4.90%	3.98%	5.77%	1
2012 Q4	10.06%	4.51%	5.55%	3.92%	6.14%	20
2013 Q1	9.57%	4.71%	4.86%	4.18%	5.39%	3
2013 Q2	9.47%	4.73%	4.74%	4.22%	5.24%	6
2013 Q3	9.60%	5.26%	4.34%	4.74%	4.86%	1
2013 Q4	9.83%	5.22%	4.61%	4.76%	5.07%	11
2014 Q1	9.54%	5.03%	4.51%	4.56%	4.98%	6
2014 Q2	9.84%	4.75%	5.08%	4.32%	5.52%	8
2014 Q3	9.45%	4.70%	4.75%	4.20%	5.25%	6
2014 Q4	10.28%	4.70%	5.58%	4.03%	6.25%	6
2015 Q1	9.47%	4.45%	5.02%	3.67%	5.80%	3
2015 Q2	9.43%	4.85%	4.59%	4.10%	5.33%	3
2015 Q3	9.75%	5.29%	4.46%	4.34%	5.41%	1
2015 Q4	9.68%	5.53%	4.15%	4.35%	5.33%	9
2016 Q1	9.48%	5.29%	4.20%	4.18%	5.31%	6
2016 Q2	9.42%	4.60%	4.81%	3.90%	5.52%	6
2016 Q3	9.47%	4.21%	5.25%	3.61%	5.86%	4
2016 Q4	9.67%	4.59%	5.08%	4.04%	5.63%	9
2017 Q1	9.60%	4.60%	5.00%	4.18%	5.42%	3
2017 Q2	9.47%	4.44%	5.03%	4.06%	5.41%	7
2017 Q3	10.14%	4.28%	5.86%	3.91%	6.23%	6
2017 Q4	9.68%	4.19%	5.49%	3.85%	5.83%	8
2018 Q1	9.68%	4.37%	5.31%	4.02%	5.66%	2

Average Risk Premium: 3.92%
Total Number of Rate Cases: 561

Expected Earnings Analysis - Proxy Group

Company	Ticker	[1] Five-Year Projected Expected ROE	[2] Projected Common Shares 2018	[3] Five-Year Projected Common Shares	[4] Projected BPS 2018	[5] Five-Year Projected BPS	[6] Book Value Growth Rate	[7] Adjusted ROE
Atmos Energy Corporation	ATO	11.00%	114.00	130.00	42.10	46.55	5.97%	11.34%
Black Hills Corporation	BKH	10.50%	60.25	61.00	35.00	40.00	4.98%	10.77%
Chesapeake Utilities Corporation	CPK	11.50%	17.00	20.00	30.70	36.75	8.94%	12.04%
New Jersey Resources Corporation	NJR	13.00%	86.50	86.50	15.95	22.70	9.22%	13.63%
Northwest Natural Gas Company	NWN	11.00%	29.50	30.00	30.45	30.85	0.75%	11.04%
One Gas Inc	OGS	9.00%	52.50	55.00	38.40	43.40	4.31%	9.20%
Southwest Gas Corporation	SWX	8.50%	49.00	53.00	39.80	58.50	12.29%	9.06%
Spire Inc	SR	9.50%	48.50	50.00	43.75	53.50	5.96%	9.79%
Vectren Corporation	VVC	12.50%	83.50	86.00	23.60	29.05	6.11%	12.89%
								11.08%
								11.04%

Expected Earnings Analysis - Value Line Gas Universe

Company	Ticker	[1] Five-Year Projected Expected ROE	[2] Projected Common Shares 2018	[3] Five-Year Projected Common Shares	[4] Projected BPS 2018	[5] Five-Year Projected BPS	[6] Book Value Growth Rate	[7] Adjusted ROE
Atmos Energy Corporation	ATO	11.00%	114.00	130.00	42.10	46.55	5.97%	11.34%
Chesapeake Utilities Corporation	CPK	11.50%	17.00	20.00	30.70	36.75	8.94%	12.04%
New Jersey Resources Corporation	NJR	13.00%	86.50	86.50	15.95	22.70	9.22%	13.63%
NiSource Inc.	NI	12.00%	340.00	350.00	13.65	15.00	3.13%	12.19%
Northwest Natural Gas Company	NWN	11.00%	29.50	30.00	30.45	30.85	0.75%	11.04%
One Gas Inc	OGS	9.00%	52.50	55.00	38.40	43.40	4.31%	9.20%
South Jersey Industries Inc	SJI	11.00%	81.00	85.00	16.35	20.00	6.44%	11.37%
Southwest Gas Corporation	SWX	8.50%	49.00	53.00	39.80	58.50	12.29%	9.06%
Spire Inc	SR	9.50%	48.50	50.00	43.75	53.50	5.96%	9.79%
UGI Corporation	UGI	11.50%	173.00	173.00	19.65	26.95	8.22%	11.99%
WGL Holdings, Inc.	WGL	11.00%	53.00	55.00	32.95	43.10	7.94%	11.45%
								11.19%
								11.37%

Notes:

[1] Source: Value Line

[2] Source: Value Line

[3] Source: Value Line

[4] Source: Value Line

[5] Source: Value Line

[6] Equals $(([3] \times [5]) / ([2] \times [4]))^{(1/3)-1}$ or $([3] \times [5]) / ([2] \times [4])^{(1/4)-1}$, depending on the 5-year projection period

[7] Equals $[1] \times (1 / (1 - 0.5 \times [6]))$

Proxy Group Capital Structure - Current

Company	Ticker	% Common Equity								Average
		2017Q4	2017Q3	2017Q2	2017Q1	2016Q4	2016Q3	2016Q2	2016Q1	
Atmos Energy Corporation	ATO	59.80%	55.97%	55.99%	59.92%	59.06%	58.68%	58.54%	57.66%	58.20%
Black Hills Corporation	BKH	35.43%	35.07%	34.62%	34.23%	33.42%	33.28%	33.14%	31.91%	33.89%
Chesapeake Utilities Corporation	CPK	70.16%	68.49%	68.36%	75.61%	74.95%	73.80%	70.88%	70.35%	71.57%
New Jersey Resources Corporation	NJR	53.59%	51.55%	54.23%	54.25%	51.34%	51.10%	54.46%	58.51%	53.63%
Northwest Natural Gas Company	NWN	48.78%	52.07%	54.58%	54.86%	54.17%	56.69%	57.35%	57.57%	54.51%
ONE Gas, Inc.	OGS	62.16%	61.82%	61.84%	61.98%	61.29%	60.97%	61.14%	61.04%	61.53%
Southwest Gas Holdings, Inc.	SWX	49.87%	49.36%	50.05%	51.89%	50.97%	49.74%	52.67%	53.47%	51.00%
Spire Inc.	SR	49.33%	48.73%	51.30%	49.44%	46.45%	46.06%	49.49%	47.76%	48.57%
Vectren Corporation	VVC	50.14%	50.13%	51.14%	51.09%	50.78%	50.25%	49.82%	49.62%	50.37%
Mean		53.25%	52.58%	53.57%	54.81%	53.60%	53.40%	54.16%	54.21%	53.70%
Median		50.14%	51.55%	54.23%	54.25%	51.34%	51.10%	54.46%	57.57%	53.63%

Company	Ticker	% Long-Term Debt								Average
		2017Q4	2017Q3	2017Q2	2017Q1	2016Q4	2016Q3	2016Q2	2016Q1	
Atmos Energy Corporation	ATO	40.20%	44.03%	44.01%	40.08%	40.94%	41.32%	41.46%	42.34%	41.80%
Black Hills Corporation	BKH	64.57%	64.93%	65.38%	65.77%	66.58%	66.72%	66.86%	68.09%	66.11%
Chesapeake Utilities Corporation	CPK	29.84%	31.51%	31.64%	24.39%	25.05%	26.20%	29.12%	29.65%	28.43%
New Jersey Resources Corporation	NJR	46.41%	48.45%	45.77%	45.75%	48.66%	48.90%	45.54%	41.49%	46.37%
Northwest Natural Gas Company	NWN	51.22%	47.93%	45.42%	45.14%	45.83%	43.31%	42.65%	42.43%	45.49%
ONE Gas, Inc.	OGS	37.84%	38.18%	38.16%	38.02%	38.71%	39.03%	38.86%	38.96%	38.47%
Southwest Gas Holdings, Inc.	SWX	50.13%	50.64%	49.95%	48.11%	49.03%	50.26%	47.33%	46.53%	49.00%
Spire Inc.	SR	50.67%	51.27%	48.70%	50.56%	53.55%	53.94%	50.51%	52.24%	51.43%
Vectren Corporation	VVC	49.86%	49.87%	48.86%	48.91%	49.22%	49.75%	50.18%	50.38%	49.63%
Mean		46.75%	47.42%	46.43%	45.19%	46.40%	46.60%	45.84%	45.79%	46.30%
Median		49.86%	48.45%	45.77%	45.75%	48.66%	48.90%	45.54%	42.43%	46.37%

Source: SNL Financial

Proxy Group Capital Structure - Value Line Projections

% Common Equity		
Company	Ticker	Five-Year Projected
Atmos Energy Corporation	ATO	55.00%
Black Hills Corporation	BKH	39.50%
Chesapeake Utilities Corporation	CPK	70.00%
New Jersey Resources Corporation	NJR	62.00%
Northwest Natural Gas Company	NWN	54.00%
ONE Gas, Inc.	OGS	62.00%
Southwest Gas Holdings, Inc.	SWX	58.50%
Spire Inc.	SR	51.00%
Vectren Corporation	VVC	53.00%
Mean		56.11%
Median		55.00%

% Long-Term Debt		
Company	Ticker	Five-Year Projected
Atmos Energy Corporation	ATO	45.00%
Black Hills Corporation	BKH	60.50%
Chesapeake Utilities Corporation	CPK	30.00%
New Jersey Resources Corporation	NJR	38.00%
Northwest Natural Gas Company	NWN	46.00%
ONE Gas, Inc.	OGS	38.00%
Southwest Gas Holdings, Inc.	SWX	41.50%
Spire Inc.	SR	49.00%
Vectren Corporation	VVC	45.50%
Mean		43.72%
Median		45.00%

Source: Value Line as of March 29, 2018

Flotation Cost Adjustment

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

Company	Date	Shares Issued	Offering Price	Underwriting Discount	Offering Expense	Net Proceeds Per Share	Total Flotation Costs	Gross Equity Issue Before Costs	Net Proceeds	Flotation Cost Percent
Algonquin Power & Utilities Corp.	11/25/2015	16,508,250	\$10.45	\$0.4180	\$500,000	\$10.00	\$7,400,449	\$172,511,213	\$165,110,764	4.290%
Algonquin Power & Utilities Corp.	12/2/2014	10,055,000	\$9.95	\$0.3980	\$700,000	\$9.48	\$4,701,890	\$100,047,250	\$95,345,360	4.700%
Atmos Energy Corporation	11/28/2017	4,558,404	\$88.56	NA	NA	NA	NA	NA	NA	NA
Atmos Energy Corporation	2/11/2014	9,200,000	\$44.00	\$1.5400	\$350,000	\$42.42	\$14,518,000	\$404,800,000	\$390,282,000	3.586%
Black Hills Corp.	11/19/2015	6,325,000	\$40.25	\$1.4088	\$1,200,000	\$38.65	\$10,110,344	\$254,581,250	\$244,470,906	3.971%
Black Hills Corp.	12/7/2010	4,413,519	\$29.75	\$1.0413	\$276,650	\$28.65	\$4,872,227	\$131,302,190	\$126,429,964	3.711%
Chesapeake Utilities Corporation	9/22/2016	960,488	\$62.26	\$2.3300	\$157,000	\$59.77	\$2,394,937	\$59,799,983	\$57,405,046	4.005%
Chesapeake Utilities Corporation	11/16/2006	690,345	\$30.10	\$1.1250	\$225,000	\$28.65	\$1,001,638	\$20,779,385	\$19,777,746	4.820%
Northwest Natural Gas Company	11/10/2016	1,012,000	\$54.63	\$2.0500	\$250,000	\$52.33	\$2,324,600	\$55,285,560	\$52,960,960	4.205%
Northwest Natural Gas Company	3/30/2004	1,290,000	\$31.00	\$1.0100	\$175,000	\$29.85	\$1,477,900	\$39,990,000	\$38,512,100	3.696%
Spire Inc.	5/13/2016	2,185,000	\$63.05	\$2.0491	\$300,000	\$60.86	\$4,777,284	\$137,764,250	\$132,986,967	3.468%
Spire Inc.	6/5/2014	10,350,000	\$46.25	\$1.7113	\$1,000,000	\$44.44	\$18,711,438	\$478,687,500	\$459,976,063	3.909%
Vectren Corporation	2/20/2007	5,290,000	\$28.33	\$0.9900	\$425,000	\$27.26	\$5,662,100	\$149,865,700	\$144,203,600	3.778%
Vectren Corporation	7/31/2003	7,475,000	\$22.81	\$0.7980	\$300,000	\$21.97	\$6,265,050	\$170,504,750	\$164,239,700	3.674%
Mean							\$6,478,297	\$167,378,387		
							WEIGHTED AVERAGE FLOTATION COSTS:		3.870%	

Discounted Cash Flow Model Adjustment for Flotation Costs - 30 Day Average Stock Price

Company	Ticker	[1]	[2]
		Expected Dividend Yield	Dividend Yield Adjusted for Flot. Costs
Atmos Energy Corporation	ATO	2.48%	2.58%
Black Hills Corporation	BKH	3.73%	3.88%
Chesapeake Utilities	CPK	1.94%	2.01%
Northwest Natural Gas Company	NWN	3.50%	3.64%
One Gas Inc	OGS	2.90%	3.02%
Southwest Gas	SWX	3.15%	3.27%
Spire Inc	SR	3.38%	3.52%
Vectren Corporation	VVC	2.98%	3.10%
PROXY GROUP MEAN		3.01%	3.13%

Dividend Yield Adjusted For Flotation Costs: 3.13%
 Dividend Yield Unadjusted For Flotation Costs: 3.01%
 Difference (Flotation Cost Adjustment): 0.12% [3]

Notes:

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

[1] Source: Schedule KM-R1

[2] Equals [1] / (1 - 0.0387)

[3] Equals average [2] - average [1]

5-Year Average Operating Utility Capital Structure - Murray Proxy Group

Utility	Parent	2016Y	2015Y	2014Y	2013Y	2012Y	
EQUITY (EXCLUDING PREFERRED)							
Atmos Energy Corporation	ATO	3,724,404	3,292,249	2,637,707	2,235,379	2,021,627	
Northwest Natural Gas Company	NWN	852,400	782,369	772,058	756,085	733,034	
Oklahoma Natural Gas Company	OGS	700,288	664,236	711,388	500,317	450,950	
Mobile Gas Service Corporation	SR	79,891	78,320	78,155	73,614	68,246	
Willmut Gas & Oil Company	SR	10,722	11,693	10,696	9,488	8,760	
Spire Alabama Inc.	SR	867,318	874,580	849,647	364,739	353,762	
Spire Missouri Inc.	SR	1,068,487	1,037,879	1,007,827	973,930	491,329	
Southwest Gas Corporation	SWX	1,667,880	1,593,186	1,490,121	1,414,523	1,310,179	
LONG-TERM DEBT							
Atmos Energy Corporation	ATO	2,580,816	2,455,474	2,455,131	1,955,750	1,956,376	
Northwest Natural Gas Company	NWN	686,700	576,700	601,700	641,700	651,700	
Oklahoma Natural Gas Company	OGS	426,797	431,805	483,311	354,307	354,313	
Mobile Gas Service Corporation	SR	62,000	62,000	62,000	62,000	62,000	
Willmut Gas & Oil Company	SR	9,408	7,169	7,086	6,492	4,695	
Spire Alabama Inc.	SR	250,000	170,000	249,810	249,973	250,103	
Spire Missouri Inc.	SR	808,338	808,130	807,921	887,712	339,416	
Southwest Gas Corporation	SWX	1,381,712	1,375,970	1,426,389	1,350,219	1,211,227	
EQUITY RATIO							
Atmos Energy Corporation	ATO	59.07%	57.28%	51.79%	53.34%	50.82%	<u>Average</u> 54.46%
Northwest Natural Gas Company	NWN	55.38%	57.57%	56.20%	54.09%	52.94%	55.24%
Oklahoma Natural Gas Company	OGS	62.13%	60.60%	59.55%	58.54%	56.00%	59.36%
Mobile Gas Service Corporation	SR	56.30%	55.82%	55.76%	54.28%	52.40%	54.91%
Willmut Gas & Oil Company	SR	53.26%	61.99%	60.15%	59.37%	65.11%	59.98%
Spire Alabama Inc.	SR	77.62%	83.73%	77.28%	59.33%	58.58%	71.31%
Spire Missouri Inc.	SR	56.93%	56.22%	55.50%	52.32%	59.14%	56.02%
Southwest Gas Corporation	SWX	54.69%	53.66%	51.09%	51.16%	51.96%	52.51%
						Mean:	57.97%
						Median:	55.63%
						Minimum:	52.51%
						Maximum:	71.31%

Notes

Includes natural gas and diversified operating utilities with five years of data available

Excludes companies with 100% equity financing

Source: LDC filings, as reported by SNL Financial

Authorized ROEs and Equity Ratios - Murray Proxy Group

Company	Ticker	Utility	Jurisdiction	ROE	Equity Ratio	Date	
Atmos Energy Corporation	ATO	Atmos Energy Corp.	Colorado	9.60%	52.00%	1/1/2016	[1]
Atmos Energy Corporation	ATO	Atmos Energy Corp.	Kansas	NA	NA	3/17/2016	
Atmos Energy Corporation	ATO	Atmos Energy Corp.	Kentucky	NA	NA	8/4/2016	
Atmos Energy Corporation	ATO	Atmos Energy Corp.	Louisiana - Trans La	9.80%	53.00%	4/1/2017	[1]
Atmos Energy Corporation	ATO	Atmos Energy Corp.	Louisiana - LGS	9.80%	53.00%	7/1/2017	[1]
Atmos Energy Corporation	ATO	Atmos Energy Corp.	Mississippi	9.73%	53.00%	1/12/2017	[1]
Atmos Energy Corporation	ATO	Atmos Energy Corp.	Tennessee	9.80%	53.00%	6/1/2017	[1]
Atmos Energy Corporation	ATO	Atmos Energy Corp. Mid-Tex Cities	Texas	10.50%	55.00%	6/1/2017	[1]
Atmos Energy Corporation	ATO	Atmos Energy Corp. Mid-Tex Dallas	Texas	10.10%	59.00%	6/1/2017	[1]
Atmos Energy Corporation	ATO	Atmos Energy Corp. West Texas	Texas	10.50%	NA	3/15/2017	[1]
Atmos Energy Corporation	ATO	Atmos Energy Corp.	Virginia	NA	NA	11/7/2016	[1]
Northwest Natural Gas Company	NWN	Northwest Natural Gas Co.	Oregon	9.50%	50.00%	10/26/2012	
Northwest Natural Gas Company	NWN	Northwest Natural Gas Co.	Washington	10.10%	50.74%	12/26/2008	
ONE Gas Inc.	OGS	Kansas Gas Service Co.	Kansas	NA	NA	11/29/2016	
ONE Gas Inc.	OGS	Oklahoma Natural Gas Co	Oklahoma	NA	NA	8/9/2017	
ONE Gas Inc.	OGS	Texas Gas Service Co.	Texas	NA	NA	11/15/2016	
Spire Inc	SR	Alabama Gas Corp.	Alabama	10.80%	56.50%	12/20/2013	[2], [3]
Spire Inc	SR	Laclede Gas Co.	Missouri	NA	NA	6/26/2013	
Spire Inc	SR	Missouri Gas Energy	Missouri	9.80%	54.16%	2/21/2018	
Spire Inc	SR	Mobile Gas Service Corp	Alabama	10.80%	56.00%	8/9/2013	[2], [4]
Southwest Gas	SWX	Southwest Gas Corp.	Arizona	9.50%	51.70%	4/11/2017	
Southwest Gas	SWX	Southwest Gas Corp.	California	10.10%	55.00%	6/12/2014	
Southwest Gas	SWX	Southwest Gas Corp. (Northern)	Nevada	9.30%	59.06%	10/31/2012	
Southwest Gas	SWX	Southwest Gas Corp. (Southern)	Nevada	10.00%	42.74%	10/31/2012	
				Mean:	9.98%	53.37%	
				Median:	9.80%	53.00%	

Notes:

Source: Regulatory Research Associates, unless otherwise noted

[1] Atmos Energy Corporation SEC Form 10-K, September 30, 2017, at 8

[2] Spire Inc. SEC Form 10-K, September 30, 2017, at 42-43

[3] Alabama Public Service Commission, Docket Nos. 18046 and 18328, Order on December 20, 2013

[4] Alabama Public Service Commission, Docket No. 28101, Order on August 9, 2013

Regulated Natural Gas Utilities - Implied Cost of Debt

State	Utility	Docket	Date	Decision Type	Rate of Return	ROE	Equity Ratio	Implied Cost of Debt
New York	Consolidated Edison Co. of NY	C-16-G-0061	1/24/2017	Settled	6.82%	9.00%	48.00%	4.81%
Georgia	Atlanta Gas Light Co.	D-40828	2/21/2017	Settled	NA	10.55%	51.00%	NA
District of Columbia	Washington Gas Light Co.	FC-1137	3/1/2017	Fully Litigated	7.57%	9.25%	55.70%	5.46%
Virginia	Columbia Gas of Virginia Inc	C-PUE-2016-00033	3/17/2017	Settled	NA	NA	NA	NA
Arizona	Southwest Gas Corp.	D-G-01551A-16-0107	4/11/2017	Settled	7.42%	9.50%	51.70%	5.19%
New York	National Fuel Gas Dist Corp.	C-16-G-0257	4/20/2017	Fully Litigated	6.92%	8.70%	42.90%	5.58%
Idaho	Intermountain Gas Co.	C-INT-G-16-2	4/28/2017	Fully Litigated	7.30%	9.50%	50.00%	5.10%
California	Pacific Gas and Electric Co.	A-15-09-001 (Gas)	5/11/2017	Settled	NA	NA	NA	NA
Texas	CenterPoint Energy Resources	D-GUD-10567	5/23/2017	Settled	8.02%	9.60%	55.15%	6.08%
Delaware	Delmarva Power & Light Co.	D-16-0650	6/6/2017	Settled	NA	9.70%	NA	NA
Kentucky	Louisville Gas & Electric Co.	C-2016-00371 (gas)	6/22/2017	Settled	NA	9.70%	NA	NA
New Jersey	Pivotal Utility Holdings Inc.	D-GR-16090826	6/30/2017	Settled	6.71%	9.60%	46.00%	4.25%
Montana	NorthWestern Corp.	D-D2016.9.68	7/20/2017	Settled	6.96%	9.55%	46.79%	4.68%
Michigan	Consumers Energy Co.	C-U-18124	7/31/2017	Fully Litigated	5.97%	10.10%	41.27%	3.07%
Oklahoma	Oklahoma Natural Gas Co	Ca-PUD201700079	8/9/2017	Settled	NA	NA	NA	NA
Wisconsin	Wisconsin Electric Power Co.	D-5-UR-108 (WEP-Gas)	8/10/2017	Settled	NA	NA	NA	NA
Wisconsin	Wisconsin Gas LLC	D-5-UR-108 (WG)	8/10/2017	Settled	NA	NA	NA	NA
Wisconsin	Wisconsin Public Service Corp.	D-6690-UR-125 (Gas)	8/10/2017	Settled	NA	NA	NA	NA
Pennsylvania	UGI Penn Natural Gas	D-R-2016-2580030	8/31/2017	Settled	NA	NA	NA	NA
Arkansas	CenterPoint Energy Resources	D-17-010-FR	9/6/2017	Settled	4.58%	NA	31.02%	NA
Virginia	Washington Gas Light Co.	C-PUE-2016-00001	9/8/2017	Settled	NA	NA	NA	NA
Oregon	Avista Corp.	D-UG 325	9/13/2017	Settled	7.35%	9.40%	50.00%	5.30%
Maryland	Columbia Gas of Maryland Inc	C-9447	9/19/2017	Settled	7.35%	9.70%	NA	NA
Alaska	ENSTAR Natural Gas Co.	D-U-16-066	9/22/2017	Fully Litigated	8.59%	11.88%	51.81%	5.05%
South Carolina	Piedmont Natural Gas Co.	D-2017-7-G	9/27/2017	Settled	7.60%	10.20%	53.00%	4.67%
South Carolina	South Carolina Electric & Gas	D-2017-6-G	9/27/2017	Fully Litigated	8.15%	NA	52.16%	NA
Oklahoma	CenterPoint Energy Resources	Ca-PUD201700078	10/19/2017	Fully Litigated	NA	NA	NA	NA
New Jersey	South Jersey Gas Co.	D-GR-17010071	10/20/2017	Settled	6.80%	9.60%	52.50%	3.71%
California	San Diego Gas & Electric Co.	Advice No. 2611-G	10/26/2017	Settled	7.55%	10.20%	52.00%	4.68%
California	Southern California Gas Co.	Advice No. 5192	10/30/2017	Settled	7.34%	10.05%	52.00%	4.40%
Virginia	Washington Gas Light Co.	C-PUR-2017-00102 (SAVE)	11/21/2017	Fully Litigated	7.35%	9.50%	59.63%	4.17%
Washington	Puget Sound Energy Inc.	D-UG-170034	12/5/2017	Settled	7.60%	9.50%	48.50%	5.81%
Wisconsin	Northern States Power Co - WI	D-4220-UR-123 (Gas)	12/7/2017	Fully Litigated	7.56%	9.80%	51.45%	5.19%
Connecticut	Southern Connecticut Gas Co.	D-17-05-42	12/13/2017	Settled	7.42%	9.25%	52.19%	5.42%
Virginia	Virginia Natural Gas Inc.	C-PUE-2016-00143	12/21/2017	Settled	NA	NA	NA	NA
Idaho	Avista Corp.	C-AVU-G-17-01	12/28/2017	Settled	7.61%	9.50%	50.00%	5.72%
Illinois	Northern Illinois Gas Co.	D-17-0124	1/31/2018	Fully Litigated	7.26%	9.80%	52.00%	4.51%
Missouri	Missouri Gas Energy	C-GR-2017-0216	2/21/2018	Fully Litigated	7.20%	9.80%	54.16%	4.13%
Missouri	Spire Missouri Inc.	C-GR-2017-0215	2/21/2018	Fully Litigated	7.20%	9.80%	54.16%	4.13%
Maine	Northern Utilities Inc.	D-2017-00065	2/28/2018	Fully Litigated	7.53%	9.50%	50.00%	5.56%
New York	Niagara Mohawk Power Corp.	C-17-G-0239	3/15/2018	Settled	6.53%	9.00%	48.00%	4.25%
Florida	Pivotal Utility Holdings Inc.	20170179-GU	3/26/2018	Settled	NA	10.19%	48.00%	NA
				Mean:	7.22%	9.71%	50.04%	4.84%
				Fully Litigated mean:	7.38%	9.78%	51.27%	4.72%
				Mean (excluding AR/MI):			51.07%	4.91%
				Fully Litigated mean (excluding AR/MI):			52.18%	4.89%

Source: Regulatory Research Associates. Excludes limited-issue riders.

Effect of Murray's Proposed Leverage on ROE
CAPM Estimate Using Hamada Equation

CALCULATIONS AND ASSUMPTIONS		NOTES
Tax Rate	21.00%	Corporate tax rate under the Tax Cut and Jobs Act
Starting Equity Ratio	54.20%	Spire's equity ratio in Case No. GR-2017-0216
Starting D/E Ratio	0.85	(1 - Current Equity Ratio) / Current Equity Ratio
Adjusted Equity Ratio	40.94%	Murray Schedule 13
Adjusted D/E Ratio	1.44	(1 - Adjusted Equity Ratio) / Adjusted Equity Ratio
Sector Equity Beta	0.68	Murray Schedule 12
Sector Asset Beta (unlevered)	0.41	Equals Equity Beta / (1 + (1 - Tax Rate) * Current D/E Ratio)
Check: Re-Lever Beta	0.68	Equals Asset Beta x (1 + Starting D/E Ratio * (1 - Tax Rate))
Re-Levered Beta at 40.94% Equity	0.87	Equals Asset Beta x (1 + New D/E Ratio * (1 - Tax Rate))
Difference in Re-Levered Beta	0.19	Equals Re-Levered Equity Beta - Sector Equity Beta
Assumed MRP	10.26%	Implied MRP assuming Spire's 9.80% ROE, and Murray's 2.82% risk-free rate and 0.68 beta
Cost of Equity Effect	1.98%	Equals Difference in Re-Levered Beta x MRP

Notes:

Hamada's Equation:

$$B_a = \frac{B_e}{(1 + (1 - T) \times \frac{D}{E})}$$

or, rearranged:

$$B_e = B_a \times (1 + (1 - T) \times \frac{D}{E})$$

Where:

B_a = Asset Beta
 B_e = Equity Beta
 T = Tax Rate
 D/E = Debt/Equity Ratio

Growth Rate Regression Analysis

Company	Ticker	Median P/E Ratio	Proj. Earnings Growth Rate	Proj. Dividend Growth Rate	Proj. Book Value Growth Rate	Past 10 Year Earnings Growth Rate	Past 10 Year Dividend Growth Rate	Past 10 Year Book Value Growth Rate	Past 5 Year Earnings Growth Rate	Past 5 Year Dividend Growth Rate	Past 5 Year Book Value Growth Rate
Atmos Energy Corporation	ATO	16.00	7.50%	7.00%	5.50%	6.00%	3.00%	5.00%	9.00%	4.50%	6.00%
Chesapeake Utilities Corporation	CPK	15.00	6.50%	5.00%	6.50%	9.00%	4.00%	9.00%	9.00%	5.50%	8.50%
Spire Inc	SR	16.00	9.00%	4.00%	5.50%	4.00%	3.50%	7.50%	4.00%	4.00%	9.00%
New Jersey Resources Corporation	NJR	16.00	9.50%	4.00%	9.00%	7.00%	7.50%	7.00%	5.50%	6.50%	8.00%
NiSource Inc.	NI	20.00	18.00%	9.00%	3.00%	-5.00%	-2.50%	-4.00%	-10.50%	-5.00%	-7.00%
Northwest Natural Gas Company	NWN	19.00	7.00%	2.50%	1.00%	--	3.50%	3.00%	-4.50%	2.00%	2.00%
ONE Gas, Inc.	OGS	NMF	8.00%	12.00%	3.00%	-	-	-	-	-	-
South Jersey Industries, Inc.	SJI	18.00	6.50%	4.00%	4.50%	4.00%	9.00%	8.00%	1.50%	8.50%	9.00%
Southwest Gas Corporation	SWX	17.00	7.50%	7.00%	8.50%	6.50%	7.00%	5.50%	6.50%	10.00%	5.50%
UGI Corporation	UGI	16.00	6.50%	3.00%	8.00%	6.50%	7.50%	9.00%	9.00%	7.00%	7.00%
WGL Holdings, Inc.	WGL	16.00	6.50%	2.50%	8.00%	4.50%	3.50%	3.50%	6.00%	4.50%	2.50%
ALLETE, Inc.	ALE	16.00	4.50%	4.50%	4.00%	1.50%	3.50%	6.00%	5.50%	3.00%	6.00%
Alliant Energy Corporation	LNT	15.00	6.50%	6.00%	5.00%	5.00%	7.50%	4.00%	6.50%	6.50%	4.50%
Ameren Corporation	AEE	15.00	7.50%	4.50%	4.00%	-1.00%	-4.00%	-1.00%	0.50%	2.00%	-1.00%
American Electric Power Company, Inc.	AEP	14.00	4.50%	5.00%	4.50%	3.00%	4.00%	4.00%	5.50%	4.50%	4.00%
Avangrid, Inc.	AGR	NMF	NMF	NMF	NMF	-	-	-	-	-	-
Avista Corporation	AVA	16.00	4.00%	4.00%	3.00%	6.50%	9.50%	4.00%	3.50%	6.50%	4.50%
Black Hills Corporation	BKH	18.00	7.50%	6.00%	5.00%	3.50%	2.50%	2.50%	11.00%	2.50%	1.50%
CenterPoint Energy, Inc.	CNP	15.00	-0.50%	2.00%	7.50%	1.50%	7.00%	6.00%	-	7.00%	-0.50%
CMS Energy Corporation	CMS	16.00	8.50%	7.00%	6.50%	10.00%	-	4.00%	7.00%	8.50%	5.00%
Consolidated Edison, Inc.	ED	15.00	3.00%	3.50%	3.50%	3.50%	1.50%	4.00%	2.50%	2.00%	3.50%
Dominion Energy Inc.	D	19.00	7.00%	8.50%	6.00%	5.00%	7.00%	2.50%	3.00%	7.00%	1.50%
DTE Energy Company	DTE	15.00	6.50%	6.50%	5.00%	6.00%	4.00%	4.00%	6.00%	6.00%	4.00%
Duke Energy Corporation	DUK	17.00	4.50%	4.50%	1.50%	3.50%	-	-0.50%	0.50%	2.50%	3.00%
Edison International	EIX	12.00	4.00%	9.00%	4.00%	5.50%	6.00%	5.50%	5.00%	6.50%	2.50%
El Paso Electric Company	EE	15.00	5.00%	7.00%	4.00%	9.50%	-	8.00%	2.00%	-	7.00%
Energy Corporation	ETR	12.00	5.00%	2.00%	3.00%	1.50%	4.00%	2.00%	-2.50%	1.00%	-1.00%
Exelon Corporation	EXC	15.00	6.00%	4.50%	5.50%	-4.00%	-2.00%	7.00%	-11.50%	-10.00%	6.00%
FirstEnergy Corp.	FE	16.00	9.00%	1.50%	Nil	-6.00%	-2.50%	-1.00%	-10.00%	-8.00%	-3.50%
Great Plains Energy Inc.	GXP	17.00	NMF	5.50%	-1.00%	-6.50%	-4.50%	3.50%	-6.50%	4.50%	2.00%
Hawaiian Electric Industries, Inc.	HE	18.00	1.50%	2.00%	3.50%	2.50%	-	2.50%	9.00%	-	3.00%
IDACORP, Inc.	IDA	14.00	3.50%	7.00%	4.00%	7.00%	5.00%	5.00%	5.50%	10.00%	5.50%
MGE Energy, Inc.	MGEE	17.00	6.00%	5.00%	7.50%	6.00%	2.50%	6.00%	6.00%	3.50%	6.00%
NextEra Energy, Inc.	NEE	16.00	8.50%	9.50%	6.50%	8.00%	8.50%	8.00%	5.00%	9.00%	7.50%
Eversource Energy	ES	17.00	6.50%	6.00%	4.00%	12.00%	9.50%	6.00%	6.00%	10.50%	8.50%
NorthWestern Corporation	NWE	16.00	4.50%	5.00%	4.00%	-	9.50%	5.00%	7.00%	6.00%	8.00%
OGE Energy Corp.	OGE	15.00	2.50%	8.00%	4.00%	4.50%	5.50%	7.50%	1.00%	8.50%	6.50%
Otter Tail Corporation	OTTR	24.00	7.00%	3.50%	6.50%	-0.50%	1.00%	-	21.50%	1.00%	1.00%
PG&E Corporation	PCG	17.00	8.50%	3.00%	5.50%	1.00%	8.00%	5.00%	-2.00%	1.00%	3.50%
Pinnacle West Capital Corporation	PNW	15.00	5.50%	5.50%	4.00%	3.50%	2.50%	2.00%	6.50%	3.00%	4.00%
PNM Resources, Inc.	PNM	18.00	7.50%	9.00%	2.00%	-0.50%	1.00%	1.00%	11.50%	10.50%	2.50%
Portland General Electric Company	POR	15.00	6.00%	6.00%	4.00%	7.00%	13.50%	3.00%	5.50%	3.00%	3.50%
PPL Corporation	PPL	13.00	NMF	3.50%	NMF	2.00%	4.50%	3.00%	4.50%	1.50%	--
Public Service Enterprise Group Incorporated	PEG	13.00	2.00%	5.00%	4.50%	6.00%	3.50%	7.50%	-0.50%	3.00%	6.00%
SCANA Corporation	SCG	14.00	-0.50%	-5.50%	6.00%	4.00%	3.50%	5.00%	6.00%	3.00%	5.50%
Sempra Energy	SRE	15.00	7.50%	8.50%	2.00%	2.00%	9.50%	7.00%	1.00%	11.00%	5.00%
Southern Company	SO	16.00	4.00%	3.50%	2.50%	3.00%	4.00%	5.00%	3.00%	3.50%	4.00%
Vectren Corporation	VVC	17.00	6.50%	6.50%	5.50%	4.00%	3.00%	3.00%	7.00%	3.00%	3.50%
Westar Energy, Inc.	WR	16.00	7.50%	4.00%	3.00%	4.00%	5.00%	4.50%	7.00%	3.00%	4.00%
WEC Energy Group, Inc.	WEC	16.00	6.00%	6.00%	3.50%	7.50%	15.50%	8.50%	5.50%	14.00%	10.50%
Xcel Energy Inc.	XEL	15.00	4.50%	6.00%	4.00%	5.00%	4.00%	4.50%	6.00%	5.00%	4.50%

Notes:

Source: Value Line Reports as of March 29, 2018.

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.44708
R Square	0.19988
Adjusted R Square	0.18210
Standard Error	1.81814
Observations	47

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	37.16129	37.16129	11.24180	0.00163
Residual	45	148.75360	3.30564		
Total	46	185.91489			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	14.18449	0.61436	23.08828	0.00000	12.94711	15.42187
Projected EPS Growth	30.96774	9.23616	3.35288	0.00163	12.36515	49.57033

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.08415
R Square	0.00708
Adjusted R Square	-0.01404
Standard Error	2.03487
Observations	49

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	1.38808	1.38808	0.33523	0.56536
Residual	47	194.61192	4.14068		
Total	48	196.00000			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	15.66748	0.64369	24.34019	0.00000	14.37255	16.96241
Projected DPS Growth	6.60992	11.41627	0.57899	0.56536	-16.35666	29.57651

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.01684
R Square	0.00028
Adjusted R Square	-0.02193
Standard Error	2.03718
Observations	47

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	0.05300	0.05300	0.01277	0.91053
Residual	45	186.75552	4.15012		
Total	46	186.80851			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	15.98613	0.74908	21.34102	0.00000	14.47740	17.49485
Projected BVPS Growth	1.68297	14.89314	0.11300	0.91053	-28.31335	31.67928

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.22943
R Square	0.05264
Adjusted R Square	0.03159
Standard Error	1.98312
Observations	47

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	9.83362	9.83362	2.50043	0.12082
Residual	45	176.97489	3.93278		
Total	46	186.80851			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	16.38287	0.40432	40.51913	0.00000	15.56852	17.19722
Past 10yr EPS Growth	-11.76180	7.43818	-1.58127	0.12082	-26.74307	3.21947

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.13971
R Square	0.01952
Adjusted R Square	-0.00328
Standard Error	2.08095
Observations	45

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	3.70675	3.70675	0.85600	0.36002
Residual	43	186.20436	4.33033		
Total	44	189.91111			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	16.28124	0.46920	34.70015	0.00000	15.33502	17.22747
Past 10yr DPS Growth	-7.02924	7.59753	-0.92520	0.36002	-22.35111	8.29263

SUMMARY OUTPUT

Regression Statistics						
Multiple R		0.28339				
R Square		0.08031				
Adjusted R Square		0.06032				
Standard Error		1.61631				
Observations		48				

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	10.49371	10.49371	4.01680	0.05096
Residual	46	120.17295	2.61246		
Total	47	130.66667			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	16.60682	0.45097	36.82504	0.00000	15.69907	17.51456
Past 10yr BVPS Growth	-17.10932	8.53675	-2.00420	0.05096	-34.29290	0.07427

SUMMARY OUTPUT

Regression Statistics						
Multiple R		0.20500				
R Square		0.04202				
Adjusted R Square		0.02120				
Standard Error		2.01508				
Observations		48				

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	8.19369	8.19369	2.01787	0.16220
Residual	46	186.78548	4.06055		
Total	47	194.97917			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	15.74340	0.35034	44.93730	0.00000	15.03820	16.44860
Past 5yr EPS Growth	7.17892	5.05373	1.42052	0.16220	-2.99371	17.35154

SUMMARY OUTPUT

Regression Statistics						
Multiple R		0.07267				
R Square		0.00528				
Adjusted R Square		-0.01682				
Standard Error		2.05464				
Observations		47				

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	1.00866	1.00866	0.23893	0.62735
Residual	45	189.97007	4.22156		
Total	46	190.97872			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	16.12835	0.42839	37.64839	0.00000	15.26552	16.99118
Past 5yr DPS Growth	-3.30938	6.77036	-0.48881	0.62735	-16.94558	10.32681

SUMMARY OUTPUT

Regression Statistics						
Multiple R		0.21793				
R Square		0.04750				
Adjusted R Square		0.02679				
Standard Error		1.96679				
Observations		48				

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	8.87271	8.87271	2.29372	0.13674
Residual	46	177.93979	3.86826		
Total	47	186.81250			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	16.61465	0.46207	35.95735	0.00000	15.68456	17.54474
Past 5yr BVPS Growth	-13.12045	8.66320	-1.51450	0.13674	-30.55857	4.31767

AFFIDAVIT OF KEITH MAGEE


COMMONWEALTH OF MASSACHUSETTS)
) ss
COUNTY OF WORCESTER)

On the 12 day of April, 2018, before me appeared Keith Magee, to me personally known, who, being by me first duly sworn, states that he is a director at ScottMadden, inc. and acknowledges that he has read the above and foregoing document and believes that the statements therein are true and correct to the best of his information, knowledge and belief.



Keith Magee

Subscribed and sworn to before me this 12 day of April, 2018.



Notary Public

My commission expires: March 11, 2022

