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Sponsoring Party: Liberty Utilities  
Case No.: WR-2018-0170  
Date Testimony Prepared: August 7, 2018

**BEFORE THE PUBLIC SERVICE COMMISSION  
OF THE STATE OF MISSOURI**

**SURREBUTTAL TESTIMONY**

**OF**

**KEITH MAGEE**

**SCOTTMADDEN, INC.**

**SUBMITTED ON BEHALF OF**

**LIBERTY UTILITIES (MISSOURI WATER) LLC  
d/b/a LIBERTY UTILITIES**

**AUGUST 2018**



**Liberty Utilities**

Exhibit No. 4  
Date 8-16-18 Reporter TM  
File No. WR-2018-0170

SURREBUTTAL TESTIMONY  
OF  
KEITH MAGEE  
LIBERTY UTILITIES (MISSOURI WATER) LLC.  
BEFORE THE  
MISSOURI PUBLIC SERVICE COMMISSION  
CASE NO. WR-2018-0170

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**I. WITNESS IDENTIFICATION**

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

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

**Q. ON WHOSE BEHALF ARE YOU SUBMITTING THIS TESTIMONY?**

A. I am submitting this surrebuttal testimony (“Surrebuttal Testimony”) before the Missouri Public Service Commission (“Commission”) on behalf of Liberty Utilities (Missouri Water) LLC (“Liberty Water” or “Company”), an indirect wholly owned subsidiary of Algonquin Power & Utilities Corp. (“Algonquin”).

**Q. PLEASE SUMMARIZE YOUR EDUCATIONAL AND PROFESSIONAL EXPERIENCE.**

A. I hold a Bachelor’s degree in Economics from Whitman College, and an MBA with a concentration in Finance from the F.W. Olin Graduate School of Business at Babson College. I also hold the professional designation of Chartered Financial Analyst (“CFA”) awarded by the CFA Institute, and the professional designation of Certified Rate of Return Analyst (“CRRA”) awarded by the Society of Utility and Regulatory Financial Analysts.

As a consultant in the utility and energy industry, I have provided consulting services on a range of financial and economic issues including areas such as rate case

1 activities (e.g., cost of capital, cost of service, financial reporting filing requirements and  
2 rate design) and policy and strategy issues (e.g., capital investment related activities).  
3 Many of my engagements have included developing cost of capital analyses and  
4 testimony. A summary of my professional and educational background is included in  
5 Attachment A to my Direct Testimony.

6 **Q. HAVE YOU PREVIOUSLY SUBMITTED TESTIMONY BEFORE THIS**  
7 **COMMISSION?**

8 A. Yes, I have. I submitted testimony in Case No. GR-2018-0013 on behalf of Liberty  
9 Utilities (Midstates Natural Gas) Corp., d/b/a Liberty Utilities.

10

11 **II. PURPOSE OF SURREBUTTAL TESTIMONY**

12 **Q. WHAT IS THE PURPOSE OF YOUR SURREBUTTAL TESTIMONY?**

13 A. In her direct testimony, Company witness Schwartz attached a copy of my direct  
14 testimony from Case No. GR-2018-0013 (“Liberty Midstates Direct Testimony”) in  
15 support of the Company’s proposed 10.25 percent ROE and 53.00 percent equity ratio.  
16 The purpose of my Surrebuttal Testimony is to respond to certain portions of the rebuttal  
17 testimonies filed by Mr. Dave Murray on behalf of the Staff of the Missouri Public  
18 Service Commission and Mr. William Stannard on behalf of Silverleaf Resorts, Inc. and  
19 Orange Lake Country Club as they relate to the Company’s ROE<sup>1</sup> and capital structure.  
20 My analyses and conclusions are supported by the data presented in Schedules KM-S1  
21 through Schedule KM-S12, which have been prepared by me or under my direction.

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<sup>1</sup> Throughout my Direct Testimony, I interchangeably use the terms “ROE” and “cost of equity.”

1 Q. HOW IS THE REMAINDER OF YOUR SURREBUTTAL TESTIMONY  
2 ORGANIZED?

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

4 Section III – Provides a summary and overview of my Surrebuttal Testimony;

5 Section IV – Provides my response to Mr. Murray regarding the Company’s cost of  
6 capital and capital structure;

7 Section V – Provides my response to Mr. Stannard regarding the Company’s cost of  
8 capital;

9 Section VI – Summarizes my conclusions and recommendations.

10 III. SUMMARY AND OVERVIEW OF SURREBUTTAL TESTIMONY

11 Q. PLEASE SUMMARIZE THE KEY RECOMMENDATIONS AND  
12 CONCLUSIONS ADDRESSED IN YOUR SURREBUTTAL TESTIMONY.

13 A. My primary recommendations and conclusions are:

14 • I agree with Staff and the Company that the cost of capital developed for Liberty  
15 Midstates is reasonable and appropriate for Liberty Water.

16 • Updating the ROE and capital structure analysis from my recent Liberty  
17 Midstates testimony continues to support an ROE range of 9.90 percent to 10.35  
18 percent (with a point estimate of 10.25 percent) and a capital structure consisting  
19 of 53.00 percent equity and 47.00 percent long-term debt, which are the same  
20 ROE and capital structure I recommended for Liberty Midstates in Case No. GR-  
21 2018-0013.

22 • Mr. Murray’s recommended 42.83 percent equity ratio is unreasonably low  
23 relative to the capital structures in place at the proxy group companies and the

1 universe of water companies covered by Value Line, which have mean equity  
2 ratios of 53.64 percent and 54.66 percent, respectively (*see* Schedule KM-S9).  
3 Mr. Murray's recommendation is also well below Value Line's near-term  
4 projected capital structures for those companies (*see* Table 2, below).

- 5 • The unreasonableness of Mr. Murray's 42.83 percent recommended equity ratio is  
6 also demonstrated by the fact that the average authorized water utility equity ratio  
7 reported by Regulatory Research Associates for January through June 2018 was  
8 53.85 percent.<sup>2</sup>
- 9 • Adoption of an equity ratio as low as the one proposed by Mr. Murray would  
10 serve to increase the Company's total risk by decreasing cashflow (which is a key  
11 component of financial integrity and credit metrics) and reducing investor  
12 confidence in the regulatory support for the Company's operations. The  
13 increased overall risk would imply a significantly higher cost of equity.
- 14 • In Case No. GR-2018-0013 Mr. Murray based his recommendation on the 9.80  
15 percent ROE and 54.20 percent equity ratio recently authorized for Spire  
16 Missouri. The 20 basis point ROE premium Mr. Murray recommends to account  
17 for an equity ratio that is 11.37 percentage points lower than Spire Missouri's  
18 recently authorized equity ratio does not sufficiently compensate equity holders  
19 for the increased risk they face from a significant increase in financial leverage.
- 20 • Assuming an equity ratio consistent with the proxy group average, I find Mr.  
21 Murray's 10.00 percent ROE recommendation reasonable; it falls within my  
22 recommended ROE range of 9.90 percent to 10.35 percent.

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<sup>2</sup> Regulatory Research Associates Water Advisory, Major Rate Case Decisions, January – June 2018, at 1.

- 1           • Mr. Stannard’s 7.97 percent ROE recommendation is unduly low relative to  
2           authorized returns for other utilities. His recommendation relies on a single ROE  
3           model, and is based on a method that has consistently produced ROE estimates  
4           more than 100 basis points below average authorized returns since at least 2012.
- 5           • Other approaches to estimating the Company’s cost of equity, including the  
6           Discounted Cash Flow (“DCF”), Capital Asset Pricing Model (“CAPM”) and  
7           expected earnings approach demonstrate the reasonableness of my ROE  
8           recommendation (*see* Schedules KM-S1 through KM-S8).
- 9           • Mr. Stannard’s suggestion that Liberty Water is less risky because the Company  
10          is a subsidiary of a larger publicly-traded company is misplaced. Individual  
11          projects and business operations have their own cost of capital. The salient issue  
12          for determining Liberty Water’s required ROE is the size of the Company and the  
13          risks it faces. Duff & Phelps, the source of Mr. Stannard’s risk premium data, for  
14          example, notes size risk premiums apply to business segments and subsidiaries.  
15          Duff & Phelps provides a size risk premium of 5.58 percent for the micro-cap  
16          decile in which the Company would fall – however, Mr. Stannard did not account  
17          for that risk premium in his ROE analyses.
- 18          • Lastly, estimating the cost of capital is a risk-comparable exercise. Mr. Stannard  
19          did not fully consider the prevalence of straight-fixed variable rate designs,  
20          decoupling, infrastructure riders, future test years and other rate mechanisms  
21          available to utilities when suggesting my recommended ROE is unreasonable.

1 **IV. RESPONSE TO REBUTTAL TESTIMONY OF STAFF WITNESS MURRAY**

2 **Q. PLEASE SUMMARIZE MR. MURRAY’S REBUTTAL TESTIMONY.**

3 A. Mr. Murray agrees with Company witness Schwartz’ that it is reasonable to apply the  
4 Rate of Return (“ROR”) recently developed for Liberty Midstates for purposes of setting  
5 the ROR for Liberty Water in this proceeding.<sup>3</sup> Mr. Murray, therefore, recommends a  
6 10.00 percent ROE and a 42.83 percent equity ratio for Liberty Water,<sup>4</sup> which are the  
7 same recommendations he made for Liberty Midstates in Case No. GR-2018-0013.<sup>5</sup>

8 However, Mr. Murray also notes that Staff and the Company did not agree on the  
9 specific parameters of ROE and capital structure in the Liberty Midstates case.<sup>6</sup> With  
10 regard to capital structure, Mr. Murray’s 42.83 percent common equity recommendation  
11 is based on his estimate of the capital structure for Liberty Utilities Company (“LUCo”)  
12 as of December 31, 2017.<sup>7</sup>

13 **Q. DO YOU AGREE THAT THE ROE AND CAPITAL STRUCTURE**  
14 **RECOMMENDATIONS RECENTLY DEVELOPED FOR LIBERTY**  
15 **MIDSTATES ARE APPROPRIATE FOR LIBERTY WATER IN THIS**  
16 **PROCEEDING?**

17 A. Yes, I do. As Mr. Murray notes, gas utilities and water utilities generally have similar  
18 business risk profiles.<sup>8</sup> As shown in Table 1 below, the proxy group I used in the Liberty  
19 Midstates case has business and financial risk characteristics generally comparable to the

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<sup>3</sup> Substitute Rebuttal Testimony of David Murray, at 1-2.  
<sup>4</sup> Staff Review and Audit of Liberty Utilities (Missouri Water). LLC (Water) d/b/a Liberty Utilities, June 22, 2018, at 2.  
<sup>5</sup> See, Missouri Public Service Commission, Case No. GR-2018-0013, Rebuttal Testimony of David Murray, at 2.  
<sup>6</sup> Substitute Rebuttal Testimony of David Murray, at 2.  
<sup>7</sup> Substitute Rebuttal Testimony of David Murray, at 3.  
<sup>8</sup> Substitute Rebuttal Testimony of David Murray, at 2.



1 universe of 11 water utility companies covered by Value Line (*see* Table 1 below).<sup>9</sup>

2 **Table 1: Business and Financial Risk Measures Comparison**<sup>10</sup>

	Beta Coefficient	S&P Corporate Credit Rating	2018 Common Equity Ratio
Magee gas proxy group	0.70	A- / A	52.50%
Value Line water companies	0.75	A	55.00%

3  
4 The water utilities covered by Value Line are investor-owned companies with  
5 water distribution operations, and range in size from approximately \$200 million to  
6 \$15.80 billion.<sup>11</sup>

7 **Q. IS IT REASONABLE TO ASSUME, AS MR. MURRAY HAS DONE, THAT**  
8 **LUCO'S CONSOLIDATED CAPITAL STRUCTURE REFLECTS AN**  
9 **APPROPRIATE REGULATORY CAPITAL STRUCTURE FOR LIBERTY**  
10 **WATER?**

11 **A.** No, it is not. LUCo is an intermediate holding company, and its capital structure will  
12 change over time as it pursues its own strategic corporate initiatives and priorities.  
13 LUCo's consolidated capital structure has, and likely will continue to, reflect business  
14 activities, such as mergers and acquisitions, that are not directly germane to Liberty  
15 Water's operations or financing. Even if LUCo's business focus were solely on operating  
16 its existing diverse regulated utility portfolio, its capital structure will not necessarily be

<sup>9</sup> Beta coefficient is the measure of company-specific risk used in the Capital Asset Pricing Model, and it reflects the volatility of a company's stock price as well as its sensitivity to fluctuations in the overall stock market.

<sup>10</sup> Median values. *See* Schedule KM-S10. Sources: Value Line (beta coefficient and common equity ratio) and Standard & Poor's Market Intelligence (credit rating).

<sup>11</sup> Source: Value Line. The companies include (1) Artesian Resources Corp., (2) American Water Works, (3) American States Water Co, (4) Connecticut Water Services Inc, (5) Consolidated Water, (6) California Water Service Group, (7) Global Water Resources Inc, (8) Middlesex Water Co, (9) SJW Group, (10) Aqua America Inc, and (11) York Water Company.

1 an appropriate benchmark for Liberty Water’s capital structure.

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

3 A. LUCo is composed of over 30 water, gas and electric utilities that are regulated by 12  
4 different regulatory commissions. Liberty Water’s customers make up less than 1.00  
5 percent of the 762,000 customers served by LUCo.<sup>12</sup> Over time, Liberty Midstates  
6 regulatory capital structure should not be driven by the decisions of other commissions  
7 for other utilities, which may have been made under significantly different capital market  
8 circumstances or regulatory constructs. That is, using LUCo’s capital structure would  
9 potentially remove the capital structure from Missouri regulators’ hands. This was a  
10 concern that led in part to the Commission’s decision to adopt an operating company  
11 capital structure in Spire’s recent rate cases and I think it is equally applicable in this  
12 instance.<sup>13</sup>

13 **Q. IS IT REASONABLE TO ASSUME LUCO’S CAPITAL STRUCTURE**  
14 **REFLECTS THE FUNDS USED TO FINANCE LIBERTY WATER?**

15 A. No, it is not. The disconnect is plainly illustrated by the fact that the consolidated capital  
16 structure used by Mr. Murray includes debt such as Empire District Electric (“EDE”)  
17 First Mortgage bonds which were issued prior to the merger and specifically related to  
18 the financing of legacy Empire District Electric assets. A sizeable portion of the debt in  
19 LUCo’s capital structure is therefore not related to Liberty Water, and should not be used  
20 to set the Company’s regulatory capital structure.

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<sup>12</sup> Liberty Water has approximately 1,200 Missouri customers (see Direct Testimony of Jill Schwartz, at 9.) 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.

<sup>13</sup> See, Missouri Public Service Commission, Report and Order, Case Nos. GR-2017-0215 and GR-2017-0216, at 42 (Issued February 21, 2018).

1           Moreover, cash is fungible, which is to say it is not possible to trace a dollar of  
2 capital from source to ultimate use. Importantly, the cost of capital is a function of the  
3 risks and characteristics of the investment, in this case Liberty Water, not the source of  
4 the capital funding the investment.<sup>14</sup> As stated by Morningstar:

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

7  
8           The cost of capital is an opportunity cost. Some people consider  
9 the phrase 'opportunity cost of capital' to be more correct. The  
10 opportunity cost of an investment is the expected return that would  
11 be earned on the next best investment. In a competitive world with  
12 many investment choices, a given investment and the next best  
13 alternative have practically identical expected returns.<sup>15</sup>

14           The Company's cost of capital, therefore, should be assessed on a stand-alone basis, and  
15 reflect the risk and operational needs of Liberty Water's water distribution business. The  
16 proxy group's mean equity ratio is a reasonable benchmark of industry-established  
17 financing practices for companies with risk characteristics similar to Liberty Water.

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

22 **Q. HAVE YOU UPDATED THE CAPITAL STRUCTURE ANALYSIS YOU**  
23 **PERFORMED IN LIBERTY MIDSTATES RECENT RATE CASE?**

24 **A.** Yes, I have. Looking at the gas proxy company financing data reported by Standard &  
25 Poor's Market Intelligence, over the eight quarters ending Q1 2018 (the most recent data

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<sup>14</sup> 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.

<sup>15</sup> Morningstar, Inc., *Ibbotson SBBI 2013 Valuation Yearbook*, at 21-22.

1 available) the proxy group’s average equity ratio was 53.64 percent and average long-  
 2 term debt ratio was 47.06 percent. Over the same period, the Value Line universe of  
 3 water utilities’ average equity ratio was 54.11 percent and the average long-term debt  
 4 ratio was 45.89 percent over the same period.<sup>16</sup>

5 As shown in Table 2, Value Line equity ratio projections for the proxy companies  
 6 and for the water utility companies average between 52.50 percent and 57.00 percent (*see*  
 7 *also* Schedule KM-S9).

8 **Table 2: Value Line Projections - Capital Structure<sup>17</sup>**

	Common Equity Ratio		Long-Term Debt Ratio	
	2018	2021-23	2018	2021-23
Proxy Group (gas) - average	55.11%	56.06%	44.89%	43.94%
Proxy Group (gas) – median	52.50%	53.50%	47.50%	46.50%
Water Companies – average	55.45%	59.61%	44.55%	40.39%
Water Companies – median	57.00%	55.00%	43.00%	46.00%

9  
 10 **Q. BASED ON THOSE ANALYSES, DO YOU BELIEVE A 53.00 PERCENT**  
 11 **EQUITY RATIO IS APPROPRIATE FOR LIBERTY WATER?**

12 **A.** Yes, I do. My equity ratio recommendation of 53.00 percent for Liberty Midstates is also  
 13 reasonable and appropriate for Liberty Water based on the updated analysis discussed  
 14 above.

15 **Q. IS MR. MURRAY’S RECOMMENDED 42.83 PERCENT EQUITY RATIO**  
 16 **CONSISTENT WITH RELEVANT INDUSTRY BENCHMARKS?**

17 **A.** No, it is not. Mr. Murray’s proposed equity ratio is more than 10.00 percentage points

<sup>16</sup> Source: Bloomberg. Standard & Poor’s Market Intelligence standardized data was not available for the water utility companies.

<sup>17</sup> See Schedule KM-S9.

1 below the average equity ratios for both the proxy group and the Value Line water  
2 universe.

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

6 A. Increasing financial leverage (*i.e.*, the percentage of debt) increases financial risk which  
7 effects the cost of, and access to, capital. Authorizing a capital structure with  
8 significantly less equity than industry benchmarks (such as the equity ratios in place at  
9 the proxy companies) would also likely be seen as a negative regulatory outcome and  
10 therefore a sign of higher regulatory risk, which is a key component of investors'  
11 perception of business risk.<sup>18</sup> Ultimately, an increase in risk perception and a  
12 deterioration in financial strength can impair the utility's ability to attract capital and  
13 fulfill its service obligations at a reasonable cost.<sup>19</sup>

14 **Q. MR. MURRAY NOTES THAT IN LIBERTY MIDSTATES' 2014 RATE CASE**  
15 **(CASE NO. GR-2014-0152), THE COMMISSION ADOPTED LUCO'S CAPITAL**  
16 **STRUCTURE WHEN SETTING RATES FOR LIBERTY MIDSTATES.<sup>20</sup> WHY**  
17 **HAVE YOU NOT RECOMMENDED USING LUCO'S CAPITAL STRUCTURE**  
18 **IN THIS CASE?**

19 A. LUCo's capital structure is inconsistent with the industry benchmarks noted above. While  
20 the Commission authorized an equity ratio based on LUCo's *unadjusted* book capital

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<sup>18</sup> 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.  
<sup>19</sup> *Ibid.*, at 22.  
<sup>20</sup> Substitute Rebuttal Testimony of David Murray, at 3.

1 structure in Case No. GR-2014-0152, LUCo's characteristics and circumstances are not  
2 the same as they were at the time of the Company's last case. LUCo has been growing  
3 through acquisitions, and it is likely they will continue to do so. In 2017, LUCo  
4 completed the acquisition of Empire District Electric Company as well as additional  
5 smaller utilities including St. Lawrence Gas Company, Inc., Perris Water Distribution  
6 System, and Park Water System.<sup>21</sup> As discussed above, LUCo is now an intermediate  
7 holding company composed of approximately 30 electric, gas and water distribution  
8 utilities regulated across 12 jurisdictions. APUC has also noted that LUCo will continue  
9 to seek earnings growth through accretive acquisitions of additional utility systems.<sup>22</sup>  
10 This significant change in the number and location of the utilities owned by LUCo means  
11 that its capital structure is increasingly a function of the different financing practices and  
12 decisions of other utilities and regulatory commissions – a factor that the Commission  
13 cited in rejecting the use of a holding company's capital structure in the recent Spire case.

14 LUCo's assets have approximately tripled from the end of 2014. The majority of  
15 LUCo's current debt was not part of its, or its then-affiliated companies', capital  
16 structures at the time of Liberty Midstates 2014 rate case.<sup>23</sup> The equity ratio authorized  
17 in the Company's last case was somewhat low relatively to industry averages, but within  
18 the range of authorized equity ratios nationally. The 42.83 percent equity ratio proposed  
19 by Mr. Murray in this proceeding, however, is below the range of recently authorized  
20 water and natural gas utility equity ratios and is highly inconsistent with peer financing

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<sup>21</sup> Algonquin Power & Utilities Corp., 2017 Annual Report, at 81-83.

<sup>22</sup> Algonquin Power & Utilities Corp., 2017 Annual Report, at 4.

<sup>23</sup> Includes all debt assumed with the acquisition of Empire District Electric Company.

1 practices.<sup>24</sup>

2 **Q. HAVE YOU CONDUCTED ANY ANALYSIS TO DETERMINE THE**  
3 **INCREMENTAL RETURN ON EQUITY REQUIRED TO OFFSET THE**  
4 **HIGHER FINANCIAL RISK IMPLIED BY MR. MURRAY'S 42.83 PERCENT**  
5 **ROE RECOMMENDATION RELATIVE TO THE 54.20 PERCENT RATIO**  
6 **RECENTLY APPROVED FOR SPIRE MISSOURI?**<sup>25</sup>

7 A. Yes, I have. I used the Hamada Equation to determine the difference in cost of equity  
8 implied by the CAPM method.<sup>26</sup> The Hamada Equation reflects the increased risk from  
9 additional financial leverage by adjusting the beta component of the model. Using the  
10 risk-free rate and beta coefficient assumptions from my CAPM analysis, the Hamada  
11 Equation indicates a 11.37 percentage point reduction in equity ratio results in a 157 basis  
12 point increase in the required ROE (*see* Schedule KM-S11).

13 **Q. CAN YOU ILLUSTRATE THE INSUFFICIENCY OF MR. MURRAY'S**  
14 **PROPOSED 20 BASIS POINT ROE ADJUSTMENT RELATIVE TO HIS VERY**  
15 **LOW 42.83 PERCENT EQUITY RATIO RECOMMENDATION?**

16 A. Yes. One approach is to look at the effect on the overall rate of return. For illustrative  
17 purposes, combining the 9.80 percent ROE and 54.20 percent equity ratio recently  
18 authorized for Spire with Staff's recommended cost of debt of 4.65 percent results in an

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<sup>24</sup> Source: Regulatory Research Associates; based on authorized returns from January 1, 2018 through July 13, 2018.

<sup>25</sup> Mr. Murray notes his allowed ROE recommendation is 20 basis points higher than the Commission's allowed ROE of 9.80 percent for Spire Missouri to account for his more leverage capital structure recommendation. *See* Substitute Rebuttal Testimony of David Murray, at 3.

<sup>26</sup> Shannon P. Pratt, Robert F. Reilly, and Robert P. Schweihs, Valuing a Business, Fourth Edition, at 169.

1 after-tax rate of return of 7.44 percent.<sup>27</sup> That rate of return is only 8 basis points  
2 removed from the 7.52 mean authorized rate of return for 2018 shown in Table 7 (below).

3 Assuming Mr. Murray’s proposed 42.83 percent equity ratio, a 20 basis point  
4 ROE increase would result in a 6.94 percent rate of return – a decrease of 50 basis points  
5 from the benchmark scenario. As shown in Table 3 (below), an ROE of 11.16 percent  
6 would be necessary to achieve a 7.44 percent overall rate of return, which is a 136 basis  
7 point premium.

8 **Table 3: ROE and Equity Ratio Adjustments – Effect on Rate of Return**<sup>28</sup>

	<i>Benchmark Scenario: Spire ROE / Equity Ratio</i>	<i>Murray Equity Ratio &amp; ROE + 20bp</i>	<i>Murray Equity Ratio &amp; 11.16% ROE</i>
ROE	9.80%	10.00%	11.16%
Staff Cost of Debt	4.65%	4.65%	4.65%
Equity Ratio	54.20%	42.83%	42.83%
<b>Rate of Return</b>	<b>7.44%</b>	<b>6.94%</b>	<b>7.44%</b>

9 Mr. Murray’s 20 basis point ROE adder is clearly insufficient to offset the revenue effect  
10 of his lower recommended equity ratio. Moreover, to the extent investor confidence in  
11 the regulatory support for Liberty Midstates operations would be negatively affected by  
12 an equity ratio below industry norms, there would be upward pressure on the cost of  
13 capital suggesting a higher overall rate of return would be required. That is, the 136 basis  
14 point estimate likely understates the required incremental increase in ROE to offset such  
15 a low equity ratio.  
16

<sup>27</sup> See Staff Review and Audit of Liberty Utilities (Missouri Water). LLC (Water) d/b/a Liberty Utilities, June 22, 2018, at 2 for 4.65% cost of debt recommendation.

<sup>28</sup> After-tax rate of return = cost of equity x equity ratio + cost of debt x (1 – equity ratio).



1 Q. HAVE YOU UPDATED THE ROE ANALYSES PRESENTED IN YOUR  
2 LIBERTY MIDSTATES TESTIMONY?

3 A. Yes. I have updated my DCF (both constant growth and quarterly forms), CAPM, bond  
4 yield plus risk premium, and expected earnings analyses using data as of July 13, 2018. I  
5 rely on the same proxy companies, inputs and methodologies used in my Liberty  
6 Midstates rebuttal testimony.

7 Q. PLEASE SUMMARIZE YOUR UPDATED DCF MODEL RESULTS.

8 A. For the growth component, I use projected earnings growth rates from Zacks, First Call  
9 and Value Line and an estimate of Retention Growth. For the stock price component, I  
10 alternately use 30, 90, and 180-day average stock prices. Stock prices, analyst  
11 projections, and dividend payment data are as of July 13, 2018. See Schedules KM-S1  
12 and KM-S2.

13 Table 4: DCF Model Results<sup>29</sup>

	<i>Mean Low</i>	<i>Mean</i>	<i>Mean High</i>
Constant Growth, 30-day Stock Prices	7.63%	9.06%	10.87%
Constant Growth, 90-day Stock Prices	7.73%	9.16%	10.97%
Constant Growth, 180-day Stock Prices	7.72%	9.17%	10.96%
Quarterly Growth, 30-day Stock Prices	7.79%	9.17%	11.14%
Quarterly Growth, 90-day Stock Prices	7.90%	9.27%	11.22%
Quarterly Growth, 180-day Stock Prices	7.89%	9.26%	11.21%

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15 Q. PLEASE SUMMARIZE YOUR UPDATED CAPM RESULTS.

16 A. For the risk-free rate component, I refer alternatively to: (1) the 30-day average of the 30-  
17 year Treasury yield; and (2) a consensus forecast of the average 30-year Treasury yield

<sup>29</sup> DCF results presented in Table 4 are unadjusted (*i.e.*, prior to any adjustment for flotation costs).

1 for the coming six quarters. I also rely on published beta coefficients from Bloomberg  
2 and Value Line, and the ex-ante market risk premia described in my Direct Testimony  
3 (*i.e.*, the expected return on the S&P 500 Index less the current 30-year Treasury yield).  
4 As shown in Table 5 (below; *see also*, Schedule KM-S6), based upon updated market  
5 information, my CAPM analyses produce a range of ROE estimates from 10.99 percent  
6 to 12.77 percent.

7 **Table 5: Summary of CAPM Results<sup>30</sup>**

	<i>Bloomberg MRP</i>	<i>Value Line MRP</i>
Value Line Beta, Current Risk-Free Rate (3.02%)	12.46%	12.64%
Value Line Beta, Projected Risk-Free Rate (3.55%)	12.60%	12.77%
Bloomberg Beta, Current Risk-Free Rate (3.02%)	10.99%	11.14%
Bloomberg Beta, Projected Risk-Free Rate (3.55%)	11.19%	11.34%

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9 **Q. PLEASE SUMMARIZE YOUR UPDATED BOND YIELD PLUS RISK**  
10 **PREMIUM MODEL RESULTS.**

11 A. My updated risk premium analysis includes authorized gas utility ROEs as reported by  
12 Regulatory Research Associates (“RRA”) through July 13, 2018. For the purpose of  
13 calculating the expected risk premium and ROE, I have used current and projected long-  
14 term utility bond yields. As shown in Table 6 (below; *see also*, Schedule KM-S7), my  
15 results range from 9.70 percent to 10.33 percent.

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<sup>30</sup> See Schedule KM-S6.

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**Table 6: Summary of Risk Premium Results**

	<i>Return on Equity</i>
Current Baa Utility Yield (4.69%)	9.70%
Near-Term Projected Baa Utility Yield (5.32%)	9.97%
Long-Term Projected Baa Utility Yield (6.15%)	10.33%

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With regard to recent authorized returns for Water utilities, Table 7 provides data by state for rate cases reported by RRA with decisions issued between January and June 2018.

**Table 7: Average Authorized Water Utility Returns by State - 2018<sup>31</sup>**

	<i>Rate of Return</i>	<i>Return on Equity</i>	<i>Equity Ratio</i>	<i>No. of Cases</i>
Illinois	7.52%	9.60%	53.22%	1
California	7.66%	9.05%	54.77%	4
New Jersey	6.50%	9.60%	52.75%	1
Missouri	n/a	9.50%-10.00%	n/a	1
North Carolina	8.40%	10.50%	51.89%	1
Average:	7.52%	9.69%	53.16%	

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However, it is important to consider that RRA currently only evaluates water utility regulation in 25 state jurisdictions, and only monitors proceedings involving rate change requests of at least \$0.5 million or greater.<sup>32</sup> In Missouri, I note the Commission approved a stipulation and agreement specifying a return on equity range of 9.50 percent to 10.00 percent for Missouri American Water Company in May 2018, and the

<sup>31</sup> Regulatory Research Associates Water Advisory, Major Rate Case Decisions, January – June 2018, at 1. RRA does not provide an authorized return on equity for Missouri American Water Company; the referenced range is based on the stipulation agreement in Case No. WR-2017-0285 (Filed March 1, 2018).

<sup>32</sup> Regulatory Research Associates Water Advisory, Major Rate Case Decisions, January – June 2018, at 3.

1 Commission authorized a 12.00 percent ROE for Indiana Hills in February 2018.<sup>33</sup>

2 **Q. PLEASE SUMMARIZE YOUR UPDATED EXPECTED EARNINGS ANALYSIS**  
3 **RESULTS.**

4 A. I have updated my expected earnings analysis using Value Line's projections for return  
5 on common equity, common share growth and book value per share for my gas proxy  
6 group in the recent Liberty Midstates case as well as the water utility industry. Based on  
7 data as of July 13, 2018, the proxy company results range from 9.14 percent to 13.63  
8 percent, with mean and median results of 11.34 percent to 11.02 percent. The Value Line  
9 water utility company results range from 10.84 percent to 14.31 percent, with mean and  
10 median results of 12.55 percent to 12.74 percent (*see* Schedule KM-S8).

11 **Q. BASED ON THOSE ANALYSES, DO YOU BELIEVE A 10.25 PERCENT ROE IS**  
12 **APPROPRIATE FOR LIBERTY WATER?**

13 A. Yes, I do. My ROE recommendation for Liberty Midstates was 10.25 percent, within a  
14 range of 9.90 percent to 10.35 percent. That ROE recommendation remains reasonable  
15 and appropriate for Liberty Water based on the updated analysis discussed above.

16  
17 **V. RESPONSE TO REBUTTAL TESTIMONY OF MR. STANNARD**

18 **Q. PLEASE SUMMARIZE MR. STANNARD'S TESTIMONY AS IT RELATES TO**  
19 **THE COMPANY'S COST OF CAPITAL.**

20 A. Mr. Stannard recommends an ROE of 7.97 percent based on the result of a risk premium  
21 analysis that adds Duff & Phelps' equity risk premium ("ERP") to the 2.97 percent 30-

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<sup>33</sup> *See*, Missouri Public Service Commission, Case No. WR-2017-0285, Report and Order (Issued May 2, 2018), at 2-3; Missouri Public Service Commission, Case No. WR-2017-0285, Stipulation and Agreement (Filed March 1, 2018), at 2-3; and, Missouri Public Service Commission, Case No. WR-2017-0259, Report and Order (Issued February 7, 2018), at 66.

1 year Treasury yield as of July 17, 2018.<sup>34</sup> He also recommends adopting Staff's proposed  
2 capital structure.<sup>35</sup> Mr. Stannard argues the Company's proposed cost of capital and  
3 capital structure are unreasonable because (1) the Company receives a portion of its  
4 revenue from fixed cost recovery charges; and (2) Liberty Water is a subsidiary of a  
5 larger publicly traded company.

6 **Q. DO YOU HAVE ANY CONCERNS WITH MR. STANNARD'S USE OF DUFF &**  
7 **PHELPS' ERP ESTIMATE TO DEVELOP HIS RISK PREMIUM ANALYSIS?**

8 A. Yes, I do. It is not clear the return assumptions used to develop Duff & Phelps' 5.00  
9 percent ERP estimate are comparable to the ROE used in utility ratemaking. To that  
10 point, I compared Duff & Phelps' recommended risk premium the risk premium implied  
11 by subtracting the quarterly average 30-year Treasury yield from the corresponding  
12 average authorized gas utility return. As shown in Table 8 below, the Duff & Phelps risk  
13 premium consistently understates the risk premium authorized for gas utilities.

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<sup>34</sup> Rebuttal Testimony of William G. Stannard, at 9-10.

<sup>35</sup> Rebuttal Testimony of William G. Stannard, at 9.

1           **Table 8: Authorized Risk Premiums vs. Duff & Phelps Recommended ERP<sup>36</sup>**

	<i>Gas Utility Average Authorized Risk Premium</i>	<i>Duff &amp; Phelps Average Risk Premium</i>	<i>Difference</i>
2008	6.08%	5.25%	-0.83%
2009	6.06%	5.88%	-0.19%
2010	5.93%	5.50%	-0.43%
2011	5.96%	5.75%	-0.21%
2012	6.90%	5.50%	-1.40%
2013	6.17%	5.00%	-1.17%
2014	6.44%	5.00%	-1.44%
2015	6.74%	5.00%	-1.74%
2016	6.91%	5.50%	-1.41%
2017	6.83%	5.25%	-1.58%
2018	6.50%	5.00%	-1.50%

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It is apparent, therefore, that the Duff & Phelps' ERP estimate is not an appropriate input for determining the authorized ROE for a utility, such as Liberty Water. Mr. Stannard's use of the Duff & Phelps' ERP estimate, therefore, leads to unduly low ROE estimates relative to the returns allowed for utilities nationally.

Lastly, I note Duff & Phelps also provides size premia for use in risk premium analysis (both the "build-up" method and CAPM approach) to compensate for the incremental risk associated with small size; the "Micro-Cap" risk premium associated with Liberty Water's size would be 5.59 percent.<sup>37</sup> Mr. Stannard does not consider the size risk adjustment in his ROE estimate.

<sup>36</sup> See, Schedule KM-S12.

<sup>37</sup> See Duff & Phelps, 2017 Valuation Handbook, Appendix 3.

1 Q. DO YOU AGREE WITH MR. STANNARD'S ASSESSMENT THAT THE  
2 STRUCTURE OF THE COMPANY'S RATES SUGGEST A LOWER ROE?<sup>38</sup>

3 A. No, I do not. Fixed rate charges and other rate mechanisms, such as decoupling, are  
4 common among utilities.<sup>39</sup> Adoption of the rate structure proposed by the Company  
5 would only serve to provide Liberty Water a more reasonable opportunity to earn its  
6 allowed return, and make its risk level comparable to other similar utilities. Because the  
7 cost of equity is a comparative exercise, there is no need to adjust the ROE if the  
8 proposed rate structure is adopted.

9 Q. WHAT IS YOUR RESPONSE TO MR. STANNARD'S SUGGESTION THAT  
10 LIBERTY WATER'S RISK IS MITIGATED BECAUSE IT IS OWNED BY A  
11 LARGER PUBLICLY TRADED COMPANY.<sup>40</sup>

12 A. While I agree with Mr. Stannard that size is a factor that influences risk, the salient issue  
13 is Liberty Water's size, not the size of the parent holding company. Liberty Water  
14 continues to have its own company-specific risk even though its ultimate parent is  
15 Algonquin. As discussed by Duff and Phelps, size risk premia can apply to operating  
16 units within a parent company:

17 The Risk Premium Report Study can be used to develop estimates of  
18 cost of equity capital for divisions, reporting units and closely held  
19 businesses without "guessing" at the value of the business before one  
20 begins the analysis. Rather, fundamental measures of firm size (e.g.,  
21 sales, net income, EBITDA) and risk (e.g., operating margin) can be  
22 used to directly estimate cost of equity capital for non-public

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38 Rebuttal Testimony of William G. Stannard, at 9.

39 Based on a review of their most recent annual SEC Form 10-K filings, all of the companies in my Liberty Midstates proxy group report having weather normalization adjustments, straight-fixed variable rate design or decoupling mechanisms in place that help mitigate weather risk for at least a portion of their gas customer bases. All but one of the proxy companies report using infrastructure recovery mechanisms, with the outlier (Northwest Natural Gas) having a decoupling mechanism.

40 Rebuttal Testimony of William G. Stannard, at 9.

1 businesses.<sup>41</sup> [emphasis added]

2 Regardless of its ownership structure, Liberty Water must compete for capital  
3 with other entities, whether affiliated or not. To the degree that Liberty Water has more  
4 risk by virtue of its comparatively small size, it will have to generate the returns required  
5 by its owners as compensation for that risk.

6 **VI. CONCLUSIONS AND RECOMMENDATION**

7 **Q. WHAT IS YOUR CONCLUSION REGARDING THE COMPANY'S COST OF**  
8 **CAPITAL AND CAPITAL STRUCTURE?**

9 A. I believe an ROE of 10.25 percent, within a range of 9.90 percent to 10.35 percent, is an  
10 appropriate estimate of Liberty Water's cost of equity. I also recommend a 53.00 percent  
11 common equity ratio, which is consistent with industry practice and, therefore, reasonable  
12 and appropriate.

13 **Q. HAVE YOU CONSIDERED WHETHER YOUR RECOMMENDED ROE MEETS**  
14 **THE STANDARD OF A FAIR RATE OF RETURN?**

15 A. Yes. My recommendation is based upon my understanding of the *Hope* and *Bluefield*  
16 cases, wherein those decisions established the standards for determining a fair and  
17 reasonable allowed return on equity including: consistency of the allowed return with  
18 other businesses having similar risk; adequacy of the return to provide access to capital  
19 and support credit quality; and that the end result must lead to just and reasonable rates.<sup>42</sup>

20 **Q. SUBJECT TO THE UPDATED ANALYSIS TO YOUR COST OF CAPITAL**  
21 **TESTIMONY IN THE LIBERTY MIDSTATES CASE DESCRIBED ABOVE, DO**

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<sup>41</sup> Duff and Phelps 2018 Valuation Handbook, at Chapter 9, page 1 [emphasis added].

<sup>42</sup> See Direct Testimony of Keith Magee, at 8.



1           **YOU ADOPT AND RESTATE YOUR TESTIMONY AS CONTAINED IN**  
2           **SCHEDULE KM-S13 FOR PURPOSES OF THIS CASE?**

3    A.    Yes, I do.

4    **Q.    DOES THIS CONCLUDE YOUR SURREBUTTAL TESTIMONY?**

5    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	\$88.66	2.19%	2.27%	7.00%	6.65%	7.50%	9.27%	7.60%	8.91%	9.88%	11.56%
Black Hills Corporation	BKH	\$1.90	\$59.44	3.20%	3.26%	4.10%	3.93%	5.00%	3.83%	4.21%	7.08%	7.48%	8.28%
Chesapeake Utilities	CPK	\$1.48	\$79.93	1.85%	1.92%	6.00%	6.00%	8.50%	10.84%	7.83%	7.91%	9.76%	12.79%
New Jersey Resources Corporation	NJR	\$1.09	\$43.95	2.48%	2.57%	6.00%	6.43%	9.50%	7.82%	7.44%	8.55%	10.01%	12.10%
Northwest Natural Gas Company	NWN	\$1.89	\$61.95	3.05%	3.13%	4.30%	4.50%	n/a	7.08%	5.29%	7.42%	8.42%	10.24%
One Gas Inc	OGS	\$1.84	\$73.81	2.49%	2.56%	5.70%	5.50%	7.00%	4.42%	5.66%	6.97%	8.22%	9.58%
Southwest Gas Corporation	SWX	\$2.08	\$76.61	2.71%	2.81%	NA	4.00%	9.00%	7.54%	6.85%	6.77%	9.66%	11.84%
Spire Inc	SR	\$2.25	\$70.13	3.21%	3.29%	4.00%	3.47%	7.50%	6.52%	5.37%	6.73%	8.67%	10.83%
Vectren Corporation	VVC	\$1.80	\$71.11	2.53%	2.62%	7.00%	8.00%	6.50%	5.74%	6.81%	8.35%	9.43%	10.63%
Proxy Group Mean				2.63%	2.72%	5.51%	5.39%	7.56%	7.01%	6.34%	7.63%	9.06%	10.87%
Proxy Group Median				2.53%	2.62%	5.85%	5.50%	7.50%	7.08%	6.81%	7.42%	9.43%	10.83%

Notes:

[1] Source: Bloomberg Professional

[2] Source: Bloomberg Professional, equals indicated number of trading day average as of July 13, 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 (excludes a growth rate of 30.50% for NWN)

[8] Source: Schedule KM-S3, 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

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
Company	Ticker	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	\$86.06	2.25%	2.34%	7.00%	6.65%	7.50%	9.27%	7.60%	8.98%	9.94%	11.63%
Black Hills Corporation	BKH	\$1.90	\$56.56	3.36%	3.43%	4.10%	3.93%	5.00%	3.83%	4.21%	7.25%	7.64%	8.44%
Chesapeake Utilities	CPK	\$1.48	\$76.13	1.94%	2.02%	6.00%	6.00%	8.50%	10.84%	7.83%	8.00%	9.85%	12.89%
New Jersey Resources Corporation	NJR	\$1.09	\$42.11	2.59%	2.68%	6.00%	6.43%	9.50%	7.82%	7.44%	8.67%	10.12%	12.21%
Northwest Natural Gas Company	NWN	\$1.89	\$59.86	3.16%	3.24%	4.30%	4.50%	n/a	7.08%	5.29%	7.53%	8.53%	10.35%
One Gas Inc	OGS	\$1.84	\$70.45	2.61%	2.69%	5.70%	5.50%	7.00%	4.42%	5.66%	7.09%	8.34%	9.70%
Southwest Gas Corporation	SWX	\$2.08	\$72.76	2.86%	2.96%	NA	4.00%	9.00%	7.54%	6.85%	6.92%	9.80%	11.99%
Spire Inc	SR	\$2.25	\$70.51	3.19%	3.28%	4.00%	3.47%	7.50%	6.52%	5.37%	6.72%	8.65%	10.81%
Vectren Corporation	VVC	\$1.80	\$68.11	2.64%	2.73%	7.00%	8.00%	6.50%	5.74%	6.81%	8.46%	9.54%	10.75%
Proxy Group Mean				2.73%	2.82%	5.51%	5.39%	7.56%	7.01%	6.34%	7.73%	9.16%	10.97%
Proxy Group Median				2.64%	2.73%	5.85%	5.50%	7.50%	7.08%	6.81%	7.53%	9.54%	10.81%

Notes:

[1] Source: Bloomberg Professional

[2] Source: Bloomberg Professional, equals indicated number of trading day average as of July 13, 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 (excludes a growth rate of 30.50% for NWN)

[8] Source: Schedule KM-S3, 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

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
Company	Ticker	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	\$85.60	2.27%	2.35%	7.00%	6.65%	7.50%	9.27%	7.60%	8.99%	9.96%	11.64%
Black Hills Corporation	BKH	\$1.90	\$56.70	3.35%	3.42%	4.10%	3.93%	5.00%	3.83%	4.21%	7.24%	7.64%	8.43%
Chesapeake Utilities	CPK	\$1.48	\$76.18	1.94%	2.02%	6.00%	6.00%	8.50%	10.84%	7.83%	8.00%	9.85%	12.89%
New Jersey Resources Corporation	NJR	\$1.09	\$41.49	2.63%	2.73%	6.00%	6.43%	9.50%	7.82%	7.44%	8.71%	10.16%	12.25%
Northwest Natural Gas Company	NWN	\$1.89	\$60.35	3.13%	3.21%	4.30%	4.50%	n/a	7.08%	5.29%	7.50%	8.51%	10.32%
One Gas Inc	OGS	\$1.84	\$71.37	2.58%	2.65%	5.70%	5.50%	7.00%	4.42%	5.66%	7.06%	8.31%	9.67%
Southwest Gas Corporation	SWX	\$2.08	\$74.92	2.78%	2.87%	NA	4.00%	9.00%	7.54%	6.85%	6.83%	9.72%	11.90%
Spire Inc	SR	\$2.25	\$71.75	3.14%	3.22%	4.00%	3.47%	7.50%	6.52%	5.37%	6.66%	8.59%	10.75%
Vectren Corporation	VVC	\$1.80	\$66.28	2.72%	2.81%	7.00%	8.00%	6.50%	5.74%	6.81%	8.54%	9.62%	10.82%
Proxy Group Mean				2.72%	2.81%	5.51%	5.39%	7.56%	7.01%	6.34%	7.72%	9.15%	10.96%
Proxy Group Median				2.72%	2.81%	5.85%	5.50%	7.50%	7.08%	6.81%	7.50%	9.62%	10.82%

Notes:

[1] Source: Bloomberg Professional

[2] Source: Bloomberg Professional, equals indicated number of trading day average as of July 13, 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 (excludes a growth rate of 30.50% for NWN)

[8] Source: Schedule KM-S3, 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	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	\$0.49	\$0.49	\$0.49	\$0.48	\$0.52	\$0.52	\$0.52	\$88.66	7.00%	6.65%	7.50%	9.27%	7.60%	9.07%	10.00%	11.77%
Black Hills Corporation	BKH	\$0.45	\$0.48	\$0.48	\$0.48	\$0.46	\$0.50	\$0.50	\$0.50	\$59.44	4.10%	3.93%	5.00%	3.83%	4.21%	7.29%	7.58%	8.52%
Chesapeake Utilities	CPK	\$0.33	\$0.33	\$0.33	\$0.37	\$0.35	\$0.35	\$0.35	\$0.40	\$79.93	6.00%	6.00%	8.50%	10.84%	7.83%	7.87%	9.71%	12.82%
New Jersey Resources Corporation	NJR	\$0.27	\$0.27	\$0.27	\$0.27	\$0.29	\$0.29	\$0.29	\$0.29	\$43.95	6.00%	6.43%	9.50%	7.82%	7.44%	8.79%	10.20%	12.74%
Northwest Natural Gas Company	NWN	\$0.47	\$0.47	\$0.47	\$0.47	\$0.50	\$0.50	\$0.50	\$0.50	\$61.95	4.30%	4.50%	n/a	7.08%	5.28%	7.68%	8.61%	10.58%
One Gas Inc	OGS	\$0.42	\$0.42	\$0.46	\$0.46	\$0.44	\$0.44	\$0.49	\$0.49	\$73.81	5.70%	5.50%	7.00%	4.42%	5.66%	7.04%	8.25%	9.71%
Southwest Gas Corporation	SWX	\$0.50	\$0.50	\$0.52	\$0.52	\$0.53	\$0.53	\$0.56	\$0.56	\$76.61	NA	4.00%	9.00%	7.54%	6.85%	6.90%	9.78%	12.10%
Spire Inc	SR	\$0.53	\$0.56	\$0.56	\$0.56	\$0.55	\$0.59	\$0.59	\$0.59	\$70.13	4.00%	3.47%	7.50%	6.52%	5.37%	6.93%	8.80%	11.15%
Vectren Corporation	VVC	\$0.42	\$0.45	\$0.45	\$0.45	\$0.48	\$0.48	\$0.48	\$0.48	\$71.11	7.00%	8.00%	6.50%	5.74%	6.81%	8.53%	9.56%	10.86%
Proxy Group Mean										5.51%	5.39%	7.56%	7.01%	6.34%	7.79%	9.17%	11.14%	
Proxy Group Median										5.85%	5.50%	7.50%	7.08%	6.81%	7.68%	9.56%	11.15%	

Notes:

- [1] Source: Bloomberg Professional Service
- [2] Source: Bloomberg Professional Service
- [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, equals indicated number of trading day average as of July 13, 2018
- [10] Source: Zacks
- [11] Source: Yahoo! Finance
- [12] Source: Value Line
- [13] Source: Schedule KM-S3, 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	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	
Almos Energy Corporation	ATO	\$0.45	\$0.49	\$0.49	\$0.49	\$0.48	\$0.52	\$0.52	\$0.52	\$86.06	7.00%	6.65%	7.50%	9.27%	7.60%	9.15%	10.07%	11.85%
Black Hills Corporation	BKH	\$0.45	\$0.48	\$0.48	\$0.48	\$0.46	\$0.50	\$0.50	\$0.50	\$56.56	4.10%	3.93%	5.00%	3.83%	4.21%	7.48%	7.76%	8.71%
Chesapeake Utilities	CPK	\$0.33	\$0.33	\$0.33	\$0.37	\$0.35	\$0.35	\$0.35	\$0.40	\$76.13	6.00%	6.00%	8.50%	10.84%	7.83%	7.96%	9.81%	12.92%
New Jersey Resources Corporation	NJR	\$0.27	\$0.27	\$0.27	\$0.27	\$0.29	\$0.29	\$0.29	\$0.29	\$42.11	6.00%	6.43%	9.50%	7.82%	7.44%	8.91%	10.32%	12.55%
Northwest Natural Gas Company	NWN	\$0.47	\$0.47	\$0.47	\$0.47	\$0.50	\$0.50	\$0.50	\$0.50	\$59.86	4.30%	4.50%	n/a	7.08%	5.29%	7.80%	8.72%	10.71%
One Gas Inc	OGS	\$0.42	\$0.42	\$0.46	\$0.46	\$0.44	\$0.44	\$0.49	\$0.49	\$70.45	5.70%	5.50%	7.00%	4.42%	5.66%	7.17%	8.37%	9.84%
Southwest Gas Corporation	SWX	\$0.50	\$0.50	\$0.52	\$0.52	\$0.53	\$0.53	\$0.56	\$0.56	\$72.76	NA	4.00%	9.00%	7.54%	6.85%	7.06%	9.94%	12.27%
Spire Inc	SR	\$0.53	\$0.56	\$0.56	\$0.56	\$0.55	\$0.59	\$0.59	\$0.59	\$70.51	4.00%	3.47%	7.50%	6.52%	5.37%	6.91%	8.78%	11.13%
Vectren Corporation	VVC	\$0.42	\$0.45	\$0.45	\$0.45	\$0.48	\$0.48	\$0.48	\$0.48	\$68.11	7.00%	8.00%	6.50%	5.74%	6.81%	8.66%	9.68%	11.00%
Proxy Group Mean											5.51%	5.39%	7.56%	7.01%	6.34%	7.90%	9.27%	11.22%
Proxy Group Median											5.85%	5.50%	7.50%	7.08%	6.81%	7.80%	9.68%	11.13%

Notes:

- [1] Source: Bloomberg Professional Service
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- [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])
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- [9] Source: Bloomberg Professional Service, equals indicated number of trading day average as of July 13, 2018
- [10] Source: Zacks
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- [12] Source: Value Line
- [13] Source: Schedule KM-S3, 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	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	\$0.49	\$0.49	\$0.49	\$0.48	\$0.52	\$0.52	\$0.52	\$85.80	7.00%	6.65%	7.50%	9.27%	7.60%	9.16%	10.09%	11.87%
Black Hills Corporation	BKH	\$0.45	\$0.48	\$0.48	\$0.48	\$0.46	\$0.50	\$0.50	\$0.50	\$56.70	4.10%	3.93%	5.00%	3.83%	4.21%	7.47%	7.75%	8.70%
Chesapeake Utilities	CPK	\$0.33	\$0.33	\$0.33	\$0.37	\$0.35	\$0.35	\$0.35	\$0.40	\$76.18	6.00%	6.00%	8.50%	10.84%	7.83%	7.96%	9.80%	12.92%
New Jersey Resources Corporation	NJR	\$0.27	\$0.27	\$0.27	\$0.27	\$0.29	\$0.29	\$0.29	\$0.29	\$41.49	6.00%	6.43%	9.50%	7.82%	7.44%	8.96%	10.37%	12.59%
Northwest Natural Gas Company	NWN	\$0.47	\$0.47	\$0.47	\$0.47	\$0.50	\$0.50	\$0.50	\$0.50	\$60.35	4.30%	4.50%	n/a	7.08%	5.29%	7.77%	8.70%	10.68%
One Gas Inc	OGS	\$0.42	\$0.42	\$0.46	\$0.46	\$0.44	\$0.44	\$0.49	\$0.49	\$71.37	5.70%	5.50%	7.00%	4.42%	5.66%	7.13%	8.34%	9.80%
Southwest Gas Corporation	SWX	\$0.50	\$0.50	\$0.52	\$0.52	\$0.53	\$0.53	\$0.56	\$0.56	\$74.92	NA	4.00%	9.00%	7.54%	6.85%	6.97%	9.85%	12.17%
Spire Inc	SR	\$0.53	\$0.56	\$0.56	\$0.56	\$0.55	\$0.59	\$0.59	\$0.59	\$71.75	4.00%	3.47%	7.50%	6.52%	5.37%	6.85%	8.72%	11.06%
Vectren Corporation	VVC	\$0.42	\$0.45	\$0.45	\$0.45	\$0.45	\$0.48	\$0.48	\$0.48	\$66.28	7.00%	8.00%	6.50%	5.74%	6.81%	8.74%	9.76%	11.09%
Proxy Group Mean											5.51%	5.39%	7.56%	7.01%	6.34%	7.89%	9.26%	11.21%
Proxy Group Median											5.85%	5.50%	7.50%	7.08%	6.81%	7.77%	9.76%	11.09%

Notes:

- [1] Source: Bloomberg Professional Service
- [2] Source: Bloomberg Professional Service
- [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, equals indicated number of trading day average as of July 13, 2018
- [10] Source: Zacks
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- [12] Source: Value Line
- [13] Source: Schedule KM-S3, 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	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	4.00	2.45	38.75%	35.25	41.25	9.88%	3.83%	59.50	59.50	0.00%	72.00	57.00	\$ 64.50	31.92
Chesapeake Utilities	CPK	4.50	2.00	55.56%	32.30	45.50	10.26%	5.70%	17.00	20.00	4.15%	86.40	63.00	\$ 74.70	29.75
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%	26.35	29.40	12.06%	4.48%	29.50	32.00	2.05%	69.50	56.50	\$ 63.00	25.85
One Gas Inc	OGS	4.00	2.50	37.50%	40.25	43.40	9.30%	3.49%	52.50	55.00	1.17%	79.50	61.40	\$ 70.45	37.47
Southwest Gas Corporation	SWX	5.50	2.60	52.73%	39.80	52.85	10.74%	5.66%	49.00	53.00	1.98%	86.90	72.30	\$ 79.60	37.74
Spire Inc	SR	5.00	2.50	50.00%	41.60	48.10	10.57%	5.29%	51.00	55.00	1.91%	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

Company	Market/ Book Ratio	[15]	[16]	[17]	[18]	[19]
Ticker		"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	2.02	0.00%	50.51%	0.00%	3.83%
Chesapeake Utilities	CPK	2.51	10.41%	60.17%	6.27%	10.84%
New Jersey Resources Corporation	NJR	2.76	0.00%	63.77%	0.00%	7.82%
Northwest Natural Gas Company	NWN	2.44	5.01%	58.97%	2.95%	7.08%
One Gas Inc	OGS	1.88	2.20%	46.81%	1.03%	4.42%
Southwest Gas Corporation	SWX	2.11	4.18%	52.59%	2.20%	7.54%
Spire Inc	SR	1.76	3.35%	43.17%	1.45%	6.52%
Vectren Corporation	VVC	2.72	2.02%	63.29%	1.28%	5.74%

Mean: 7.01%  
Median: 7.08%

Notes:

- [1] Source: Value Line
- [2] Source: Value Line
- [3] Equals 1 - [2] / [1]
- [4] Source: Value Line
- [5] Source: Value Line
- [6] Equals [1] / (([4] + (3.5/4) x ([5] - [4]))
- [7] Equals [3] x [6]
- [8] Source: Value Line
- [9] Source: Value Line
- [10] Equals ([9] / [8]) ^ (1/4) - 1
- [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]:	15.70%	15.94%
Current Risk-Free Rate [2]:	3.02%	3.02%
Near-Term Projected Risk-Free Rate [3]:	3.55%	3.55%
Current Market Risk Premium [4]:	12.68%	12.91%
Near-Term Projected Market Risk Premium [5]:	12.15%	12.39%

Company	Ticker	Market Capitalization (\$MM)	Dividend Yield	Bloomberg			Value Line		
				Growth Rate	DCF Result	Weight in Index	Growth Rate	DCF Result	Weight in Index
AGILENT TECHNOLOGIES INC	A	20,278.57	0.95%	-0.45%	0.49%	0.08%	12.00%	13.00%	0.09%
AMERICAN AIRLINES GROUP INC	AAL	17,377.83	1.14%	16.36%	17.60%	0.07%	3.50%	4.66%	0.07%
ADVANCE AUTO PARTS INC	AAP	10,315.52	0.18%	16.64%	16.84%	0.04%	13.00%	13.19%	0.04%
APPLE INC	AAPL	940,413.35	1.43%	11.46%	12.97%	3.75%	13.00%	14.52%	3.98%
ABBVIE INC	ABBV	153,340.16	4.00%	12.93%	17.20%	0.61%	14.50%	18.79%	0.65%
AMERISOURCEBERGEN CORP	ABC	19,322.98	1.72%	9.78%	11.58%	0.08%	7.00%	8.78%	0.08%
ABIOMED INC	ABMD	18,694.22	0.00%	37.00%	37.00%	0.07%	23.00%	23.00%	0.08%
ABBOTT LABORATORIES	ABT	110,556.02	1.78%	13.00%	14.90%	0.44%	9.50%	11.37%	0.47%
ACCENTURE PLC-CL A	ACN	107,864.65	1.59%	11.15%	12.83%	0.43%	9.50%	11.16%	0.46%
ADOBE SYSTEMS INC	ADBE	126,621.87	0.00%	18.66%	18.66%	0.51%	25.50%	25.50%	0.54%
ANALOG DEVICES INC	ADI	36,392.44	1.93%	9.47%	11.48%	0.15%	13.00%	15.05%	0.15%
ARCHER-DANIELS-MIDLAND CO	ADM	26,600.39	2.75%	10.00%	12.89%	0.11%	6.00%	8.83%	0.11%
AUTOMATIC DATA PROCESSING	ADP	60,501.34	1.80%	13.50%	15.42%	0.24%	11.00%	12.90%	0.26%
ALLIANCE DATA SYSTEMS CORP	ADS	13,489.84	0.94%	12.40%	13.39%	0.05%	13.00%	14.00%	0.06%
AUTODESK INC	ADSK	30,068.90	0.00%	34.00%	34.00%	0.12%	N/A	N/A	N/A
AMEREN CORPORATION	AEE	14,893.21	3.05%	8.97%	12.16%	0.06%	7.50%	10.66%	0.06%
AMERICAN ELECTRIC POWER	AEP	34,649.03	3.57%	5.64%	9.31%	0.14%	4.50%	8.15%	0.15%
AES CORP	AES	8,717.25	4.02%	8.19%	12.38%	0.03%	N/A	N/A	N/A
AETNA INC	AET	62,767.22	1.04%	10.41%	11.51%	0.25%	10.00%	11.10%	0.27%
AFLAC INC	AFL	32,979.52	2.45%	8.04%	10.59%	0.13%	8.50%	11.05%	0.14%
ALLERGAN PLC	AGN	60,065.12	1.66%	7.88%	9.60%	0.24%	4.50%	6.20%	0.25%
AMERICAN INTERNATIONAL GROUP	AIG	48,690.35	2.36%	11.00%	13.49%	0.19%	52.00%	54.97%	0.21%
APARTMENT INVT & MGMT CO -A	AIV	6,712.56	3.57%	6.02%	9.70%	0.03%	4.50%	8.15%	0.03%
ASSURANT INC	AIZ	6,814.98	2.14%	N/A	N/A	N/A	5.50%	7.70%	0.03%
ARTHUR J GALLAGHER & CO	AJG	12,551.32	2.36%	10.32%	12.81%	0.05%	17.00%	19.57%	0.05%
AKAMAI TECHNOLOGIES INC	AKAM	13,193.14	0.00%	11.71%	11.71%	0.05%	17.00%	17.00%	0.06%
ALBEMARLE CORP	ALB	10,585.64	1.41%	12.23%	13.73%	0.04%	10.00%	11.48%	0.04%
ALIGN TECHNOLOGY INC	ALGN	29,130.39	0.00%	30.05%	30.05%	0.12%	27.50%	27.50%	0.12%
ALASKA AIR GROUP INC	ALK	7,571.49	2.08%	10.03%	12.22%	0.03%	4.50%	6.63%	0.03%
ALLSTATE CORP	ALL	32,628.71	1.94%	9.00%	11.03%	0.13%	12.00%	14.06%	0.14%
ALLEGION PLC	ALLE	7,569.21	0.95%	12.18%	13.19%	0.03%	9.50%	10.50%	0.03%
ALEXION PHARMACEUTICALS INC	ALXN	30,231.17	0.00%	18.87%	18.87%	0.12%	26.50%	26.50%	0.13%
APPLIED MATERIALS INC	AMAT	46,501.24	1.30%	14.46%	15.85%	0.19%	20.00%	21.43%	0.20%
ADVANCED MICRO DEVICES	AMD	15,771.23	0.00%	23.60%	23.60%	0.06%	N/A	N/A	N/A
AMETEK INC	AME	17,067.37	0.76%	11.54%	12.34%	0.07%	10.50%	11.30%	0.07%
AFFILIATED MANAGERS GROUP	AMG	8,064.71	0.80%	12.56%	13.41%	0.03%	6.50%	7.33%	0.03%
AMGEN INC	AMGN	129,634.82	2.64%	5.11%	7.81%	0.52%	8.00%	10.74%	0.55%
AMERIPRISE FINANCIAL INC	AMP	20,536.46	2.49%	N/A	N/A	N/A	16.00%	18.69%	0.09%
AMERICAN TOWER CORP	AMT	63,258.95	2.18%	13.23%	15.56%	0.25%	11.50%	13.81%	0.27%
AMAZON.COM INC	AMZN	879,730.93	0.00%	41.63%	41.63%	3.51%	48.00%	48.00%	3.72%
ANDEAVOR	ANDV	20,475.59	1.81%	7.95%	9.84%	0.08%	5.50%	7.36%	0.09%
ANSYS INC	ANSS	15,099.51	0.00%	13.05%	13.05%	0.06%	10.50%	10.50%	0.06%
ANTHEM INC	ANTM	63,929.97	1.20%	10.09%	11.35%	0.26%	15.50%	16.79%	0.27%
ACON PLC	ACON	35,258.70	1.08%	11.42%	12.56%	0.14%	9.50%	10.63%	0.15%
SMITH (A.O.) CORP	AOS	10,307.89	1.20%	11.50%	12.76%	0.04%	13.00%	14.27%	0.04%
APACHE CORP	APA	18,133.22	2.11%	-17.09%	-15.16%	0.07%	N/A	N/A	N/A
ANADARKO PETROLEUM CORP	APC	38,420.43	1.04%	19.23%	20.38%	0.15%	N/A	N/A	N/A
AIR PRODUCTS & CHEMICALS INC	APD	34,485.74	2.70%	11.42%	14.27%	0.14%	8.00%	10.81%	0.15%
AMPHENOL CORP-CL A	APH	26,740.37	0.96%	10.51%	11.52%	0.11%	8.50%	9.50%	0.11%
APTIV PLC	APTIV	24,790.33	0.94%	10.59%	11.58%	0.10%	10.00%	10.99%	0.10%
ALEXANDRIA REAL ESTATE EQUIT	ARE	13,172.50	2.87%	6.78%	9.74%	0.05%	N/A	N/A	N/A
ARCONIC INC	ARNC	8,391.62	1.39%	15.95%	17.45%	0.03%	N/A	N/A	N/A
ACTIVISION BLIZZARD INC	ATVI	62,038.19	0.42%	14.21%	14.66%	0.25%	13.50%	13.95%	0.26%
AVALONBAY COMMUNITIES INC	AVB	23,958.50	3.39%	5.61%	9.09%	0.10%	6.50%	10.00%	0.10%

BROADCOM INC	AVGO	87,398.11	3.46%	13.58%	17.27%	0.35%	44.50%	48.73%	0.37%
AVERY DENNISON CORP	AVY	9,125.28	1.93%	9.83%	11.86%	0.04%	12.50%	14.55%	0.04%
AMERICAN WATER WORKS CO INC	AWK	15,614.80	2.06%	8.00%	10.14%	0.06%	10.00%	12.16%	0.07%
AMERICAN EXPRESS CO	AXP	86,466.40	1.45%	17.30%	18.88%	0.35%	8.50%	10.02%	0.37%
AUTOZONE INC	AZO	18,160.81	0.00%	12.87%	12.87%	0.07%	12.50%	12.50%	0.08%
BOEING CO/THE	BA	204,363.58	1.99%	15.33%	17.48%	0.82%	18.00%	20.17%	0.86%
BANK OF AMERICA CORP	BAC	289,478.57	2.00%	13.40%	15.53%	1.16%	13.00%	15.13%	1.22%
BAXTER INTERNATIONAL INC	BAX	40,217.21	0.97%	13.06%	14.09%	0.16%	13.50%	14.53%	0.17%
BB&T CORP	BBT	39,712.76	3.08%	14.57%	17.87%	0.16%	9.00%	12.22%	0.17%
BEST BUY CO INC	BBY	21,200.26	2.37%	11.22%	13.72%	0.08%	10.50%	13.00%	0.09%
BECTON DICKINSON AND CO	BDX	66,025.57	1.24%	13.91%	15.24%	0.26%	10.00%	11.31%	0.28%
FRANKLIN RESOURCES INC	BEN	17,464.93	10.69%	10.00%	21.23%	0.07%	7.50%	18.59%	0.07%
BROWN-FORMAN CORP-CLASS B	BF/B	24,629.55	1.30%	12.85%	14.23%	0.10%	14.00%	15.39%	0.10%
BRIGHTHOUSE FINANCIAL INC	BHF	4,854.40	0.00%	8.00%	8.00%	0.02%	N/A	N/A	N/A
BAKER HUGHES A GE CO	BHGE	36,313.02	1.96%	66.45%	69.05%	0.14%	N/A	N/A	N/A
BIOGEN INC	BIIB	73,532.05	0.00%	4.86%	4.86%	0.29%	6.50%	6.50%	0.31%
BANK OF NEW YORK MELLON CORP	BK	53,596.16	1.95%	8.10%	10.13%	0.21%	9.00%	11.04%	0.23%
BOOKING HOLDINGS INC	BKNG	97,864.55	0.00%	14.12%	14.12%	0.39%	14.00%	14.00%	0.41%
BLACKROCK INC	BLK	81,710.61	2.31%	11.00%	13.44%	0.33%	12.00%	14.45%	0.35%
BALL CORP	BLL	13,138.44	1.02%	5.50%	6.55%	0.05%	22.00%	23.14%	0.06%
BRISTOL-MYERS SQUIBB CO	BMY	92,939.86	2.82%	9.85%	12.80%	0.37%	13.50%	16.51%	0.39%
BROADRIDGE FINANCIAL SOLUTIO	BR	13,911.01	1.24%	10.00%	11.30%	0.06%	14.00%	15.32%	0.06%
BERKSHIRE HATHAWAY INC-CL B	BRK/B	473,873.19	0.00%	1.30%	1.30%	1.89%	N/A	N/A	N/A
BOSTON SCIENTIFIC CORP	BSX	46,016.68	0.00%	21.34%	21.34%	0.18%	16.00%	16.00%	0.19%
BORGWARNER INC	BWA	9,471.39	1.50%	4.68%	6.21%	0.04%	9.00%	10.57%	0.04%
BOSTON PROPERTIES INC	BXP	19,653.62	2.54%	5.91%	8.52%	0.08%	3.50%	6.08%	0.08%
CITIGROUP INC	C	170,845.54	2.23%	14.46%	16.85%	0.68%	11.00%	13.36%	0.72%
CA INC	CA	18,424.54	2.34%	3.08%	5.45%	0.07%	7.00%	9.42%	0.08%
CONAGRA BRANDS INC	CAG	14,099.21	2.54%	10.35%	13.02%	0.06%	6.50%	9.12%	0.06%
CARDINAL HEALTH INC	CAH	15,782.80	3.64%	9.93%	13.75%	0.06%	11.00%	14.84%	0.07%
CATERPILLAR INC	CAT	84,161.43	2.28%	25.37%	27.93%	0.34%	17.50%	19.97%	0.36%
CHUBB LTD	CB	61,551.09	2.21%	10.00%	12.32%	0.25%	9.50%	11.82%	0.26%
CBOE GLOBAL MARKETS INC	CBOE	11,575.25	1.12%	13.64%	14.83%	0.05%	17.00%	18.21%	0.05%
CBRE GROUP INC - A	CBRE	16,684.62	0.00%	10.75%	10.75%	0.07%	11.50%	11.50%	0.07%
CBS CORP-CLASS B NON VOTING	CBS	22,375.36	1.31%	15.39%	16.80%	0.09%	10.50%	11.88%	0.09%
CROWN CASTLE INTL CORP	CCI	46,070.24	3.85%	12.77%	16.86%	0.18%	12.00%	16.08%	0.19%
CARNIVAL CORP	CCL	40,953.97	3.30%	13.80%	17.33%	0.16%	12.50%	16.01%	0.17%
CADENCE DESIGN SYS INC	CDNS	12,767.52	0.00%	12.00%	12.00%	0.05%	10.50%	10.50%	0.05%
CELGENE CORP	CELG	62,110.44	0.00%	18.97%	18.97%	0.25%	14.50%	14.50%	0.26%
CERNER CORP	CERN	20,396.62	0.00%	11.68%	11.68%	0.08%	9.00%	9.00%	0.09%
CF INDUSTRIES HOLDINGS INC	CF	9,873.45	2.84%	11.75%	14.76%	0.04%	47.00%	50.51%	0.04%
CITIZENS FINANCIAL GROUP	CFG	19,078.84	2.49%	21.56%	24.32%	0.08%	15.50%	18.18%	0.08%
CHURCH & DWIGHT CO INC	CHD	13,676.40	1.56%	10.24%	11.88%	0.05%	9.00%	10.63%	0.06%
C.H. ROBINSON WORLDWIDE INC	CHRW	12,077.56	2.16%	9.58%	11.85%	0.05%	10.50%	12.78%	0.05%
CHARTER COMMUNICATIONS INC-A	CHTR	80,256.21	0.00%	29.32%	29.32%	0.32%	19.50%	19.50%	0.34%
CIGNA CORP	CI	42,107.29	0.02%	11.84%	11.87%	0.17%	12.50%	12.53%	0.18%
CINCINNATI FINANCIAL CORP	CINF	11,426.20	3.05%	N/A	N/A	N/A	7.00%	10.15%	0.05%
COLGATE-PALMOLIVE CO	CL	57,355.09	2.53%	8.43%	11.06%	0.23%	11.00%	13.67%	0.24%
CLOROX COMPANY	CLX	17,413.64	2.57%	8.53%	11.21%	0.07%	8.00%	10.67%	0.07%
COMERICA INC	CMA	15,381.15	1.67%	26.80%	28.69%	0.06%	16.50%	18.31%	0.07%
COMCAST CORP-CLASS A	CMCSA	159,676.91	2.18%	15.40%	17.75%	0.64%	12.50%	14.82%	0.68%
CME GROUP INC	CME	56,843.81	3.87%	15.00%	19.16%	0.23%	4.50%	8.46%	0.24%
CHIPOTLE MEXICAN GRILL INC	CMG	12,707.40	0.00%	19.29%	19.29%	0.05%	18.00%	18.00%	0.05%
CUMMINS INC	CM	22,550.82	3.23%	9.06%	12.44%	0.09%	8.50%	11.87%	0.10%
CMS ENERGY CORP	CMS	13,518.89	2.98%	6.35%	9.43%	0.05%	7.00%	10.09%	0.06%
CENTENE CORP	CNC	27,602.70	0.00%	15.49%	15.49%	0.11%	11.50%	11.50%	0.12%
CENTERPOINT ENERGY INC	CNP	11,977.70	4.03%	5.77%	9.91%	0.05%	8.50%	12.70%	0.05%
CAPITAL ONE FINANCIAL CORP	COF	46,011.81	1.72%	16.09%	17.95%	0.18%	5.50%	7.27%	0.19%
CABOT OIL & GAS CORP	COG	10,587.39	1.01%	39.25%	40.46%	0.04%	N/A	N/A	N/A
ROCKWELL COLLINS INC	COL	22,640.82	1.08%	11.60%	12.74%	0.09%	12.50%	13.64%	0.10%
COOPER COS INC/THE	COO	12,134.61	0.03%	10.50%	10.53%	0.05%	16.50%	16.53%	0.05%
CONOCOPHILLIPS	COP	84,244.77	1.59%	6.00%	7.64%	0.34%	N/A	N/A	N/A
COSTCO WHOLESALE CORP	COST	94,961.79	0.99%	11.51%	12.56%	0.38%	9.00%	10.03%	0.40%
COTY INC-CL A	COTY	10,687.65	3.51%	15.63%	19.42%	0.04%	7.00%	10.63%	0.05%
CAMPBELL SOUP CO	CPB	12,341.50	3.49%	3.30%	6.85%	0.05%	4.50%	8.07%	0.05%
COPART INC	CPRT	13,776.42	0.00%	N/A	N/A	N/A	13.50%	13.50%	0.06%
SALESFORCE.COM INC	CRM	109,654.90	0.00%	26.30%	26.30%	0.44%	N/A	N/A	N/A
CISCO SYSTEMS INC	CSCO	196,486.43	2.98%	6.15%	9.22%	0.78%	7.50%	10.59%	0.83%
CSX CORP	CSX	56,644.13	1.36%	15.44%	16.90%	0.23%	17.50%	18.98%	0.24%
CINTAS CORP	CTAS	20,886.35	0.83%	12.13%	13.01%	0.08%	14.50%	15.39%	0.09%
CENTURYLINK INC	CTL	21,447.47	10.87%	-15.40%	-5.37%	0.09%	2.50%	13.50%	0.09%
COGNIZANT TECH SOLUTIONS-A	CTSH	47,873.80	0.92%	15.03%	16.03%	0.19%	11.50%	12.48%	0.20%

CITRIX SYSTEMS INC	CTXS	14,876.62	0.00%	11.00%	11.00%	0.06%	6.50%	6.50%	0.06%
CVS HEALTH CORP	CVS	69,772.44	2.91%	11.14%	14.22%	0.28%	9.00%	12.05%	0.29%
CHEVRON CORP	CVX	237,035.48	3.61%	54.01%	58.59%	0.95%	31.00%	35.17%	1.00%
CONCHO RESOURCES INC	CXO	22,074.17	0.00%	32.85%	32.85%	0.09%	33.00%	33.00%	0.09%
DOMINION ENERGY INC	D	45,689.47	4.77%	5.55%	10.45%	0.18%	6.50%	11.42%	0.19%
DELTA AIR LINES INC	DAL	35,098.89	2.53%	15.41%	18.13%	0.14%	10.50%	13.16%	0.15%
DEERE & CO	DE	44,615.07	2.01%	7.67%	9.76%	0.18%	15.50%	17.67%	0.19%
DISCOVER FINANCIAL SERVICES	DFS	24,085.20	2.13%	9.18%	11.41%	0.10%	8.00%	10.22%	0.10%
DOLLAR GENERAL CORP	DG	26,621.97	1.15%	15.96%	17.21%	0.11%	12.50%	13.73%	0.11%
QUEST DIAGNOSTICS INC	DGX	15,612.19	1.67%	10.90%	12.66%	0.06%	9.50%	11.25%	0.07%
DR HORTON INC	DHI	15,651.40	1.17%	20.52%	21.81%	0.06%	12.00%	13.24%	0.07%
DANAHER CORP	DHR	69,298.41	0.61%	8.15%	8.79%	0.28%	11.00%	11.64%	0.29%
WALT DISNEY CO/THE	DIS	163,542.56	1.54%	12.20%	13.83%	0.65%	9.00%	10.61%	0.69%
DISCOVERY INC - A	DISCA	19,308.77	0.00%	N/A	N/A	N/A	15.00%	15.00%	0.08%
DISH NETWORK CORP-A	DISH	15,699.30	0.00%	-11.61%	-11.61%	0.06%	1.00%	1.00%	0.07%
DIGITAL REALTY TRUST INC	DLR	24,955.48	3.47%	7.28%	10.88%	0.10%	8.00%	11.61%	0.11%
DOLLAR TREE INC	DLTR	20,627.03	0.00%	13.99%	13.99%	0.08%	19.50%	19.50%	0.09%
DOVER CORP	DOV	11,586.91	2.58%	12.63%	15.37%	0.05%	13.00%	15.74%	0.05%
DUKE REALTY CORP	DRE	10,325.31	2.79%	-4.09%	-1.35%	0.04%	7.00%	9.88%	0.04%
DARDEN RESTAURANTS INC	DRI	13,875.57	2.65%	10.09%	12.87%	0.06%	13.00%	15.82%	0.06%
DTE ENERGY COMPANY	DTE	19,271.70	3.32%	5.53%	8.95%	0.08%	7.00%	10.44%	0.08%
DUKE ENERGY CORP	DUK	56,514.62	4.53%	4.45%	9.08%	0.23%	5.50%	10.16%	0.24%
DAVITA INC	DVA	12,523.87	0.00%	20.25%	20.25%	0.05%	11.00%	11.00%	0.05%
DEVON ENERGY CORP	DVN	23,406.45	0.69%	10.58%	11.30%	0.09%	29.00%	29.79%	0.10%
DOWDUPONT INC	DWDP	154,007.40	2.38%	8.23%	10.72%	0.61%	N/A	N/A	N/A
DXC TECHNOLOGY CO	DXC	24,462.34	0.89%	6.15%	7.07%	0.10%	17.00%	17.96%	0.10%
ELECTRONIC ARTS INC	EA	45,528.03	0.00%	13.10%	13.10%	0.18%	12.00%	12.00%	0.19%
EBAY INC	EBAY	37,383.51	0.00%	10.17%	10.17%	0.15%	12.50%	12.50%	0.16%
ECOLAB INC	ECL	41,304.59	1.13%	13.30%	14.50%	0.16%	9.00%	10.18%	0.17%
CONSOLIDATED EDISON INC	ED	24,690.64	3.61%	3.00%	6.66%	0.10%	3.00%	6.66%	0.10%
EQUIFAX INC	EFX	15,274.92	1.23%	7.76%	9.05%	0.06%	8.00%	9.28%	0.06%
EDISON INTERNATIONAL	EIX	21,386.25	3.69%	5.26%	9.05%	0.09%	4.50%	8.28%	0.09%
ESTEE LAUDER COMPANIES-CL A	EL	51,565.30	1.05%	19.60%	20.75%	0.21%	13.50%	14.62%	0.22%
EASTMAN CHEMICAL CO	EMN	14,201.64	2.29%	7.65%	10.03%	0.06%	8.50%	10.89%	0.06%
EMERSON ELECTRIC CO	EMR	44,471.76	2.75%	11.91%	14.83%	0.18%	12.00%	14.92%	0.19%
EOG RESOURCES INC	EOG	72,913.37	0.57%	9.50%	10.09%	0.29%	N/A	N/A	N/A
EQUINIX INC	EQIX	35,233.96	2.06%	16.11%	18.33%	0.14%	26.00%	28.32%	0.15%
EQUITY RESIDENTIAL	EQR	23,749.78	3.34%	5.73%	9.17%	0.09%	-15.00%	-11.91%	0.10%
EQT CORP	EQT	14,740.11	0.22%	17.50%	17.74%	0.06%	40.50%	40.76%	0.06%
EVERSOURCE ENERGY	ES	18,740.63	3.42%	6.27%	9.80%	0.07%	5.00%	8.51%	0.08%
EXPRESS SCRIPTS HOLDING CO	ESRX	45,753.55	0.00%	6.52%	6.52%	0.18%	14.50%	14.50%	0.19%
ESSEX PROPERTY TRUST INC	ESS	15,825.99	3.09%	6.65%	9.84%	0.06%	0.50%	3.59%	0.07%
E*TRADE FINANCIAL CORP	ETFC	15,771.25	0.00%	29.86%	29.86%	0.06%	17.50%	17.50%	0.07%
EATON CORP PLC	ETN	34,004.45	3.35%	9.04%	12.54%	0.14%	9.00%	12.50%	0.14%
ENTERGY CORP	ETR	16,057.13	4.39%	3.01%	7.47%	0.06%	2.00%	6.44%	0.07%
ENVISION HEALTHCARE CORP	EVHC	5,421.30	0.00%	14.96%	14.96%	0.02%	N/A	N/A	N/A
EVERGY INC	EVRG	15,168.41	3.34%	9.34%	12.84%	0.06%	N/A	N/A	N/A
EDWARDS LIFESCIENCES CORP	EW	31,222.71	0.00%	15.33%	15.33%	0.12%	15.00%	15.00%	0.13%
EXELON CORP	EXC	40,905.80	3.27%	5.31%	8.67%	0.16%	8.00%	11.40%	0.17%
EXPEDITORS INTL WASH INC	EXPD	12,791.82	1.23%	10.83%	12.12%	0.05%	9.00%	10.29%	0.05%
EXPEDIA GROUP INC	EXPE	19,061.26	0.96%	16.76%	17.79%	0.08%	21.00%	22.06%	0.08%
EXTRA SPACE STORAGE INC	EXR	12,208.64	3.38%	6.04%	9.52%	0.05%	5.00%	8.46%	0.05%
FORD MOTOR CO	F	43,754.79	5.82%	-7.42%	-1.82%	0.17%	2.50%	8.39%	0.18%
FASTENAL CO	FAST	15,851.04	2.78%	13.85%	16.82%	0.06%	9.00%	11.90%	0.07%
FACEBOOK INC-A	FB	600,339.69	0.00%	21.49%	21.49%	2.40%	28.50%	28.50%	2.54%
FORTUNE BRANDS HOME & SECURI	FBHS	8,052.02	1.45%	12.68%	14.22%	0.03%	13.50%	15.05%	0.03%
FREEMPORT-MCMORAN INC	FCX	24,339.74	1.08%	-0.58%	0.50%	0.10%	N/A	N/A	N/A
FEDEX CORP	FDX	62,461.55	1.07%	15.40%	16.56%	0.25%	11.00%	12.13%	0.26%
FIRSTENERGY CORP	FE	17,092.43	4.02%	-0.33%	3.68%	0.07%	3.00%	7.08%	0.07%
F5 NETWORKS INC	FFIV	10,758.00	0.00%	10.31%	10.31%	0.04%	10.50%	10.50%	0.05%
FIDELITY NATIONAL INFO SERV	FIS	35,792.59	1.18%	4.40%	5.61%	0.14%	16.00%	17.28%	0.15%
FISERV INC	FISV	31,710.88	0.00%	11.00%	11.00%	0.13%	10.00%	10.00%	0.13%
FIFTH THIRD BANCORP	FITB	19,941.07	2.60%	6.00%	8.68%	0.08%	6.50%	9.19%	0.08%
FOOT LOCKER INC	FL	6,157.60	2.63%	6.58%	9.29%	0.02%	7.50%	10.22%	0.03%
FLIR SYSTEMS INC	FLIR	7,249.03	1.20%	N/A	N/A	N/A	11.50%	12.77%	0.03%
FLUOR CORP	FLR	6,952.03	1.74%	27.68%	29.65%	0.03%	8.50%	10.31%	0.03%
FLOWSERVE CORP	FLS	5,504.17	1.84%	18.96%	20.97%	0.02%	7.50%	9.41%	0.02%
FLEETCOR TECHNOLOGIES INC	FLT	19,740.91	0.00%	16.50%	16.50%	0.08%	15.00%	15.00%	0.08%
FMC CORP	FMC	11,882.99	0.90%	14.17%	15.13%	0.05%	22.50%	23.50%	0.05%
TWENTY-FIRST CENTURY FOX - B	FOX	87,811.99	0.83%	9.95%	10.82%	0.35%	N/A	N/A	N/A
FEDERAL REALTY INVS TRUST	FRT	9,159.27	3.25%	4.40%	7.72%	0.04%	3.50%	6.81%	0.04%
TECHNIPFMC PLC	FTI	14,285.68	1.71%	8.57%	10.35%	0.06%	N/A	N/A	N/A

FORTIVE CORP	FTV	26,944.34	0.38%	11.26%	11.66%	0.11%	N/A	N/A	N/A
GENERAL DYNAMICS CORP	GD	57,250.22	1.90%	11.45%	13.46%	0.23%	9.00%	10.98%	0.24%
GENERAL ELECTRIC CO	GE	120,639.34	3.54%	4.03%	7.65%	0.48%	6.00%	9.65%	0.51%
GGP INC	GGP	20,030.41	4.46%	1.10%	5.59%	0.08%	-2.50%	1.91%	0.08%
GILEAD SCIENCES INC	GILD	100,614.18	2.92%	-5.21%	-2.36%	0.40%	-6.50%	-3.67%	0.43%
GENERAL MILLS INC	GIS	26,648.15	4.47%	8.67%	13.33%	0.11%	4.00%	8.56%	0.11%
CORNING INC	GLW	23,914.05	2.50%	4.96%	7.52%	0.10%	13.00%	15.66%	0.10%
GENERAL MOTORS CO	GM	55,475.63	3.89%	11.05%	15.15%	0.22%	3.50%	7.46%	0.23%
ALPHABET INC-CL C	GOOG	830,718.63	0.00%	18.96%	18.96%	3.31%	12.50%	12.50%	3.51%
GENUINE PARTS CO	GPC	13,683.30	3.06%	-2.49%	0.54%	0.05%	9.00%	12.20%	0.06%
GLOBAL PAYMENTS INC	GPN	18,818.32	0.03%	22.03%	22.07%	0.08%	11.00%	11.04%	0.08%
GAP INC/THE	GPS	11,391.60	3.30%	9.25%	12.71%	0.05%	6.50%	9.91%	0.05%
GARMIN LTD	GRMN	11,920.25	3.32%	5.90%	9.32%	0.05%	7.00%	10.43%	0.05%
GOLDMAN SACHS GROUP INC	GS	88,825.06	1.40%	11.80%	13.28%	0.35%	9.00%	10.47%	0.38%
GOODYEAR TIRE & RUBBER CO	GT	5,439.32	2.34%	N/A	N/A	N/A	12.50%	14.98%	0.02%
WW GRAINGER INC	GWW	17,392.22	1.75%	13.40%	15.27%	0.07%	8.50%	10.32%	0.07%
HALLIBURTON CO	HAL	39,725.53	1.61%	67.55%	69.70%	0.16%	N/A	N/A	N/A
HASBRO INC	HAS	12,355.71	2.60%	8.17%	10.87%	0.05%	9.50%	12.22%	0.05%
HUNTINGTON BANCSHARES INC	HBAN	16,141.31	3.30%	13.99%	17.52%	0.06%	11.00%	14.49%	0.07%
HANESBRANDS INC	HBI	7,812.83	2.78%	5.87%	8.73%	0.03%	6.00%	8.86%	0.03%
HCA HEALTHCARE INC	HCA	37,217.83	1.31%	12.58%	13.97%	0.15%	12.50%	13.89%	0.16%
HCP INC	HCP	12,139.55	5.74%	-0.44%	5.29%	0.05%	35.50%	42.26%	0.05%
HOME DEPOT INC	HD	229,197.58	2.03%	13.25%	15.41%	0.91%	12.00%	14.15%	0.97%
HESS CORP	HES	19,969.51	1.56%	-9.34%	-7.85%	0.08%	N/A	N/A	N/A
HOLLYFRONTIER CORP	HFC	12,124.92	1.95%	8.92%	10.95%	0.05%	17.50%	19.62%	0.05%
HARTFORD FINANCIAL SVCS GRP	HIG	18,813.05	1.98%	9.50%	11.57%	0.08%	13.00%	15.10%	0.08%
HUNTINGTON INGALLS INDUSTRIE	HII	10,011.72	1.27%	27.50%	28.94%	0.04%	12.50%	13.85%	0.04%
HILTON WORLDWIDE HOLDINGS INC	HLT	24,324.76	0.75%	11.23%	12.02%	0.10%	8.50%	9.28%	0.10%
HARLEY-DAVIDSON INC	HOG	7,145.12	3.43%	8.25%	11.83%	0.03%	9.00%	12.59%	0.03%
HOLOGIC INC	HOLX	11,469.19	0.00%	9.51%	9.51%	0.05%	22.00%	22.00%	0.05%
HONEYWELL INTERNATIONAL INC	HON	110,172.15	2.07%	10.91%	13.09%	0.44%	9.50%	11.66%	0.47%
HELMERICH & PAYNE	HP	7,022.87	4.35%	122.99%	130.01%	0.03%	56.50%	62.08%	0.03%
HEWLETT PACKARD ENTERPRISE	HPE	23,451.26	2.44%	-4.05%	-1.66%	0.09%	6.00%	8.51%	0.10%
HP INC	HPQ	38,185.25	2.36%	5.45%	7.87%	0.15%	6.00%	8.43%	0.16%
H&R BLOCK INC	HRB	5,007.48	4.15%	11.00%	15.37%	0.02%	10.50%	14.86%	0.02%
HORMEL FOODS CORP	HRL	19,936.45	1.99%	8.05%	10.12%	0.08%	9.50%	11.58%	0.08%
HARRIS CORP	HRS	17,677.55	1.53%	N/A	N/A	N/A	12.00%	13.63%	0.07%
HENRY SCHEIN INC	HSIC	11,530.31	0.00%	8.36%	8.36%	0.05%	9.00%	9.00%	0.05%
HOST HOTELS & RESORTS INC	HST	15,701.52	3.93%	3.98%	7.98%	0.06%	N/A	N/A	N/A
HERSHEY CO/THE	HSY	19,669.00	2.91%	8.10%	11.13%	0.08%	7.50%	10.52%	0.08%
HUMANA INC	HUM	43,661.77	0.63%	13.13%	13.80%	0.17%	13.00%	13.67%	0.18%
INTL BUSINESS MACHINES CORP	IBM	133,931.58	4.25%	1.97%	6.26%	0.53%	0.50%	4.76%	0.57%
INTERCONTINENTAL EXCHANGE INC	ICE	43,268.33	1.29%	10.14%	11.49%	0.17%	11.50%	12.86%	0.18%
IDEXX LABORATORIES INC	IDXX	20,686.47	0.00%	16.91%	16.91%	0.08%	17.00%	17.00%	0.09%
INTL FLAVORS & FRAGRANCES	IFF	10,124.02	2.17%	9.40%	11.67%	0.04%	8.50%	10.76%	0.04%
ILLUMINA INC	ILMN	45,127.53	0.00%	16.59%	16.59%	0.18%	16.00%	16.00%	0.19%
INCYTE CORP	INCY	14,878.12	0.00%	58.81%	58.81%	0.06%	N/A	N/A	N/A
IHS MARKIT LTD	INFO	20,490.70	0.00%	11.27%	11.27%	0.08%	18.50%	18.50%	0.09%
INTEL CORP	INTC	243,345.20	2.28%	8.98%	11.37%	0.97%	12.50%	14.93%	1.03%
INTUIT INC	INTU	54,835.48	0.73%	16.29%	17.07%	0.22%	14.50%	15.28%	0.23%
INTERNATIONAL PAPER CO	IP	22,008.96	3.67%	8.67%	12.49%	0.09%	17.00%	20.98%	0.09%
INTERPUBLIC GROUP OF COS INC	IPG	8,982.61	3.63%	6.24%	9.98%	0.04%	9.50%	13.30%	0.04%
IPG PHOTONICS CORP	IPGP	12,504.37	0.00%	12.00%	12.00%	0.05%	14.00%	14.00%	0.05%
IQVIA HOLDINGS INC	IQV	21,702.23	0.00%	14.65%	14.65%	0.09%	14.50%	14.50%	0.09%
INGERSOLL-RAND PLC	IR	22,577.23	2.02%	10.92%	13.05%	0.09%	11.50%	13.64%	0.10%
IRON MOUNTAIN INC	IRM	10,476.25	6.20%	9.00%	15.48%	0.04%	12.50%	19.09%	0.04%
INTUITIVE SURGICAL INC	ISRG	59,405.15	0.00%	11.75%	11.75%	0.24%	17.50%	17.50%	0.25%
GARTNER INC	IT	12,769.98	0.00%	15.00%	15.00%	0.05%	13.50%	13.50%	0.05%
ILLINOIS TOOL WORKS	ITW	48,697.13	2.47%	10.16%	12.75%	0.19%	11.50%	14.11%	0.21%
INVESCO LTD	IVZ	10,523.74	4.68%	8.50%	13.37%	0.04%	7.50%	12.35%	0.04%
HUNT (JB) TRANSPRT SVCS INC	JBHT	13,371.53	0.78%	12.72%	13.55%	0.05%	13.00%	13.83%	0.06%
JOHNSON CONTROLS INTERNATION	JCI	32,528.30	3.02%	10.47%	13.65%	0.13%	3.00%	6.07%	0.14%
JACOBS ENGINEERING GROUP INC	JEC	9,403.64	0.91%	19.36%	20.36%	0.04%	11.00%	11.96%	0.04%
JEFFERIES FINANCIAL GROUP IN	JEF	7,786.63	1.77%	18.00%	19.93%	0.03%	20.50%	22.45%	0.03%
JOHNSON & JOHNSON	JNJ	337,763.14	2.88%	7.39%	10.37%	1.35%	9.00%	12.01%	1.43%
JUNIPER NETWORKS INC	JNPR	9,727.38	2.38%	8.68%	11.16%	0.04%	4.50%	6.93%	0.04%
JPMORGAN CHASE & CO	JPM	362,132.07	2.44%	9.80%	12.36%	1.45%	9.50%	12.06%	1.53%
NORDSTROM INC	JWN	8,734.33	2.87%	8.45%	11.44%	0.03%	5.50%	8.44%	0.04%
KELLOGG CO	K	24,685.20	3.12%	8.02%	11.26%	0.10%	7.00%	10.22%	0.10%
KEYCORP	KEY	20,766.14	2.77%	16.47%	19.47%	0.08%	12.50%	15.44%	0.09%
KRAFT HEINZ CO/THE	KHC	77,844.15	3.98%	6.58%	10.69%	0.31%	9.50%	13.67%	0.33%
KIMCO REALTY CORP	KIM	7,027.80	6.84%	2.92%	9.86%	0.03%	-0.50%	6.32%	0.03%

KLA-TENCOR CORP	KLAC	16,316.74	2.39%	11.16%	13.68%	0.07%	15.50%	18.07%	0.07%
KIMBERLY-CLARK CORP	KMB	36,896.14	3.79%	14.07%	18.12%	0.15%	10.50%	14.49%	0.16%
KINDER MORGAN INC	KMI	39,510.74	4.47%	88.15%	94.59%	0.16%	57.00%	62.74%	0.17%
CARMAX INC	KMX	13,581.30	0.00%	13.11%	13.11%	0.05%	11.50%	11.50%	0.06%
COCA-COLA CO/THE	KO	190,380.45	3.43%	8.25%	11.81%	0.76%	6.50%	10.04%	0.80%
MICHAEL KORS HOLDINGS LTD	KORS	9,984.54	0.00%	7.83%	7.83%	0.04%	5.00%	5.00%	0.04%
KROGER CO	KR	22,346.75	1.89%	6.21%	8.16%	0.09%	5.00%	6.94%	0.09%
KOHL'S CORP	KSS	11,551.37	3.61%	6.93%	10.67%	0.05%	7.50%	11.24%	0.05%
KANSAS CITY SOUTHERN	KSU	10,938.24	1.38%	8.70%	10.14%	0.04%	12.50%	13.97%	0.05%
LOEWS CORP	L	15,803.26	0.51%	N/A	N/A	N/A	16.50%	17.05%	0.07%
L BRANDS INC	LB	8,790.14	7.59%	9.95%	17.91%	0.04%	0.50%	8.11%	0.04%
LEGGETT & PLATT INC	LEG	5,995.08	3.28%	10.00%	13.45%	0.02%	9.00%	12.43%	0.03%
LENNAR CORP-A	LEN	17,435.22	0.30%	21.15%	21.48%	0.07%	11.00%	11.31%	0.07%
LABORATORY CRP OF AMER HLDGS	LH	19,151.58	0.00%	9.15%	9.15%	0.08%	9.50%	9.50%	0.08%
LKQ CORP	LKQ	10,362.92	0.00%	13.15%	13.15%	0.04%	11.00%	11.00%	0.04%
L3 TECHNOLOGIES INC	LLL	15,957.99	1.61%	11.07%	12.76%	0.06%	11.00%	12.70%	0.07%
ELI LILLY & CO	LLY	97,845.04	2.51%	10.96%	13.61%	0.39%	11.00%	13.65%	0.41%
LOCKHEED MARTIN CORP	LMT	90,904.02	2.57%	22.09%	24.94%	0.36%	13.00%	15.73%	0.38%
LINCOLN NATIONAL CORP	LNC	13,896.64	2.11%	N/A	N/A	N/A	7.50%	9.68%	0.06%
ALLIANT ENERGY CORP	LNT	9,937.51	3.12%	5.92%	9.13%	0.04%	6.50%	9.72%	0.04%
LOWE'S COS INC	LOW	81,272.61	1.82%	15.34%	17.30%	0.32%	13.00%	14.94%	0.34%
LAM RESEARCH CORP	LRCX	28,181.33	1.39%	11.95%	13.42%	0.11%	22.00%	23.54%	0.12%
SOUTHWEST AIRLINES CO	LUV	30,781.75	1.09%	11.06%	12.21%	0.12%	11.50%	12.65%	0.13%
LYONDELLBASELL INDU-CL A	LYB	42,100.40	3.73%	7.73%	11.61%	0.17%	7.50%	11.37%	0.18%
MACY'S INC	M	11,148.83	4.39%	0.10%	4.49%	0.04%	5.00%	9.50%	0.05%
MASTERCARD INC - A	MA	214,964.08	0.48%	21.41%	21.95%	0.86%	15.00%	15.52%	0.91%
MID-AMERICA APARTMENT COMM	MAA	11,316.56	3.74%	7.00%	10.87%	0.05%	-4.50%	-0.85%	0.05%
MACERICH CO/THE	MAC	8,155.00	5.17%	4.95%	10.25%	0.03%	8.00%	13.38%	0.03%
MARRIOTT INTERNATIONAL -CL A	MAR	46,293.09	1.16%	17.58%	18.84%	0.18%	12.50%	13.73%	0.20%
MASCO CORP	MAS	11,801.76	1.12%	15.84%	17.05%	0.05%	15.50%	16.71%	0.05%
MATTEL INC	MAT	5,662.51	0.00%	10.00%	10.00%	0.02%	26.50%	26.50%	0.02%
MCDONALD'S CORP	MCD	124,458.47	2.60%	8.77%	11.48%	0.50%	10.00%	12.73%	0.53%
MICROCHIP TECHNOLOGY INC	MCHP	22,138.21	1.55%	11.79%	13.43%	0.09%	15.00%	16.67%	0.09%
MCKESSON CORP	MCK	27,560.56	1.01%	6.40%	7.44%	0.11%	9.50%	10.56%	0.12%
MOODY'S CORP	MCO	34,918.12	0.98%	8.00%	9.02%	0.14%	13.00%	14.05%	0.15%
MONDELEZ INTERNATIONAL INC-A	MDLZ	63,177.16	2.17%	10.52%	12.80%	0.25%	9.50%	11.77%	0.27%
MEDTRONIC PLC	MDT	119,437.02	2.19%	7.07%	9.34%	0.48%	7.50%	9.77%	0.50%
METLIFE INC	MET	44,930.66	3.80%	11.42%	15.44%	0.18%	6.00%	9.91%	0.19%
MGM RESORTS INTERNATIONAL	MGM	17,232.53	1.55%	7.79%	9.40%	0.07%	25.00%	26.74%	0.07%
MOHAWK INDUSTRIES INC	MHK	16,699.66	0.00%	8.58%	8.58%	0.07%	8.50%	8.50%	0.07%
MCCORMICK & CO-NON VTG SHRS	MKC	15,619.28	1.75%	8.80%	10.62%	0.06%	9.50%	11.33%	0.07%
MARTIN MARIETTA MATERIALS	MLM	14,248.81	0.79%	13.36%	14.20%	0.06%	13.00%	13.84%	0.06%
MARSH & MCLENNAN COS	MMC	43,999.04	1.82%	12.77%	14.70%	0.18%	9.00%	10.90%	0.19%
3M CO	MMM	119,439.01	2.70%	8.70%	11.52%	0.48%	9.50%	12.33%	0.50%
MONSTER BEVERAGE CORP	MNST	34,441.76	0.00%	16.30%	16.30%	0.14%	14.50%	14.50%	0.15%
ALTRIA GROUP INC	MO	110,719.93	5.03%	4.87%	10.02%	0.44%	10.50%	15.79%	0.47%
MOSAIC CO/THE	MOS	10,849.47	0.36%	7.00%	7.37%	0.04%	10.00%	10.37%	0.05%
MARATHON PETROLEUM CORP	MPC	33,135.18	2.57%	6.87%	9.53%	0.13%	13.00%	15.74%	0.14%
MERCK & CO. INC.	MRK	169,193.21	3.08%	7.22%	10.40%	0.68%	5.50%	8.66%	0.72%
MARATHON OIL CORP	MRO	18,326.61	0.94%	5.00%	5.96%	0.07%	N/A	N/A	N/A
MORGAN STANLEY	MS	85,114.12	2.29%	13.08%	15.51%	0.34%	11.00%	13.41%	0.36%
MSCI INC	MSCI	15,241.33	0.98%	10.00%	11.03%	0.06%	22.00%	23.09%	0.06%
MICROSOFT CORP	MSFT	810,039.51	1.59%	11.41%	13.09%	3.23%	12.00%	13.68%	3.42%
MOTOROLA SOLUTIONS INC	MSI	19,581.08	1.75%	7.30%	9.11%	0.08%	12.00%	13.85%	0.08%
M & T BANK CORP	MTB	24,174.47	2.06%	13.84%	16.05%	0.10%	12.00%	14.19%	0.10%
METTLER-TOLEDO INTERNATIONAL	MTD	14,807.35	0.00%	11.95%	11.95%	0.06%	11.00%	11.00%	0.06%
MICRON TECHNOLOGY INC	MU	65,355.33	0.00%	3.70%	3.70%	0.26%	24.50%	24.50%	0.28%
MYLAN NV	MYL	18,856.08	0.00%	6.37%	6.37%	0.08%	14.00%	14.00%	0.08%
NOBLE ENERGY INC	NBL	17,449.55	1.17%	12.50%	13.74%	0.07%	N/A	N/A	N/A
NORWEGIAN CRUISE LINE HOLDIN	NCLH	10,578.38	0.14%	19.90%	20.06%	0.04%	16.50%	16.65%	0.04%
NASDAQ INC	NDAQ	15,546.18	1.85%	10.72%	12.67%	0.06%	9.50%	11.44%	0.07%
NEXTERA ENERGY INC	NEE	79,917.91	2.62%	8.57%	11.30%	0.32%	8.50%	11.23%	0.34%
NEWMONT MINING CORP	NEM	19,653.64	1.52%	-3.00%	-1.50%	0.08%	8.50%	10.08%	0.08%
NETFLIX INC	NFLX	172,051.31	0.00%	47.27%	47.27%	0.69%	47.00%	47.00%	0.73%
NEWFIELD EXPLORATION CO	NFX	6,011.76	0.00%	13.72%	13.72%	0.02%	21.00%	21.00%	0.03%
NISOURCE INC	NI	9,540.56	2.95%	5.63%	8.66%	0.04%	18.00%	21.22%	0.04%
NIKE INC -CL B	NKE	124,717.94	1.10%	14.05%	15.23%	0.50%	14.00%	15.18%	0.53%
NEKTAR THERAPEUTICS	NKTR	8,191.32	0.00%	N/A	N/A	N/A	N/A	N/A	N/A
NIELSEN HOLDINGS PLC	NLSN	11,071.49	4.52%	12.00%	16.79%	0.04%	7.50%	12.19%	0.05%
NORTHROP GRUMMAN CORP	NOC	56,104.62	1.42%	14.77%	16.29%	0.22%	8.50%	9.98%	0.24%
NATIONAL OILWELL VARCO INC	NOV	16,900.69	0.45%	77.95%	78.57%	0.07%	41.50%	42.05%	0.07%
NRG ENERGY INC	NRG	9,940.96	0.38%	19.82%	20.24%	0.04%	N/A	N/A	N/A

NORFOLK SOUTHERN CORP	NSC	45,054.13	1.80%	14.38%	16.31%	0.18%	13.50%	15.43%	0.19%
NETAPP INC	NTAP	21,789.85	1.86%	11.77%	13.74%	0.09%	17.50%	19.53%	0.09%
NORTHERN TRUST CORP	NTRS	23,408.06	1.82%	13.91%	15.85%	0.09%	11.00%	12.92%	0.10%
NUCOR CORP	NUE	20,396.36	2.37%	6.45%	8.90%	0.08%	19.50%	22.10%	0.09%
NVIDIA CORP	NVDA	151,337.24	0.25%	10.40%	10.66%	0.60%	22.00%	22.27%	0.64%
NEWELL BRANDS INC	NWL	13,502.46	3.31%	5.30%	8.70%	0.05%	9.50%	12.97%	0.06%
NEWS CORP - CLASS B	NWS	9,129.30	1.39%	12.95%	14.43%	0.04%	N/A	N/A	N/A
REALTY INCOME CORP	O	15,683.96	4.74%	4.39%	9.23%	0.06%	4.50%	9.35%	0.07%
ONEOK INC	OKE	29,350.84	4.53%	25.16%	30.26%	0.12%	20.50%	25.50%	0.12%
OMNICOM GROUP	OMC	17,617.22	3.14%	5.56%	8.79%	0.07%	7.00%	10.25%	0.07%
ORACLE CORP	ORCL	193,603.57	1.62%	7.87%	9.56%	0.77%	8.00%	9.69%	0.82%
O'REILLY AUTOMOTIVE INC	ORLY	23,426.76	0.00%	14.72%	14.72%	0.09%	11.50%	11.50%	0.10%
OCCIDENTAL PETROLEUM CORP	OXY	64,049.02	3.70%	11.55%	15.46%	0.26%	N/A	N/A	N/A
PAYCHEX INC	PAYX	25,323.86	3.19%	9.00%	12.33%	0.10%	10.50%	13.86%	0.11%
PEOPLE'S UNITED FINANCIAL	PBCT	6,279.11	3.85%	2.00%	5.89%	0.03%	10.50%	14.56%	0.03%
PACCAR INC	PCAR	22,322.46	3.59%	6.03%	9.72%	0.09%	6.50%	10.21%	0.09%
P G & E CORP	PCG	22,345.82	2.80%	5.25%	8.12%	0.09%	7.50%	10.40%	0.09%
PUBLIC SERVICE ENTERPRISE GP	PEG	26,291.52	3.46%	6.54%	10.11%	0.10%	4.00%	7.53%	0.11%
PEPSICO INC	PEP	159,379.91	3.13%	6.68%	9.92%	0.64%	7.50%	10.75%	0.67%
PFIZER INC	PFE	219,534.40	3.62%	6.73%	10.48%	0.88%	14.00%	17.88%	0.93%
PRINCIPAL FINANCIAL GROUP	PFJ	15,224.29	3.94%	8.69%	12.80%	0.06%	5.00%	9.04%	0.06%
PROCTER & GAMBLE CO/THE	PG	199,432.88	3.52%	7.30%	10.94%	0.80%	9.00%	12.68%	0.84%
PROGRESSIVE CORP	PGR	34,041.30	2.42%	8.00%	10.52%	0.14%	15.50%	18.11%	0.14%
PARKER HANNIFIN CORP	PH	21,474.28	1.68%	9.59%	11.35%	0.09%	14.00%	15.80%	0.09%
PULTEGROUP INC	PHM	8,465.81	1.24%	21.25%	22.62%	0.03%	16.00%	17.34%	0.04%
PACKAGING CORP OF AMERICA	PKG	10,833.83	2.50%	9.00%	11.61%	0.04%	8.50%	11.10%	0.05%
PERKINELMER INC	PKI	8,371.70	0.38%	15.34%	15.74%	0.03%	12.50%	12.90%	0.04%
PROLOGIS INC	PLD	34,947.35	2.91%	6.34%	9.34%	0.14%	1.00%	3.92%	0.15%
PHILIP MORRIS INTERNATIONAL	PM	128,523.89	5.30%	10.78%	16.37%	0.51%	8.50%	14.03%	0.54%
PNC FINANCIAL SERVICES GROUP	PNC	64,941.07	2.48%	9.75%	12.35%	0.26%	9.50%	12.09%	0.27%
PENTAIR PLC	PNR	7,763.37	1.88%	10.55%	12.53%	0.03%	6.50%	8.44%	0.03%
PINNACLE WEST CAPITAL	PNW	8,971.44	3.52%	4.49%	8.09%	0.04%	5.00%	8.61%	0.04%
PPG INDUSTRIES INC	PPG	25,318.87	1.82%	8.73%	10.63%	0.10%	7.50%	9.39%	0.11%
PPL CORP	PPL	19,937.06	5.75%	8.10%	14.08%	0.08%	2.00%	7.81%	0.08%
PERRIGO CO PLC	PRGO	10,509.27	0.90%	7.20%	8.14%	0.04%	3.50%	4.42%	0.04%
PRUDENTIAL FINANCIAL INC	PRU	39,929.40	3.79%	9.00%	12.96%	0.16%	6.00%	9.90%	0.17%
PUBLIC STORAGE	PSA	39,738.24	3.55%	5.46%	9.11%	0.16%	7.00%	10.68%	0.17%
PHILLIPS 66	PSX	52,085.23	2.77%	10.00%	12.91%	0.21%	8.00%	10.88%	0.22%
PVH CORP	PVH	11,429.50	0.10%	10.51%	10.61%	0.05%	11.00%	11.11%	0.05%
QUANTA SERVICES INC	PWR	5,055.21	0.00%	N/A	N/A	N/A	17.50%	17.50%	0.02%
PRAXAIR INC	PX	47,933.23	1.98%	13.97%	16.09%	0.19%	10.00%	12.08%	0.20%
PIONEER NATURAL RESOURCES CO	PXD	31,452.39	0.15%	15.00%	15.16%	0.13%	72.00%	72.20%	0.13%
PAYPAL HOLDINGS INC	PYPL	104,478.17	0.00%	18.69%	18.69%	0.42%	16.50%	16.50%	0.44%
QUALCOMM INC	QCOM	86,570.32	4.07%	5.67%	9.86%	0.35%	4.50%	8.67%	0.37%
QORVO INC	QRVO	10,218.59	0.25%	13.06%	13.32%	0.04%	21.00%	21.27%	0.04%
ROYAL CARIBBEAN CRUISES LTD	RCL	22,841.13	2.27%	15.52%	17.96%	0.09%	11.00%	13.39%	0.10%
EVEREST RE GROUP LTD	RE	9,489.03	2.27%	10.00%	12.39%	0.04%	5.50%	7.83%	0.04%
REGENCY CENTERS CORP	REG	10,381.46	3.65%	8.51%	12.32%	0.04%	16.00%	19.94%	0.04%
REGENERON PHARMACEUTICALS	REGN	39,654.08	0.00%	14.66%	14.66%	0.16%	14.50%	14.50%	0.17%
REGIONS FINANCIAL CORP	RF	19,329.39	2.65%	18.09%	18.96%	0.08%	13.00%	15.82%	0.08%
ROBERT HALF INTL INC	RHI	8,340.47	1.60%	16.20%	17.93%	0.03%	7.50%	9.16%	0.04%
RED HAT INC	RHT	26,185.71	0.00%	17.34%	17.34%	0.10%	20.50%	20.50%	0.11%
RAYMOND JAMES FINANCIAL INC	RJF	13,565.15	1.16%	17.00%	18.25%	0.05%	14.00%	15.24%	0.06%
RALPH LAUREN CORP	RL	10,418.22	1.88%	4.83%	6.75%	0.04%	3.00%	4.91%	0.04%
RESMED INC	RMD	15,575.61	1.32%	16.10%	17.53%	0.06%	11.00%	12.39%	0.07%
ROCKWELL AUTOMATION INC	ROK	21,483.04	1.99%	11.49%	13.59%	0.09%	10.00%	12.09%	0.09%
ROPER TECHNOLOGIES INC	ROP	29,240.80	0.57%	13.27%	13.87%	0.12%	14.00%	14.61%	0.12%
ROSS STORES INC	ROST	32,066.20	1.01%	13.67%	14.75%	0.13%	11.50%	12.57%	0.14%
REPUBLIC SERVICES INC	RSG	23,000.96	1.99%	12.32%	14.43%	0.09%	13.50%	15.63%	0.10%
RAYTHEON COMPANY	RTN	57,378.19	1.68%	14.97%	16.78%	0.23%	11.00%	12.77%	0.24%
SBA COMMUNICATIONS CORP	SBAC	18,960.76	0.00%	27.15%	27.15%	0.08%	45.50%	45.50%	0.08%
STARBUCKS CORP	SBUX	71,235.60	2.44%	14.33%	16.95%	0.28%	15.00%	17.63%	0.30%
SCANA CORP	SCG	5,582.33	3.84%	-2.24%	1.55%	0.02%	N/A	N/A	N/A
SCHWAB (CHARLES) CORP	SCHW	68,295.75	0.79%	20.68%	21.55%	0.27%	16.00%	16.85%	0.29%
SEALED AIR CORP	SEE	6,892.77	1.55%	11.28%	12.92%	0.03%	19.00%	20.69%	0.03%
SHERWIN-WILLIAMS CO/THE	SHW	39,138.58	0.82%	12.38%	13.25%	0.16%	12.00%	12.87%	0.17%
SVB FINANCIAL GROUP	SIVB	15,643.20	0.00%	10.75%	10.75%	0.06%	17.00%	17.00%	0.07%
JM SMUCKER CO/THE	SJM	12,609.19	2.98%	7.00%	10.08%	0.05%	7.50%	10.59%	0.05%
SCHLUMBERGER LTD	SLB	94,299.87	2.94%	39.63%	43.15%	0.38%	28.00%	31.35%	0.40%
SL GREEN REALTY CORP	SLG	9,256.10	3.18%	4.45%	7.69%	0.04%	6.50%	9.78%	0.04%
SNAP-ON INC	SNA	9,352.93	2.09%	9.70%	11.89%	0.04%	8.00%	10.17%	0.04%
SYNOPSIS INC	SNPS	13,621.09	0.00%	N/A	N/A	N/A	10.50%	10.50%	0.06%

SOUTHERN CO/THE	SO	48,561.80	4.95%	4.38%	9.44%	0.19%	3.00%	8.03%	0.21%
SIMON PROPERTY GROUP INC	SPG	53,172.03	4.61%	6.21%	10.96%	0.21%	3.00%	7.68%	0.22%
S&P GLOBAL INC	SPGI	52,936.35	0.93%	11.70%	12.68%	0.21%	14.50%	15.50%	0.22%
STERICYCLE INC	SRCL	5,892.80	0.07%	8.87%	8.94%	0.02%	8.00%	8.07%	0.02%
SEMPRA ENERGY	SRE	32,058.73	3.07%	16.34%	19.66%	0.13%	8.50%	11.70%	0.14%
SUNTRUST BANKS INC	STI	31,440.87	2.64%	13.31%	16.12%	0.13%	9.50%	12.26%	0.13%
STATE STREET CORP	STT	33,778.32	1.91%	17.38%	19.46%	0.13%	10.00%	12.01%	0.14%
SEAGATE TECHNOLOGY	STX	16,942.41	4.27%	3.15%	7.49%	0.07%	5.50%	9.89%	0.07%
CONSTELLATION BRANDS INC-A	STZ	41,202.64	1.37%	11.36%	12.80%	0.16%	12.50%	13.95%	0.17%
STANLEY BLACK & DECKER INC	SWK	20,919.77	1.89%	11.00%	13.00%	0.08%	10.00%	11.99%	0.08%
SKYWORKS SOLUTIONS INC	SWKS	18,134.64	1.31%	11.69%	13.07%	0.07%	13.50%	14.89%	0.08%
SYNCHRONY FINANCIAL	SYF	24,484.30	2.11%	10.60%	12.82%	0.10%	10.50%	12.72%	0.10%
STRYKER CORP	SYK	65,137.82	1.04%	8.89%	9.97%	0.26%	14.50%	15.61%	0.28%
SYMANTEC CORP	SYMC	13,468.74	1.38%	8.52%	9.96%	0.05%	7.50%	8.94%	0.06%
SYSCO CORP	SYI	36,854.72	1.96%	11.85%	13.92%	0.15%	14.50%	16.60%	0.16%
AT&T INC	T	232,014.42	6.34%	-0.50%	5.82%	0.93%	5.50%	12.01%	0.98%
MOLSON COORS BREWING CO -B	TAP	14,714.52	2.46%	5.24%	7.76%	0.06%	11.50%	14.10%	0.06%
TRANSDIGM GROUP INC	TDG	18,921.61	0.00%	11.80%	11.80%	0.08%	11.00%	11.00%	0.08%
TE CONNECTIVITY LTD	TEL	32,160.27	1.79%	8.99%	10.85%	0.13%	11.00%	12.88%	0.14%
TARGET CORP	TGT	41,435.24	3.39%	5.22%	8.69%	0.17%	6.50%	10.00%	0.18%
TIFFANY & CO	TIF	16,430.91	1.59%	12.94%	14.63%	0.07%	12.00%	13.69%	0.07%
TJX COMPANIES INC	TJX	59,600.57	1.65%	12.67%	14.42%	0.24%	12.50%	14.25%	0.25%
TORCHMARK CORP	TMK	9,474.06	0.77%	12.90%	13.72%	0.04%	10.00%	10.81%	0.04%
THERMO FISHER SCIENTIFIC INC	TMO	84,970.68	0.31%	11.50%	11.83%	0.34%	9.50%	9.82%	0.36%
TAPESTRY INC	TPR	13,392.16	2.93%	11.31%	14.41%	0.05%	13.50%	16.63%	0.06%
TRIPADVISOR INC	TRIP	8,124.68	0.00%	14.41%	14.41%	0.03%	7.00%	7.00%	0.03%
T ROWE PRICE GROUP INC	TROW	28,870.05	2.28%	12.54%	14.96%	0.12%	11.50%	13.91%	0.12%
TRAVELERS COS INC/THE	TRV	34,223.19	2.42%	17.85%	20.49%	0.14%	5.50%	7.99%	0.14%
TRACTOR SUPPLY COMPANY	TSCO	9,549.21	1.53%	13.29%	14.92%	0.04%	10.50%	12.11%	0.04%
TYSON FOODS INC-CL A	TSN	26,487.56	1.77%	8.50%	10.35%	0.11%	10.50%	12.36%	0.11%
TOTAL SYSTEM SERVICES INC	TSS	16,458.61	0.58%	14.57%	15.19%	0.07%	10.50%	11.11%	0.07%
TAKE-TWO INTERACTIVE SOFTWARE	TTWO	14,451.87	0.00%	13.15%	13.15%	0.06%	N/A	N/A	N/A
TWITTER INC	TWTR	33,486.13	0.00%	30.68%	30.68%	0.13%	N/A	N/A	N/A
TEXAS INSTRUMENTS INC	TXN	112,712.64	2.19%	10.58%	12.88%	0.45%	11.50%	13.82%	0.48%
TEXTRON INC	TXT	17,231.38	0.12%	13.51%	13.64%	0.07%	15.00%	15.13%	0.07%
UNDER ARMOUR INC-CLASS C	UA	9,251.34	0.00%	36.02%	36.02%	0.04%	N/A	N/A	N/A
UNITED CONTINENTAL HOLDINGS	UAL	19,990.84	0.00%	17.17%	17.17%	0.08%	2.50%	2.50%	0.08%
UDR INC	UDR	10,008.25	3.45%	5.36%	8.90%	0.04%	-1.50%	1.92%	0.04%
UNIVERSAL HEALTH SERVICES-B	UHS	10,832.21	0.23%	9.44%	9.67%	0.04%	11.00%	11.24%	0.05%
ULTA BEAUTY INC	ULTA	15,638.97	0.00%	18.50%	18.50%	0.06%	21.00%	21.00%	0.07%
UNITEDHEALTH GROUP INC	UNH	248,605.85	1.25%	13.05%	14.38%	0.99%	14.50%	15.84%	1.05%
UNUM GROUP	UNM	8,330.19	2.57%	9.00%	11.68%	0.03%	9.50%	12.19%	0.04%
UNION PACIFIC CORP	UNP	107,788.21	2.07%	14.20%	16.42%	0.43%	13.00%	15.21%	0.46%
UNITED PARCEL SERVICE-CL B	UPS	93,898.16	3.28%	8.73%	12.15%	0.37%	8.50%	11.92%	0.40%
UNITED RENTALS INC	URI	12,943.27	0.00%	17.76%	17.76%	0.05%	14.00%	14.00%	0.05%
US BANCORP	USB	83,617.63	2.60%	8.03%	10.74%	0.33%	8.50%	11.21%	0.35%
UNITED TECHNOLOGIES CORP	UTX	103,615.70	2.23%	10.59%	12.94%	0.41%	9.00%	11.33%	0.44%
VISA INC-CLASS A SHARES	V	284,962.57	0.59%	17.35%	17.99%	1.14%	15.00%	15.64%	1.20%
VARIAN MEDICAL SYSTEMS INC	VAR	10,647.49	0.00%	16.05%	16.05%	0.04%	10.00%	10.00%	0.05%
VF CORP	VFC	33,655.93	2.21%	8.06%	10.36%	0.13%	7.50%	9.80%	0.14%
VIACOM INC-CLASS B	VIAB	12,321.78	2.69%	4.23%	6.97%	0.05%	2.00%	4.72%	0.05%
VALERO ENERGY CORP	VLO	46,266.05	2.98%	26.90%	30.28%	0.18%	10.00%	13.13%	0.20%
VULCAN MATERIALS CO	VMC	16,676.51	0.86%	21.09%	22.05%	0.07%	18.00%	18.94%	0.07%
VORNADO REALTY TRUST	VNO	14,057.30	3.41%	7.41%	10.95%	0.06%	-5.50%	-2.18%	0.06%
VERISK ANALYTICS INC	VRSK	18,680.90	0.00%	12.84%	12.84%	0.07%	9.50%	9.50%	0.08%
VERISIGN INC	VRSN	18,164.94	0.00%	10.40%	10.40%	0.07%	12.00%	12.00%	0.08%
VERTEX PHARMACEUTICALS INC	VRTX	45,996.86	0.00%	62.48%	62.48%	0.18%	N/A	N/A	N/A
VENTAS INC	VTR	20,740.94	5.45%	1.83%	7.33%	0.08%	4.50%	10.07%	0.09%
VERIZON COMMUNICATIONS INC	VZ	212,420.80	4.64%	2.19%	6.88%	0.85%	4.50%	9.25%	0.90%
WATERS CORP	WAT	15,518.93	0.00%	8.61%	8.61%	0.06%	10.50%	10.50%	0.07%
WALGREENS BOOTS ALLIANCE INC	WBA	64,675.48	2.51%	10.78%	13.42%	0.26%	10.50%	13.14%	0.27%
WESTERN DIGITAL CORP	WDC	23,795.73	2.53%	18.37%	21.14%	0.09%	11.50%	14.18%	0.10%
WEC ENERGY GROUP INC	WEC	20,569.97	3.38%	3.00%	6.43%	0.08%	7.00%	10.50%	0.09%
WELLTOWER INC	WELL	23,315.80	5.56%	5.72%	11.43%	0.09%	8.00%	13.78%	0.10%
WELLS FARGO & CO	WFC	268,446.18	2.95%	13.41%	16.56%	1.07%	5.00%	8.03%	1.13%
WHIRLPOOL CORP	WHR	11,027.67	2.94%	9.80%	12.88%	0.04%	8.00%	11.05%	0.05%
WILLIS TOWERS WATSON PLC	WLTW	20,835.98	1.50%	10.00%	11.58%	0.08%	N/A	N/A	N/A
WASTE MANAGEMENT INC	WM	36,479.77	2.19%	11.71%	14.03%	0.15%	9.50%	11.79%	0.15%
WILLIAMS COS INC	WMB	22,613.67	4.99%	-12.20%	-7.52%	0.09%	22.50%	28.05%	0.10%
WALMART INC	WMT	258,789.05	2.39%	6.83%	9.30%	1.03%	5.50%	7.96%	1.09%
WESTROCK CO	WRK	14,730.60	3.00%	8.00%	11.12%	0.06%	9.50%	12.64%	0.06%
WESTERN UNION CO	WU	9,380.41	3.70%	4.26%	8.03%	0.04%	7.00%	10.83%	0.04%

WEYERHAEUSER CO	WY	27,585.59	3.56%	9.25%	12.97%	0.11%	21.50%	25.44%	0.12%
WYNN RESORTS LTD	WYNN	17,942.92	1.77%	18.70%	20.63%	0.07%	27.00%	29.00%	0.08%
CIMAREX ENERGY CO	XEC	9,540.14	0.52%	73.00%	73.71%	0.04%	38.50%	39.12%	0.04%
XCEL ENERGY INC	XEL	23,544.81	3.29%	5.85%	9.23%	0.09%	5.50%	8.88%	0.10%
XL GROUP LTD	XL	14,557.06	1.56%	N/A	N/A	N/A	42.00%	43.89%	0.06%
XILINX INC	XLNX	17,125.59	2.12%	10.80%	13.04%	0.07%	7.50%	9.70%	0.07%
EXXON MOBIL CORP	XOM	352,720.75	3.86%	13.05%	17.16%	1.41%	18.00%	22.21%	1.49%
DENTSPLY SIRONA INC	XRAY	10,314.34	0.79%	8.95%	9.77%	0.04%	8.50%	9.32%	0.04%
XEROX CORP	XRX	6,446.42	3.92%	N/A	N/A	N/A	9.00%	13.09%	0.03%
XYLEM INC	XYL	12,328.21	1.19%	N/A	N/A	N/A	15.50%	16.78%	0.05%
YUM! BRANDS INC	YUM	25,579.40	1.87%	12.40%	14.38%	0.10%	9.50%	11.45%	0.11%
ZIMMER BIOMET HOLDINGS INC	ZBH	23,353.84	0.86%	4.01%	4.89%	0.09%	5.00%	5.88%	0.10%
ZIONS BANCORPORATION	ZION	10,202.67	1.90%	10.23%	12.22%	0.04%	15.00%	17.04%	0.04%
ZOETIS INC	ZTS	41,680.17	0.58%	17.87%	18.50%	0.17%	13.50%	14.12%	0.18%
Total Market Capitalization:		25,252,673			15.70%			15.94%	
W/ Bloomberg Growth Est.:		25,060,545							
W/ Value Line Growth Est.:		23,652,612							

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. 7, July 1, 2018, at 2. (6 quarters ending December 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 Coefficients

Company	Ticker	[1]	[2]
		Value Line	Bloomberg
Atmos Energy Corporation	ATO	0.70	0.59
Black Hills Corporation	BKH	0.90	0.61
Chesapeake Utilities	CPK	0.70	0.72
New Jersey Resources Corporation	NJR	0.80	0.77
Northwest Natural Gas Company	NWN	0.70	0.62
One Gas Inc	OGS	0.70	0.62
Southwest Gas Corporation	SWX	0.80	0.81
Spire Inc	SR	0.70	0.49
Vectren Corporation	VVC	0.70	0.44
Mean		0.74	0.63

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
<b>VALUE LINE BETA COEFFICIENT</b>						
Current 30-Year Treasury (30-day average) [7]	3.02%	0.744	12.68%	12.91%	12.46%	12.64%
Near-Term Projected Treasury Yield [8]	3.55%	0.744	12.15%	12.39%	12.60%	12.77%
<b>BLOOMBERG BETA COEFFICIENT</b>						
Current 30-Year Treasury (30-day average) [7]	3.02%	0.629	12.68%	12.91%	10.99%	11.14%
Near-Term Projected Treasury Yield [8]	3.55%	0.629	12.15%	12.39%	11.19%	11.34%

Summary of Results	
Mean:	11.89%
Minimum:	10.99%
Maximum:	12.77%

Notes:

[1] See Notes [7], [8]

[2] Source: Schedule KM-S5

[3] Source: Schedule KM-S4

[4] Source: Schedule KM-S4

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

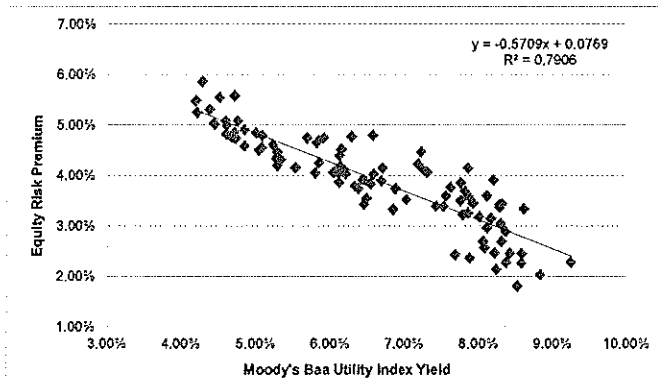
[6] Equals Col. [1] + (Col. [2] x Col. [4])

[7] Source: Bloomberg Professional

[8] Source: Blue Chip Financial Forecasts, Vol. 37, No. 7, July 1, 2018, at 2. (6 quarters ending December 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	7.69%	-0.571	4.69%	5.01%	9.70%
Near-Term Projected Utility Bond Yield	7.69%	-0.571	5.32%	4.65%	9.97%
Long-Term Projected Utility Bond Yield	7.69%	-0.571	6.15%	4.17%	10.33%



Notes:

[1] Constant of regression equation

[2] Slope of regression equation

[3] Projected yields = Current yield + Blue Chip's projected change in corporate Baa bond yields

Sources: Current = Bloomberg Professional (30-day average);

Near Term Projected = Blue Chip Financial Forecasts, Vol. 37, No. 7, July, 1, 2018, at 2;

Long Term Projected = Blue Chip Financial Forecasts, Vol. 37, No. 16, June 1, 2018, at 14

[4] Equals [1] + [3] x [2]

[5] Equals [3] + [4]

[6] Source: S&P Global Market Intelligence (excludes quarters without rate case activity)

[7] Source: S&P Global Market Intelligence

[8] Source: Bloomberg Professional

[9] Equals [7] - [8]

[10] Source: S&P Global Market Intelligence

	[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		Number of Cases
1992 Q4	11.94%	8.61%	3.33%		15
1993 Q1	11.75%	8.31%	3.44%		4
1993 Q2	11.71%	8.11%	3.60%		6
1993 Q3	11.39%	7.62%	3.77%		12
1993 Q4	11.16%	7.56%	3.59%		18
1994 Q1	11.12%	7.86%	3.26%		5
1994 Q2	10.84%	8.58%	2.26%		4
1994 Q3	10.87%	8.83%	2.03%		3
1994 Q4	11.53%	9.25%	2.28%		12
1995 Q2	11.00%	8.31%	2.69%		1
1995 Q3	11.07%	8.11%	2.95%		3
1995 Q4	11.61%	7.76%	3.85%		9
1996 Q1	11.45%	7.86%	3.59%		2
1996 Q2	10.88%	8.42%	2.45%		6
1996 Q3	11.25%	8.37%	2.88%		2
1996 Q4	11.19%	8.01%	3.18%		7
1997 Q1	11.31%	8.16%	3.15%		7
1997 Q2	11.70%	8.27%	3.43%		1
1997 Q3	12.00%	7.86%	4.14%		1
1997 Q4	10.92%	7.53%	3.39%		3
1998 Q2	11.37%	7.30%	4.07%		3
1998 Q3	11.41%	7.19%	4.22%		3
1998 Q4	11.69%	7.23%	4.46%		4
1999 Q1	10.82%	7.43%	3.39%		3
1999 Q2	11.25%	7.76%	3.49%		1

1999 Q4	10.38%	8.24%	2.13%	2
2000 Q1	10.66%	8.38%	2.28%	2
2000 Q2	11.03%	8.58%	2.45%	3
2000 Q3	11.33%	8.30%	3.04%	5
2000 Q4	12.10%	8.19%	3.91%	3
2001 Q1	11.38%	7.92%	3.45%	2
2001 Q2	10.75%	8.06%	2.69%	1
2001 Q4	10.65%	8.08%	2.57%	2
2002 Q1	10.67%	8.21%	2.46%	3
2002 Q2	11.64%	8.28%	3.36%	4
2002 Q3	11.50%	7.82%	3.68%	3
2002 Q4	11.01%	7.79%	3.22%	9
2003 Q1	11.38%	7.23%	4.15%	5
2003 Q2	11.36%	6.57%	4.80%	4
2003 Q3	10.61%	6.87%	3.74%	5
2003 Q4	10.84%	6.70%	4.14%	11
2004 Q1	11.06%	6.28%	4.78%	5
2004 Q2	10.57%	6.68%	3.89%	3
2004 Q3	10.37%	6.46%	3.91%	8
2004 Q4	10.66%	6.14%	4.52%	6
2005 Q1	10.65%	5.91%	4.74%	2
2005 Q2	10.54%	5.84%	4.70%	5
2005 Q3	10.47%	5.81%	4.66%	5
2005 Q4	10.32%	6.14%	4.18%	14
2006 Q1	10.68%	6.15%	4.53%	5
2006 Q2	10.60%	6.58%	4.02%	1
2006 Q3	10.34%	6.43%	3.91%	4
2006 Q4	10.14%	6.11%	4.03%	5
2007 Q1	10.52%	6.12%	4.40%	11
2007 Q2	10.13%	6.34%	3.79%	3
2007 Q3	10.03%	6.49%	3.54%	8
2007 Q4	10.12%	6.38%	3.74%	13
2008 Q1	10.38%	6.54%	3.84%	7
2008 Q2	10.17%	6.84%	3.32%	3
2008 Q3	10.55%	7.03%	3.52%	9
2008 Q4	10.34%	8.53%	1.81%	13
2009 Q1	10.24%	7.88%	2.36%	4
2009 Q2	10.11%	7.89%	2.42%	8
2009 Q3	9.88%	6.45%	3.43%	2
2009 Q4	10.31%	6.19%	4.11%	16
2010 Q1	10.24%	6.21%	4.03%	9
2010 Q2	9.99%	6.12%	3.87%	11
2010 Q3	10.43%	5.68%	4.74%	6
2010 Q4	10.09%	5.84%	4.25%	13
2011 Q1	10.10%	6.04%	4.06%	5
2011 Q2	9.85%	5.79%	4.05%	4
2011 Q3	9.65%	5.34%	4.31%	2
2011 Q4	9.88%	5.08%	4.79%	4
2012 Q1	9.63%	5.07%	4.56%	5
2012 Q2	9.83%	4.99%	4.84%	8
2012 Q3	9.75%	4.85%	4.90%	1
2012 Q4	10.06%	4.51%	5.55%	20
2013 Q1	9.57%	4.71%	4.86%	3
2013 Q2	9.47%	4.73%	4.74%	6
2013 Q3	9.60%	5.26%	4.34%	1
2013 Q4	9.83%	5.22%	4.61%	11
2014 Q1	9.54%	5.03%	4.51%	6
2014 Q2	9.84%	4.75%	5.08%	8
2014 Q3	9.45%	4.70%	4.75%	6
2014 Q4	10.28%	4.70%	5.58%	6
2015 Q1	9.47%	4.45%	5.02%	3
2015 Q2	9.43%	4.85%	4.59%	3
2015 Q3	9.75%	5.29%	4.46%	1
2015 Q4	9.68%	5.53%	4.15%	9
2016 Q1	9.48%	5.29%	4.20%	6
2016 Q2	9.42%	4.60%	4.81%	6
2016 Q3	9.47%	4.21%	5.25%	4
2016 Q4	9.67%	4.59%	5.08%	9
2017 Q1	9.60%	4.60%	5.00%	3
2017 Q2	9.47%	4.44%	5.03%	7
2017 Q3	10.14%	4.28%	5.86%	6
2017 Q4	9.68%	4.19%	5.49%	8
2018 Q1	9.68%	4.37%	5.31%	6
2018 Q2	9.43%	4.67%	4.76%	7

Average Risk Premium: 3.92%

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	10.00%	59.50	59.50	35.25	41.25	4.01%	10.20%
Chesapeake Utilities Corporation	CPK	10.00%	17.00	20.00	32.30	45.50	13.46%	10.72%
New Jersey Resources Corporation	NJR	13.00%	86.50	86.50	15.95	22.70	9.22%	13.63%
Northwest Natural Gas Company	NWN	12.00%	29.50	32.00	26.35	29.40	4.89%	12.30%
One Gas Inc	OGS	9.00%	52.50	55.00	40.25	43.40	3.09%	9.14%
Southwest Gas Corporation	SWX	10.50%	49.00	53.00	39.80	52.85	9.47%	11.02%
Spire Inc	SR	10.50%	51.00	55.00	41.60	48.10	5.67%	10.81%
Vectren Corporation	VVC	12.50%	83.50	86.00	23.60	29.05	6.11%	12.89%
							Mean:	11.34%
							Median:	11.02%

Expected Earnings Analysis - Value Line Water 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
Artesian Resources Corporation	ARTNA	N/A	N/A	N/A	N/A	N/A	N/A	N/A
American Water	AWK	10.50%	179.00	187.50	31.75	42.00	8.50%	10.97%
American States Water Company	AWR	14.00%	36.80	37.50	15.20	17.35	3.85%	14.27%
Connecticut Water Service, Inc.	CTWS	11.00%	12.15	12.50	24.70	26.80	2.79%	11.16%
Consolidated Water Company	CWCO	10.50%	15.00	16.00	10.45	12.50	6.28%	10.84%
California Water Service Group	CWT	11.50%	48.50	50.00	14.45	16.70	4.48%	11.76%
Global Water Resources Inc	GWRS	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Middlesex Water Company	MSEX	12.50%	16.50	17.00	14.85	16.75	3.83%	12.74%
SJW Group	SJW	14.00%	21.00	23.00	22.65	24.55	4.38%	14.31%
Aqua America	WTR	12.50%	178.25	180.00	11.00	14.50	7.41%	12.98%
York Water Company	YORW	13.50%	12.80	12.75	9.35	11.75	5.77%	13.90%
							Mean:	12.55%
							Median:	12.74%

Notes:

- [1] Source: Value Line  
[2] Source: Value Line  
[3] Source: Value Line  
[4] Source: Value Line  
[5] Source: Value Line  
[6] Equals  $(([3] \times [5]) / ([2] \times [4]))^{(1/4)} - 1$   
[7] Equals  $[1] \times (1 / (1 - 0.5 \times [6]))$

Gas Proxy Group Capital Structure - Current

Company	Ticker	% Common Equity								
		2018Q1	2017Q4	2017Q3	2017Q2	2017Q1	2016Q4	2016Q3	2016Q2	Average
Atmos Energy Corporation	ATO	60.61%	59.80%	55.97%	55.99%	59.92%	59.06%	58.68%	58.54%	58.57%
Black Hills Corporation	BKH	36.87%	35.43%	35.07%	34.62%	34.23%	33.42%	33.28%	33.14%	34.51%
Chesapeake Utilities Corporation	CPK	68.59%	70.16%	68.49%	68.36%	75.61%	74.95%	73.80%	70.88%	71.35%
New Jersey Resources	NJR	55.77%	53.59%	51.55%	54.23%	54.25%	51.34%	51.10%	54.46%	53.29%
Northwest Natural Gas Company	NWN	50.45%	48.78%	52.07%	54.58%	54.86%	54.17%	56.69%	57.35%	53.62%
ONE Gas, Inc.	OGS	62.87%	62.16%	61.82%	61.84%	61.98%	61.29%	60.97%	61.14%	61.76%
Southwest Gas Holdings, Inc.	SWX	48.16%	49.87%	49.36%	50.05%	51.89%	50.97%	49.74%	52.67%	50.34%
Spire Inc.	SR	49.70%	49.33%	48.73%	51.30%	49.44%	46.45%	46.06%	49.49%	48.81%
Vectren Corporation	VVC	50.52%	50.14%	50.13%	51.14%	51.09%	50.78%	50.25%	49.82%	50.48%
Mean		53.73%	53.25%	52.58%	53.57%	54.81%	53.60%	53.40%	54.16%	53.64%
Median		50.52%	50.14%	51.55%	54.23%	54.25%	51.34%	51.10%	54.46%	53.29%

Company	Ticker	% Long-Term Debt								
		2018Q1	2017Q4	2017Q3	2017Q2	2017Q1	2016Q4	2016Q3	2016Q2	Average
Atmos Energy Corporation	ATO	39.39%	40.20%	44.03%	44.01%	40.08%	40.94%	41.32%	41.46%	41.43%
Black Hills Corporation	BKH	63.13%	64.57%	64.93%	65.38%	65.77%	66.58%	66.72%	66.86%	65.49%
Chesapeake Utilities Corporation	CPK	31.41%	29.84%	31.51%	31.64%	24.39%	25.05%	26.20%	29.12%	28.65%
New Jersey Resources	NJR	44.23%	46.41%	48.45%	45.77%	45.75%	48.66%	48.90%	45.54%	46.71%
Northwest Natural Gas Company	NWN	49.55%	51.22%	47.93%	45.42%	45.14%	45.83%	43.31%	42.65%	46.38%
ONE Gas, Inc.	OGS	37.13%	37.84%	38.18%	38.16%	38.02%	38.71%	39.03%	38.86%	38.24%
Southwest Gas Holdings, Inc.	SWX	51.84%	50.13%	50.64%	49.95%	48.11%	49.03%	50.26%	47.33%	49.66%
Spire Inc.	SR	50.30%	50.67%	51.27%	48.70%	50.56%	53.55%	53.94%	50.51%	51.19%
Vectren Corporation	VVC	49.48%	49.86%	49.87%	48.86%	48.91%	49.22%	49.75%	50.18%	49.52%
Mean		46.27%	46.75%	47.42%	46.43%	45.19%	46.40%	46.60%	45.84%	46.36%
Median		49.48%	49.86%	48.45%	45.77%	45.75%	48.66%	48.90%	45.54%	46.71%

Value Line Water Group Capital Structure - Current

Company	Ticker	% Common Equity								
		2018Q1	2017Q4	2017Q3	2017Q2	2017Q1	2016Q4	2016Q3	2016Q2	Average
Artesian Resources Corporation	ARTNA	57.46%	57.83%	57.42%	56.99%	56.57%	57.29%	56.67%	56.49%	57.09%
American Water	AWK	44.41%	44.12%	42.82%	45.90%	45.52%	45.17%	47.00%	46.56%	45.19%
American States Water Company	AWR	62.32%	62.25%	62.07%	61.49%	60.78%	60.60%	60.44%	59.74%	61.21%
Connecticut Water Service, Inc.	CTWS	52.83%	52.91%	52.80%	55.28%	54.68%	54.14%	53.92%	53.08%	53.70%
Consolidated Water	CWCO	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
California Water Service Group	CWT	56.64%	56.60%	55.31%	54.35%	53.87%	54.17%	53.72%	53.12%	54.72%
Global Water Resources Inc	GWRS	10.82%	11.50%	10.48%	10.39%	11.08%	11.58%	12.17%	12.11%	11.27%
Middlesex Water Company	MSEX	61.05%	61.10%	61.46%	60.92%	60.71%	60.82%	61.43%	60.80%	61.04%
SJW Group	SJW	51.50%	51.80%	51.21%	50.30%	49.29%	49.31%	52.27%	51.31%	50.87%
Aqua America	WTR	47.65%	47.99%	48.76%	49.10%	49.34%	49.49%	50.30%	49.68%	49.04%
York Water Company	YORW	57.50%	56.98%	56.92%	56.65%	57.44%	57.40%	57.31%	56.96%	57.14%
Mean		54.74%	54.83%	54.48%	54.67%	54.48%	54.54%	55.02%	54.53%	54.66%
Median		56.64%	56.60%	55.31%	55.26%	54.68%	54.17%	53.92%	53.12%	54.72%

Company	Ticker	% Long-Term Debt								
		2018Q1	2017Q4	2017Q3	2017Q2	2017Q1	2016Q4	2016Q3	2016Q2	Average
Artesian Resources Corporation	ARTNA	42.54%	42.17%	42.58%	43.01%	43.43%	42.71%	43.33%	43.51%	42.91%
American Water	AWK	55.59%	55.88%	57.18%	54.10%	54.48%	54.83%	53.00%	53.44%	54.81%
American States Water Company	AWR	37.68%	37.75%	37.93%	38.51%	39.22%	39.40%	39.56%	40.26%	38.79%
New Jersey Resources	NJR	47.17%	47.09%	47.20%	44.74%	45.32%	45.86%	46.08%	46.92%	46.30%
Consolidated Water	CWCO	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
California Water Service Group	CWT	43.36%	43.40%	44.69%	45.65%	46.13%	45.83%	46.28%	46.88%	45.28%
Global Water Resources Inc	GWRS	89.18%	88.50%	89.52%	89.61%	88.92%	88.42%	87.83%	87.89%	88.73%
Middlesex Water Company	MSEX	38.95%	38.90%	38.54%	39.08%	39.29%	39.18%	38.57%	39.20%	38.96%
SJW Group	SJW	48.50%	48.20%	48.79%	49.70%	50.71%	50.69%	47.73%	48.69%	49.13%
Aqua America	WTR	52.35%	52.01%	51.24%	50.90%	50.66%	50.51%	49.70%	50.32%	50.96%
York Water Company	YORW	42.50%	43.02%	43.08%	43.35%	42.56%	42.60%	42.69%	43.04%	42.86%
Mean		45.26%	45.17%	45.52%	45.33%	45.52%	45.46%	44.98%	45.47%	45.34%
Median		43.36%	43.40%	44.69%	44.74%	45.32%	45.83%	46.08%	46.88%	45.28%

Sources: S&P Global Market Intelligence; Bloomberg

Gas Proxy Group Equity Ratio - Value Line Projections

Company	% Common Equity			
	Ticker	2018	2019	21-23
Atmos Energy Corporation	ATO	60.00%	60.00%	55.00%
Black Hills Corporation	BKH	41.50%	39.00%	46.00%
Chesapeake Utilities Corporation	CPK	70.00%	70.00%	70.00%
New Jersey Resources Corporation	NJR	55.50%	57.50%	62.00%
Northwest Natural Gas Company	NWN	52.50%	53.00%	53.50%
ONE Gas, Inc.	OGS	65.00%	62.00%	62.00%
Southwest Gas Holdings, Inc.	SWX	48.50%	49.50%	52.00%
Spire Inc.	SR	50.50%	50.50%	51.00%
Vectren Corporation	VVC	52.50%	53.00%	53.00%
Mean		55.11%	54.94%	56.06%
Median		52.50%	53.00%	53.50%

Value Line Water Group Equity Ratio - Value Line Projections

Company	% Common Equity			
	Ticker	2018	2019	21-23
Artesian Res. Corp.	ARTNA	59.00%	N/A	N/A
American Water	AWK	43.50%	42.50%	42.50%
Amer. States Water	AWR	58.50%	58.00%	54.00%
Connecticut Water	CTWS	53.50%	54.50%	55.00%
Consol. Water Co.	CWCO	100.00%	100.00%	100.00%
California Water	CWT	57.00%	57.50%	58.00%
Global Water Resources Inc	GWRS	11.00%	N/A	N/A
Middlesex Water	MSEX	62.50%	62.50%	62.50%
SJW Group	SJW	51.50%	52.00%	52.00%
Aqua America	WTR	49.00%	46.50%	46.50%
York Water	YORW	64.50%	65.00%	66.00%
Mean		55.45%	59.83%	59.61%
Median		57.00%	57.50%	55.00%

Source: Value Line as of July 13, 2018



Risk Metrics

Proxy Group

Company	Ticker	Beta	S&P Credit Rating	2018 Equity Ratio
Atmos Energy Corporation	ATO	0.70	A	60.00%
Black Hills Corporation	BKH	0.90	BBB	41.50%
Chesapeake Utilities	CPK	0.70	n/a	70.00%
New Jersey Resources Corporation	NJR	0.80	A	55.50%
Northwest Natural Gas Company	NWN	0.70	A+	52.50%
One Gas Inc	OGS	0.70	A	65.00%
Southwest Gas	SWX	0.80	BBB+	48.50%
Spire Inc	SR	0.70	A-	50.50%
Vectren Corporation	VVC	0.70	A-	52.50%
<b>Mean</b>		0.74	A-	55.11%
<b>Median</b>		0.70	A-/A	52.50%

Value Line Water Utilities

Company	Ticker	Beta	S&P Credit Rating	2018 Equity Ratio
Artesian Res. Corp.	ARTNA	0.65	n/a	59.00%
American Water	AWK	0.65	A	43.50%
Amer. States Water	AWR	0.80	A+	58.50%
Connecticut Water	CTWS	0.65	A	53.50%
Consol. Water Co.	CWCO	0.95	n/a	100.00%
California Water	CWT	0.80	A+	57.00%
Global Water Resources Inc	GWRG	0.35	n/a	11.00%
Middlesex Water	MSEX	0.80	A	62.50%
SJW Group	SJW	0.75	n/a	51.50%
Aqua America	WTR	0.75	n/a	49.00%
York Water	YORW	0.80	A-	64.50%
<b>Mean</b>		0.72	A	55.45%
<b>Median</b>		0.75	A	57.00%

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	42.83%	Murray Recommendation
Adjusted D/E Ratio	1.33	(1 - Adjusted Equity Ratio) / Adjusted Equity Ratio
Sector Equity Beta	0.69	Schedule KM-S4; average of Value Line and Bloomberg betas
Sector Asset Beta (unlevered)	0.41	Equals Equity Beta / (1 + (1 - Tax Rate) * Current D/E Ratio)
Check: Re-Lever Beta	0.69	Equals Asset Beta x (1 + Starting D/E Ratio * (1 - Tax Rate))
Re-Levered Beta at 42.83% Equity	0.85	Equals Asset Beta x (1 + New D/E Ratio * (1 - Tax Rate))
Difference in Re-Levered Beta	0.16	Equals Re-Levered Equity Beta - Sector Equity Beta
Assumed MRP	9.87%	Implied MRP assuming Spire's 9.80% ROE, and 3.02% current risk-free rate and 0.69 beta
Cost of Equity Effect	1.57%	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

## Authorized Gas Utility Risk Premiums vs. Duff &amp; Phelps Equity Risk Premium

Year	Authorized Risk Premium	Duff & Phelps ERP	Difference
2008	6.08%	5.25%	-0.83%
2009	6.06%	5.88%	-0.19%
2010	5.93%	5.50%	-0.43%
2011	5.96%	5.75%	-0.21%
2012	6.90%	5.50%	-1.40%
2013	6.17%	5.00%	-1.17%
2014	6.44%	5.00%	-1.44%
2015	6.74%	5.00%	-1.74%
2016	6.91%	5.50%	-1.41%
2017	6.83%	5.25%	-1.58%
2018	6.50%	5.00%	-1.50%

Quarter	Average ROE	Average Treasury	Authorized Risk Premium	Number of Cases	Duff & Phelps ERP	Difference
2008 Q1	10.38%	4.41%	5.96%	7	5.00%	-0.96%
2008 Q2	10.17%	4.57%	5.59%	3	5.00%	-0.59%
2008 Q3	10.55%	4.45%	6.10%	9	5.00%	-1.10%
2008 Q4	10.34%	3.66%	6.68%	13	6.00%	-0.68%
2009 Q1	10.24%	3.46%	6.79%	4	6.00%	-0.79%
2009 Q2	10.11%	4.17%	5.94%	8	6.00%	0.06%
2009 Q3	9.88%	4.32%	5.56%	2	6.00%	0.44%
2009 Q4	10.31%	4.34%	5.97%	16	5.50%	-0.47%
2010 Q1	10.24%	4.62%	5.61%	9	5.50%	-0.11%
2010 Q2	9.99%	4.37%	5.61%	11	5.50%	-0.11%
2010 Q3	10.43%	3.86%	6.57%	6	5.50%	-1.07%
2010 Q4	10.09%	4.17%	5.93%	13	5.50%	-0.43%
2011 Q1	10.10%	4.56%	5.54%	5	5.50%	-0.04%
2011 Q2	9.85%	4.34%	5.51%	4	5.50%	-0.01%
2011 Q3	9.65%	3.69%	5.96%	2	6.00%	0.04%
2011 Q4	9.88%	3.04%	6.83%	4	6.00%	-0.83%
2012 Q1	9.63%	3.14%	6.49%	5	5.50%	-0.99%
2012 Q2	9.83%	2.94%	6.89%	8	5.50%	-1.39%
2012 Q3	9.75%	2.74%	7.01%	1	5.50%	-1.51%
2012 Q4	10.06%	2.86%	7.19%	20	5.50%	-1.69%
2013 Q1	9.57%	3.13%	6.43%	3	5.00%	-1.43%
2013 Q2	9.47%	3.14%	6.33%	6	5.00%	-1.33%
2013 Q3	9.60%	3.71%	5.89%	1	5.00%	-0.89%
2013 Q4	9.83%	3.79%	6.04%	11	5.00%	-1.04%
2014 Q1	9.54%	3.68%	5.86%	6	5.00%	-0.86%
2014 Q2	9.84%	3.44%	6.39%	8	5.00%	-1.39%
2014 Q3	9.45%	3.27%	6.18%	6	5.00%	-1.18%
2014 Q4	10.28%	2.97%	7.32%	6	5.00%	-2.32%
2015 Q1	9.47%	2.55%	6.92%	3	5.00%	-1.92%
2015 Q2	9.43%	2.88%	6.55%	3	5.00%	-1.55%
2015 Q3	9.75%	2.96%	6.79%	1	5.00%	-1.79%
2015 Q4	9.68%	2.96%	6.72%	9	5.00%	-1.72%
2016 Q1	9.48%	2.72%	6.76%	6	5.50%	-1.26%
2016 Q2	9.42%	2.57%	6.85%	6	5.50%	-1.35%
2016 Q3	9.47%	2.28%	7.19%	4	5.50%	-1.69%
2016 Q4	9.67%	2.83%	6.84%	9	5.50%	-1.34%
2017 Q1	9.60%	3.05%	6.55%	3	5.50%	-1.05%
2017 Q2	9.47%	2.90%	6.57%	7	5.50%	-1.07%
2017 Q3	10.14%	2.82%	7.32%	6	5.00%	-2.32%
2017 Q4	9.68%	2.82%	6.86%	8	5.00%	-1.86%
2018 Q1	9.68%	3.03%	6.65%	6	5.00%	-1.65%
2018 Q2	9.43%	3.09%	6.34%	7	5.00%	-1.34%

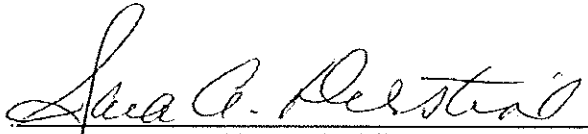
**AFFIDAVIT OF KEITH MAGEE**

COMMONWEALTH OF MASSACHUSETTS     )  
   ) ss  
COUNTY OF WORCESTER                    )

On the 3<sup>rd</sup> day of August, 2018, before me appeared Keith Magee, to me personally known, who, being by me first duly sworn, states that he 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 3<sup>rd</sup> day of August, 2018.

  
\_\_\_\_\_  
Notary Public

My commission expires: November 8, 2024

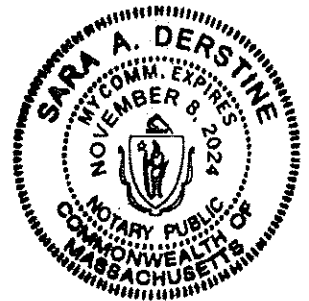


Exhibit No.:

Issue: Rate of Return/Capital Structure

Witness: Keith Magee

Type of Exhibit: Direct Testimony

Sponsoring Party: Liberty Utilities

(Midstates Natural Gas) Corp.

d/b/a Liberty Utilities

Case No.: GR-2018-0013

Date Testimony Prepared: September 28, 2017

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

**Direct Testimony**

**of**

**Keith Magee  
ScottMadden, Inc**

**On Behalf Of**

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

**September 2017**



**Liberty Utilities**

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

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

1 I. INTRODUCTION

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. ON WHOSE BEHALF ARE YOU SUBMITTING THIS TESTIMONY?

6 A. I am submitting this direct testimony ("Direct Testimony") before the Missouri Public  
7 Service Commission ("Commission") on behalf of Liberty Utilities (Midstates Natural  
8 Gas) Corp., d/b/a Liberty Utilities ("Liberty Midstates" or the "Company"), an indirect  
9 wholly owned subsidiary of Algonquin Power & Utilities Corp ("APUC").

10 Q. PLEASE SUMMARIZE YOUR EDUCATIONAL AND PROFESSIONAL  
11 EXPERIENCE.

12 A. I hold a Bachelor's degree in Economics from Whitman College, and an MBA with a  
13 concentration in Finance from the F.W. Olin Graduate School of Business at Babson  
14 College. I also hold the professional designation of Chartered Financial Analyst ("CFA")  
15 awarded by the CFA Institute, and the professional designation of Certified Rate of  
16 Return Analyst ("CRRA") awarded by the Society of Utility and Regulatory Financial  
17 Analysts.

18 As a consultant in the utility and energy industry, I have provided consulting

1 services on a range of financial and economic issues including areas such as rate case  
2 activities (e.g., cost of capital, cost of service, financial reporting filing requirements and  
3 rate design) and policy and strategy issues (e.g., capital investment related activities).  
4 Many of my engagements have included developing cost of capital analyses and  
5 testimony. A summary of my professional and educational background is included in  
6 Attachment A to my Direct Testimony.

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

8 **Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?**

9 A. The purpose of my Direct Testimony is to present evidence and provide a  
10 recommendation regarding the Company's return on equity ("ROE" or "cost of equity")  
11 and capital structure, and to assess the reasonableness of the Company's cost of debt. My  
12 analyses and conclusions are supported by the data presented in Schedule KM-1 through  
13 Schedule KM-12, which have been prepared by me or under my direction. In addition, I  
14 sponsor WP-1 Rate of Return, setting forth the capital structure and cost of capital, as  
15 noted by Company witness Schwartz.

16 **Q. WHAT ARE YOUR CONCLUSIONS REGARDING THE APPROPRIATE COST**  
17 **OF EQUITY, CAPITAL STRUCTURE AND COST OF DEBT FOR THE**  
18 **COMPANY?**

19 A. My analyses indicate that the Company's cost of equity currently is in the range of 9.90  
20 percent to 10.35 percent. Based on the quantitative and qualitative analyses discussed  
21 throughout my Direct Testimony, I recommend that the Commission authorize the  
22 Company the opportunity to earn an ROE of 10.25 percent.

23 With respect to the Company's capital structure, I propose a capital structure



1 consisting of 53.00 percent common equity and 47.00 percent long-term debt. That  
2 capital structure includes an equity ratio that is below Liberty Midstates' equity ratio, but  
3 is consistent with those in place at comparable natural gas companies. In light of the  
4 importance of maintaining access to capital, and seeing that it is consistent with similarly  
5 situated utility companies, I conclude that a 53.00 percent equity ratio is reasonable and  
6 appropriate.

7 Lastly, I note that the Company's 4.70 percent cost of debt is consistent with,  
8 although lower than, the debt cost rates authorized for natural gas utilities during the  
9 twelve months ended August 18, 2017. As such, I conclude that the Company's cost of  
10 debt is reasonable and appropriate.

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

13 A. Because all models are subject to various assumptions and constraints, equity analysts  
14 and investors tend use multiple methods to develop their return requirements.<sup>1</sup> My ROE  
15 recommendation in this proceeding relies on the results of the quarterly growth  
16 discounted cash flow ("DCF") model, the capital asset pricing model ("CAPM"), the  
17 bond yield plus risk premium ("Risk Premium") model, and the expected earnings  
18 approach.

19 My recommendation also takes into consideration the Company's risk and cost  
20 profile, in particular: (1) its relatively small size; (2) the regulatory environment in which  
21 the Company operates; and (3) the direct costs associated with equity issuances.

---

<sup>1</sup> See, e.g., Eugene Brigham, Louis Gapenski, Financial Management: Theory and Practice, 7th Ed., 1994, at 341, and Tom Copeland, Tim Koller and Jack Murrin, Valuation: Measuring and Managing the Value of Companies, 3rd ed., 2000, at 214.

1 Although I did not make explicit adjustments to my ROE estimates for those factors, I did  
2 take them into consideration in determining the range in which the Company's cost of  
3 equity likely falls.

4 **Q. WHAT ARE THE KEY FACTORS CONSIDERED IN YOUR ANALYSES AND**  
5 **UPON WHICH YOU BASE YOUR RECOMMENDED ROE?**

6 A. My analyses and recommendations considered the following:

- 7 • The United States Supreme Court's *Bluefield* and *Hope* decisions<sup>2</sup> that established the  
8 following standards for determining a fair and reasonable allowed ROE: (1)  
9 consistency of the allowed return with other businesses having similar risk; (2)  
10 adequacy of the return to provide access to capital and support credit quality; (3) an  
11 end result of just and reasonable rates;
- 12 • The Company's business risks relative to the proxy group of comparable companies  
13 (set forth in Table 2 below) and the implications of those risks in arriving at the  
14 appropriate ROE from within the range of results established by the DCF, CAPM,  
15 Risk Premium and Expected Earnings methods;
- 16 • The capital-intensive nature of utility operations, indicating the need to finance large,  
17 long-lived investments with internally generated and externally acquired funds, even  
18 during periods of capital market distress, both of which depend on the Company's  
19 ability to earn a reasonable return on its rate base; and
- 20 • The effect of current capital market conditions on investors' return requirements.

21 **Q. WHAT ARE THE RESULTS OF YOUR ROE ANALYSES?**

---

<sup>2</sup> *Bluefield Waterworks & Improvement Co., v. Public Service Comm'n of West Virginia*, 262 U.S. 679 (1923) ("Bluefield"); *Federal Power Comm'n v. Hope Natural Gas Co.*, 320 U.S. 591 (1944) ("Hope").

1 A. The results of my analyses are summarized in Table 1, below.

2 **Table 1: Summary of Analytical Results**

<b>DCF Analyses</b>	<i>Proxy Group</i>		
	<i>Low</i>	<i>Mean</i>	<i>High</i>
Constant Growth, 30-day Stock Prices	7.22%	8.96%	11.13%
Constant Growth, 90-day Stock Prices	7.26%	9.01%	11.17%
Constant Growth, 180-day Stock Prices	7.36%	9.10%	11.27%
Quarterly Growth, 30-day Stock Prices	7.37%	9.08%	11.37%
Quarterly Growth, 90-day Stock Prices	7.42%	9.13%	11.41%
Quarterly Growth, 180-day Stock Prices	7.52%	9.23%	11.52%
<b>CAPM</b>	<i>Bloomberg MRP</i>		<i>Value Line MRP</i>
Value Line Beta, Current Risk-Free Rate (2.85%)	10.53%		11.08%
Value Line Beta, Projected Risk-Free Rate (3.35%)	10.67%		11.22%
Bloomberg Beta, Current Risk-Free Rate (2.85%)	9.62%		10.11%
Bloomberg Beta, Projected Risk-Free Rate (3.35%)	9.80%		10.29%
<b>Bond Yield Plus Risk Premium</b>	<i>Low</i>	<i>Mean</i>	<i>High</i>
Current and Projected Baa Utility Bond Yields	9.52%	9.83%	10.41%
<b>Expected Earnings Analysis</b>	<i>Low</i>	<i>Mean</i>	<i>High</i>
Value Line Projected Return on Book Equity	10.74%	10.93%	11.11%

3  
4 **Q. ARE THERE FACTORS THAT SHOULD BE CONSIDERED IN DETERMINING**  
5 **THE WEIGHT GIVEN TO THE RESULTS OF THE DIFFERENT ROE**  
6 **MODELS?**

7 A. Yes, there are. All of the models used to estimate the cost of equity are subject to certain  
8 assumptions, which may become more or less relevant as market conditions, and market  
9 data, change. An important consideration is the consistency of each model's underlying  
10 assumptions with current and expected market conditions, and the reasonableness of its  
11 results relative to observable benchmarks. For example, utility Price/Earnings (P/E)  
12 ratios recently have been well in excess of their historical averages. Those pricing levels,  
13 which had been associated with Federal Reserve monetary policy initiatives, weighed on

1 utility dividend yields and, therefore, DCF-based ROE estimates. An important  
2 analytical question is whether the increase in P/E ratios represents a fundamental shift in  
3 utility valuation, or a temporary trading position to be unwound as conditions change.  
4 That question is important because the constant growth and quarterly growth models  
5 assume that current underlying relationships will remain constant, forever; the model  
6 does not allow us to incorporate such important factors, nor does it enable us to reflect  
7 the expected risk associated with changing market conditions.

8 Risk premium-based methods (such as the capital asset pricing model), on the  
9 other hand, incorporate measures of risk and have the benefit of directly considering  
10 investors' expectations regarding future market returns. Other risk premium approaches  
11 (the bond yield plus risk premium approach) reflect the well-documented finding that the  
12 cost of equity does not move in lock-step with interest rates. For example, at times  
13 interest rates fall because investors are so risk averse that they would rather accept a very  
14 modest return on Treasury securities than take on the risk of equity ownership. In such  
15 circumstances, low interest rates suggest an increasing, not a decreasing cost of equity.  
16 The important analytical issue, therefore, is understanding each model's fundamental  
17 structure and assumptions, and interpreting its results in the context of current and  
18 expected market conditions.

19 Every model has its own strengths and weaknesses, and it is important to reflect  
20 those relative strengths in estimating the cost of equity. On balance, I believe the DCF  
21 model results in particular should be viewed with considerable caution, and should be  
22 given less weight than the other approaches in the current capital market environment.  
23 And, because risk premium-based methods provide the ability to reflect investors' views

1 of risk, future market returns, and the relationship between interest rates and the cost of  
2 equity, those methods should be given more weight than the DCF method.

3 **Q. WHAT ARE YOUR CONCLUSIONS REGARDING LIBERTY MIDSTATES’**  
4 **COST OF EQUITY?**

5 A. Giving less weight to the low end of the DCF results shown in Table 1, I believe that a  
6 reasonable range of Liberty Midstates’ cost of equity is from 9.90 percent to 10.35  
7 percent. Considering the capital market environment and the Company’s business risks  
8 relative to the proxy group, it is my view that an ROE of 10.25 percent is reasonable.

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

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

11 Section III – Discusses the regulatory guidelines and financial considerations  
12 pertinent to the development of the cost of capital;

13 Section IV – Explains my selection of the proxy group of natural gas utilities used to  
14 develop my analytical results;

15 Section V – Explains my analyses and the analytical bases for my ROE  
16 recommendation;

17 Section VI – Provides a discussion of specific business risks and other considerations  
18 that have a direct bearing on the Company’s cost of equity;

19 Section VII – Highlights the current capital market conditions and their effect on the  
20 Company’s cost of equity;

21 Section VIII – Explains my recommendation for the Company’s capital structure;

22 Section IX – Briefly discusses the Company’s cost of debt; and

23 Section X – Summarizes my conclusions and recommendations.

1 III. REGULATORY GUIDELINES AND FINANCIAL CONSIDERATIONS

2 Q. PLEASE PROVIDE A BRIEF SUMMARY OF THE GUIDELINES  
3 ESTABLISHED BY THE UNITED STATES SUPREME COURT (THE  
4 “COURT”) FOR THE PURPOSE OF DETERMINING THE ROE.

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

12 Q. DOES MISSOURI PRECEDENT PROVIDE SIMILAR GUIDANCE?

13 A. Yes, the Commission cited the *Hope* and *Bluefield* decisions in its order in the  
14 Company’s last rate case and acknowledged its authority and responsibility to set “just  
15 and reasonable” rates for public utility service, stating that:

16 The Commission must draw primary guidance in the evaluation of the  
17 expert testimony from the Supreme Court’s *Hope* and *Bluefield*  
18 decisions. Pursuant to those decisions, returns for Liberty’s  
19 shareholders must be commensurate with returns in other enterprises  
20 with corresponding risks. Just and reasonable rates must include  
21 revenue sufficient to cover operating expenses, service debt and pay a  
22 dividend commensurate with the risk involved. The language of *Hope*  
23 and *Bluefield* unmistakably requires a *comparative method*, based on a  
24 quantification of risk.

25 [...]

26 *Hope* and *Bluefield* also expressly refer to objective measures. The  
27 allowed return must be sufficient to ensure confidence in the financial

1 integrity of the company in order to maintain its credit and attract  
2 necessary capital.<sup>3</sup>

3 Based on those standards, the authorized ROE should provide the Company with  
4 the opportunity to earn a fair and reasonable return on its regulated utility operations and  
5 should enable efficient access to external capital under a variety of market conditions.

6 **Q. WHY IS IT IMPORTANT FOR A UTILITY TO BE ALLOWED THE**  
7 **OPPORTUNITY TO EARN A RETURN ADEQUATE TO ATTRACT EQUITY**  
8 **CAPITAL AND MAINTAIN FINANCIAL INTEGRITY?**

9 A. Investors have many options available to them and will only invest in a firm if the  
10 expected return justifies the risks taken on in making that investment. Customers have an  
11 interest in safe, reliable, and efficient service, which depends on investors' willingness to  
12 commit the capital needed to maintain and improve the utility system. In that important  
13 sense, investors and customers have a common interest in a financially strong utility that  
14 is able to access capital on reasonable terms when and as needed. A return that is  
15 adequate to attract capital and maintain financial integrity enables a utility to access  
16 capital markets at reasonable terms and continue to make needed investments. To the  
17 extent Liberty Midstates is provided a reasonable opportunity to earn its market-based  
18 cost of equity, neither customers nor shareholders should be disadvantaged.

19 **IV. PROXY GROUP SELECTION**

---

<sup>3</sup> *In the Matter of Liberty Utilities (Midstates Natural Gas) Corp. d/b/a Liberty Utilities' Tariff Revisions Designed to Implement a General Rate Increase for Natural Gas Service in the Missouri Service Areas of the Company*, Report and Order, Missouri Public Service Commission, Case No. GR-2014-0152, December 3, 2014, at 27.

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

4 A. Since the ROE is a market-based concept and Liberty Midstates is not a publicly traded  
5 entity, it is necessary to establish a group of comparable publicly-traded companies to  
6 serve as its “proxy.”

7 Even if Liberty Midstates were a publicly traded entity, short-term events could  
8 bias its market data (such as market value or reported growth expectations) during a  
9 given period of time. A significant benefit of using a proxy group is that it serves to  
10 moderate the effects of anomalous, temporary events associated with any one company.  
11 In addition, the use of a proxy group is consistent with the *Bluefield* and *Hope* standards  
12 that require the allowed return to be commensurate with the returns available to other  
13 investments with comparable risks.

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

17 A. No. For example, the constant growth DCF approach, defines the cost of equity as the  
18 sum of the expected dividend yield and projected long-term growth. Despite the care  
19 taken to ensure risk comparability, market expectations with respect to future risks and  
20 growth opportunities will vary from company to company. Even when looking at a  
21 single company, growth projections can vary significantly. Therefore, even within a  
22 group of similarly situated companies, it is common for analytical results to reflect a  
23 seemingly wide range. Consequently, at issue is how to estimate a Company’s ROE from



1 within that range. That determination necessarily must consider a wide range of both  
2 empirical and qualitative information.

3 **Q. PLEASE PROVIDE A SUMMARY PROFILE OF LIBERTY MIDSTATES.**

4 A. Liberty Midstates is a subsidiary of Liberty Utilities Co. (“LUCo”), which in turn is an  
5 indirect wholly owned subsidiary of APUC. Liberty Midstates provides natural gas  
6 distribution service to approximately 82,900 customers in Missouri, Illinois, and Iowa.<sup>4</sup>

7 **Q. HOW DID YOU SELECT THE COMPANIES INCLUDED IN YOUR PROXY  
8 GROUP?**

9 A. I began with the universe of companies that Value Line classifies as Electric or Natural  
10 Gas Utilities, which includes a group of 51 domestic U.S. utilities, and applied the  
11 following screening criteria:

- 12 • Because certain of the models used in my analyses assume that earnings and  
13 dividends grow over time, I excluded companies that do not have positive  
14 earnings growth estimates or pay consistent quarterly cash dividends;
- 15 • To ensure that my analyses are based on consensus growth expectations, I  
16 excluded companies that were not covered by at least two utility industry equity  
17 analysts;
- 18 • To select a proxy group with financial characteristics similar to Liberty Midstates,  
19 I excluded companies that have below investment grade corporate credit ratings  
20 and/or senior unsecured bond ratings from Standard & Poor’s (“S&P”) or  
21 Moody’s;

---

<sup>4</sup> Source: Algonquin Power & Utilities Corp., Form 40-F for fiscal year ended December 31, 2016, at 43.

- 1           • To select companies with a substantial portion of their business activity directly  
2           involved in regulated natural gas distribution, I excluded companies with less than  
3           40.00 percent of regulated operating income derived from regulated natural gas  
4           utility operations.
- 5           • To ensure the data used in my ROE analyses are not skewed by temporary  
6           corporate actions, I eliminated companies that are, or have recently have been,  
7           party to a merger or other significant transaction.

8   **Q.    WHAT COMPANIES MET THOSE SCREENING CRITERIA?**

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

10                           **Table 2: Proxy Group Screening Results**

<b>Company</b>	<b>Ticker</b>
Atmos Energy Corporation	ATO
Black Hills Corporation	BKH
Chesapeake Utilities Corporation	CPK
Northwest Natural Gas Company	NWN
ONE Gas, Inc.	OGS
Sempra Energy	SRE
Southwest Gas Holdings, Inc.	SWX
Spire Inc.	SR
Vectren Corporation	VVC

11  
12   **Q.    DO YOU BELIEVE THAT A PROXY GROUP OF NINE COMPANIES IS**  
13   **SUFFICIENTLY LARGE?**

14   A.    Yes. The analyses performed in estimating the ROE are more likely to be representative  
15   of the subject utility's cost of equity to the extent that the chosen proxy companies are  
16   fundamentally comparable to the subject utility. Because all analysts use some form of  
17   screening process to arrive at a proxy group, the group, by definition, is not randomly

1 drawn from a larger population. Consequently, there is no reason to place more reliance  
2 on the quantitative results of a larger proxy group simply by virtue of the resulting larger  
3 number of observations. In my view, including companies whose fundamental  
4 comparability is tenuous at best simply for the purpose of expanding the number of  
5 observations does not add relevant information to the analysis.

6 **V. COST OF EQUITY ESTIMATION**

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

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

14 **Q. HOW IS THE REQUIRED ROE DETERMINED?**

15 A. The required ROE is estimated using quantitative models that rely on market data to  
16 quantify investor expectations regarding the range of expected equity returns. The use of  
17 different models, and the use of varying investor assumptions within each model,  
18 produces a range of results from which the market-required ROE must be estimated. As  
19 discussed throughout my Direct Testimony, that estimation must be based on a  
20 comprehensive review of relevant data and information, and does not necessarily lend  
21 itself to a strict mathematical solution. Consequently, the key consideration in  
22 determining the ROE is to ensure that the overall analysis reasonably reflects investors'  
23 view of the financial markets in general and the subject company (in the context of the

1 proxy companies) in particular.

2 **Q. WHAT METHODS DID YOU USE TO DETERMINE THE COMPANY'S ROE?**

3 A. I have relied on DCF, CAPM, Risk Premium and expected earnings methods to  
4 determine my recommended ROE.<sup>5</sup> While I have performed both constant growth and  
5 quarterly DCF analyses, I have relied primarily on the latter in arriving at my ROE  
6 recommendation.

7 **Q. HAVE OTHER REGULATORS RECOGNIZED THE IMPORTANCE OF**  
8 **CONSIDERING MULTIPLE METHODS GIVEN CURRENT MARKET**  
9 **CONDITIONS?**

10 A. Yes. For example, in Opinion No. 531 the Federal Energy Regulatory Commission  
11 (FERC) noted the anomalous nature of prevailing capital markets make it more difficult  
12 to determine the rate of return needed to satisfy the *Hope* and *Bluefield* standards and  
13 expressed concern that economic anomalies may have affected the reliability of DCF  
14 analyses.<sup>6</sup> FERC therefore concluded that a mechanical application of the DCF  
15 methodology would be inappropriate and found it necessary to review alternative  
16 benchmark methods to gain insight into the effect of market conditions on the cost of  
17 equity, including the Risk Premium, CAPM and expected earnings approaches.<sup>7</sup> After  
18 review of the evidence in that case, including economic conditions and the results of

---

<sup>5</sup> Referring to the DCF, CAPM and Risk Premium approaches, the Commission noted in Case No. ER-2016-0285: "No one method is any more correct than any other method in all circumstances. Analysts balance their use of all three methods to reach a recommended return on equity." See Report and Order, *In the Matter of Kansas City Power & Light Company's Request for Authority to Implement a General Rate Increase for Electric Service*, ER-2016-0285, pp. 15-16 (May 3, 2017).

<sup>6</sup> See, *Martha Coakley v. Bangor Hydro-Electric Company*, Opinion No. 531, 147 FERC ¶ 61,234 (2014), at P 41 and P 145.

<sup>7</sup> *Ibid.*, at P 142 and PP 145-146.

1 multiple ROE methodologies, FERC determined it would be appropriate to set the ROE  
2 at the midpoint of the upper half of the zone of reasonableness established by the DCF  
3 methodology.<sup>8</sup>

4 Commissions in other regulatory jurisdictions, such as Hawaii, Maryland,  
5 Massachusetts, and North Carolina, have also recognized that no single model is most  
6 reliable under all market conditions, and that the application of reasoned judgment is  
7 important in developing ROE estimates.<sup>9</sup> As discussed throughout the balance of my  
8 testimony, I have applied those principles in developing my recommendation.

9 ***CONSTANT GROWTH DCF MODEL***

10 **Q. IS THE DCF METHODOLOGY WIDELY USED IN REGULATORY**  
11 **PROCEEDINGS?**

12 A. Yes. In my experience, the DCF methodology is widely recognized in regulatory  
13 proceedings, as well as in financial literature. Nonetheless, neither the DCF nor any  
14 other model should be applied without considerable judgment in the selection of data and  
15 the interpretation of results.

16 **Q. PLEASE DESCRIBE THE DCF APPROACH.**

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<sup>8</sup> *Ibid.*, at PP 145-146 and P 152. In April 2017 the United States Court of Appeals for the District of Columbia Circuit issued an opinion in *Emera Maine (formerly known as Bangor Hydro-Electric Company), et al., v. FERC* which vacated and remanded Opinion No. 531 because “FERC did not meet the first requirement of Section 206 that it demonstrate the unlawfulness of transmission owners’ base ROE” and because FERC had relied on the midpoint of the upper half of the zone of reasonableness without adequately “citing record evidence” demonstrating the resulting ROE was a just and reasonable. Importantly, the D.C. Circuit decision did not suggest FERC was wrong to consider alternative methods, nor suggest the alternative methods used or their results were inappropriate.

<sup>9</sup> *See*, for example: (1) Public Utilities Commission of the State of Hawaii, Order No. 13704 in Docket No. 7700, December 28, 1994 at 92; (2) Public Service Commission of Maryland, Order No. 87591 in Case No. 9406, at 153; (3) The Commonwealth of Massachusetts Department of Public Utilities, Order in Docket D.P.U. 15-155, September 30, 2016, at 376-378; and (4) State of North Carolina Utilities Commission, Order in Docket No. G-5, Sub 565, October 28, 2016, at 35-36.

1 A. The DCF approach is based on the theory that a stock's current price represents the  
2 present value of its expected future cash flows. A common formulation of the DCF  
3 approach, also known as the dividend discount model, can be expressed as follows:

4 
$$P = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \dots + \frac{D_\infty}{(1+k)^\infty} \quad \text{Equation [1]}$$

5 where  $P$  represents the current stock price,  $D_1 \dots D_\infty$  represent expected future dividends,  
6 and  $k$  is the discount rate, or required ROE. Under the assumption that cash flows will  
7 grow at a constant rate, Equation [1] is a standard present value calculation that can be  
8 simplified and rearranged into the familiar form:

9 
$$k = \frac{D_0 (1+g)}{P} + g \quad \text{Equation [2]}$$

10 Equation [2] often is referred to as the "constant growth DCF" model, in which the first  
11 term is the expected dividend yield and the second term is the expected long-term annual  
12 growth rate.

13 In its simplest form, the DCF model expresses the cost of equity as the sum of the  
14 expected dividend yield and long-term growth rate. In essence, the DCF model assumes  
15 that the total return received by investors includes the dividend yield, and the rate of  
16 growth. As explained below, under the model's assumptions, the rate of growth equals  
17 the rate of capital appreciation. That is, the model assumes that the investor's return is  
18 the sum of the dividend yield and the increase in the stock price.

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

21 A. The constant growth DCF model requires the following assumptions: (1) a constant  
22 average growth rate for earnings and dividends; (2) a stable dividend payout ratio; (3) a

1 constant price-to-earnings multiple; and (4) a discount rate greater than the expected  
2 growth rate. In addition, the constant growth DCF model assumes that the same return  
3 will be required every year, in perpetuity (*see* Equation [1], above).

4 **Q. WHAT MARKET DATA DID YOU USE TO CALCULATE THE DIVIDEND**  
5 **YIELD IN YOUR CONSTANT GROWTH DCF MODEL?**

6 A. The dividend yield is based on the proxy companies' current annualized dividend, and  
7 average closing stock price over the 30-, 90- and 180-trading days ended August 18,  
8 2017.

9 **Q. WHY DID YOU USE THREE AVERAGING PERIODS TO CALCULATE AN**  
10 **AVERAGE STOCK PRICE?**

11 A. I did so to ensure that the model's results are not skewed by anomalous events that may  
12 affect stock prices on any given trading day. At the same time, the averaging period  
13 should be reasonably representative of expected capital market conditions over the long  
14 term. In my view, using 30-, 90-, and 180-day averaging periods reasonably balances  
15 those concerns.

16 **Q. DID YOU MAKE ANY ADJUSTMENTS TO THE DIVIDEND YIELD TO**  
17 **ACCOUNT FOR PERIODIC GROWTH IN DIVIDENDS?**

18 A. Yes, I did. Since utility companies tend to increase their quarterly dividends at different  
19 times throughout the year, it is reasonable to assume that dividend increases will be  
20 evenly distributed over calendar quarters. Given that assumption, it is appropriate to  
21 calculate the expected dividend yield by applying one-half of the long-term growth rate

1 to the current dividend yield.<sup>10</sup> That adjustment ensures that the expected dividend yield  
2 is, on average, representative of the coming twelve-month period, and does not overstate  
3 the dividends to be paid during that time.

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

6 A. Yes. In its constant growth form, the DCF model (*i.e.*, as presented in Equation [2]  
7 above) assumes a single growth estimate in perpetuity. In order to reduce the long-term  
8 growth rate to a single measure, one must assume a constant payout ratio, and that  
9 earnings per share, dividends per share and book value per share all grow at the same  
10 constant rate. Over the long term, however, dividend growth can only be sustained by  
11 earnings growth. Consequently, it is important to incorporate a variety of measures of  
12 long-term earnings growth into the constant growth DCF model.

13 **Q. IS IT COMMON IN PRACTICE TO RELY ON ANALYSTS' FORECASTS AS**  
14 **THE BASIS OF GROWTH RATE PROJECTIONS?**

15 A. Yes. The cost of equity is a forward-looking concept that focuses on investor  
16 expectations regarding future returns. The estimation of such returns, therefore, should  
17 be based on forward-looking or projected data. Indeed, substantial academic research has  
18 demonstrated the relationship between analysts' forecasts and investor expectations.<sup>11</sup> In  
19 my view, therefore, Value Line, First Call Corporation (now known as Thomson Reuters  
20 I/B/E/S) ("First Call") and Zacks Investment Research ("Zacks") (the latter two of which

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<sup>10</sup> See Schedule KM-1.

<sup>11</sup> See, for example, Roger A. Morin, New Regulatory Finance, Public Utility Reports, Inc., 2006, at 298-303; Harris and Marston, "Estimating Shareholder Risk Premia Using Analysts Growth Forecasts", Financial Management, 21 (Summer 1992); Charles F. Phillips, Jr., The Economics of Regulation, Revised Edition, 1969, Richard D. Irwin, Inc., at 285.



1 are consensus earnings forecast estimates) provide appropriate sources of earnings  
2 growth forecasts.

3 **Q. PLEASE DESCRIBE THE RETENTION GROWTH ESTIMATE AS APPLIED IN**  
4 **YOUR CONSTANT GROWTH DCF MODEL.**

5 A. The Retention Growth model, which is a generally recognized and widely taught method  
6 of estimating long-term growth, is an alternative approach to the use of analysts' earnings  
7 growth estimates. In essence, the model is premised on the proposition that a firm's  
8 growth is a function of its expected earnings, and the extent to which it retains earnings to  
9 invest in the enterprise. In its simplest form, the model represents long-term growth as  
10 the product of the retention ratio (*i.e.*, the percentage of earnings not paid out as  
11 dividends (referred to below as "b") and the expected return on book equity (referred to  
12 below as "r")). Thus, the simple "b x r" form of the model projects growth as a function  
13 of internally generated funds. That form of the model is limiting, however, in that it does  
14 not provide for growth funded from external equity.

15 The "br + sv" form of the Retention Growth estimate used in my DCF analysis is  
16 meant to reflect growth from both internally generated funds (*i.e.*, the "br" term) and  
17 from issuances of equity (*i.e.*, the "sv" term). The first term, which is the product of the  
18 retention ratio (*i.e.*, "b", or the portion of net income not paid to shareholders as  
19 dividends) and the expected Return on Equity (*i.e.*, "r") represents the portion of net  
20 income that is reinvested into the Company as a means of funding growth. The "sv" term  
21 is represented as:

$$\left(\frac{m}{b} - 1\right) \times \text{Growth rate in Common Shares} \quad \text{Equation [3]}$$

23 where  $\frac{m}{b}$  is the Market-to-Book ratio.

1           In this form, the “sv” term reflects an element of growth as the product of (a) the  
2           expected growth in shares outstanding, and (b) that portion of the market-to-book ratio  
3           that exceeds unity. As shown in Schedule KM-3, all of the components of the Retention  
4           Growth model can be derived from data provided by Value Line.

5   **Q. PLEASE EXPLAIN HOW YOU APPLIED THE CONSTANT GROWTH DCF**  
6   **MODEL.**

7   A. I applied the DCF model to the proxy group of natural gas utility companies using the  
8   following inputs for the price and dividend terms:

- 9           1. The average daily closing prices for the 30-, 90- and 180-trading days ended  
10           August 18, 2017, for the term  $P_0$ ; and
- 11           2. The annualized dividend per share as of August 18, 2017, for the term  $D_0$ .

12   I then calculated my DCF results using each of the following growth terms:

- 13           1. The Zacks consensus long-term earnings growth estimates;
- 14           2. The First Call consensus long-term earnings growth estimates; and
- 15           3. The Value Line long-term earnings growth estimates;
- 16           4. An estimate of Retention Growth.

17   **Q. HOW DID YOU CALCULATE THE HIGH AND LOW DCF RESULTS?**

18   A. I calculated the proxy group mean high DCF result using the highest of the EPS growth  
19   estimates (*i.e.*, the Value Line, Zacks, First Call, and Retention Growth estimates) for  
20   each proxy group company. The proxy group mean high result then reflects the average  
21   of the maximum DCF results for each proxy company. I used a similar approach to  
22   calculate the proxy group mean low results, using instead the lowest of the growth  
23   estimates for each proxy group company.

1 Q. WHAT ARE THE RESULTS OF YOUR CONSTANT GROWTH DCF  
2 ANALYSIS?

3 A. My constant growth DCF results are summarized in Table 3, below (see also Schedule  
4 KM-1).

5 Table 3: Constant Growth DCF Results<sup>12</sup>

	<i>Mean Low</i>	<i>Mean</i>	<i>Mean High</i>
30-Day Average	7.22%	8.96%	11.13%
90-Day Average	7.26%	9.01%	11.17%
180-Day Average	7.36%	9.10%	11.27%

6

7 ***QUARTERLY GROWTH DCF MODEL***

8 Q. PLEASE BRIEFLY DESCRIBE THE QUARTERLY GROWTH DCF MODEL.

9 A. As noted earlier, the constant growth DCF model is based on several limiting  
10 assumptions, one of which is that dividends are paid annually. However, most dividend-  
11 paying companies, including utilities, pay dividends on a quarterly (as opposed to an  
12 annual) basis. While the adjusted dividend yield discussed earlier is meant to address  
13 that assumption (by increasing the observed dividend yield by one-half of the expected  
14 growth rate), it does not fully reflect the quarterly receipt and reinvestment of dividends.  
15 As a consequence, the constant growth DCF model likely understates the cost of equity.  
16 The quarterly growth DCF model specifically incorporates investors' expectation of the  
17 quarterly payment of dividends, and the associated quarterly compounding of those  
18 dividends as they are reinvested at the required ROE. As noted by Dr. Roger Morin:

19 Clearly, given that dividends are paid quarterly and that the observed

---

<sup>12</sup> DCF results presented in Table 3 are unadjusted (i.e., prior to any adjustment for flotation costs).

1 stock price reflects the quarterly nature of dividend payments, the  
2 market-required return must recognize quarterly compounding, for the  
3 investor receives dividend checks and reinvests the proceeds on a  
4 quarterly schedule ... The annual DCF model inherently understates  
5 the investors' true return because it assumes all cash flows received by  
6 investors are paid annually<sup>13</sup>  
7

8 **Q. HOW IS THE DIVIDEND YIELD PORTION OF THE QUARTERLY DCF**  
9 **MODEL CALCULATED?**

10 A. To reflect the timing and compounding of quarterly dividends, the model replaces the *D*  
11 component of the constant growth DCF model with the following equation:

$$12 \quad D = d_1(1+k)^{.75} + d_2(1+k)^{.50} + d_3(1+k)^{.25} + d_4(1+k)^0 \quad \text{Equation [4]}$$

13 where:

14  $d_1, d_2, d_3, d_4$  = expected quarterly dividends over the coming year; and

15  $k$  = the required Return on Equity.

16 Because the required ROE ( $k$ ) is a variable in the dividend calculation, the quarterly  
17 growth DCF model is solved in an iterative fashion.

18 To calculate the expected dividends over the coming year for the proxy  
19 companies (*i.e.*,  $d_1, d_2, d_3$ , and  $d_4$ ), I obtained the last four paid quarterly dividends for  
20 each company, and multiplied them by one plus the growth rate (*i.e.*,  $1 + g$ ). For the  $P_0$   
21 component of the dividends yield, I obtained the closing stock prices over the 30-, 90-,  
22 and 180-trading days ended August 18, 2017 for each company in the proxy group.

23 **Q. PLEASE SUMMARIZE THE RESULTS OF YOUR DCF ANALYSES.**

24 A. Table 4 (below) presents the results of the quarterly growth DCF analysis (*see also*  
25 Schedule KM-2).

---

<sup>13</sup> Roger A. Morin, New Regulatory Finance, Public Utility Reports, Inc., 2006 at 344.

Table 4: Quarterly Growth DCF Model Results<sup>14</sup>

	<i>Low</i>	<i>Mean</i>	<i>High</i>
30-Day Average	7.37%	9.08%	11.37%
90-Day Average	7.42%	9.13%	11.41%
180-Day Average	7.52%	9.23%	11.52%

**CAPITAL ASSET PRICING MODEL**

**Q. PLEASE BRIEFLY DESCRIBE THE CAPM.**

A. The CAPM is a risk premium method that estimates the cost of equity for a given security as a function of a risk-free return plus a risk premium (to compensate investors for the non-diversifiable or “systematic” risk of that security). As shown in Equation [4], the CAPM is defined by four components, each of which theoretically must be a forward-looking estimate:

$$k = r_f + \beta(r_m - r_f) \quad \text{Equation [4]}$$

where:

$k$  = the required market ROE for a security;

$\beta$  = the beta coefficient of that security;

$r_f$  = the risk-free rate of return; and

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

In Equation [4], the term  $(r_m - r_f)$  represents the market risk premium.<sup>15</sup>

According to the theory underlying the CAPM, since unsystematic risk can be diversified away by adding securities to their investment portfolio, investors should be concerned

<sup>14</sup> DCF results presented in Table 4 are unadjusted (*i.e.*, prior to any adjustment for flotation costs).

<sup>15</sup> The market risk premium is defined as the incremental return of the market over the risk-free rate.

1 only with systematic or non-diversifiable risk. Non-diversifiable risk is measured by the  
2 beta coefficient, which is defined as:

$$\beta_j = \frac{\sigma_j}{\sigma_m} \times \rho_{j,m} \quad \text{Equation [5]}$$

4 Where  $\sigma_j$  is the standard deviation of returns for company "j,"  $\sigma_m$  is the standard  
5 deviation of returns for the broad market (as measured, for example, by the S&P 500  
6 Index), and  $\rho_{j,m}$  is the correlation of returns in between company j and the broad market.  
7 The beta coefficient therefore represents both relative volatility (*i.e.*, the standard  
8 deviation) of returns, and the correlation in returns between the subject company and the  
9 overall market.

10 Intuitively, higher beta coefficients indicate that the subject company's returns  
11 have been relatively volatile, and are responsive to the movements of the overall market.  
12 If a company has a beta coefficient of 1.00, it is considered as risky as the market and its  
13 required return equals the expected market return.

14 **Q. WHAT RISK-FREE RATE ASSUMPTION DID YOU INCLUDE IN YOUR**  
15 **CAPM ANALYSIS?**

16 A. In determining the security most relevant to the application of the CAPM, it is important  
17 to select the term (or maturity) that best matches the life of the underlying investment.  
18 Natural gas utilities typically are long-duration investments and as such, I used the 30-  
19 year Treasury bonds as my estimate of the risk-free rate. I relied on both the current 30-  
20 day average yield (2.85 percent as of August 18, 2017) and the near-term projected yield  
21 reported by Blue Chip Financial Forecast (3.35 percent).

22 **Q. WHY HAVE YOU CONSIDERED A FORWARD-LOOKING RISK-FREE RATE?**

23 A. In general, the cost of capital is a forward-looking concept. The relevant analytical issue

1 in the application of the CAPM is to ensure that all three components of the model (*i.e.*,  
2 the risk-free rate, beta, and the MRP) are consistent with current market conditions and  
3 investor perceptions.

4 Since the purpose of this proceeding is to establish the cost of equity for Liberty  
5 Midstates' gas distribution operations on a going-forward basis, it is important to develop  
6 a CAPM analysis that reflects investor expectations concerning the risk-free rate. As  
7 discussed in more detail in Section VII, the need to consider forward-looking interest  
8 rates is particularly important at the current time given that the Federal Reserve has  
9 begun to "unwind" its monetary policy actions that were intended to lower Treasury  
10 yields in response to the 2008/2009 financial crisis and the ensuing protracted economic  
11 recovery.

12 **Q. WHAT BETA COEFFICIENTS DID YOU USE IN YOUR CAPM MODEL?**

13 A. I considered the beta coefficients reported by two sources: Bloomberg Professional  
14 ("Bloomberg") and Value Line. For each source, I employed the average of the reported  
15 beta coefficient for each proxy group company. Value Line calculates the beta  
16 coefficient over a five-year period using the New York Stock Exchange ("NYSE") Index  
17 as the market return, while Bloomberg's calculation is based on two years of data and  
18 uses the S&P 500 Index as the market return. Both of those services adjust their  
19 calculated (or raw) beta coefficients to reflect the tendency of the beta coefficient to  
20 regress to the market mean of 1.00.<sup>16</sup> The Value Line and Bloomberg proxy group

---

<sup>16</sup> The regression tendency of beta coefficients to converge to 1.0 over time is well known and widely discussed in financial literature. (*See, e.g.*, Blume, Marshall E., *On the Assessment of Risk*, The Journal of Finance, Vol. 26, No. 1, March 1971, at 1-10).

1 average beta coefficients are 0.73 and 0.64, respectively.<sup>17</sup>

2 **Q. PLEASE DESCRIBE YOUR APPROACH TO ESTIMATING THE MARKET**  
3 **RISK PREMIUM.**

4 A. The approach is based on the market required return, less the current 30-year Treasury  
5 bond yield. To estimate the market required return, I calculated the market capitalization  
6 weighted average ROE using the constant growth DCF model. To do so, I relied on data  
7 from two sources: (1) Bloomberg and (2) Value Line. For both Bloomberg and Value  
8 Line, I calculated the market capitalization weighted expected dividend yield (using the  
9 same one-half growth rate assumption described earlier), and combined that amount with  
10 the market capitalization weighted projected earnings growth rate to arrive at the average  
11 DCF result. I performed that calculation using each of companies in the S&P 500 Index  
12 for which Bloomberg and Value Line provided growth estimates. I then subtracted the  
13 risk-free rate from that amount to arrive at the market DCF-derived ex-ante market risk  
14 premium estimate. The results of those calculations are provided in Schedule KM-4.

15 **Q. WHAT ARE THE RESULTS OF YOUR CAPM ANALYSIS?**

16 A. The results of my CAPM analysis are summarized in Table 5, below (*see* also Schedule  
17 KM-6).

---

<sup>17</sup> See Schedule KM-5.



1

**Table 5: Summary of CAPM Results**

	<i>Bloomberg MRP</i>	<i>Value Line MRP</i>
Value Line Beta, Current Risk-Free Rate (2.85%)	10.53%	11.08%
Value Line Beta, Projected Risk-Free Rate (3.35%)	10.67%	11.22%
Bloomberg Beta, Current Risk-Free Rate (2.85%)	9.62%	10.11%
Bloomberg Beta, Projected Risk-Free Rate (3.35%)	9.80%	10.29%

2

3 ***BOND YIELD PLUS RISK PREMIUM APPROACH***

4 **Q. PLEASE GENERALLY DESCRIBE THE BOND YIELD PLUS RISK PREMIUM**  
5 **APPROACH.**

6 A. This approach is based on the basic financial tenet that equity investors bear the residual  
7 risk associated with ownership and therefore require a premium over the return they  
8 would have earned as a bondholder. That is, because returns to equity holders are more  
9 risky than returns to bondholders, equity investors must be compensated for bearing that  
10 risk. Risk premium approaches, therefore, estimate the cost of equity as the sum of the  
11 equity risk premium and the yield on a particular class of bonds. Because the equity risk  
12 premium is not directly observable, it typically is estimated using a variety of approaches,  
13 some of which incorporate *ex-ante*, or forward-looking estimates of the cost of equity,  
14 and others that consider historical, or *ex-post*, estimates. An alternative approach is to  
15 use actual authorized returns for natural gas utilities to estimate the equity risk premium.

16 **Q. PLEASE EXPLAIN HOW YOU PERFORMED YOUR RISK PREMIUM**  
17 **ANALYSIS.**

18 A. I first defined the equity risk premium as the difference between actual authorized ROEs  
19 and the then-prevailing level of long-term utility bond rates. I then gathered data from

1 547 natural gas rate proceedings between the fourth quarter of 1992 and August 18, 2017  
2 and calculated the average authorized ROE for each calendar quarter.<sup>18</sup> Using that data, I  
3 calculated the observed risk premium in each quarter as the difference between the  
4 average authorized ROE and the average utility Baa bond yield reported by Moody's.

5 Relative to the long-term historical average, the analytical period includes interest  
6 rates and authorized ROEs that are relatively high during one period (*i.e.*, the early  
7 1990s) and that are quite low during another (*i.e.*, the post-Lehman bankruptcy period).  
8 To account for the well-documented inverse relationship between interest rates and the  
9 risk premium,<sup>19</sup> I conducted a regression analysis in which the observed equity risk  
10 premium is the dependent variable, and the average utility Baa bond yield is the  
11 independent variable. The form of the equation for the regression analysis was:

$$RP = \alpha + \beta(T) \quad \text{Equation [6]}$$

12 where "RP" is the risk premium (*i.e.*, average authorized ROE less average utility Baa  
13 bond yield yield), " $\alpha$ " is the intercept term, " $\beta$ " is the slope term and "T" is the average  
14 yield on Baa-rated utility bonds.  
15

16 **Q. WHAT WERE THE RESULTS OF YOUR RISK PREMIUM ANALYSIS?**

17 A. As Chart 1 illustrates, over time there has been a statistically significant, negative  
18 relationship between Baa-rated utility bond yields and the equity risk premium.

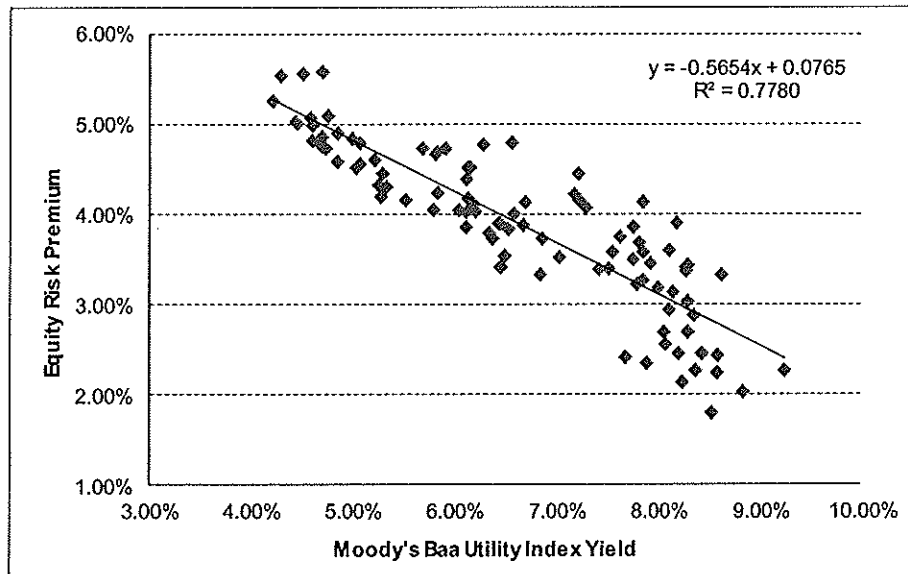
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<sup>18</sup> The period for which data was available. The data covers a number of economic cycles; see National Bureau of Economic Research, *U.S. Business Cycle Expansion and Contractions*.

<sup>19</sup> 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.

1

Chart 1: Equity Risk Premium



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Consequently, simply applying the long-term average equity risk premium of 3.88 percent would significantly understate the cost of equity and produce results well below any reasonable estimate. Based on the regression coefficients in Chart 1, however, the implied ROE is between 9.52 percent and 10.41 percent (see Schedule KM-7, and Table 6, below).

Table 6: Bond Yield Plus Risk Premium Results<sup>20</sup>

Treasury Yield	Return on Equity
Current Baa Utility Bond Yield (4.53%)	9.52%
Near Term Projected Utility Bond Yield (5.39%)	9.83%
Long Term Projected Utility Bond Yield (6.67%)	10.41%

9

**EXPECTED EARNINGS ANALYSIS**

10

**Q. PLEASE GENERALLY DESCRIBE THE EXPECTED EARNINGS ANALYSIS.**

<sup>20</sup>

Projected Baa utility bond yields calculated as current yield plus Blue Chip Financial Forecast's projected increase in corporate Baa bond yields. See, Blue Chip Financial Forecasts, Vol. 36, No. 8, Aug. 1, 2017, at 2; and, Blue Chip Financial Forecasts, Vol. 36, No. 6, Jun. 1, 2017, at 14.

1 A. The expected earnings analysis calculates the projected returns on book value for the gas  
2 industry group as a whole and for the specific firms in the proxy group individually. To  
3 implement the model, I used the projected return on common equity for the period 2020-  
4 2022 provided in the latest Value Line utility reports. I then adjusted those returns to  
5 account for the fact that they show ROE on the basis of book equity at the end of the  
6 period, as opposed to ROE on average book equity.

7 I first considered the expected returns for the proxy group companies for which  
8 the mean and median expected returns were 11.11 percent and 10.80 percent. I then  
9 reviewed the mean and median returns for all Value Line gas utilities (note that mergers  
10 do not affect book returns on equity as they do the DCF returns on market value), which  
11 were 10.74 percent and 10.35 percent, respectively (*see* Exhibit KM-8).

12 **Q. WHAT ARE THE ADVANTAGES OF USING THE EXPECTED EARNINGS**  
13 **APPROACH?**

14 A. Whereas other cost of equity analyses calculate investors' required return on the market  
15 value of their investments, the expected earnings model is uniquely suited to the task of  
16 determining an appropriate return on book value of equity. For example, as noted above,  
17 the DCF model depends on market data. The dividend yield, a principal component of  
18 the DCF analysis, is a market-derived parameter. Since the DCF model calculates the  
19 discount rate that equates the future stream of cash flows to the current market price, it  
20 calculates the required return on the market value of the utility's stock (rather than the  
21 book value of equity). Similarly, the CAPM also calculates a required return on market  
22 price (*e.g.*, risk is based on movements in stock prices, and required risk compensation is  
23 based on expected returns on a market index). In practice, those returns are applied to the

1 book value of the utility's equity to determine the revenue requirement. The market  
2 value, except under very rare circumstances, is not equal to the book value. Given this  
3 mismatch, it is useful to consider a direct measure of the expected return on the book  
4 value, versus market value, of utility stocks.

5 **VI. BUSINESS RISKS AND OTHER CONSIDERATIONS**

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

8 A. Because the analytical methods discussed above provide a range of estimates, there are  
9 several additional factors that should be taken into consideration when establishing a  
10 reasonable range for the Company's cost of equity. Those factors include (1) the  
11 Company's relatively small size; (2) the regulatory environment in which the Company  
12 operates; and (3) flotation costs associated with equity issuances.

13 ***SMALL SIZE PREMIUM***

14 **Q. PLEASE EXPLAIN THE RISK ASSOCIATED WITH SMALL SIZE.**

15 A. Both the financial and academic communities have long accepted the proposition that the  
16 cost of equity for small firms is subject to a "size effect."<sup>21</sup> While empirical evidence of  
17 the size effect often is based on studies of industries beyond regulated utilities, utility  
18 analysts also have noted the risks associated with small market capitalizations.  
19 Specifically, Ibbotson Associates noted: "For small utilities, investors face additional  
20 obstacles, such as a smaller customer base, limited financial resources, and a lack of  
21 diversification across customers, energy sources, and geography. These obstacles imply

---

<sup>21</sup> See Mario Levis, *The record on small companies: A review of the evidence*, Journal of Asset Management, March 2002, at 368-397, for a review of literature relating to the size effect.

1 a higher investor return.”<sup>22</sup>

2 **Q. HOW DOES LIBERTY MIDSTATES COMPARE IN SIZE TO THE PROXY**  
3 **COMPANIES?**

4 A. Liberty Midstates is significantly smaller than the proxy group, both in terms of number  
5 of customers and annual revenues. Schedule KM-10 estimates the implied market  
6 capitalization for Liberty Midstates (*i.e.*, the implied market capitalization if Liberty  
7 Midstates were a stand-alone, publicly traded entity). That is, because Liberty Midstates  
8 is not a separately traded entity, an estimated stand-alone market capitalization for  
9 Liberty Midstates must be calculated. The implied market capitalization of Liberty  
10 Midstates is calculated by applying the median market-to-book ratio for the proxy group  
11 of 2.21 to the Company’s implied total common equity of approximately \$52.56 million.  
12 The implied market capitalization based on that calculation is \$116.15 million, which is  
13 less than 4 percent of the proxy group median of \$3.79 billion.

14 **Q. HAVE YOU CONSIDERED LIBERTY MIDSTATES’ COMPARATIVELY**  
15 **SMALL SIZE IN YOUR ESTIMATED COST OF EQUITY?**

16 A. Yes. While I have quantified the small size effect, rather than proposing a specific  
17 premium, I have considered the small size of Liberty Midstates in my assessment of  
18 business risks in order to determine where, within a reasonable range of returns, Liberty  
19 Midstates’ required ROE appropriately falls. In that regard, Liberty Midstates’  
20 comparatively small size further supports my conclusion that an ROE at the upper end of  
21 my recommended range is reasonable.

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<sup>22</sup> Michael Annin, *Equity and the Small-Stock Effect*, Public Utilities Fortnightly, October 15, 1995.

1 **Q. HOW DID YOU ESTIMATE THE SIZE PREMIUM FOR LIBERTY**  
2 **MIDSTATES?**

3 A. In its *2016 Valuation Handbook*, Duff & Phelps presents its calculation of the size  
4 premium for deciles of market capitalizations relative to the S&P 500 Index. An estimate  
5 of the size premium associated with Liberty Midstates, therefore, is the difference in the  
6 Duff & Phelps size risk premiums for the proxy group median market capitalization  
7 relative to the implied market capitalization for Liberty Midstates.

8 As shown on Schedule KM-10, based on recent market data, the median market  
9 capitalization of the proxy group was approximately \$3.79 billion, which corresponds to  
10 the fourth decile of Duff & Phelps's market capitalization data. Based on the Duff &  
11 Phelps analysis, that decile has a size premium of 0.98 percent (or 98 basis points). The  
12 implied market capitalization for Liberty Midstates is approximately \$116 million, which  
13 falls within the 10th decile and corresponds to a size premium of 5.59 percent (or 559  
14 basis points). The difference between those size premiums is 461 basis points (4.61  
15 percent).

16 ***REGULATORY RISK***

17 **Q. HOW DOES THE REGULATORY ENVIRONMENT IN WHICH A UTILITY**  
18 **OPERATES AFFECT ITS ACCESS TO AND COST OF CAPITAL?**

19 A. The regulatory environment in which a utility operates can significantly affect both the  
20 access to, and the cost of capital in several ways. The proportion and cost of debt capital  
21 available to utility companies are influenced by the rating agencies' assessment of the  
22 regulatory environment. One element of this assessment includes evaluating a  
23 company's ability to recover costs. Moody's, for example, considers the nature of

1 regulation, including its effect on cost recovery and cash flow generation, to be of such  
2 consequence that it represents one-half of the factors analyzed in arriving at credit  
3 ratings.<sup>23</sup> As to the overall regulatory environment, Moody's notes that the regulatory  
4 "framework in which a regulated utility operates is typically one of its most significant  
5 credit considerations. The regulatory structure and its general framework is a primary  
6 consideration that differentiates the industry from most other corporate sectors."<sup>24</sup>

7 Moody's further explains:

8 As the revenues set by the regulator are a primary component of a  
9 utility's cash flow, the utility's ability to obtain predictable and  
10 supportive treatment within its regulatory framework is one of the  
11 most significant factors in assessing a utility's credit quality. The  
12 regulatory framework generally provides more certainty around a  
13 utility's cash flow and typically allows the company to operate with  
14 significantly less cushion in its cash flow metrics than comparably  
15 rated companies in other industrial sectors. In situations where the  
16 regulatory framework is less supportive, or is more contentious, a  
17 utility's credit quality can deteriorate rapidly.<sup>25</sup>

18 Similarly, Standard & Poor's has noted that:

19 Regulatory advantage is the most heavily weighted factor when S&P  
20 Global Ratings analyzes a regulated utility's business risk profile. One  
21 significant aspect of regulatory risk that influences credit quality is the  
22 regulatory environment in the jurisdictions where a utility operates.

23 ...

24 When we evaluate U.S utility regulatory environments, we consider  
25 financial stability to be of substantial importance. Cash takes  
26 precedence in credit analysis. A regulatory jurisdiction that recognizes  
27 the significance of cash flow in its decision-making is one that will  
28 appeal to creditors.<sup>26</sup>

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<sup>23</sup> See Moody's Investors Service, *Rating Methodology: Regulated Electric and Gas Utilities*, December 23, 2013, at 6.

<sup>24</sup> See Moody's Investors Service, *Special Comment: Regulatory Frameworks – Ratings and Credit Quality for Investor-Owned Utilities*, June 18, 2010, at 1.

<sup>25</sup> *Ibid.*, at 2.

<sup>26</sup> S&P Global Ratings, RatingsDirect, "Assessing U.S. Investor-Owned Utility Regulatory Environments," August 10, 2016, at 2.



1           It is important to recognize that regulatory mechanisms and regulatory decisions  
2 regarding the authorized ROE and capital structure have direct consequences for the  
3 subject utility's internal cash flow generation (sometimes referred to as "Funds from  
4 Operations", or FFO). Since credit ratings are intended to reflect the ability to meet  
5 financial obligations as they come due, the ability to generate the cash flows required to  
6 meet those obligations (and to provide an additional amount for unexpected events) is of  
7 critical importance to debt investors. Two of the most important metrics used to assess  
8 that ability are the ratios of FFO to debt, and FFO to interest expense, both of which are  
9 directly affected by regulatory decisions regarding the appropriate rate of return, and  
10 capital structure.

11 **Q. HAVE YOU PERFORMED ANY ANALYSES OF INVESTOR'S PERCEPTIONS**  
12 **OF THE REGULATORY ENVIRONMENT IN WHICH LIBERTY MIDSTATES**  
13 **OPERATES RELATIVE TO THE PROXY GROUP COMPANIES?**

14 **A.** Yes, I have. In order to assess investors' relative view of the Company's regulatory  
15 environment, I considered the jurisdictional rankings developed by Regulatory Research  
16 Associates ("RRA").<sup>27</sup> RRA rates regulatory jurisdictions from the perspective of  
17 investors, and assigns ratings of "Above Average," "Average," or "Below Average."  
18 RRA further distinguishes jurisdictions within those respective categories by applying  
19 ratings of 1, 2 or 3, with a rating of "1" being the strongest. In describing its ranking  
20 system, RRA notes that:

21           The evaluations are assigned from an investor perspective and  
22           indicate the relative regulatory risk associated with the  
23           ownership of securities issued by each jurisdiction's electric

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<sup>27</sup> See Regulatory Research Associates, *State Regulatory Evaluations*, May 11, 2017, at 3.

1 and gas utilities. Each evaluation is based upon our  
2 consideration of the numerous factors affecting the regulatory  
3 process in the state, and may be adjusted as events occur that  
4 cause RRA to modify its view of the regulatory risk accruing to  
5 the ownership of utility securities in that individual  
6 jurisdiction.<sup>28</sup>

7 Missouri was downgraded to “Below Average 1” from “Average 2” in May 2017.  
8 Regarding Missouri’s regulatory environment, RRA has noted “[t]he state's traditional  
9 approach to ratemaking is less investor friendly than the more constructive frameworks  
10 now being utilized in many other jurisdictions” and highlighted that the 2017 legislative  
11 session did not adopt a proposed bill that would have altered the state’s ratemaking  
12 structure to address concerns regarding regulatory lag.

13 To compare Liberty Midstates’ regulatory environment to the proxy group, I used  
14 a numerical approach that ranks jurisdictions from 9 to 1, using Regulatory Research  
15 Associate’s ranking convention. Under that approach, higher values indicate a more  
16 credit supportive jurisdiction. I applied that ranking system to the proxy group  
17 companies by regulatory jurisdiction. For each proxy group company that operates in  
18 multiple jurisdictions, I considered the ranking for each regulatory jurisdiction in which  
19 they operate. As shown in Exhibit KM-12, the simple average of the RRA ranking for  
20 each of the proxy group companies, in all jurisdictions, is 5.10 (*i.e.*, generally Average/2).  
21 The Company’s Missouri operations have a ranking of 3.00 (*i.e.*, Below Average/1).

22 **Q. WHAT IS YOUR CONCLUSION REGARDING THE EFFECT OF THE**  
23 **COMPANY’S REGULATORY RISK ON ITS ROE?**

24 **A.** Rankings such as those provided by RRA are observable and meaningful indicators of the

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<sup>28</sup> *Ibid.*, at 2.

1 financial community's view of the regulatory risks faced by utilities. Based on my  
2 analysis, using the RRA ranking structure, the financial community appears to attribute  
3 somewhat higher regulatory risk to the Company than to the proxy group (on average).  
4 This would support an ROE for the Company toward the upper end of the range of  
5 results.

6 ***FLOTATION COSTS***

7 **Q. WHAT ARE FLOTATION COSTS?**

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

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

13 A. Flotation costs are part of capital costs, which are properly reflected on the balance sheet  
14 under "paid in capital" rather than current expenses on the income statement. Flotation  
15 costs are incurred over time, just as investments in rate base or debt issuance costs. As a  
16 result, the great majority of flotation costs are incurred prior to the test year, but remain  
17 part of the cost structure during the test year and beyond.

18 **Q. HOW DID YOU CALCULATE THE FLOTATION COST RECOVERY**  
19 **ADJUSTMENT?**

20 A. I modified the constant growth DCF calculation to provide a dividend yield that would  
21 reimburse investors for issuance costs. My flotation cost adjustment recognizes the costs  
22 of issuing equity that were incurred by APUC and the proxy companies in their most  
23 recent two issuances. As shown in Schedule KM-12, an adjustment of 0.10 percent (*i.e.*,

1 10 basis points) reasonably represents flotation costs for the Company.

2 **Q. ARE YOU PROPOSING TO ADJUST YOUR RECOMMENDED ROE BY 10**  
3 **BASIS POINTS TO REFLECT THE EFFECT OF FLOTATION COSTS ON**  
4 **LIBERTY MIDSTATES' ROE?**

5 A. No. Rather, I have considered the effect of flotation costs, in addition to the Company's  
6 other business risks, in determining where the Company's ROE falls within the range of  
7 results.

8 **VII. CAPITAL MARKET ENVIRONMENT**

9 **Q. DO ECONOMIC CONDITIONS INFLUENCE THE REQUIRED COST OF**  
10 **CAPITAL AND REQUIRED RETURN ON COMMON EQUITY?**

11 A. Yes. The required cost of capital, including the ROE, is a function of prevailing and  
12 expected economic and capital market conditions. As discussed in Section V, the models  
13 used to estimate the cost of equity are meant to reflect, and therefore are influenced by,  
14 current and expected capital market conditions. However, it is important to recognize  
15 that all analytical models used to estimate the required ROE are based on simplifying  
16 assumptions that may not hold true under specific market circumstances. When market  
17 data used in the ROE models reflect unusual market conditions that investors may not  
18 expect to persist (such as current interest rates), it is important to assess the  
19 reasonableness of the results in the context of other observable market data. To the  
20 extent that certain ROE estimates are incompatible with such data or inconsistent with  
21 basic financial principles, it is appropriate to consider whether alternative estimation  
22 techniques are likely to provide more meaningful and reliable results.

1 **Q. ARE THERE ANY MARKET FACTORS THAT CALL INTO QUESTION**  
2 **ROUTINE APPLICATION OF THE DCF, CAPM AND BOND YIELD PLUS**  
3 **RISK PREMIUM ANALYSES AT THE CURRENT TIME?**

4 A. Yes, there are. In particular, as discussed in more detail below, the Federal Reserve's  
5 unprecedented actions after the recent financial crisis have continued to have a significant  
6 influence on capital markets. It is clear, for example, that those actions have led to  
7 historically low long-term yields (which can skew the results of risk premium models  
8 such as the CAPM) and unusually high utility stock valuations (which can suppress DCF-  
9 based market results). Consequently, I believe it is reasonable to give more weight to the  
10 upper end of the range of DCF results at the current time and to give particular  
11 consideration to investors' expectations for future interest rate levels when performing  
12 risk premium analyses.

13 **Q. PLEASE SUMMARIZE THE EFFECT OF RECENT FEDERAL RESERVE**  
14 **POLICIES ON INTEREST RATES AND THE COST OF CAPITAL.**

15 A. Starting in the summer of 2007, the Federal Reserve took a number of steps to respond to  
16 the emerging financial crisis. Among other actions, the Federal Reserve lowered the  
17 Federal Funds target rate from 5.25 percent in September 2007 to a range of 0.00-0.25  
18 percent by December 2008.<sup>29</sup> Beginning in 2008, the Federal Reserve also proceeded on  
19 a steady path of "quantitative easing" ("QE") initiatives intended to lower long-term  
20 Treasury yields.<sup>30</sup> QE was "designed to put downward pressure on longer-term interest  
21 rates by having the Federal Reserve take onto its balance sheet some of the duration and

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<sup>29</sup> See <http://www.federalreserve.gov/monetarypolicy/openmarket.htm>.

<sup>30</sup> See Federal Reserve Press Release dated June 19, 2013.  
(Available at <http://www.federalreserve.gov/newsevents/press/monetary/20130619a.htm>).

1       prepayment risks that would otherwise have been borne by private investors.”<sup>31</sup> While  
2       the Federal Reserve completed its final round of QE in October 2014, it has continued to  
3       reinvest principal repayments from its holdings of agency debt and mortgage-backed  
4       securities.<sup>32</sup> Under that policy, “Securities Held Outright” on the Federal Reserve’s  
5       balance sheet increased from approximately \$489 billion at the beginning of October  
6       2008 to \$4.25 trillion by mid-August 2017.<sup>33</sup> To put that increase in context, the  
7       securities held by the Federal Reserve represented approximately 3.28 percent of Gross  
8       Domestic Product (“GDP”) at the end of September 2008, and had risen to 22.09 percent  
9       of GDP in August 2017.<sup>34</sup> As of the end of 2016, the Federal Reserve held  
10      approximately 36 percent of the supply of U.S. government Treasury securities with  
11      maturities over ten years.<sup>35</sup> As such, the Federal Reserve policy actions have represented  
12      a significant source of liquidity, and have had a substantial effect on capital markets.

13             In December 2015 the Federal Reserve raised the Federal Funds rate for the first  
14      time in nine years, and began the process of rate normalization.<sup>36</sup> Since that time the  
15      Federal Reserve has made three more 25 basis point increases to the federal funds target  
16      rate.<sup>37</sup> The Federal Reserve has also begun to consider unwinding the \$4 trillion of

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<sup>31</sup> Federal Reserve Bank of New York, *Domestic Open Market Operations During 2012*, April 2013, at 29.  
(Available at <https://www.newyorkfed.org/medialibrary/media/markets/omo/omo2012-pdf.pdf>).

<sup>32</sup> [http://www.federalreserve.gov/monetarypolicy/bst\\_openmarketops.htm](http://www.federalreserve.gov/monetarypolicy/bst_openmarketops.htm).

<sup>33</sup> Source: Federal Reserve Schedule H.4.1. “Securities Held Outright” include U.S. Treasury securities, Federal agency debt securities, and mortgage-backed securities.

<sup>34</sup> Sources: Federal Reserve Schedule H.4.1; Bureau of Economic Analysis, GDP data as of the second calendar quarter of 2017.

<sup>35</sup> Federal Reserve Bank of New York, *Domestic Open Market Operations During 2016*, April 2017 at 25.

<sup>36</sup> *Federal Reserve Press Release* dated December 16, 2015.

(Available at <http://www.federalreserve.gov/newsevents/press/monetary/20151216a1.htm>).

<sup>37</sup> 25 basis point increases were made in December 14, 2016, March 15, 2017 and June 14, 2017. The current federal funds target rate had increased to 1.00% - 1.25% as of August 18, 2017.

1 securities put on its balance sheet during its various QE initiatives (*e.g.*, capping the  
2 dollar amount of maturing securities that are reinvested); there is widespread expectation  
3 that process will begin soon.<sup>38</sup> Although there remains some uncertainty regarding the  
4 timing and approach under which the positions will be unwound, market data indicates  
5 investors expect the Federal Reserve to continue down the path of monetary policy  
6 normalization, and interest rates to increase significantly over the coming year. That  
7 market uncertainty, together with the prospect of increasing interest rates presents  
8 additional risks for utility equity holders.

9 **Q. DOES YOUR RECOMMENDATION CONSIDER THE INTEREST RATE**  
10 **ENVIRONMENT?**

11 A. Yes, it does. From an analytical perspective, it is important that the inputs and  
12 assumptions used to arrive at an ROE recommendation, including assessments of capital  
13 market conditions, are consistent with the recommendation itself. Although all analyses  
14 require an element of judgment, the application of that judgment must be made in the  
15 context of the quantitative and qualitative information available to the analyst, and the  
16 capital market environment in which the analyses were undertaken. Because the cost of  
17 equity is forward-looking, the salient issue is whether investors see the likelihood of  
18 increased interest rates during the period in which the rates set in this proceeding will be  
19 in effect.

20 The low interest rate environment associated with central bank intervention may  
21 lead some analysts to conclude that current capital costs, including the cost of equity, are

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<sup>38</sup> Blue Chip Financial Forecast, Vol. 36, No. 8, August 1, 2017, at 1 and 14.

1 low and will remain as such. However, that conclusion only holds true under the  
2 hypothesis of Perfectly Competitive Capital Markets (“PCCM”) and the classical  
3 valuation framework which, under normal economic and capital market conditions,  
4 underpin the traditional cost of equity models. Perfectly Competitive Capital Markets are  
5 those in which no single trader, or “market-mover”, would have the power to change the  
6 prices of goods or services, including bond and common stock securities. In other words,  
7 under the PCCM hypothesis, no single trader would have a significant effect on market  
8 prices.

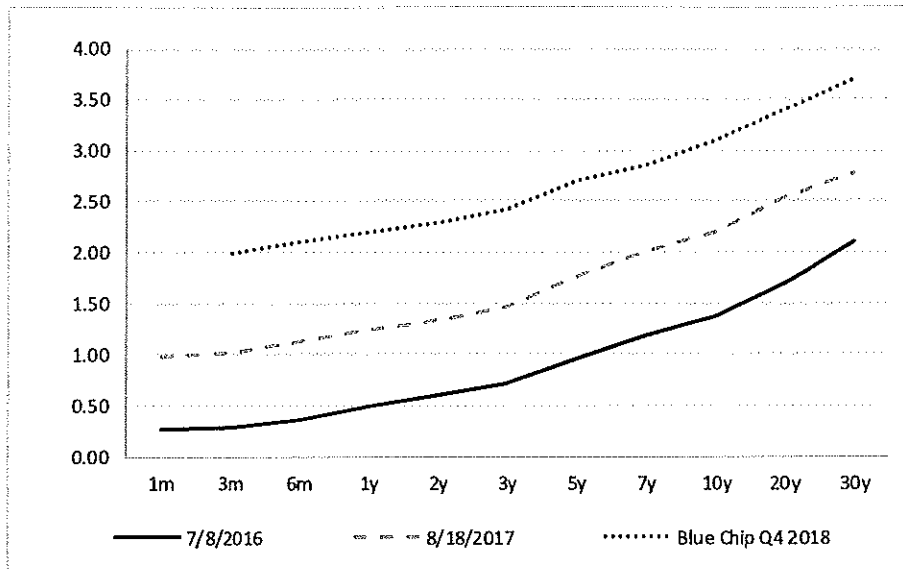
9 Classic valuation theory assumes investors trade securities rationally, with prices  
10 reflecting their perceptions of value. Although central banks may set benchmark interest  
11 rates, they have maintained below-normal rates to stimulate economic expansion and  
12 capital market recovery. It therefore is reasonable to conclude that the Federal Reserve  
13 and other central banks have been acting as market-movers, thereby having a significant  
14 effect on the market prices of both bonds and stocks. The presence of market-movers,  
15 such as the Federal Reserve, runs counter to the PCCM hypothesis, which underlies  
16 traditional cost of equity models. Consequently, the results of those models should be  
17 considered in the context of both quantitative and qualitative information.

18 Although the Federal Reserve’s market intervention policies have kept interest  
19 rates historically low, since July 8, 2016 (when the 30-year Treasury yield hit an all-time  
20 low of 2.11 percent), rates have risen. As the Federal Reserve increased the Federal  
21 Funds target rate range by 25 basis points in December 2016 (to 0.50-0.75 percent),  
22 March 2017 (to 0.75-1.00 percent) and June 2017 (to 1.00-1.25 percent), short-term



1 interest rates increased by a corresponding amount.<sup>39</sup> Long-term yields have also  
2 increased by similar margins, with the ten-year and 30-year Treasury yields increasing by  
3 82 basis points and 67 basis points, respectively, by August 18, 2017 (*see* Chart 2 below).

4 **Chart 2: Treasury Yield Curve: 7/8/2016, 8/18/2017 and Projected Q4 2018<sup>40</sup>**



5  
6 The increases in the ten and 30-year yields since July 2016 are among the highest  
7 increases in at least 25 years.<sup>41</sup>

8 **Q. DOES MARKET-BASED DATA INDICATE THAT INVESTORS SEE A**  
9 **PROBABILITY OF INCREASING INTEREST RATES?**

10 **A.** Yes. Forward Treasury yields implied by the slope of the yield curve and published  
11 projections by sources such as *Blue Chip Financial Forecasts* (which provides consensus  
12 estimates from approximately 50 professional economists) indicate investors expect long-

<sup>39</sup> Federal Reserve Board Schedule H.15. 6-month and 1-year Treasury yields increased by 77 basis points and 76 basis points, respectively, July 8, 2016 to August 18, 2017.

<sup>40</sup> Sources: Federal Reserve Board Schedule H.15.; Blue Chip Financial Forecasts, Vol. 36, No.8, August 1, 2017, at 2. 3-year, 7-year and 20-year projected Treasury yields interpolated.

<sup>41</sup> Source: Federal Reserve Schedule H.15. The increases fall in approximately the top 88<sup>th</sup> and 89<sup>th</sup> percentiles for both the 10 and 30-year Treasury yields, respectively.

1 term interest rates to increase (*see* Chart 2 above). Those projections are supported by  
 2 the fact that investors are willing to pay a significantly higher premium for the option to  
 3 sell long-term Government bonds, at today's price, in January 2019 than they are for the  
 4 option to buy.<sup>42</sup> Because the value of bonds fall as interest rates increase, the option to  
 5 sell bonds at today's price becomes more valuable when interest rates are expected to  
 6 increase.<sup>43</sup> That market-based data tells us that investors consider an increase in interest  
 7 rates as likely.

8 Looking to short-term interest rates, data compiled by CME Groups indicates that  
 9 investors see a high likelihood of further Federal Funds rate increases, even after the  
 10 three increases between December 14, 2016 and June 14, 2017. As shown in Table 7,  
 11 (below) the market is now anticipating at least one additional rate hike (69.40 percent  
 12 probability) by June 2018.

13 **Table 7: Probability of Federal Funds Rate Increases<sup>44</sup>**

Target Rate (bps)	Federal Reserve Meeting Date						
	Sep 17	Nov 17	Dec 17	Jan 18	Mar 18	May 18	Jun 18
100-125	98.6%	92.7%	49.6%	48.6%	40.4%	39.5%	30.6%
125-150	1.4%	7.2%	47.0%	47.0%	47.3%	47.1%	45.6%
150-175		0.1%	3.4%	4.3%	11.5%	12.3%	19.2%
175-200				0.1%	0.8%	1.0%	3.3%
200-225							0.2%

14  
 42 The option to sell the TLT index in January 2019 at today's price costs approximately one-third more than the option to buy the fund. Source: <http://www.nasdaq.com/symbol/tlt/option-chain?dateindex=7>.

43 In other words, if there is a high probability that interest rates will increase and bond prices will fall, there is value in the option to sell those bonds in the future at today's price. Conversely, if there is a strong probability that interest rates will decrease (price of bonds will increase), there is value in the option to buy those bonds in the future at today's price.

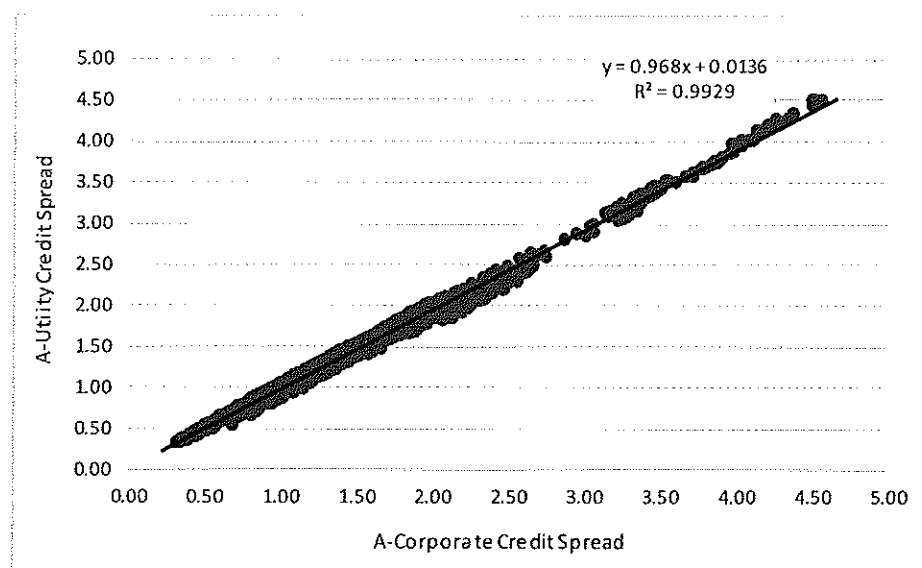
44 Source: <http://www.cmegroup.com/trading/interest-rates/countdown-to-fomc.html>, accessed Aug 1, 2017.

1 Q. HAVE YOU ALSO REVIEWED THE RELATIONSHIP BETWEEN CREDIT  
2 SPREADS FOR A-RATED UTILITY DEBT RELATIVE TO A-RATED  
3 CORPORATE DEBT?

4 A. Yes, I have. Given the historical volatility in the spread between corporate and utility A-  
5 rated debt, there is no reason to conclude that utility yields are different than those of  
6 their corporate counterparts. That conclusion is consistent with the finding that over  
7 time, there has been a nearly one-to-one relationship between credit spreads on A-rated  
8 corporate and utility bonds. In fact, a regression analysis in which corporate credit  
9 spreads are the explanatory variable and utility credit spreads are the dependent variable  
10 shows that slope is approximately 1.00 and highly significant (*see* Chart 3, below).  
11 Because the intercept term is statistically insignificant, we can conclude that there has  
12 been no material difference between the two, and there certainly is no meaningful  
13 difference in the current market.

1

Chart 3: Corporate and Utility Credit Spreads (A-Rated)<sup>45</sup>



2

3

It also is important to recognize that the policy of reducing asset purchases under the Federal Reserve's quantitative easing program is related to expectations of improved conditions and sustained growth in the overall economy.<sup>46</sup> From that perspective, we would expect to see higher growth estimates for companies in the overall economy, including the utility sector. Since companies such as Liberty Midstates continue to invest in their rate base, and given that utilities provide a vital service to other industry sectors, it also would not be surprising to see an increase in expected utility growth rates.

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10 **Q. HAVE THERE BEEN RECENT PERIODS WHEN UTILITY VALUATION**  
11 **LEVELS WERE HIGH RELATIVE TO BOTH THEIR LONG-TERM AVERAGE**  
12 **AND THE MARKET?**

13 **A.** Yes. For example, between July and December 2016, the S&P Electric Utility Index lost  
14 approximately 9.00% of its value. At the same time, the S&P 500 increased

<sup>45</sup> Source: Federal Reserve Schedule H.15.

<sup>46</sup> See, Minutes of the Federal Open Market Committee December 17–18, 2013, at 10.

1 approximately by 7.00%, indicating that the utility sector under-performed the market by  
2 about 16.00%. Also during that time, the 30-year Treasury yield increased by  
3 approximately 95 basis points (an increase of nearly 45.00%). The point simply is that as  
4 interest rates increased, utility valuations fell. Because (as noted above) investors see the  
5 strong likelihood of further interest rate increases, there is a continuing risk of losses in  
6 the utility sector.

7 **Q. WHAT CONCLUSIONS DO YOU DRAW FROM YOUR ANALYSES OF THE**  
8 **CURRENT CAPITAL MARKET ENVIRONMENT, AND HOW DO THOSE**  
9 **CONCLUSIONS AFFECT YOUR ROE RECOMMENDATION?**

10 A. I do not believe we can conclude that the recent levels of utility valuations are due to a  
11 fundamental change in the risk perceptions of utility investors. There is no measurable  
12 difference between credit spreads of A-rated utility debt and A-rated corporate debt. That  
13 is, based on analyses of credit spreads, there is no reason to conclude that investors see  
14 utilities as less risky relative to either historical levels or to their corporate counterparts.

15 From an analytical perspective, it is important that the inputs and assumptions  
16 used to arrive at an ROE determination, including assessments of capital market  
17 conditions, are consistent with the conclusion itself. Although all analyses require an  
18 element of judgment, the application of that judgment must be made in the context of the  
19 quantitative and qualitative information available to the analyst and the capital market  
20 environment in which the analyses were undertaken. Because the application of financial  
21 models and interpretation of their results often is the subject of differences among  
22 analysts in regulatory proceedings, I believe that it is important to review and consider a  
23 variety of data points; doing so enables us to put in context both quantitative analyses and

1 the associated recommendations.

2 Because not all models used to estimate the cost of equity adequately reflect those  
3 changing market dynamics, it is important to give appropriate weight to the methods and  
4 to their results. Moreover, because those models produce a range of results, it is  
5 important to consider the type of data discussed above in determining where the  
6 Company's ROE falls within that range. On balance, I believe that the DCF-based results  
7 should be viewed very carefully, and that somewhat more weight should be afforded the  
8 risk premium-based methods. I believe that doing so supports my recommended range of  
9 9.90 percent to 10.35 percent, and my ROE recommendation of 10.25 percent.

10 **VIII. CAPITAL STRUCTURE**

11 **Q. WHAT CAPITAL STRUCTURE ARE YOU PROPOSING FOR LIBERTY**  
12 **MIDSTATES?**

13 A. I am proposing an authorized capital structure consisting of 53.00 percent common equity  
14 and 47.00 percent long-term debt based on the average capital structure employed by the  
15 proxy companies (*see* Schedule KM-9). A 53.00 percent equity ratio is generally  
16 consistent with Value Line's projected proxy group average equity ratio,<sup>47</sup> but somewhat  
17 lower than Liberty Midstates' equity ratio as of December 31, 2017.<sup>48</sup>

18 **Q. HOW DOES THE CAPITAL STRUCTURE AFFECT THE COST OF EQUITY?**

19 A. The capital structure relates to a Company's financial risk, which represents the risk that  
20 a company may not have adequate cash flows to meet its financial obligations, and is a  
21 function of the percentage of debt (or financial leverage) in its capital structure. In that

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<sup>47</sup> See Schedule KM-9.

<sup>48</sup> Calculated from FERC Form 2 data provided by Company.

1 regard, as the percentage of debt in the capital structure increases, so do the fixed  
2 obligations for the repayment of that debt. To the extent earnings and cash flows become  
3 less certain, the ability to meet those fixed obligations also becomes less certain. That is,  
4 as the degree of financial leverage increases, the risk of financial distress (i.e., financial  
5 risk) also increases; it is for that reason that (in general) credit quality deteriorates and the  
6 cost of debt increases with higher levels of debt in the capital structure.

7 From the perspective of equity investors, who do not have the contractual claim  
8 on cash flows given to bondholders, increased levels of debt tend to concentrate the  
9 uncertainty of the cash flows remaining after debt payments are made. Because their risk  
10 is increased, equity investors also require higher returns as the use of debt increases.  
11 Since the capital structure can affect the subject company's overall level of risk,<sup>49</sup> it is an  
12 important consideration in establishing a just and reasonable rate of return.

13 **Q. WILL THE CAPITAL STRUCTURE AND ROE AUTHORIZED IN THIS**  
14 **PROCEEDING AFFECT THE COMPANY'S ABILITY TO MAINTAIN ACCESS**  
15 **TO CAPITAL AT REASONABLE RATES?**

16 **A.** Yes. The level of earnings authorized by the Commission directly affects the Company's  
17 ability to finance its operations with internally-generated funds. Internally-generated  
18 funds are a very important source of investment funding for all utilities, including the  
19 Company. For that reason, credit rating agencies and investors expect the Company to be  
20 able to generate a substantial portion of its investment funding from operating cash flow  
21 in order to maintain adequate financial strength.

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<sup>49</sup> See Roger A. Morin, *New Regulatory Finance, Public Utility Reports, Inc.*, 2006, at 45-46.

1           Similarly, it also is important to realize that because a utility's investment horizon  
2           is very long, investors require the assurance of a sufficiently high ROE to satisfy the  
3           long-run financing requirements of the assets the Company places into service. Those  
4           assurances, which often are measured by the relationship between internally-generated  
5           cash flows and debt (or interest expense), depend quite heavily on the capital structure.  
6           As a consequence, both the ROE and capital structure are very important to both debt and  
7           equity investors.

8   **Q.   PLEASE DISCUSS YOUR ANALYSIS OF THE CAPITAL STRUCTURES OF**  
9   **THE PROXY GROUP COMPANIES.**

10   **A.**   I calculated the average capital structure for each of the proxy group companies over the  
11           past eight calendar quarters. As shown in Table 8 (below), the proxy group had a mean  
12           equity ratio of 53.08 percent and a mean long-term debt ratio of 46.92 percent.



1 **Table 8: Proxy Group Average Capital Structure Q3 2015 – Q2 2017<sup>50</sup>**

		<b>Common Equity Ratio</b>	<b>Long-Term Debt Ratio</b>
Atmos Energy Corp.	ATO	57.96%	42.04%
Black Hills Corp.	BKH	36.26%	63.74%
Chesapeake Utilities Corp.	CPK	71.43%	28.57%
Northwest Natural Gas Co.	NWN	55.91%	44.09%
ONE Gas, Inc.	OGS	61.14%	38.86%
Sempra Energy	SRE	45.82%	54.18%
Southwest Gas Corp.	SWX	51.13%	48.87%
Spire Inc.	SR	47.85%	52.15%
Vectren Corp.	VVC	50.23%	49.77%
<b>Average</b>		<b>53.08%</b>	<b>46.92%</b>
<b>Median</b>		<b>51.13%</b>	<b>48.87%</b>

2  
3 **Q. WHAT IS THE BASIS FOR USING AVERAGE CAPITAL COMPONENTS**  
4 **RATHER THAN A POINT-IN-TIME MEASUREMENT?**

5 A. Measuring the capital components at a particular point in time can skew the capital  
6 structure by the specific circumstances of a particular period. Therefore, it is more  
7 appropriate to normalize the relative relationship between the capital components over a  
8 period of time.

9 **Q. WHAT IS YOUR CONCLUSION REGARDING AN APPROPRIATE CAPITAL**  
10 **STRUCTURE FOR LIBERTY MIDSTATES?**

11 A. At the current time, Liberty Midstates' actual equity ratio is at the high end of the range  
12 of equity ratios employed by the proxy companies. Considering the range of capital  
13 structures employed by the proxy group companies, I believe a 53.00 percent equity ratio

<sup>50</sup> See Schedule KM-9.

1 is reasonable and appropriate.

2 **IX. COST OF DEBT**

3 **Q. WHAT IS THE COMPANY'S COST OF DEBT?**

4 A. As shown in WP-1 Rate of Return, the Company's cost of debt of is 4.70 percent.

5 **Q. HAVE YOU ASSESSED THE COMPANY'S COST OF DEBT RELATIVE TO**  
6 **OTHER NATURAL GAS UTILITIES?**

7 A. Yes, I calculated the embedded cost of debt for all authorized returns from January 1,  
8 2016 through August 18, 2017. The mean embedded cost of debt over that period was  
9 4.91 percent and the median was 4.95 percent.<sup>51</sup> Based on that review, I believe the  
10 Company's 4.70 percent cost of debt is reasonable and appropriate.

11 **X. CONCLUSIONS AND RECOMMENDATION**

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

14 A. As discussed earlier in my Direct Testimony, I have performed several analyses to  
15 estimate the Company's cost of equity, and have considered several market-wide and  
16 Company-specific issues. In light of those considerations, I believe that a rate of return  
17 on common equity in the range of 9.90 percent to 10.35 percent represents the range of  
18 equity investors' required rate of return for investment in natural gas utilities similar to  
19 Liberty Midstates in today's capital markets. Within that range, it is my view that an  
20 ROE of 10.25 percent is reasonable and appropriate.

21 As discussed earlier in my testimony, my recommendation reflects analytical

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<sup>51</sup> Excludes rate cases from Arkansas and Michigan because those jurisdictions report capital structures that include non-investor supplied financing sources (*e.g.*, deferred taxes), which skews the implied cost of debt calculation.

1 results based on a proxy group of natural gas utilities. My recommendation also takes  
2 into consideration a variety of factors such as the financial environment and the  
3 Company's risk profile, including its relatively small size and its regulatory environment.  
4 My recommendation also considers the direct costs associated with equity issuances,  
5 although I do not make a specific adjustment for those costs.

6 I also conclude that a capital structure consisting of 53.00 percent common equity  
7 and 47.00 percent debt, is consistent with industry practice and, therefore, is reasonable  
8 and appropriate. Lastly, I conclude that the Company's 4.70 percent cost of debt, which  
9 is consistent with the cost of debt reflected in the overall rate of return for gas utilities  
10 since the beginning of 2016, also is reasonable and appropriate.

11 **Table 9: Summary of Analytical Results**

<b>DCF Analyses</b>	<i>Proxy Group</i>		
	<i>Low</i>	<i>Mean</i>	<i>High</i>
Constant Growth, 30-day Stock Prices	7.22%	8.96%	11.13%
Constant Growth, 90-day Stock Prices	7.26%	9.01%	11.17%
Constant Growth, 180-day Stock Prices	7.36%	9.10%	11.27%
Quarterly Growth, 30-day Stock Prices	7.37%	9.08%	11.37%
Quarterly Growth, 90-day Stock Prices	7.42%	9.13%	11.41%
Quarterly Growth, 180-day Stock Prices	7.52%	9.23%	11.52%
<b>CAPM</b>	<i>Bloomberg</i>		<i>Value Line</i>
		<i>MRP</i>	<i>MRP</i>
Value Line Beta, Current Risk-Free Rate (2.85%)		10.53%	11.08%
Value Line Beta, Projected Risk-Free Rate (3.35%)		10.67%	11.22%
Bloomberg Beta, Current Risk-Free Rate (2.85%)		9.62%	10.11%
Bloomberg Beta, Projected Risk-Free Rate (3.35%)		9.80%	10.29%
<b>Bond Yield Plus Risk Premium</b>	<i>Low</i>	<i>Mean</i>	<i>High</i>
Current and Projected Baa Utility Bond Yields	9.52%	9.83%	10.41%
<b>Expected Earnings Analysis</b>	<i>Low</i>	<i>Mean</i>	<i>High</i>
Value Line Projected Return on Book Equity	10.74%	10.93%	11.11%

12  
13 **Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?**

1 A. Yes, it does.

Constant Growth Discounted Cash Flow Model  
30 Day Average Stock Price

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
Company	Ticker	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	\$1.80	\$86.23	2.09%	2.18%	7.00%	7.30%	6.00%	8.44%	7.19%	8.15%	9.35%	10.62%
Black Hills Corporation	BKH	\$1.78	\$69.39	2.57%	2.65%	5.00%	7.65%	7.50%	5.51%	6.42%	7.63%	9.06%	10.31%
Chesapeake Utilities	CPK	\$1.30	\$77.71	1.67%	1.75%	6.00%	8.10%	8.00%	13.24%	8.84%	7.72%	10.58%	15.03%
Northwest Natural Gas Company	NWN	\$1.88	\$62.99	2.98%	3.06%	4.30%	4.00%	7.00%	4.10%	4.85%	7.04%	7.91%	10.09%
One Gas Inc	OGS	\$1.68	\$72.42	2.32%	2.39%	5.50%	5.50%	9.50%	4.81%	6.33%	7.19%	8.72%	11.83%
Sompra Energy	SRE	\$3.29	\$114.33	2.88%	2.98%	8.70%	7.80%	8.00%	2.73%	6.81%	5.65%	9.78%	11.70%
Southwest Gas	SWX	\$1.98	\$79.73	2.49%	2.55%	5.00%	4.00%	7.50%	6.03%	5.63%	6.53%	8.19%	10.08%
Spire Inc	SR	\$2.10	\$72.96	2.88%	2.95%	4.40%	3.74%	8.00%	5.16%	5.33%	6.67%	8.28%	10.99%
Vectron Corporation	VVC	\$1.68	\$59.87	2.81%	2.89%	5.70%	5.50%	6.50%	5.96%	5.92%	8.38%	8.81%	9.40%
Proxy Group Mean				2.52%	2.60%	5.73%	5.95%	7.56%	6.22%	6.37%	7.22%	8.96%	11.13%
Proxy Group Median				2.57%	2.65%	5.50%	5.50%	7.50%	5.51%	6.33%	7.19%	8.81%	10.62%

Notes:

- [1] Source: Bloomberg Professional
- [2] Source: Bloomberg Professional, equals indicated number of trading day average as of August 18, 2017
- [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-3, 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

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
Company	Ticker	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	\$1.80	\$83.64	2.15%	2.23%	7.00%	7.30%	6.00%	8.44%	7.19%	8.22%	9.41%	10.68%
Black Hills Corporation	BKH	\$1.78	\$69.09	2.58%	2.66%	5.00%	7.65%	7.50%	5.51%	6.42%	7.64%	9.07%	10.32%
Chesapeake Utilities	CPK	\$1.30	\$75.03	1.73%	1.81%	6.00%	8.10%	8.00%	13.24%	8.84%	7.78%	10.64%	15.09%
Northwest Natural Gas Company	NWN	\$1.88	\$61.37	3.06%	3.14%	4.30%	4.00%	7.00%	4.10%	4.85%	7.12%	7.99%	10.17%
One Gas Inc	OGS	\$1.68	\$70.76	2.37%	2.45%	5.50%	5.50%	9.50%	4.81%	6.33%	7.24%	8.78%	11.99%
Sompra Energy	SRE	\$3.29	\$113.65	2.89%	2.99%	8.70%	7.80%	8.00%	2.73%	6.81%	5.67%	9.80%	11.72%
Southwest Gas	SWX	\$1.98	\$79.27	2.50%	2.57%	5.00%	4.00%	7.50%	6.03%	5.63%	6.55%	8.20%	10.09%
Spiro Inc	SR	\$2.10	\$71.02	2.96%	3.04%	4.40%	3.74%	8.00%	5.16%	5.33%	6.75%	8.36%	11.08%
Vectren Corporation	VVC	\$1.68	\$59.83	2.80%	2.89%	5.70%	5.50%	6.50%	5.90%	5.92%	8.38%	8.80%	9.39%
Proxy Group Mean				2.56%	2.64%	5.73%	5.95%	7.56%	6.22%	6.37%	7.26%	9.01%	11.17%
Proxy Group Median				2.58%	2.66%	5.50%	5.50%	7.50%	5.51%	6.33%	7.24%	8.80%	10.68%

Notes:

- [1] Source: Bloomberg Professional
- [2] Source: Bloomberg Professional, equals indicated number of trading day average as of August 18, 2017
- [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-3, 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

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
Company	Ticker	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	\$1.80	\$79.91	2.25%	2.33%	7.00%	7.30%	6.00%	8.44%	7.19%	8.32%	9.52%	10.79%
Black Hills Corporation	BKH	\$1.78	\$66.02	2.70%	2.78%	5.00%	7.65%	7.50%	5.51%	6.42%	7.76%	9.20%	10.45%
Chesapeake Utilities	CPK	\$1.30	\$70.98	1.83%	1.91%	6.00%	8.10%	8.00%	13.24%	8.84%	7.89%	10.75%	15.19%
Northwest Natural Gas Company	NWN	\$1.88	\$60.28	3.12%	3.19%	4.30%	4.00%	7.00%	4.10%	4.85%	7.18%	8.05%	10.23%
One Gas Inc	OGS	\$1.68	\$67.70	2.48%	2.56%	5.50%	5.50%	9.50%	4.81%	6.33%	7.35%	8.89%	12.10%
Sempra Energy	SRE	\$3.29	\$109.46	3.01%	3.11%	8.70%	7.80%	8.00%	2.73%	6.81%	5.78%	9.92%	11.84%
Southwest Gas	SWX	\$1.98	\$78.81	2.48%	2.55%	5.00%	4.00%	7.50%	6.03%	5.63%	6.53%	8.18%	10.07%
Spiro Inc	SR	\$2.10	\$68.06	3.09%	3.17%	4.40%	3.74%	8.00%	5.16%	5.33%	6.88%	8.48%	11.21%
Vectren Corporation	VVC	\$1.68	\$57.38	2.93%	3.01%	5.70%	5.50%	6.50%	5.96%	5.92%	8.51%	8.93%	9.52%
Proxy Group Mean				2.65%	2.74%	5.73%	5.95%	7.56%	6.22%	6.37%	7.36%	9.10%	11.27%
Proxy Group Median				2.70%	2.78%	5.50%	5.50%	7.50%	5.51%	6.33%	7.35%	8.93%	10.79%

Notes:

- [1] Source: Bloomberg Professional
- [2] Source: Bloomberg Professional, equals indicated number of trading day average as of August 18, 2017
- [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-3, 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	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	\$0.45	\$0.45	\$0.48	\$0.48	\$0.48	\$0.48	\$86.23	7.00%	7.30%	6.00%	8.44%	7.19%	8.33%	9.50%	10.85%
Black Hills Corporation	BKH	\$0.42	\$0.45	\$0.45	\$0.45	\$0.45	\$0.47	\$0.47	\$0.47	\$69.39	5.00%	7.65%	7.50%	5.51%	6.42%	7.80%	9.20%	10.55%
Chesapeake Utilities	CPK	\$0.31	\$0.31	\$0.33	\$0.33	\$0.33	\$0.33	\$0.35	\$0.35	\$77.71	6.00%	8.10%	8.00%	13.24%	8.84%	7.80%	10.67%	15.21%
Northwest Natural Gas Company	NWN	\$0.47	\$0.47	\$0.47	\$0.47	\$0.49	\$0.49	\$0.49	\$0.49	\$62.99	4.30%	4.00%	7.00%	4.10%	4.85%	7.29%	8.07%	10.42%
Ono Gas Inc	OGS	\$0.35	\$0.42	\$0.42	\$0.42	\$0.37	\$0.45	\$0.45	\$0.45	\$72.42	5.50%	5.50%	9.50%	4.81%	6.33%	7.26%	8.76%	12.10%
Sompra Energy	SRE	\$0.76	\$0.76	\$0.82	\$0.82	\$0.81	\$0.81	\$0.88	\$0.88	\$114.33	8.70%	7.80%	8.00%	2.73%	6.81%	5.72%	9.87%	11.93%
Southwest Gas	SWX	\$0.45	\$0.45	\$0.50	\$0.50	\$0.48	\$0.48	\$0.52	\$0.52	\$79.73	5.00%	4.00%	7.50%	6.03%	5.63%	6.59%	8.21%	10.21%
Spire inc	SR	\$0.53	\$0.53	\$0.53	\$0.53	\$0.55	\$0.55	\$0.55	\$0.55	\$72.96	4.40%	3.74%	8.00%	5.16%	5.33%	6.90%	8.45%	11.34%
Vectren Corporation	VVC	\$0.42	\$0.42	\$0.42	\$0.42	\$0.44	\$0.44	\$0.44	\$0.44	\$59.87	5.70%	5.50%	6.50%	5.96%	5.92%	8.65%	8.99%	9.69%
Proxy Group Mean											5.73%	5.95%	7.56%	6.22%	6.37%	7.37%	9.08%	11.37%
Proxy Group Median											5.50%	5.50%	7.50%	5.51%	6.33%	7.29%	8.99%	10.85%

Notes:  
 [1] Source: Bloomberg Professional Service  
 [2] Source: Bloomberg Professional Service  
 [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  
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 [12] Source: Value Line  
 [13] Source: Schedule KM-3, 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	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	\$0.45	\$0.45	\$0.48	\$0.48	\$0.48	\$0.48	\$83.64	7.00%	7.30%	6.00%	8.44%	7.19%	8.41%	9.57%	10.92%
Black Hills Corporation	BKH	\$0.42	\$0.45	\$0.45	\$0.45	\$0.45	\$0.47	\$0.47	\$0.47	\$69.09	5.00%	7.65%	7.50%	5.51%	6.42%	7.82%	9.21%	10.57%
Chesapeake Utilities	CPK	\$0.31	\$0.31	\$0.33	\$0.33	\$0.33	\$0.33	\$0.35	\$0.35	\$75.03	6.00%	8.10%	8.00%	13.24%	8.84%	7.86%	10.73%	15.28%
Northwest Natural Gas Company	NWN	\$0.47	\$0.47	\$0.47	\$0.47	\$0.49	\$0.49	\$0.49	\$0.49	\$61.37	4.30%	4.00%	7.00%	4.10%	4.85%	7.38%	8.16%	10.52%
One Gas Inc	OGS	\$0.35	\$0.42	\$0.42	\$0.42	\$0.37	\$0.45	\$0.45	\$0.45	\$70.76	5.50%	5.50%	9.50%	4.81%	6.33%	7.32%	8.82%	12.16%
Sempra Energy	SRE	\$0.76	\$0.76	\$0.82	\$0.82	\$0.81	\$0.81	\$0.88	\$0.88	\$113.65	8.70%	7.80%	8.00%	2.73%	6.81%	5.74%	9.88%	11.95%
Southwest Gas	SWX	\$0.45	\$0.45	\$0.50	\$0.50	\$0.48	\$0.48	\$0.52	\$0.52	\$79.27	5.00%	4.00%	7.50%	6.03%	5.63%	6.60%	8.22%	10.22%
Spiro Inc	SR	\$0.53	\$0.53	\$0.53	\$0.53	\$0.55	\$0.55	\$0.55	\$0.55	\$71.02	4.40%	3.74%	8.00%	5.16%	5.33%	6.99%	8.54%	11.43%
Vectren Corporation	VVC	\$0.42	\$0.42	\$0.42	\$0.42	\$0.44	\$0.44	\$0.44	\$0.44	\$59.93	5.70%	5.50%	6.50%	5.96%	5.92%	8.64%	8.98%	9.68%
Proxy Group Mean											5.73%	5.95%	7.56%	6.22%	6.37%	7.42%	9.13%	11.41%
Proxy Group Median											5.50%	5.50%	7.50%	5.51%	6.33%	7.38%	8.98%	10.92%

Notes:

- [1] Source: Bloomberg Professional Service
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- [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])
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- [12] Source: Value Line
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- [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	Dividend	Dividend	Dividend	Dividend	Expected	Expected	Expected	Expected	Stock Price	Zacks	First Call	Value Line	Retention	Average	Low	Mean	High	
Company	1	2	3	4	Dividend	Dividend	Dividend	Dividend		Earnings	Earnings	Earnings	Growth	Earnings	ROE	ROE	ROE	
Company	1	2	3	4	1	2	3	4		Growth	Growth	Growth	Estimate	Growth				
Atmos Energy Corporation	ATO	\$0.45	\$0.45	\$0.45	\$0.45	\$0.48	\$0.48	\$0.48	\$0.48	\$79.91	7.00%	7.30%	6.00%	8.44%	7.19%	8.52%	9.69%	11.04%
Black Hills Corporation	BKH	\$0.42	\$0.45	\$0.45	\$0.45	\$0.45	\$0.47	\$0.47	\$0.47	\$68.02	5.00%	7.65%	7.50%	5.51%	6.42%	7.95%	9.34%	10.71%
Chesapeake Utilities	CPK	\$0.31	\$0.31	\$0.33	\$0.33	\$0.33	\$0.33	\$0.35	\$0.35	\$70.98	6.00%	8.10%	8.00%	13.24%	8.84%	7.97%	10.84%	15.40%
Northwest Natural Gas Company	NWN	\$0.47	\$0.47	\$0.47	\$0.47	\$0.49	\$0.49	\$0.49	\$0.49	\$60.28	4.30%	4.00%	7.00%	4.10%	4.85%	7.44%	8.22%	10.58%
One Gas Inc	OGS	\$0.35	\$0.42	\$0.42	\$0.42	\$0.37	\$0.45	\$0.45	\$0.45	\$67.70	5.50%	5.50%	9.50%	4.81%	6.33%	7.43%	8.94%	12.28%
Sompra Energy	SRE	\$0.76	\$0.76	\$0.82	\$0.82	\$0.81	\$0.81	\$0.88	\$0.88	\$109.46	8.70%	7.80%	8.00%	2.73%	6.81%	5.85%	10.00%	12.07%
Southwest Gas	SWX	\$0.45	\$0.45	\$0.50	\$0.50	\$0.48	\$0.48	\$0.52	\$0.52	\$79.81	5.00%	4.00%	7.50%	6.03%	5.63%	6.58%	8.21%	10.20%
Spire Inc	SR	\$0.53	\$0.53	\$0.53	\$0.53	\$0.55	\$0.55	\$0.55	\$0.55	\$68.06	4.40%	3.74%	8.00%	5.16%	5.33%	7.13%	8.68%	11.59%
Vectren Corporation	VVC	\$0.42	\$0.42	\$0.42	\$0.42	\$0.44	\$0.44	\$0.44	\$0.44	\$57.38	5.70%	5.50%	6.50%	5.96%	5.92%	8.79%	9.12%	9.83%
Proxy Group Mean											5.73%	5.95%	7.56%	6.22%	6.37%	7.52%	9.23%	11.52%
Proxy Group Median											5.50%	5.50%	7.50%	5.51%	6.33%	7.44%	9.12%	11.04%

Notes:  
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 [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	Projected Earnings per share 2020-22	Projected Dividend per share 2020-22	Retention Ratio (B)	Projected Book Value per Share 2018	Projected Book Value per Share 2020-22	Return on Average Book Value (R)	B x R	Projected Common Shares 2018	Projected Common Shares 2020-22	Common Shares Growth Rate	2017 High Price	2017 Low Price	2017 Price Midpoint	Projected Book Value per Share 2017
Atmos Energy Corporation	ATO	4.50	2.30	48.89%	37.15	38.50	11.76%	5.75%	110.00	120.00	2.94%	82.70	72.50	\$ 77.60	37.10
Black Hills Corporation	BKH	4.25	2.20	48.24%	35.35	41.00	10.61%	5.12%	60.25	61.00	0.41%	72.00	60.00	\$ 66.00	31.85
Chesapeake Utilities	CPK	4.20	1.55	63.10%	32.20	32.90	12.81%	8.08%	17.00	20.00	5.57%	74.90	63.00	\$ 68.95	31.05
Northwest Natural Gas Company	NWN	3.15	2.00	36.51%	30.40	32.25	9.86%	3.60%	29.50	30.00	0.56%	61.70	56.50	\$ 59.10	29.90
One Gas Inc	OGS	4.00	2.45	38.75%	38.95	41.45	9.75%	3.78%	52.50	55.00	1.56%	70.60	61.40	\$ 66.00	37.80
Sempra Energy	SRE	7.50	4.55	39.33%	55.25	58.25	12.99%	5.11%	254.00	236.00	-2.42%	118.00	99.70	\$ 108.85	53.45
Southwest Gas	SWX	4.75	2.50	47.37%	42.85	57.70	8.60%	4.07%	49.00	52.00	2.00%	86.60	75.60	\$ 81.10	38.55
Spire Inc	SR	4.65	2.50	46.24%	41.85	48.30	9.85%	4.55%	48.50	50.00	1.02%	70.70	62.30	\$ 66.50	39.50
Vectren Corporation	VVC	3.35	2.00	40.30%	23.80	28.50	12.09%	4.87%	84.00	86.00	0.79%	62.80	51.50	\$ 57.15	22.50

Company	Ticker	[15] Market/ Book Ratio	[16] "S"	[17] "V"	[18] S x V	[19] BR + SV
Atmos Energy Corporation	ATO	2.09	6.16%	52.19%	3.21%	8.44%
Black Hills Corporation	BKH	2.07	0.86%	51.74%	0.44%	5.51%
Chesapeake Utilities	CPK	2.22	12.36%	54.97%	6.79%	13.24%
Northwest Natural Gas Company	NWN	1.98	1.11%	49.41%	0.55%	4.10%
One Gas Inc	OGS	1.75	2.73%	42.73%	1.17%	4.81%
Sempra Energy	SRE	2.04	-4.93%	50.90%	-2.51%	2.73%
Southwest Gas	SWX	2.10	4.21%	52.47%	2.21%	6.03%
Spire Inc	SR	1.68	1.72%	40.60%	0.70%	5.16%
Vectren Corporation	VVC	2.54	2.00%	60.63%	1.21%	5.96%

Mean: 6.22%  
Median: 5.51%

## Notes:

[1] Source: Value Line

[2] Source: Value Line

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

[4] Source: Value Line

[5] Source: Value Line

[6] Equals  $[1] / ([4] + (2.5/3) \times ([5] - [4]))$ [7] Equals  $[3] \times [6]$ 

[8] Source: Value Line

[9] Source: Value Line

[10] Equals  $([9] / [8])^{(1/3)} - 1$ 

[11] Source: Value Line

[12] Source: Value Line

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

[14] Source: Value Line

[15] Equals  $[13] / [14]$ [16] Equals  $[10] \times [15]$ [17] Equals  $1 - (1 / [15])$ [18] Equals  $[16] \times [17]$ [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]:	13.41%	14.16%
Current Risk-Free Rate [2]:	2.85%	2.85%
Near-Term Projected Risk-Free Rate [3]:	3.35%	3.35%
Current Market Risk Premium [4]:	10.56%	11.31%
Near-Term Projected Market Risk Premium [5]:	10.06%	10.81%

Company	Ticker	Market Capitalization (\$MM)	Dividend Yield	Growth Rate	Bloomberg		Value Line		
					DCF Result	Weight in Index	Growth Rate	DCF Result	Weight in Index
AGILENT TECHNOLOGIES INC	A	19,681.92	0.86%	9.53%	10.43%	0.09%	7.00%	7.89%	0.10%
AMERICAN AIRLINES GROUP INC	AAL	22,183.27	0.94%	-1.26%	-0.32%	0.10%	1.00%	1.94%	0.11%
ADVANCE AUTO PARTS INC	AAP	6,888.42	0.27%	11.68%	11.96%	0.03%	9.50%	9.78%	0.03%
APPLE INC	AAPL	813,523.41	1.53%	10.35%	11.96%	3.71%	10.00%	11.60%	4.10%
ABBVIE INC	ABBV	111,522.87	3.68%	7.45%	11.27%	0.51%	11.50%	15.39%	0.56%
AMERISOURCEBERGEN CORP	ABC	17,222.17	1.86%	9.23%	11.17%	0.08%	8.00%	9.93%	0.09%
ABBOTT LABORATORIES	ABT	84,682.98	2.22%	11.33%	13.67%	0.39%	8.50%	10.82%	0.43%
ACCENTURE PLC-CL A	ACN	82,294.66	1.91%	9.75%	11.75%	0.38%	9.00%	10.99%	0.42%
ADOBE SYSTEMS INC	ADBE	73,009.24	0.00%	19.56%	19.56%	0.33%	29.50%	29.50%	0.37%
ANALOG DEVICES INC	ADI	28,531.47	2.12%	11.70%	13.95%	0.13%	16.00%	18.29%	0.14%
ARCHER-DANIELS-MIDLAND CO	ADM	23,216.33	3.11%	9.80%	13.07%	0.11%	4.00%	7.18%	0.12%
AUTOMATIC DATA PROCESSING	ADP	46,397.17	2.26%	11.60%	13.99%	0.21%	9.00%	11.36%	0.23%
ALLIANCE DATA SYSTEMS CORP	ADS	12,276.82	0.82%	14.00%	14.88%	0.06%	9.50%	10.36%	0.06%
AUTODESK INC	ADSK	23,925.72	0.00%	26.00%	26.00%	0.11%	N/A	N/A	N/A
AMEREN CORPORATION	AEE	14,366.41	3.04%	5.60%	8.72%	0.07%	6.00%	9.13%	0.07%
AMERICAN ELECTRIC POWER	AEP	35,491.20	3.30%	3.67%	7.02%	0.16%	4.00%	7.36%	0.18%
AES CORP	AES	7,309.04	4.35%	9.33%	13.89%	0.03%	N/A	N/A	N/A
AETNA INC	AET	51,292.85	1.08%	11.46%	12.60%	0.23%	8.50%	9.63%	0.26%
AFLAC INC	AFL	31,555.09	2.18%	5.00%	7.24%	0.14%	4.00%	6.23%	0.16%
ALLERGAN PLC	AGN	74,881.24	1.31%	16.00%	17.42%	0.34%	10.00%	11.38%	0.38%
AMERICAN INTERNATIONAL GROUP	AIG	55,414.90	2.10%	11.00%	13.22%	0.25%	27.00%	29.39%	0.28%
APARTMENT INVT & MGMT CO -A	AIV	7,089.58	3.20%	19.14%	22.65%	0.03%	N/A	N/A	N/A
ASSURANT INC	AIZ	5,389.22	2.17%	20.39%	22.78%	0.02%	4.00%	6.21%	0.03%
ARTHUR J GALLAGHER & CO	AJG	10,438.70	2.69%	9.95%	12.78%	0.05%	15.50%	18.40%	0.05%
AKAMAI TECHNOLOGIES INC	AKAM	7,775.75	0.00%	13.72%	13.72%	0.04%	12.50%	12.50%	0.04%
ALBEMARLE CORP	ALB	12,438.13	1.14%	12.20%	13.41%	0.06%	9.50%	10.70%	0.06%
ALIGN TECHNOLOGY INC	ALGN	13,514.19	0.00%	29.87%	29.87%	0.06%	21.50%	21.50%	0.07%
ALASKA AIR GROUP INC	ALK	9,690.57	1.54%	9.95%	11.56%	0.04%	10.00%	11.61%	0.05%
ALLSTATE CORP	ALL	33,577.53	1.57%	9.00%	10.65%	0.15%	7.50%	9.13%	0.17%
ALLEGION PLC	ALLE	7,424.97	0.76%	12.58%	13.39%	0.03%	10.00%	10.80%	0.04%
ALEXION PHARMACEUTICALS INC	ALXN	29,772.91	0.00%	20.04%	20.04%	0.14%	23.50%	23.50%	0.15%
APPLIED MATERIALS INC	AMAT	47,606.18	0.93%	19.68%	20.70%	0.22%	18.00%	19.02%	0.24%
ADVANCED MICRO DEVICES	AMD	11,711.66	0.00%	5.00%	5.00%	0.05%	N/A	N/A	N/A
AMETEK INC	AME	14,526.26	0.60%	11.62%	12.26%	0.07%	5.50%	6.12%	0.07%
AFFILIATED MANAGERS GROUP	AMG	9,672.19	0.46%	15.79%	16.29%	0.04%	7.00%	7.48%	0.05%
AMGEN INC	AMGN	122,067.29	2.75%	4.67%	7.48%	0.56%	7.50%	10.36%	0.62%
AMERIPRISE FINANCIAL INC	AMP	20,812.12	2.34%	N/A	N/A	N/A	11.50%	13.98%	0.10%
AMERICAN TOWER CORP	AMT	60,084.84	1.87%	20.68%	22.74%	0.27%	11.00%	12.97%	0.30%
AMAZON.COM INC	AMZN	460,429.36	0.00%	27.62%	27.62%	2.10%	56.00%	56.00%	2.32%
ANDEAVOR	ANDV	14,565.17	2.46%	16.76%	19.42%	0.07%	6.50%	9.04%	0.07%
ANSYS INC	ANSS	10,646.79	0.00%	11.80%	11.80%	0.05%	7.00%	7.00%	0.05%
ANTHEM INC	ANTM	50,158.93	1.41%	9.78%	11.25%	0.23%	10.00%	11.48%	0.25%
AON PLC	AON	34,722.13	1.03%	10.86%	11.95%	0.16%	9.50%	10.58%	0.18%
SMITH (A.O.) CORP	AOS	9,305.02	1.04%	15.00%	16.12%	0.04%	11.50%	12.60%	0.05%
APACHE CORP	APA	15,355.45	2.48%	-20.62%	-18.39%	0.07%	23.00%	25.77%	0.08%
ANADARKO PETROLEUM CORP	APC	23,630.30	0.47%	-10.30%	-9.85%	0.11%	N/A	N/A	N/A
AIR PRODUCTS & CHEMICALS INC	APD	31,769.47	2.53%	8.89%	11.54%	0.14%	9.00%	11.65%	0.16%
AMPHENOL CORP-CL A	APH	23,952.99	0.84%	10.00%	10.88%	0.11%	8.50%	9.37%	0.12%
ALEXANDRIA REAL ESTATE EQUIT	ARE	11,236.07	2.83%	6.90%	9.82%	0.05%	N/A	N/A	N/A
ARCONIC INC	ARNC	10,712.64	1.21%	16.90%	18.21%	0.05%	N/A	N/A	N/A
ACTIVISION BLIZZARD INC	ATVI	46,812.66	0.48%	13.17%	13.69%	0.21%	9.00%	9.51%	0.24%
AVALONBAY COMMUNITIES INC	AVB	26,096.34	3.00%	6.91%	10.02%	0.12%	N/A	N/A	N/A
BROADCOM LTD	AVGO	101,392.00	1.63%	15.42%	17.18%	0.46%	44.00%	45.99%	0.51%
AVERY DENNISON CORP	AVY	8,223.63	1.83%	7.65%	9.55%	0.04%	9.00%	10.91%	0.04%

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					Bloomberg		Value Line		
AMERICAN WATER WORKS CO INC	AWK	14,519.31	1.99%	7.00%	9.06%	0.07%	8.50%	10.58%	0.07%
AMERICAN EXPRESS CO	AXP	75,474.18	1.57%	9.00%	10.64%	0.34%	6.00%	7.62%	0.38%
ACUITY BRANDS INC	AYI	7,506.50	0.29%	17.67%	17.99%	0.03%	16.50%	16.82%	0.04%
AUTOZONE INC	AZO	14,300.98	0.00%	11.69%	11.69%	0.07%	11.50%	11.50%	0.07%
BOEING CO/THE	BA	139,359.73	2.41%	16.35%	18.96%	0.64%	9.50%	12.03%	0.70%
BANK OF AMERICA CORP	BAC	232,670.71	1.66%	17.07%	18.86%	1.06%	16.00%	17.79%	1.17%
BAXTER INTERNATIONAL INC	BAX	33,166.29	0.97%	13.56%	14.60%	0.15%	4.00%	4.99%	0.17%
BB&T CORP	BBT	37,269.23	2.73%	9.75%	12.61%	0.17%	5.50%	8.31%	0.19%
BEST BUY CO INC	BBY	18,136.11	2.28%	13.28%	15.71%	0.08%	8.00%	10.37%	0.09%
CR BARD INC	BCR	23,124.08	0.33%	8.73%	9.08%	0.11%	9.50%	9.85%	0.12%
BECTON DICKINSON AND CO	BDX	44,987.32	1.47%	10.05%	11.60%	0.21%	9.00%	10.54%	0.23%
FRANKLIN RESOURCES INC	BEN	23,328.65	1.91%	10.00%	12.00%	0.11%	5.00%	6.96%	0.12%
BROWN-FORMAN CORP-CLASS B	BF/B	19,988.12	1.50%	8.47%	10.03%	0.09%	9.00%	10.57%	0.10%
BRIGHTHOUSE FINANCIAL INC	BHF	6,880.96	0.00%	14.05%	14.05%	0.03%	N/A	N/A	N/A
BAKER HUGHES A GE CO	BHGE	37,526.30	1.70%	N/A	N/A	N/A	N/A	N/A	N/A
BIOGEN INC	BIIB	59,575.12	0.00%	6.11%	6.11%	0.27%	7.00%	7.00%	0.30%
BANK OF NEW YORK MELLON CORP	BK	53,827.44	1.65%	12.08%	13.83%	0.25%	8.50%	10.22%	0.27%
BLACKROCK INC	BLK	67,716.47	2.41%	13.60%	16.18%	0.31%	8.50%	11.01%	0.34%
BALL CORP	BLL	14,113.64	0.76%	7.23%	8.01%	0.06%	15.00%	15.82%	0.07%
BRISTOL-MYERS SQUIBB CO	BMJ	92,524.65	2.78%	8.00%	10.89%	0.42%	14.50%	17.48%	0.47%
BERKSHIRE HATHAWAY INC-CL B	BRK/B	438,811.07	0.00%	2.00%	2.00%	2.00%	N/A	N/A	N/A
BOSTON SCIENTIFIC CORP	BSX	36,896.50	0.00%	10.69%	10.69%	0.17%	18.50%	18.50%	0.19%
BORGWARNER INC	BWA	9,358.51	1.27%	5.48%	6.79%	0.04%	7.00%	8.32%	0.05%
BOSTON PROPERTIES INC	BXP	18,491.89	2.53%	5.25%	7.84%	0.08%	N/A	N/A	N/A
CITIGROUP INC	C	181,400.94	1.45%	10.18%	11.70%	0.83%	11.00%	12.53%	0.91%
CA INC	CA	13,636.51	3.15%	2.97%	6.16%	0.06%	7.00%	10.26%	0.07%
CONAGRA BRANDS INC	CAG	14,323.48	2.46%	8.65%	11.22%	0.07%	1.00%	3.47%	0.07%
CARDINAL HEALTH INC	CAH	20,373.29	2.80%	9.19%	12.12%	0.09%	13.00%	15.98%	0.10%
CATERPILLAR INC	CAT	67,323.62	2.73%	8.05%	10.89%	0.31%	10.00%	12.87%	0.34%
CHUBB LTD	CB	67,690.11	1.95%	10.00%	12.05%	0.31%	8.00%	10.03%	0.34%
CBRE GROUP INC - A	CBG	11,908.84	0.00%	9.35%	9.35%	0.05%	7.00%	7.00%	0.06%
CBOE HOLDINGS INC	CBOE	10,860.46	1.08%	21.49%	22.68%	0.05%	12.50%	13.65%	0.05%
CBS CORP-CLASS B NON VOTING	CBS	26,050.84	1.13%	13.37%	14.57%	0.12%	12.00%	13.20%	0.13%
CROWN CASTLE INTL CORP	CCI	42,300.54	3.70%	21.60%	25.70%	0.19%	8.50%	12.36%	0.21%
CARNIVAL CORP	CCL	48,975.45	2.29%	13.11%	15.56%	0.22%	12.50%	14.94%	0.25%
CELGENE CORP	CELG	99,867.06	0.00%	19.46%	19.46%	0.46%	25.00%	25.00%	0.50%
CERNER CORP	CERN	21,304.18	0.00%	12.70%	12.70%	0.10%	9.50%	9.50%	0.11%
CF INDUSTRIES HOLDINGS INC	CF	6,771.17	4.13%	6.00%	10.26%	0.03%	10.00%	14.34%	0.03%
CITIZENS FINANCIAL GROUP	CFG	16,552.19	1.92%	21.44%	23.57%	0.08%	10.50%	12.52%	0.08%
CHURCH & DWIGHT CO INC	CHD	12,487.93	1.52%	9.14%	10.73%	0.06%	7.00%	8.57%	0.06%
CHESAPEAKE ENERGY CORP	CHK	3,597.02	0.00%	-13.13%	-13.13%	0.02%	N/A	N/A	N/A
C.H. ROBINSON WORLDWIDE INC	CHRW	9,374.98	3.24%	9.20%	12.58%	0.04%	6.50%	9.84%	0.05%
CHARTER COMMUNICATIONS INC-A	CHTR	119,038.24	0.00%	23.96%	23.96%	0.54%	26.00%	26.00%	0.60%
CIGNA CORP	CI	44,572.28	0.02%	12.91%	12.93%	0.20%	11.50%	11.52%	0.22%
CINCINNATI FINANCIAL CORP	CINF	12,682.40	2.59%	N/A	N/A	N/A	6.50%	9.17%	0.06%
COLGATE-PALMOLIVE CO	CL	62,557.40	2.29%	8.99%	11.38%	0.29%	11.50%	13.92%	0.32%
CLOROX COMPANY	CLX	17,776.61	2.46%	6.88%	9.43%	0.08%	7.50%	10.05%	0.09%
COMERICA INC	CMA	12,202.94	1.57%	14.10%	15.78%	0.06%	13.50%	15.17%	0.06%
COMCAST CORP-CLASS A	CMCSA	190,985.85	1.55%	11.57%	13.21%	0.87%	11.00%	12.64%	0.96%
CME GROUP INC	CME	42,621.59	4.72%	10.47%	15.44%	0.19%	8.50%	13.42%	0.21%
CHIPOTLE MEXICAN GRILL INC	CMG	8,874.03	0.00%	50.88%	50.88%	0.04%	15.50%	15.50%	0.04%
CUMMINS INC	CMI	25,275.51	2.75%	10.23%	13.12%	0.12%	7.50%	10.35%	0.13%
CMS ENERGY CORP	CMS	13,595.83	2.75%	7.50%	10.36%	0.06%	6.50%	9.34%	0.07%
CENTENE CORP	CNC	14,399.99	0.00%	12.48%	12.48%	0.07%	17.00%	17.00%	0.07%
CENTERPOINT ENERGY INC	CNP	12,504.02	3.71%	6.00%	9.82%	0.06%	6.00%	9.82%	0.06%
CAPITAL ONE FINANCIAL CORP	COF	39,435.46	1.96%	6.99%	9.02%	0.18%	4.00%	6.00%	0.20%
CABOT OIL & GAS CORP	COG	11,280.20	0.70%	31.95%	32.75%	0.05%	N/A	N/A	N/A
COACH INC	COH	11,410.77	3.38%	12.23%	15.81%	0.05%	9.50%	13.04%	0.08%
ROCKWELL COLLINS INC	COL	20,231.49	1.08%	10.86%	12.00%	0.09%	8.00%	9.12%	0.10%
COOPER COS INC/THE	COO	11,972.35	0.02%	11.20%	11.23%	0.05%	16.50%	16.53%	0.06%
CONOCOPHILLIPS	COP	52,462.68	2.47%	7.00%	9.55%	0.24%	60.50%	63.71%	0.26%
COSTCO WHOLESALE CORP	COST	68,894.24	2.98%	10.18%	13.32%	0.31%	9.00%	12.12%	0.35%
COTY INC-CL A	COTY	14,377.09	2.94%	2.01%	4.98%	0.07%	8.00%	11.06%	0.07%
CAMPBELL SOUP CO	CPB	16,271.58	2.57%	5.37%	8.01%	0.07%	5.00%	7.64%	0.08%
SALESFORCE.COM INC	CRM	64,639.27	0.00%	26.88%	26.88%	0.30%	N/A	N/A	N/A
CISCO SYSTEMS INC	CSCO	151,851.65	3.91%	7.54%	11.60%	0.69%	7.00%	11.04%	0.77%
CSRA INC	CSRA	5,165.81	1.27%	7.55%	8.86%	0.02%	N/A	N/A	N/A
CSX CORP	CSX	44,551.41	1.60%	11.33%	13.02%	0.20%	9.00%	10.67%	0.22%
CINTAS CORP	CTAS	13,981.85	1.09%	11.58%	12.73%	0.06%	9.50%	10.64%	0.07%

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					<u>Bloomberg</u>			<u>Value Line</u>	
CENTURYLINK INC	CTL	10,530.51	11.27%	-2.62%	8.51%	0.05%	8.50%	20.25%	0.05%
COGNIZANT TECH SOLUTIONS-A	CTSH	41,384.93	0.71%	14.35%	15.11%	0.19%	12.00%	12.76%	0.21%
CITRIX SYSTEMS INC	CTXS	11,319.41	0.00%	13.10%	13.10%	0.05%	5.50%	5.50%	0.06%
CVS HEALTH CORP	CVS	78,946.42	2.61%	12.00%	14.77%	0.36%	9.00%	11.73%	0.40%
CHEVRON CORP	CVX	201,779.89	4.07%	42.57%	47.51%	0.92%	15.50%	19.89%	1.02%
CONCHO RESOURCES INC	CXO	16,138.24	0.00%	7.90%	7.90%	0.07%	27.00%	27.00%	0.08%
DOMINION ENERGY INC	D	50,565.09	3.84%	5.45%	9.39%	0.23%	5.50%	9.44%	0.26%
DELTA AIR LINES INC	DAL	34,413.16	2.04%	6.93%	9.04%	0.16%	11.50%	13.66%	0.17%
DU PONT (E.I.) DE NEMOURS	DD	70,448.49	1.88%	7.50%	9.45%	0.32%	8.00%	9.96%	0.36%
DEERE & CO	DE	37,523.02	2.05%	8.73%	10.88%	0.17%	6.00%	8.12%	0.19%
DISCOVER FINANCIAL SERVICES	DFS	22,128.88	2.16%	6.19%	8.41%	0.10%	5.00%	7.21%	0.11%
DOLLAR GENERAL CORP	DG	20,243.30	1.41%	9.08%	10.55%	0.09%	9.50%	10.97%	0.10%
QUEST DIAGNOSTICS INC	DGX	14,304.85	1.69%	7.84%	9.59%	0.07%	9.50%	11.27%	0.07%
DR HORTON INC	DHI	13,358.16	1.12%	12.66%	13.85%	0.06%	11.50%	12.69%	0.07%
DANAHER CORP	DHR	56,179.57	0.68%	8.78%	9.49%	0.26%	9.00%	9.71%	0.28%
WALT DISNEY CO/THE	DIS	155,428.53	1.61%	7.89%	9.57%	0.71%	8.00%	9.68%	0.78%
DISCOVERY COMMUNICATIONS-A	DISCA	12,630.97	0.00%	6.35%	6.35%	0.06%	13.50%	13.50%	0.06%
DISH NETWORK CORP-A	DISH	26,493.83	0.00%	-7.33%	-7.33%	0.12%	6.00%	6.00%	0.13%
DELPHI AUTOMOTIVE PLC	DLPH	24,621.71	1.28%	10.84%	12.19%	0.11%	14.00%	15.37%	0.12%
DIGITAL REALTY TRUST INC	DLR	18,905.79	3.25%	5.58%	8.92%	0.09%	N/A	N/A	N/A
DOLLAR TREE INC	DLTR	17,574.12	0.00%	17.10%	17.10%	0.08%	16.50%	16.50%	0.09%
DOVER CORP	DOV	13,059.88	2.15%	15.47%	17.78%	0.06%	4.50%	6.70%	0.07%
DOW CHEMICAL CO/THE	DOW	77,566.41	3.09%	5.70%	8.88%	0.35%	8.00%	11.22%	0.39%
DR PEPPER SNAPPLE GROUP INC	DPS	16,551.49	2.55%	8.58%	11.24%	0.08%	7.00%	9.64%	0.08%
DUKE REALTY CORP	DRE	10,266.43	5.28%	4.52%	9.92%	0.05%	33.50%	39.67%	0.05%
DARDEN RESTAURANTS INC	DRI	10,528.26	3.01%	10.05%	13.21%	0.05%	14.50%	17.73%	0.05%
DTE ENERGY COMPANY	DTE	19,845.73	3.00%	5.35%	8.43%	0.09%	6.00%	9.09%	0.10%
DUKE ENERGY CORP	DUK	60,455.91	4.07%	3.50%	7.64%	0.28%	4.50%	8.66%	0.30%
DAVITA INC	DVA	10,751.18	0.00%	7.38%	7.38%	0.05%	10.50%	10.50%	0.05%
DEVON ENERGY CORP	DVN	15,978.24	0.79%	18.42%	19.28%	0.07%	15.00%	15.85%	0.08%
DXC TECHNOLOGY CO	DXC	23,726.02	0.88%	15.25%	16.20%	0.11%	18.00%	18.96%	0.12%
ELECTRONIC ARTS INC	EA	36,084.10	0.00%	13.75%	13.75%	0.16%	12.00%	12.00%	0.18%
EBAY INC	EBAY	37,225.57	0.00%	8.05%	8.05%	0.17%	9.50%	9.50%	0.19%
ECOLAB INC	ECL	37,651.40	1.15%	12.86%	14.08%	0.17%	8.50%	9.70%	0.19%
CONSOLIDATED EDISON INC	ED	25,879.35	3.30%	4.50%	7.88%	0.12%	2.50%	5.84%	0.13%
EQUIFAX INC	EFX	16,838.91	1.12%	11.17%	12.35%	0.08%	10.00%	11.18%	0.08%
EDISON INTERNATIONAL	EIX	25,719.54	2.77%	6.23%	9.08%	0.12%	4.00%	6.83%	0.13%
ESTEE LAUDER COMPANIES-CL A	EL	38,960.80	1.39%	10.54%	12.00%	0.18%	8.50%	9.95%	0.20%
EASTMAN CHEMICAL CO	EMN	12,010.48	2.48%	7.43%	10.00%	0.05%	10.00%	12.60%	0.06%
EMERSON ELECTRIC CO	EMR	37,121.14	3.32%	7.45%	10.89%	0.17%	5.00%	8.40%	0.19%
EOG RESOURCES INC	EOG	48,557.61	0.80%	-16.18%	-15.44%	0.22%	30.00%	30.92%	0.24%
EQUINIX INC	EQIX	35,075.30	1.78%	32.64%	34.71%	0.16%	23.00%	24.99%	0.18%
EQUITY RESIDENTIAL	EQR	24,672.43	3.00%	9.54%	12.69%	0.11%	N/A	N/A	N/A
EQT CORP	EQT	10,442.95	0.20%	20.00%	20.22%	0.05%	20.50%	20.72%	0.05%
EVERSOURCE ENERGY	ES	19,982.82	3.02%	6.00%	9.11%	0.09%	6.50%	9.62%	0.10%
EXPRESS SCRIPTS HOLDING CO	ESRX	34,976.37	0.00%	11.15%	11.15%	0.16%	12.50%	12.50%	0.18%
ESSEX PROPERTY TRUST INC	ESS	17,207.48	2.68%	7.37%	10.14%	0.08%	N/A	N/A	N/A
E*TRADE FINANCIAL CORP	ETFC	10,911.48	0.00%	15.37%	15.37%	0.05%	14.00%	14.00%	0.06%
EATON CORP PLC	ETN	31,669.76	3.36%	11.28%	14.83%	0.14%	7.00%	10.48%	0.16%
ENTERGY CORP	ETR	13,973.84	4.53%	-3.83%	0.62%	0.06%	-3.50%	0.95%	0.07%
ENVISION HEALTHCARE CORP	EVHC	6,066.70	0.00%	8.03%	8.03%	0.03%	N/A	N/A	N/A
EDWARDS LIFESCIENCES CORP	EW	23,884.08	0.00%	16.60%	16.60%	0.11%	17.00%	17.00%	0.12%
EXELON CORP	EXC	35,169.74	3.45%	2.00%	5.49%	0.16%	7.00%	10.57%	0.18%
EXPEDITORS INTL WASH INC	EXPD	9,917.10	1.53%	8.40%	10.00%	0.05%	8.00%	9.59%	0.05%
EXPEDIA INC	EXPE	21,791.69	0.79%	17.98%	18.84%	0.10%	23.00%	23.88%	0.11%
EXTRA SPACE STORAGE INC	EXR	9,417.25	4.25%	6.20%	10.58%	0.04%	N/A	N/A	N/A
FORD MOTOR CO	F	41,941.73	5.86%	-2.07%	3.73%	0.19%	2.50%	8.44%	0.21%
FASTENAL CO	FAST	11,714.95	3.13%	15.40%	18.77%	0.05%	4.00%	7.19%	0.06%
FACEBOOK INC-A	FB	486,151.98	0.00%	26.79%	26.79%	2.22%	31.50%	31.50%	2.45%
FORTUNE BRANDS HOME & SECURI	FBHS	9,625.68	1.14%	12.12%	13.33%	0.04%	12.00%	13.21%	0.05%
FREEMPORT-MCMORAN INC	FCX	20,479.40	0.00%	24.46%	24.46%	0.09%	N/A	N/A	N/A
FEDEX CORP	FDX	55,261.41	0.98%	14.00%	15.05%	0.25%	12.50%	13.54%	0.28%
FIRSTENERGY CORP	FE	14,586.52	4.39%	-5.00%	-0.72%	0.07%	9.00%	13.58%	0.07%
F5 NETWORKS INC	FFIV	7,401.91	0.00%	12.48%	12.48%	0.03%	10.00%	10.00%	0.04%
FIDELITY NATIONAL INFO SERV	FIS	29,860.65	1.30%	9.18%	10.53%	0.14%	10.00%	11.37%	0.15%
FISERV INC	FISV	25,331.63	0.00%	10.80%	10.80%	0.12%	9.00%	9.00%	0.13%
FIFTH THIRD BANCORP	FITB	19,397.99	2.27%	4.20%	6.52%	0.09%	5.00%	7.33%	0.10%
FOOT LOCKER INC	FL	4,514.21	3.56%	3.40%	7.02%	0.02%	9.00%	12.72%	0.02%
FLIR SYSTEMS INC	FLIR	5,190.11	1.48%	N/A	N/A	N/A	7.50%	9.04%	0.03%

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					Bloomberg			Value Line	
FLUOR CORP	FLR	5,269.98	2.26%	12.72%	15.13%	0.02%	4.50%	6.81%	0.03%
FLOWERVE CORP	FLS	4,979.90	2.00%	12.68%	14.81%	0.02%	2.50%	4.53%	0.03%
FMC CORP	FMC	11,083.03	0.82%	14.13%	15.01%	0.05%	7.50%	8.35%	0.06%
TWENTY-FIRST CENTURY FOX-A	FOXA	50,084.53	1.50%	9.23%	10.80%	0.23%	9.50%	11.08%	0.25%
FEDERAL REALTY INVS TRUST	FRT	9,173.52	3.16%	6.20%	9.47%	0.04%	N/A	N/A	N/A
TECHNIPFMC PLC	FTI	12,030.96	0.94%	10.23%	11.22%	0.05%	N/A	N/A	N/A
FORTIVE CORP	FTV	22,572.01	0.34%	9.37%	9.73%	0.10%	N/A	N/A	N/A
GENERAL DYNAMICS CORP	GD	59,512.04	1.67%	9.54%	11.28%	0.27%	5.50%	7.21%	0.30%
GENERAL ELECTRIC CO	GE	212,552.57	3.91%	11.00%	15.13%	0.97%	14.00%	18.19%	1.07%
GGP INC	GGP	18,081.07	4.58%	4.65%	9.34%	0.08%	N/A	N/A	N/A
GILEAD SCIENCES INC	GILD	94,170.34	2.98%	-7.44%	-4.57%	0.43%	-3.50%	-0.57%	0.47%
GENERAL MILLS INC	GIS	32,759.20	3.53%	7.57%	11.23%	0.15%	5.00%	8.62%	0.17%
CORNING INC	GLW	25,180.76	2.24%	9.05%	11.39%	0.11%	10.50%	12.86%	0.13%
GENERAL MOTORS CO	GM	50,754.56	4.40%	9.04%	13.64%	0.23%	5.50%	10.02%	0.26%
ALPHABET INC-CL A	GOOGL	635,972.51	0.00%	16.64%	16.64%	2.90%	N/A	N/A	N/A
GENUINE PARTS CO	GPC	11,981.41	3.31%	7.81%	11.25%	0.05%	7.00%	10.42%	0.06%
GLOBAL PAYMENTS INC	GPN	14,297.35	0.05%	14.50%	14.55%	0.07%	12.00%	12.05%	0.07%
GAP INC/THE	GPS	8,963.94	4.05%	6.14%	10.32%	0.04%	0.50%	4.56%	0.05%
GARMIN LTD	GRMN	10,135.62	4.04%	5.68%	9.83%	0.05%	5.00%	9.14%	0.05%
GOLDMAN SACHS GROUP INC	GS	89,425.22	1.37%	11.19%	12.64%	0.41%	9.50%	10.94%	0.45%
GOODYEAR TIRE & RUBBER CO	GT	7,489.97	1.34%	N/A	N/A	N/A	10.00%	11.41%	0.04%
WW GRAINGER INC	GWW	9,310.70	3.15%	9.55%	12.85%	0.04%	5.00%	8.22%	0.05%
HALLIBURTON CO	HAL	33,983.51	1.84%	N/A	N/A	N/A	21.50%	23.54%	0.17%
HASBRO INC	HAS	11,946.49	2.39%	9.70%	12.20%	0.05%	10.50%	13.01%	0.06%
HUNTINGTON BANCSHARES INC	HBAN	13,799.61	2.76%	10.71%	13.61%	0.06%	10.00%	12.89%	0.07%
HANESBRANDS INC	HBI	8,576.19	2.50%	9.76%	12.38%	0.04%	9.00%	11.61%	0.04%
HCA HEALTHCARE INC	HCA	28,007.69	0.00%	11.30%	11.30%	0.13%	9.50%	9.50%	0.14%
WELLTOWER INC	HCN	26,061.28	4.94%	4.37%	9.41%	0.12%	N/A	N/A	N/A
HCP INC	HCP	13,529.59	5.14%	3.37%	8.59%	0.06%	N/A	N/A	N/A
HOME DEPOT INC	HD	176,332.40	2.41%	13.07%	15.64%	0.80%	10.50%	13.04%	0.89%
HES CORP	HES	12,221.09	2.64%	-14.74%	-12.29%	0.06%	N/A	N/A	N/A
HARTFORD FINANCIAL SVCS GRP	HIG	20,240.51	1.72%	9.50%	11.30%	0.09%	12.50%	14.32%	0.10%
HILTON WORLDWIDE HOLDINGS IN	HLT	19,796.42	0.98%	15.76%	16.82%	0.09%	7.00%	8.02%	0.10%
HARLEY-DAVIDSON INC	HOG	7,997.47	3.14%	8.90%	12.18%	0.04%	8.00%	11.26%	0.04%
HOLOGIC INC	HOLX	10,495.32	0.00%	9.08%	9.08%	0.05%	27.00%	27.00%	0.05%
HONEYWELL INTERNATIONAL INC	HON	102,638.81	2.00%	9.95%	12.05%	0.47%	8.50%	10.59%	0.52%
HELMERICH & PAYNE	HP	4,745.01	6.41%	N/A	N/A	N/A	8.00%	14.66%	0.02%
HEWLETT PACKARD ENTERPRIS	HPE	28,220.39	1.47%	-1.80%	-0.34%	0.13%	4.00%	5.50%	0.14%
HP INC	HPQ	31,158.53	2.87%	3.30%	6.22%	0.14%	N/A	N/A	N/A
H&R BLOCK INC	HRB	6,225.69	3.18%	11.00%	14.35%	0.03%	8.00%	11.31%	0.03%
HORMEL FOODS CORP	HRL	18,018.28	1.99%	6.40%	8.46%	0.08%	10.50%	12.60%	0.09%
HARRIS CORP	HRS	14,472.19	1.90%	N/A	N/A	N/A	7.00%	8.96%	0.07%
HENRY SCHEIN INC	HSIC	13,399.20	0.00%	10.54%	10.54%	0.06%	8.50%	8.50%	0.07%
HOST HOTELS & RESORTS INC	HST	12,899.10	4.66%	2.97%	7.70%	0.06%	N/A	N/A	N/A
HERSHEY CO/THE	HSY	22,804.04	2.38%	9.53%	12.02%	0.10%	7.00%	9.46%	0.12%
HUMANA INC	HUM	35,736.21	0.65%	16.59%	17.29%	0.16%	9.50%	10.18%	0.18%
INTL BUSINESS MACHINES CORP	IBM	130,192.06	4.20%	3.54%	7.81%	0.59%	N/A	N/A	N/A
INTERCONTINENTAL EXCHANGE IN	ICE	38,010.73	1.28%	10.92%	12.26%	0.17%	12.00%	13.35%	0.19%
IDEXX LABORATORIES INC	IDXX	13,129.77	0.00%	10.81%	10.81%	0.06%	15.00%	15.00%	0.07%
INTL FLAVORS & FRAGRANCES	IFF	10,648.30	1.93%	7.75%	9.76%	0.05%	7.50%	9.50%	0.05%
ILLUMINA INC	ILMN	27,640.72	0.00%	15.11%	15.11%	0.13%	17.00%	17.00%	0.14%
INCYTE CORP	INCY	24,929.36	0.00%	43.93%	43.93%	0.11%	62.00%	62.00%	0.13%
IHS MARKIT LTD	INFO	18,263.27	0.00%	14.21%	14.21%	0.08%	19.00%	19.00%	0.09%
INTEL CORP	INTC	164,511.99	3.09%	8.20%	11.42%	0.75%	7.50%	10.71%	0.83%
INTUIT INC	INTU	34,361.25	1.01%	15.72%	16.82%	0.16%	13.00%	14.08%	0.17%
INTERNATIONAL PAPER CO	IP	22,417.16	3.40%	6.73%	10.24%	0.10%	18.50%	22.22%	0.11%
INTERPUBLIC GROUP OF COS INC	IPG	8,065.94	3.51%	8.64%	12.30%	0.04%	10.00%	13.68%	0.04%
INGERSOLL-RAND PLC	IR	21,607.43	1.93%	10.53%	12.56%	0.10%	9.50%	11.52%	0.11%
IRON MOUNTAIN INC	IRM	9,753.37	5.67%	14.60%	20.68%	0.04%	11.00%	16.98%	0.05%
INTUITIVE SURGICAL INC	ISRG	36,645.84	0.00%	10.05%	10.05%	0.17%	14.00%	14.00%	0.18%
GARTNER INC	IT	10,827.29	0.00%	17.50%	17.50%	0.05%	15.50%	15.50%	0.05%
ILLINOIS TOOL WORKS	ITW	46,690.75	2.00%	9.20%	11.30%	0.21%	9.50%	11.60%	0.24%
INVESCO LTD	IVZ	13,370.46	3.52%	12.29%	16.03%	0.06%	5.50%	9.12%	0.07%
HUNT (JB) TRANSPRT SVCS INC	JBHT	10,574.75	0.95%	13.35%	14.36%	0.05%	9.50%	10.49%	0.05%
JOHNSON CONTROLS INTERNATIONAL	JCI	34,545.37	2.72%	12.50%	15.39%	0.16%	0.50%	3.22%	0.17%
JACOBS ENGINEERING GROUP INC	JEC	5,997.71	0.90%	8.73%	9.67%	0.03%	8.00%	8.94%	0.03%
JOHNSON & JOHNSON	JNJ	355,978.88	2.52%	6.03%	8.63%	1.62%	9.50%	12.14%	1.80%
JUNIPER NETWORKS INC	JNPR	10,329.18	1.54%	9.46%	11.08%	0.05%	8.00%	9.60%	0.05%
JPMORGAN CHASE & CO	JPM	319,310.83	2.33%	10.20%	12.65%	1.46%	5.50%	7.89%	1.61%

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					Bloomberg			Value Line	
NORDSTROM INC	JWN	7,361.09	3.39%	7.56%	11.08%	0.03%	2.00%	5.42%	0.04%
KELLOGG CO	K	24,142.17	3.04%	6.23%	9.36%	0.11%	6.50%	9.64%	0.12%
KEYCORP	KEY	19,129.92	2.17%	10.90%	13.18%	0.09%	11.50%	13.79%	0.10%
KRAFT HEINZ CO/THE	KHC	102,930.04	2.91%	8.39%	11.42%	0.47%	N/A	N/A	N/A
KIMCO REALTY CORP	KIM	8,231.81	5.65%	20.25%	26.46%	0.04%	N/A	N/A	N/A
KLA-TENCOR CORP	KLAC	14,156.42	2.48%	2.30%	4.81%	0.06%	12.50%	15.13%	0.07%
KIMBERLY-CLARK CORP	KMB	42,887.43	3.17%	6.22%	9.49%	0.20%	10.50%	13.84%	0.22%
KINDER MORGAN INC	KMI	41,426.37	2.70%	20.00%	22.96%	0.19%	24.00%	27.02%	0.21%
CARMAX INC	KMX	11,722.34	0.00%	13.89%	13.89%	0.05%	10.00%	10.00%	0.06%
COCA-COLA CO/THE	KO	194,796.44	3.23%	5.14%	8.45%	0.89%	4.50%	7.81%	0.98%
MICHAEL KORS HOLDINGS LTD	KORS	6,361.60	0.00%	4.75%	4.75%	0.03%	2.00%	2.00%	0.03%
KROGER CO	KR	20,513.34	2.24%	7.03%	9.34%	0.09%	6.50%	8.81%	0.10%
KOHL'S CORP	KSS	6,355.55	5.97%	3.48%	9.55%	0.03%	7.00%	13.18%	0.03%
KANSAS CITY SOUTHERN	KSU	11,153.56	1.32%	13.00%	14.40%	0.05%	9.50%	10.88%	0.06%
LOEWS CORP	L	16,015.49	0.53%	N/A	N/A	N/A	14.50%	15.06%	0.08%
L BRANDS INC	LB	10,383.72	6.63%	6.39%	13.23%	0.05%	0.50%	7.15%	0.05%
LEGGETT & PLATT INC	LEG	6,140.69	3.04%	14.50%	17.76%	0.03%	7.50%	10.65%	0.03%
LENNAR CORP-A	LEN	11,918.94	0.31%	11.29%	11.62%	0.05%	10.00%	10.32%	0.06%
LABORATORY CRP OF AMER HLDGS	LH	15,668.04	0.00%	10.75%	10.75%	0.07%	8.50%	8.50%	0.08%
LKQ CORP	LKQ	10,516.72	0.00%	12.50%	12.50%	0.05%	11.50%	11.50%	0.05%
L3 TECHNOLOGIES INC	LLL	13,929.07	1.72%	5.93%	7.70%	0.06%	10.00%	11.81%	0.07%
ELI LILLY & CO	LLY	84,853.22	2.70%	9.35%	12.18%	0.39%	11.00%	13.85%	0.43%
LOCKHEED MARTIN CORP	LMT	86,166.87	2.47%	9.42%	12.01%	0.39%	9.50%	12.09%	0.43%
LINCOLN NATIONAL CORP	LNC	15,062.65	1.74%	8.66%	10.47%	0.07%	7.00%	8.80%	0.08%
ALLIANT ENERGY CORP	LNT	9,760.08	2.98%	5.75%	8.81%	0.04%	6.50%	9.57%	0.05%
LOWE'S COS INC	LOW	62,168.84	2.19%	15.67%	18.02%	0.28%	13.50%	15.83%	0.31%
LAM RESEARCH CORP	LRCX	26,072.35	1.11%	12.46%	13.63%	0.12%	15.00%	16.19%	0.13%
LEUCADIA NATIONAL CORP	LUK	8,596.49	1.50%	18.00%	19.64%	0.04%	31.50%	33.24%	0.04%
SOUTHWEST AIRLINES CO	LUV	31,825.72	0.85%	8.20%	9.09%	0.15%	11.00%	11.90%	0.16%
LEVEL 3 COMMUNICATIONS INC	LVLT	19,110.23	0.00%	5.00%	5.00%	0.09%	14.50%	14.50%	0.10%
LYONDELLBASELL INDU-CL A	LYB	34,569.52	4.05%	6.50%	10.68%	0.16%	4.00%	8.13%	0.17%
MACY'S INC	M	5,934.84	7.95%	-2.48%	5.37%	0.03%	2.00%	10.03%	0.03%
MASTERCARD INC - A	MA	139,650.63	0.67%	14.33%	15.06%	0.64%	12.50%	13.22%	0.70%
MID-AMERICA APARTMENT COMM	MAA	12,016.29	3.31%	N/A	N/A	N/A	N/A	N/A	N/A
MACERICH CO/THE	MAC	7,514.76	5.80%	7.76%	13.78%	0.03%	N/A	N/A	N/A
MARRIOTT INTERNATIONAL -CL A	MAR	36,508.34	1.31%	15.32%	16.73%	0.17%	15.00%	16.41%	0.18%
MASCO CORP	MAS	11,596.81	1.15%	14.33%	15.55%	0.05%	13.50%	14.72%	0.06%
MATTEL INC	MAT	5,764.66	4.93%	11.30%	16.51%	0.03%	11.50%	16.72%	0.03%
MCDONALD'S CORP	MCD	127,785.07	2.42%	10.05%	12.60%	0.58%	9.00%	11.53%	0.64%
MICROCHIP TECHNOLOGY INC	MCHP	18,985.99	1.77%	17.06%	18.98%	0.09%	11.50%	13.37%	0.10%
MCKESSON CORP	MCK	30,698.04	0.85%	5.38%	6.26%	0.14%	11.00%	11.90%	0.15%
MOODY'S CORP	MCO	24,923.59	1.17%	8.00%	9.22%	0.11%	7.00%	8.21%	0.13%
MONDELEZ INTERNATIONAL INC-A	MDLZ	64,738.06	1.87%	11.64%	13.62%	0.30%	10.00%	11.96%	0.33%
MEDTRONIC PLC	MDT	113,356.41	2.25%	6.06%	8.38%	0.52%	5.50%	7.81%	0.57%
METLIFE INC	MET	49,976.10	3.41%	28.28%	32.17%	0.23%	7.00%	10.53%	0.25%
MGM RESORTS INTERNATIONAL	MGM	17,664.15	1.43%	17.24%	18.79%	0.08%	41.50%	43.23%	0.09%
MOHAWK INDUSTRIES INC	MHK	18,507.98	0.00%	8.48%	8.48%	0.08%	7.50%	7.50%	0.09%
MCCORMICK & CO-NON VTG SHRS	MKC	12,604.36	1.94%	9.60%	11.64%	0.06%	7.50%	9.51%	0.06%
MARTIN MARIETTA MATERIALS	MLM	12,601.87	0.85%	21.24%	22.18%	0.06%	17.50%	18.43%	0.06%
MARSH & MCLENNAN COS	MMC	39,648.92	1.85%	12.29%	14.26%	0.18%	10.00%	11.94%	0.20%
3M CO	MMM	121,460.02	2.31%	7.87%	10.27%	0.55%	8.00%	10.40%	0.61%
MONSTER BEVERAGE CORP	MNST	30,709.54	0.00%	20.30%	20.30%	0.14%	12.00%	12.00%	0.15%
ALTRIA GROUP INC	MO	122,193.57	4.02%	0.61%	4.64%	0.56%	9.50%	13.71%	0.62%
MONSANTO CO	MON	51,343.68	1.94%	10.20%	12.24%	0.23%	8.00%	10.02%	0.26%
MOSAIC CO/THE	MOS	6,971.85	3.68%	16.25%	20.22%	0.03%	3.00%	6.73%	0.04%
MARATHON PETROLEUM CORP	MPC	25,368.38	3.01%	11.96%	15.14%	0.12%	5.50%	8.59%	0.13%
MERCK & CO. INC.	MRK	167,705.02	3.06%	6.07%	9.22%	0.77%	5.50%	8.64%	0.85%
MARATHON OIL CORP	MRO	9,237.71	1.84%	5.00%	6.89%	0.04%	N/A	N/A	N/A
MORGAN STANLEY	MS	83,362.40	2.02%	16.72%	18.91%	0.38%	10.50%	12.63%	0.42%
MICROSOFT CORP	MSFT	558,335.67	2.32%	9.12%	11.55%	2.55%	8.00%	10.42%	2.82%
MOTOROLA SOLUTIONS INC	MSI	14,211.04	2.16%	4.10%	6.30%	0.06%	10.50%	12.77%	0.07%
M & T BANK CORP	MTB	23,310.91	1.97%	10.19%	12.26%	0.11%	8.00%	10.05%	0.12%
METTLER-TOLEDO INTERNATIONAL	MTD	14,749.89	0.00%	12.08%	12.08%	0.07%	11.00%	11.00%	0.07%
MICRON TECHNOLOGY INC	MU	33,845.32	0.00%	10.00%	10.00%	0.15%	22.50%	22.50%	0.17%
MYLAN NV	MYL	16,474.54	0.00%	3.20%	3.20%	0.08%	10.00%	10.00%	0.08%
NAVIANT CORP	NAVI	3,727.82	4.78%	8.00%	12.97%	0.02%	6.00%	10.92%	0.02%
NOBLE ENERGY INC	NBL	11,506.79	1.69%	3.72%	5.44%	0.05%	N/A	N/A	N/A
NASDAQ INC	NDAQ	12,494.71	1.97%	9.08%	11.13%	0.06%	10.00%	12.06%	0.06%
NEXTERA ENERGY INC	NEE	70,352.30	2.62%	6.88%	9.59%	0.32%	7.00%	9.71%	0.35%



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					Bloomberg			Value Line	
NEWMONT MINING CORP	NEM	19,107.12	0.69%	-11.65%	-11.00%	0.09%	0.50%	1.19%	0.10%
NETFLIX INC	NFLX	71,903.60	0.00%	40.60%	40.60%	0.33%	44.50%	44.50%	0.36%
NEWFIELD EXPLORATION CO	NFX	5,044.77	0.00%	12.19%	12.19%	0.02%	18.00%	18.00%	0.03%
NISOURCE INC	NI	8,730.07	2.62%	6.98%	9.69%	0.04%	5.50%	8.19%	0.04%
NIKE INC -CL B	NKE	90,194.59	1.42%	11.00%	12.49%	0.41%	15.50%	17.03%	0.45%
NIELSEN HOLDINGS PLC	NLSN	14,141.86	3.37%	10.00%	13.53%	0.06%	N/A	N/A	N/A
NORTHROP GRUMMAN CORP	NOC	46,589.38	1.46%	8.81%	10.34%	0.21%	8.00%	9.52%	0.23%
NATIONAL OILWELL VARCO INC	NOV	11,545.57	0.66%	N/A	N/A	N/A	3.00%	3.67%	0.06%
NRG ENERGY INC	NRG	8,155.19	0.47%	-9.00%	-8.56%	0.04%	N/A	N/A	N/A
NORFOLK SOUTHERN CORP	NSC	34,187.01	2.06%	12.68%	14.87%	0.16%	8.00%	10.14%	0.17%
NETAPP INC	NTAP	10,641.77	2.03%	8.60%	10.72%	0.05%	9.50%	11.63%	0.05%
NORTHERN TRUST CORP	NTRS	20,090.77	1.82%	12.14%	14.07%	0.09%	7.50%	9.39%	0.10%
NUCOR CORP	NUE	17,284.14	2.79%	12.00%	14.96%	0.08%	20.50%	23.58%	0.09%
NVIDIA CORP	NVDA	96,092.50	0.35%	12.52%	12.90%	0.44%	19.00%	19.39%	0.48%
NEWELL BRANDS INC	NWL	24,338.37	1.83%	12.05%	14.00%	0.11%	23.50%	25.55%	0.12%
NEWS CORP - CLASS A	NWSA	7,818.11	1.72%	12.59%	14.42%	0.04%	48.00%	50.13%	0.04%
REALTY INCOME CORP	O	15,581.18	4.46%	4.87%	9.43%	0.07%	N/A	N/A	N/A
ONEOK INC	OKE	19,353.82	5.61%	7.53%	13.35%	0.09%	14.50%	20.52%	0.10%
OMNICOM GROUP	OMC	17,712.69	2.94%	6.97%	10.02%	0.08%	7.50%	10.55%	0.09%
ORACLE CORP	ORCL	201,125.48	1.40%	9.40%	10.86%	0.92%	8.00%	9.45%	1.01%
O'REILLY AUTOMOTIVE INC	ORLY	17,420.26	0.00%	15.27%	15.27%	0.08%	11.00%	11.00%	0.09%
OCCIDENTAL PETROLEUM CORP	OXY	45,224.50	5.19%	-3.39%	1.71%	0.21%	25.00%	30.84%	0.23%
PAYCHEX INC	PAYX	19,763.17	3.57%	8.28%	11.99%	0.09%	8.50%	12.22%	0.10%
PEOPLE'S UNITED FINANCIAL	PBCT	5,730.19	4.15%	2.00%	6.19%	0.03%	10.50%	14.87%	0.03%
PACCAR INC	PCAR	22,136.72	2.83%	6.73%	9.66%	0.10%	6.50%	9.43%	0.11%
P G & E CORP	PCG	35,456.49	3.03%	6.00%	9.12%	0.16%	9.50%	12.67%	0.18%
PRICELINE GROUP INC/THE	PCLN	88,796.82	0.00%	17.26%	17.26%	0.41%	15.50%	15.50%	0.45%
PATTERSON COS INC	PDCO	3,491.03	2.98%	5.25%	8.30%	0.02%	13.00%	16.17%	0.02%
PUBLIC SERVICE ENTERPRISE GP	PEG	23,614.94	3.68%	2.90%	6.64%	0.11%	1.00%	4.70%	0.12%
PEPSICO INC	PEP	167,640.03	2.69%	6.39%	9.17%	0.77%	7.50%	10.29%	0.85%
PFIZER INC	PFE	194,299.89	3.92%	5.50%	9.53%	0.89%	11.00%	15.13%	0.98%
PRINCIPAL FINANCIAL GROUP	PFG	18,184.30	2.94%	9.37%	12.44%	0.08%	4.50%	7.50%	0.09%
PROCTER & GAMBLE CO/THE	PG	235,799.82	3.04%	7.22%	10.37%	1.08%	7.50%	10.66%	1.19%
PROGRESSIVE CORP	PGR	28,256.38	1.93%	8.00%	10.01%	0.13%	8.00%	10.01%	0.14%
PARKER HANNIFIN CORP	PH	20,663.40	1.74%	9.94%	11.76%	0.09%	7.50%	9.30%	0.10%
PULTEGROUP INC	PHM	7,627.20	1.30%	18.40%	19.82%	0.03%	16.50%	17.91%	0.04%
PACKAGING CORP OF AMERICA	PKG	10,377.72	2.25%	8.25%	10.59%	0.05%	6.50%	8.82%	0.05%
PERKINELMER INC	PKI	6,995.32	0.44%	10.66%	11.12%	0.03%	8.00%	8.46%	0.04%
PROLOGIS INC	PLD	32,424.95	2.85%	5.84%	8.77%	0.15%	N/A	N/A	N/A
PHILIP MORRIS INTERNATIONAL	PM	179,129.18	3.68%	9.61%	13.46%	0.82%	7.50%	11.32%	0.90%
PNC FINANCIAL SERVICES GROUP	PNC	60,911.94	2.05%	10.15%	12.30%	0.28%	5.50%	7.60%	0.31%
PENTAIR PLC	PNR	11,064.79	2.29%	5.78%	8.14%	0.05%	11.50%	13.92%	0.06%
PINNACLE WEST CAPITAL	PNW	9,966.95	2.99%	5.50%	8.56%	0.05%	5.50%	8.56%	0.05%
PPG INDUSTRIES INC	PPG	26,181.46	1.66%	8.09%	9.82%	0.12%	10.50%	12.24%	0.13%
PPL CORP	PPL	26,496.39	4.05%	2.00%	6.10%	0.12%	N/A	N/A	N/A
PERRIGO CO PLC	PRGO	11,019.56	0.83%	1.64%	2.48%	0.05%	-0.50%	0.33%	0.06%
PRUDENTIAL FINANCIAL INC	PRU	43,532.65	2.99%	10.93%	14.09%	0.20%	5.50%	8.57%	0.22%
PUBLIC STORAGE	PSA	34,155.00	4.11%	4.25%	8.44%	0.16%	N/A	N/A	N/A
PHILLIPS 66	PSX	41,718.82	3.35%	10.00%	13.52%	0.19%	5.00%	8.43%	0.21%
PVH CORP	PVH	9,423.26	0.16%	10.40%	10.57%	0.04%	7.50%	7.66%	0.05%
QUANTA SERVICES INC	PWR	5,281.99	0.00%	8.00%	8.00%	0.02%	12.50%	12.50%	0.03%
PRAXAIR INC	PX	37,846.42	2.40%	11.73%	14.27%	0.17%	8.00%	10.49%	0.19%
PIONEER NATURAL RESOURCES CO	PXD	22,444.37	0.06%	20.00%	20.07%	0.10%	38.50%	38.57%	0.11%
PAYPAL HOLDINGS INC	PYPL	71,470.48	0.00%	19.44%	19.44%	0.33%	N/A	N/A	N/A
QUALCOMM INC	QCOM	76,637.39	4.22%	8.75%	13.16%	0.35%	6.00%	10.35%	0.39%
QORVO INC	QRVO	8,866.74	0.00%	13.18%	13.18%	0.04%	N/A	N/A	N/A
ROYAL CARIBBEAN CRUISES LTD	RCL	25,557.34	1.66%	19.10%	20.92%	0.12%	12.50%	14.27%	0.13%
EVEREST RE GROUP LTD	RE	10,800.59	1.95%	10.00%	12.04%	0.05%	3.50%	5.48%	0.05%
REGENCY CENTERS CORP	REG	11,013.07	3.26%	9.43%	12.84%	0.05%	N/A	N/A	N/A
REGENERON PHARMACEUTICALS	REGN	50,145.10	0.00%	17.94%	17.94%	0.23%	22.00%	22.00%	0.25%
REGIONS FINANCIAL CORP	RF	16,802.83	2.27%	13.86%	16.29%	0.08%	9.50%	11.88%	0.08%
ROBERT HALF INTL INC	RHI	5,467.57	2.21%	8.30%	10.60%	0.02%	4.50%	6.76%	0.03%
RED HAT INC	RHT	17,822.27	0.00%	16.93%	16.93%	0.08%	17.50%	17.50%	0.09%
RAYMOND JAMES FINANCIAL INC	RJF	11,225.01	1.12%	15.45%	16.66%	0.05%	11.00%	12.18%	0.06%
RALPH LAUREN CORP	RL	6,852.05	2.45%	0.15%	2.60%	0.03%	1.00%	3.46%	0.03%
RESMED INC	RMD	10,391.22	1.96%	11.56%	13.63%	0.05%	8.50%	10.54%	0.05%
ROCKWELL AUTOMATION INC	ROK	20,714.61	1.90%	11.37%	13.37%	0.09%	5.50%	7.45%	0.10%
ROPER TECHNOLOGIES INC	ROP	23,326.53	0.61%	12.93%	13.58%	0.11%	7.00%	7.63%	0.12%
ROSS STORES INC	ROST	22,969.53	1.07%	13.40%	14.54%	0.10%	8.50%	9.61%	0.12%

		[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
					Bloomberg			Value Line	
RANGE RESOURCES CORP	RRC	4,451.49	0.45%	0.21%	0.65%	0.02%	28.00%	28.51%	0.02%
REPUBLIC SERVICES INC	RSG	21,515.75	2.04%	11.46%	13.62%	0.10%	8.50%	10.63%	0.11%
RAYTHEON COMPANY	RTN	51,345.05	1.78%	8.41%	10.27%	0.23%	8.00%	9.85%	0.26%
STARBUCKS CORP	SBUX	76,093.53	1.93%	16.68%	18.77%	0.35%	15.00%	17.07%	0.38%
SCANA CORP	SCG	8,693.64	4.03%	4.07%	8.18%	0.04%	4.00%	8.11%	0.04%
SCHWAB (CHARLES) CORP	SCHW	52,908.61	0.80%	19.46%	20.34%	0.24%	14.00%	14.86%	0.27%
SEALED AIR CORP	SEE	8,543.81	1.42%	7.45%	8.93%	0.04%	12.00%	13.51%	0.04%
SHERWIN-WILLIAMS CO/THE	SHW	30,729.14	1.03%	10.74%	11.82%	0.14%	13.50%	14.60%	0.15%
SIGNET JEWELERS LTD	SIG	3,666.29	1.90%	2.90%	4.83%	0.02%	1.50%	3.42%	0.02%
JM SMUCKER CO/THE	SJM	13,823.92	2.62%	4.93%	7.61%	0.06%	6.50%	9.20%	0.07%
SCHLUMBERGER LTD	SLB	87,668.07	3.18%	44.21%	48.10%	0.40%	17.50%	20.96%	0.44%
SL GREEN REALTY CORP	SLG	9,691.93	3.24%	0.80%	4.05%	0.04%	N/A	N/A	N/A
SNAP-ON INC	SNA	8,520.20	2.00%	10.85%	12.96%	0.04%	8.50%	10.59%	0.04%
SCRIPPS NETWORKS INTER-CL A	SNI	11,121.06	1.36%	8.53%	9.94%	0.05%	6.50%	7.90%	0.06%
SYNOPSIS INC	SNPS	11,602.12	0.00%	9.12%	9.12%	0.05%	9.50%	9.50%	0.06%
SOUTHERN CO/THE	SO	48,069.38	4.78%	4.77%	9.66%	0.22%	3.50%	8.36%	0.24%
SIMON PROPERTY GROUP INC	SPG	47,739.23	4.62%	7.26%	12.04%	0.22%	N/A	N/A	N/A
S&P GLOBAL INC	SPGI	38,575.70	1.09%	10.00%	11.15%	0.18%	12.00%	13.16%	0.19%
STAPLES INC	SPLS	6,691.91	4.74%	N/A	N/A	N/A	2.50%	7.30%	0.03%
STERICYCLE INC	SRCL	6,033.45	0.15%	7.68%	7.83%	0.03%	5.50%	5.65%	0.03%
SEMPRA ENERGY	SRE	29,234.40	2.82%	10.67%	13.64%	0.13%	8.00%	10.93%	0.15%
SUNTRUST BANKS INC	STI	26,938.80	2.36%	8.56%	11.02%	0.12%	7.00%	9.45%	0.14%
STATE STREET CORP	STT	34,560.96	1.73%	9.05%	10.86%	0.16%	7.50%	9.30%	0.17%
SEAGATE TECHNOLOGY	STX	9,154.18	8.16%	8.73%	17.24%	0.04%	4.50%	12.85%	0.05%
CONSTELLATION BRANDS INC-A	STZ	38,579.19	1.06%	16.36%	17.51%	0.18%	13.00%	14.13%	0.19%
STANLEY BLACK & DECKER INC	SWK	21,058.47	1.74%	11.00%	12.84%	0.10%	9.50%	11.33%	0.11%
SKYWORKS SOLUTIONS INC	SWKS	18,780.08	1.13%	13.59%	14.80%	0.09%	13.50%	14.71%	0.09%
SYNCHRONY FINANCIAL	SYF	23,915.73	1.87%	8.07%	10.02%	0.11%	7.50%	9.44%	0.12%
STRYKER CORP	SYK	53,973.59	1.19%	9.23%	10.47%	0.25%	14.00%	15.27%	0.27%
SYMANTEC CORP	SYMC	17,483.66	1.08%	13.14%	14.29%	0.08%	10.50%	11.64%	0.09%
SYSCO CORP	SY	27,386.06	2.66%	11.47%	14.28%	0.12%	11.50%	14.31%	0.14%
AT&T INC	T	229,451.80	5.26%	5.25%	10.65%	1.05%	5.50%	10.91%	1.16%
MOLSON COORS BREWING CO -B	TAP	19,325.54	1.84%	7.32%	9.23%	0.09%	14.50%	16.48%	0.10%
TRANSDIGM GROUP INC	TDG	14,177.29	0.00%	10.21%	10.21%	0.06%	12.00%	12.00%	0.07%
TE CONNECTIVITY LTD	TEL	27,461.48	1.96%	6.87%	8.90%	0.13%	8.00%	10.04%	0.14%
TARGET CORP	TGT	30,702.57	4.46%	-0.78%	3.66%	0.14%	4.50%	9.06%	0.15%
TIFFANY & CO	TIF	10,972.85	2.15%	10.10%	12.35%	0.05%	8.00%	10.23%	0.06%
TJX COMPANIES INC	TJX	45,331.68	1.73%	12.44%	14.28%	0.21%	10.50%	12.33%	0.23%
TORCHMARK CORP	TMK	8,911.30	0.78%	7.17%	7.97%	0.04%	7.50%	8.30%	0.04%
THERMO FISHER SCIENTIFIC INC	TMO	69,063.76	0.35%	12.40%	12.77%	0.32%	9.00%	9.36%	0.35%
TRIPADVISOR INC	TRIP	5,539.01	0.00%	14.50%	14.50%	0.03%	8.00%	8.00%	0.03%
T ROWE PRICE GROUP INC	TROW	19,781.46	2.71%	12.85%	15.74%	0.09%	8.00%	10.82%	0.10%
TRAVELERS COS INC/THE	TRV	35,290.87	2.21%	6.37%	8.64%	0.16%	1.00%	3.22%	0.18%
TRACTOR SUPPLY COMPANY	TSCO	6,930.27	1.92%	14.90%	16.96%	0.03%	10.50%	12.52%	0.03%
TYSON FOODS INC-CL A	TSN	25,481.33	1.29%	8.60%	9.95%	0.12%	9.50%	10.86%	0.13%
TOTAL SYSTEM SERVICES INC	TSS	11,966.26	0.68%	11.00%	11.71%	0.05%	10.50%	11.21%	0.06%
TIME WARNER INC	TWX	78,705.72	1.63%	8.30%	9.99%	0.36%	9.50%	11.20%	0.40%
TEXAS INSTRUMENTS INC	TXN	79,173.39	2.55%	10.53%	13.21%	0.36%	9.50%	12.17%	0.40%
TEXTRON INC	TXT	12,624.20	0.18%	8.78%	8.97%	0.06%	12.00%	12.19%	0.06%
UNDER ARMOUR INC-CLASS A	UAA	7,196.28	0.00%	13.26%	13.26%	0.03%	14.00%	14.00%	0.04%
UNITED CONTINENTAL HOLDINGS	UAL	19,698.59	0.00%	4.37%	4.37%	0.09%	6.00%	6.00%	0.10%
UDR INC	UDR	10,424.65	3.18%	5.97%	9.25%	0.05%	N/A	N/A	N/A
UNIVERSAL HEALTH SERVICES-B	UHS	10,330.03	0.28%	8.69%	8.98%	0.05%	10.00%	10.29%	0.05%
ULTA BEAUTY INC	ULTA	15,148.34	0.00%	22.17%	22.17%	0.07%	21.00%	21.00%	0.08%
UNITEDHEALTH GROUP INC	UNH	184,496.21	1.51%	12.13%	13.73%	0.84%	12.50%	14.10%	0.93%
UNUM GROUP	UNM	10,816.97	1.79%	7.00%	8.86%	0.05%	10.50%	12.39%	0.05%
UNION PACIFIC CORP	UNP	83,159.99	2.36%	11.73%	14.22%	0.38%	8.00%	10.45%	0.42%
UNITED PARCEL SERVICE-CL B	UPS	98,148.84	2.92%	9.13%	12.17%	0.45%	10.00%	13.06%	0.49%
UNITED RENTALS INC	URI	9,456.65	0.00%	14.17%	14.17%	0.04%	8.00%	8.00%	0.05%
US BANCORP	USB	86,448.76	2.24%	12.13%	14.51%	0.39%	5.00%	7.30%	0.44%
UNITED TECHNOLOGIES CORP	UTX	92,242.28	2.37%	8.56%	11.03%	0.42%	8.00%	10.46%	0.47%
VISA INC-CLASS A SHARES	V	234,416.32	0.64%	17.50%	18.20%	1.07%	11.50%	12.18%	1.18%
VARIAN MEDICAL SYSTEMS INC	VAR	9,225.99	0.00%	7.20%	7.20%	0.04%	7.00%	7.00%	0.05%
VF CORP	VFC	24,711.55	2.72%	8.77%	11.61%	0.11%	8.50%	11.34%	0.12%
VIACOM INC-CLASS B	VIAB	12,002.15	2.81%	2.96%	5.81%	0.05%	2.00%	4.83%	0.06%
VALERO ENERGY CORP	VLO	28,597.74	4.33%	10.30%	14.85%	0.13%	5.00%	9.44%	0.14%
VULCAN MATERIALS CO	VMC	15,075.38	0.88%	24.06%	25.04%	0.07%	20.50%	21.47%	0.08%
VORNADO REALTY TRUST	VNO	14,003.36	6.04%	-3.15%	2.79%	0.06%	14.50%	20.98%	0.07%
VERISK ANALYTICS INC	VRSK	13,271.43	0.00%	7.96%	7.96%	0.06%	10.50%	10.50%	0.07%

		[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
					Bloomberg			Value Line	
VERISIGN INC	VRSN	9,812.21	0.00%	10.20%	10.20%	0.04%	10.50%	10.50%	0.05%
VERTEX PHARMACEUTICALS INC	VRTX	37,346.37	0.00%	72.50%	72.50%	0.17%	N/A	N/A	N/A
VENTAS INC	VTR	23,548.65	4.73%	3.99%	8.81%	0.11%	N/A	N/A	N/A
VERIZON COMMUNICATIONS INC	VZ	194,546.97	4.89%	1.92%	6.86%	0.89%	2.00%	6.94%	0.98%
WATERS CORP	WAT	14,344.30	0.00%	8.28%	8.28%	0.07%	8.50%	8.50%	0.07%
WALGREENS BOOTS ALLIANCE INC	WBA	85,639.82	1.87%	9.35%	11.31%	0.39%	11.00%	12.98%	0.43%
WESTERN DIGITAL CORP	WDC	24,231.37	2.42%	11.74%	14.30%	0.11%	11.00%	13.56%	0.12%
WEC ENERGY GROUP INC	WEC	20,383.09	3.22%	5.55%	8.86%	0.09%	6.00%	9.32%	0.10%
WELLS FARGO & CO	WFC	256,536.66	2.98%	11.46%	14.61%	1.17%	5.00%	8.05%	1.29%
WHOLE FOODS MARKET INC	WFM	13,364.10	1.53%	6.53%	8.11%	0.06%	3.50%	5.06%	0.07%
WHIRLPOOL CORP	WHR	12,412.35	2.49%	14.19%	16.85%	0.06%	9.50%	12.11%	0.06%
WILLIS TOWERS WATSON PLC	WLTW	19,933.84	1.42%	10.00%	11.49%	0.09%	N/A	N/A	N/A
WASTE MANAGEMENT INC	WM	33,112.69	2.26%	10.22%	12.59%	0.15%	7.00%	9.34%	0.17%
WILLIAMS COS INC	WMB	24,030.74	4.13%	13.00%	17.40%	0.11%	18.50%	23.01%	0.12%
WAL-MART STORES INC	WMT	239,079.93	2.72%	5.12%	7.91%	1.09%	4.00%	6.77%	1.21%
WESTROCK CO	WRK	14,297.69	2.84%	9.67%	12.65%	0.07%	N/A	N/A	N/A
WESTERN UNION CO	WU	8,760.22	3.71%	8.00%	11.86%	0.04%	5.50%	9.31%	0.04%
WEYERHAEUSER CO	WY	23,469.16	4.01%	7.40%	11.56%	0.11%	14.50%	18.80%	0.12%
WYNDHAM WORLDWIDE CORP	WYN	9,941.44	2.40%	14.40%	16.97%	0.05%	6.50%	8.98%	0.05%
WYNN RESORTS LTD	WYNN	13,836.16	1.51%	31.90%	33.65%	0.06%	14.00%	15.61%	0.07%
CIMAREX ENERGY CO	XEC	9,365.83	0.33%	39.33%	39.72%	0.04%	31.00%	31.38%	0.05%
XCEL ENERGY INC	XEL	24,880.38	2.94%	6.10%	9.13%	0.11%	4.50%	7.50%	0.13%
XL GROUP LTD	XL	11,295.37	2.01%	9.00%	11.10%	0.05%	13.00%	15.14%	0.06%
XILINX INC	XLNX	15,169.66	2.31%	8.37%	10.77%	0.07%	8.00%	10.40%	0.08%
EXXON MOBIL CORP	XOM	324,731.79	4.00%	4.74%	8.83%	1.48%	11.50%	15.73%	1.64%
DENTSPLY SIRONA INC	XRAY	12,129.17	0.65%	9.35%	10.04%	0.06%	8.50%	9.18%	0.06%
XEROX CORP	XRX	7,993.64	3.24%	2.90%	6.18%	0.04%	4.00%	7.30%	0.04%
XYLEM INC	XYL	10,599.93	1.12%	15.00%	16.20%	0.05%	12.00%	13.19%	0.05%
YUM! BRANDS INC	YUM	25,999.35	1.71%	12.74%	14.56%	0.12%	6.00%	7.76%	0.13%
ZIMMER BIOMET HOLDINGS INC	ZBH	22,520.58	0.89%	8.26%	9.18%	0.10%	11.00%	11.93%	0.11%
ZIONS BANCORPORATION	ZION	8,879.40	1.00%	9.00%	10.05%	0.04%	14.50%	15.57%	0.04%
ZOETIS INC	ZTS	29,713.53	0.69%	13.43%	14.17%	0.14%	11.50%	12.23%	0.15%
Total Market Capitalization:		22,094,195			13.41%			14.16%	
W/ Bloomberg Growth Est.:		21,911,024							
W/ Value Line Growth Est.:		19,828,726							

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. 36, No. 8, August 1, 2017, at 2. (6 quarters ending December 2018)  
[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	0.61
Black Hills Corporation	BKH	0.85	0.54
Chesapeake Utilities	CPK	0.70	0.71
Northwest Natural Gas Company	NWN	0.65	0.55
One Gas Inc	OGS	0.70	0.69
Sempra Energy	SRE	0.80	0.72
Southwest Gas	SWX	0.75	0.63
Spire Inc	SR	0.70	0.63
Vectren Corporation	VVC	0.70	0.68
Mean		0.73	0.64

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
<b>VALUE LINE BETA COEFFICIENT</b>						
Current 30-Year Treasury (30-day average) [7]	2.85%	0.728	10.56%	11.31%	10.53%	11.08%
Near-Term Projected Treasury Yield [8]	3.35%	0.728	10.06%	10.81%	10.67%	11.22%
<b>BLOOMBERG BETA COEFFICIENT</b>						
Current 30-Year Treasury (30-day average) [7]	2.85%	0.642	10.56%	11.31%	9.62%	10.11%
Near-Term Projected Treasury Yield [8]	3.35%	0.642	10.06%	10.81%	9.80%	10.29%

Summary of Results	
Mean:	10.42%
Minimum:	9.62%
Maximum:	11.22%

Notes:

[1] See Notes [7], [8]

[2] Source: Schedule KM-5

[3] Source: Schedule KM-4

[4] Source: Schedule KM-4

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

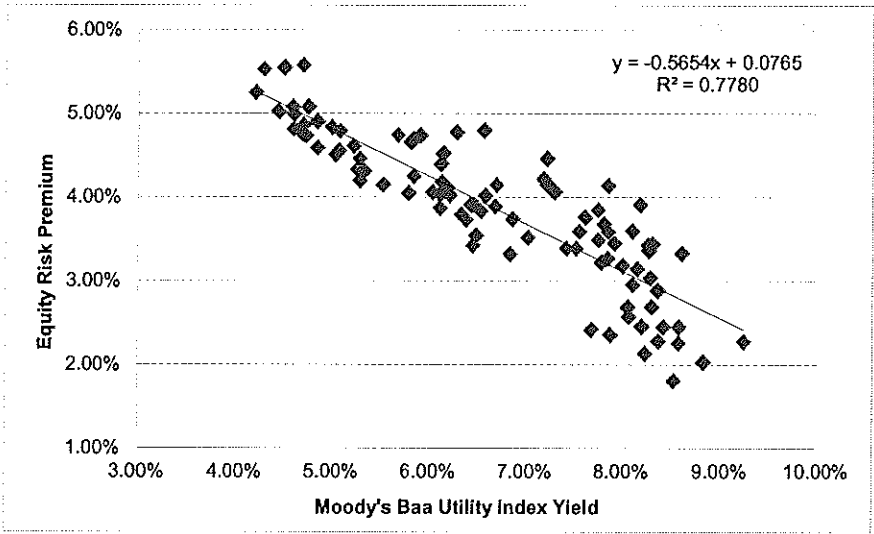
[6] Equals Col. [1] + (Col. [2] x Col. [4])

[7] Source: Bloomberg Professional

[8] Source: Blue Chip Financial Forecasts, Vol. 36, No. 8, August 1, 2017, at 2. (6 quarters ending December 2018)

Bond Yield Plus Risk Premium

Scenario	[1] Constant	[2] Slope	[3] Baa Utility Bond Yield	[4] Risk Premium	[5] Return on Equity
Current Utility Bond Yield	7.65%	-0.565	4.30%	5.22%	9.52%
Near-Term Projected Utility Bond Yield	7.65%	-0.565	5.03%	4.81%	9.83%
Long-Term Projected Utility Bond Yield	7.65%	-0.565	6.36%	4.05%	10.41%



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. 36, No. 8, August 1, 2017, at 2;  
Long Term Projected = Blue Chip Financial Forecasts, Vol. 36, No. 6, June 1, 2017, at 14
- [4] Equals [1] + [3] x [2]
- [5] Equals [3] + [4]

Expected Earnings Analysis - Proxy Group

Company	Ticker	[1]	[2]	[3]	[4]	[5]	[6]	[7]
		Expected ROE 2020-2022	Projected Common Shares 2018	Projected Common Shares 2020-22	Projected BPS 2018	Projected BPS 2020-22	Book Value Growth Rate	Adjusted ROE
Atmos Energy Corporation	ATO	11.50%	110.00	120.00	37.15	38.50	4.17%	11.75%
Black Hills Corporation	BKH	10.50%	60.25	61.00	35.35	41.00	5.50%	10.80%
Chesapeake Utilities Corporation	CPK	13.00%	17.00	20.00	32.20	32.90	6.33%	13.42%
Northwest Natural Gas Company	NWN	10.00%	29.50	30.00	30.40	32.25	2.56%	10.13%
One Gas Inc	OGS	9.50%	52.50	55.00	38.95	41.45	3.69%	9.68%
Sempra Energy	SRE	13.00%	254.00	236.00	55.25	58.25	-0.69%	12.96%
Southwest Gas Corporation	SWX	8.50%	49.00	52.00	42.85	57.70	12.64%	9.07%
Spire Inc	SR	9.50%	48.50	50.00	41.85	48.30	5.96%	9.79%
Vectren Corporation	VVC	12.00%	84.00	86.00	23.80	28.50	7.03%	12.44%
								11.11%
								10.80%

Expected Earnings Analysis - Value Line Gas Universe

Company	Ticker	[1]	[2]	[3]	[4]	[5]	[6]	[7]
		Expected ROE 2020-2022	Projected Common Shares 2018	Projected Common Shares 2020-22	Projected BPS 2018	Projected BPS 2020-22	Book Value Growth Rate	Adjusted ROE
Atmos Energy Corporation	ATO	11.50%	110.00	120.00	37.15	38.50	4.17%	11.75%
Chesapeake Utilities Corporation	CPK	13.00%	17.00	20.00	32.20	32.90	6.33%	13.42%
New Jersey Resources Corporation	NJR	12.00%	86.00	86.00	15.25	18.25	6.17%	12.38%
NiSource Inc.	NI	11.00%	325.00	330.00	13.20	13.60	1.52%	11.08%
Northwest Natural Gas Company	NWN	10.00%	29.50	30.00	30.40	32.25	2.56%	10.13%
One Gas Inc	OGS	9.50%	52.50	55.00	38.95	41.45	3.69%	9.68%
South Jersey Industries Inc	SJI	7.00%	83.00	86.00	19.60	25.00	9.74%	7.36%
Southwest Gas Corporation	SWX	8.50%	49.00	52.00	42.85	57.70	12.64%	9.07%
Spire Inc	SR	9.50%	48.50	50.00	41.85	48.30	5.96%	9.79%
UGI Corporation	UGI	12.50%	170.00	170.00	19.05	24.75	9.12%	13.10%
WGL Holdings, Inc.	WGL	10.00%	53.00	55.00	32.10	37.60	6.72%	10.35%
								10.74%
								10.35%

Notes:

[1] Source: Value Line

[2] Source: Value Line

[3] Source: Value Line

[4] Source: Value Line

[5] Source: Value Line

[6] Equals  $(([3] \times [5]) / ([2] \times [4]))^{(1/3)} - 1$

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

Proxy Group Capital Structure - Current

Company	Ticker	% Common Equity								
		2017Q2	2017Q1	2016Q4	2016Q3	2016Q2	2016Q1	2015Q4	2015Q3	Average
Atmos Energy Corporation	ATO	55.99%	59.92%	59.06%	58.68%	58.54%	57.66%	57.13%	56.72%	57.96%
Black Hills Corporation	BKH	34.62%	34.23%	33.42%	33.28%	33.14%	31.91%	44.16%	45.32%	36.26%
Chesapeake Utilities Corporation	CPK	68.36%	75.61%	74.95%	73.80%	70.88%	70.35%	69.37%	68.16%	71.43%
Northwest Natural Gas Company	NWN	54.58%	54.86%	54.17%	56.69%	57.35%	57.57%	56.75%	55.29%	55.91%
ONE Gas, Inc.	OGS	61.84%	61.98%	61.29%	60.97%	61.14%	61.04%	60.71%	60.12%	61.14%
Sempra Energy	SRE	45.01%	46.52%	45.77%	46.12%	45.55%	45.97%	45.68%	45.91%	45.82%
Southwest Gas Holdings, Inc.	SWX	50.05%	51.89%	50.97%	49.74%	52.67%	53.47%	50.37%	49.84%	51.13%
Spire Inc.	SR	51.30%	49.44%	46.45%	46.06%	49.49%	47.76%	46.36%	45.94%	47.85%
Vectren Corporation	VVC	51.14%	51.09%	50.78%	50.25%	49.82%	49.62%	48.53%	50.60%	50.23%
Mean		52.54%	53.95%	52.99%	52.84%	53.17%	52.82%	53.23%	53.10%	53.08%
Median		51.30%	51.89%	50.97%	50.25%	52.67%	53.47%	50.37%	50.60%	51.13%

Company	Ticker	% Long-Term Debt								
		2017Q2	2017Q1	2016Q4	2016Q3	2016Q2	2016Q1	2015Q4	2015Q3	Average
Atmos Energy Corporation	ATO	44.01%	40.08%	40.94%	41.32%	41.46%	42.34%	42.87%	43.28%	42.04%
Black Hills Corporation	BKH	65.38%	65.77%	66.58%	66.72%	66.86%	68.09%	55.84%	54.68%	63.74%
Chesapeake Utilities Corporation	CPK	31.64%	24.39%	25.05%	26.20%	29.12%	29.65%	30.63%	31.84%	28.57%
Northwest Natural Gas Company	NWN	45.42%	45.14%	45.83%	43.31%	42.65%	42.43%	43.25%	44.71%	44.09%
ONE Gas, Inc.	OGS	38.16%	38.02%	38.71%	39.03%	38.86%	38.96%	39.29%	39.88%	38.86%
Sempra Energy	SRE	54.99%	53.48%	54.23%	53.88%	54.45%	54.03%	54.32%	54.09%	54.18%
Southwest Gas Holdings, Inc.	SWX	49.95%	48.11%	49.03%	50.26%	47.33%	46.53%	49.63%	50.16%	48.87%
Spire Inc.	SR	48.70%	50.56%	53.55%	53.94%	50.51%	52.24%	53.64%	54.06%	52.15%
Vectren Corporation	VVC	48.86%	48.91%	49.22%	49.75%	50.18%	50.38%	51.47%	49.40%	49.77%
Mean		47.46%	46.05%	47.01%	47.16%	46.83%	47.18%	46.77%	46.90%	46.92%
Median		48.70%	48.11%	49.03%	49.75%	47.33%	46.53%	49.63%	49.40%	48.87%

Source: SNL Financial



Proxy Group Capital Structure - Value Line Projections

Company	Ticker	% Common Equity		
		2017	2018	2020-22
Atmos Energy Corporation	ATO	62.00%	61.00%	55.00%
Black Hills Corporation	BKH	32.50%	39.50%	40.50%
Chesapeake Utilities Corporation	CPK	77.00%	75.00%	70.00%
Northwest Natural Gas Company	NWN	55.50%	55.00%	54.50%
ONE Gas, Inc.	OGS	62.00%	62.00%	62.00%
Sempra Energy	SRE	46.50%	46.00%	40.00%
Southwest Gas Holdings, Inc.	SWX	52.00%	54.00%	59.00%
Spire Inc.	SR	49.50%	50.00%	51.00%
Vectren Corporation	VVC	52.50%	52.50%	54.00%
Mean		54.39%	55.00%	54.00%
Median		52.50%	54.00%	54.50%

Company	Ticker	% Long-Term Debt		
		2017	2018	2020-22
Atmos Energy Corporation	ATO	38.00%	39.00%	45.00%
Black Hills Corporation	BKH	67.50%	60.50%	59.50%
Chesapeake Utilities Corporation	CPK	23.00%	25.00%	30.00%
Northwest Natural Gas Company	NWN	44.50%	45.00%	45.50%
ONE Gas, Inc.	OGS	38.00%	38.00%	38.00%
Sempra Energy	SRE	53.50%	54.00%	60.00%
Southwest Gas Holdings, Inc.	SWX	48.00%	46.00%	41.00%
Spire Inc.	SR	50.50%	50.00%	49.00%
Vectren Corporation	VVC	47.50%	47.50%	46.00%
Mean		45.61%	45.00%	46.00%
Median		47.50%	46.00%	45.50%

Source: SNL Financial

Small Size Premium

	[1]	[2]
	Customers (Mil)	(\$Mil)
Liberty IL	0.06	\$52.56
Median Market to Book for Comp Group		2.21
Liberty IL Implied Market Cap		\$116.15

Company Name	Ticker	[3] Customers (Mil)	[4] Market Cap (\$Mil)	[5] Market to Book Ratio
Atmos Energy Corporation	ATO	3.19	\$9,145.63	2.36
Black Hills Corporation	BKH	1.03	\$3,710.50	2.21
Chesapeake Utilities Corporation	CPK	0.15	\$1,266.65	2.74
Northwest Natural Gas Company	NWN	0.73	\$1,805.29	2.07
ONE Gas, Inc.	OGS	2.15	\$3,785.47	1.96
Sempra Energy	SRE	6.81	\$28,701.63	2.16
Southwest Gas Holdings, Inc.	SWX	1.98	\$3,793.69	2.21
Spire Inc.	SR	1.68	\$3,521.21	1.76
Vectren Corporation	VVC	1.02	\$4,968.24	2.77
MEDIAN		1.7	\$3,785.47	2.21
MEAN		2.1	\$6,744.26	2.25

Market Capitalization (\$Mil) [6]				
Decile	Low	High	Size Premium	
2	\$ 10,784.101	\$ 24,233.747	0.61%	
3	\$ 5,683.991	\$ 10,711.194	0.89%	
4	\$ 3,520.566	\$ 5,676.716	0.98%	
5	\$ 2,392.689	\$ 3,512.913	1.51%	
6	\$ 1,571.193	\$ 2,390.899	1.66%	
7	\$ 1,033.341	\$ 1,569.984	1.72%	
8	\$ 569.279	\$ 1,030.426	2.08%	
9	\$ 263.715	\$ 567.843	2.68%	
10	\$ 2.516	\$ 262.891	5.59%	

Proxy Group Median	\$ 3,785.474	0.98%
10th Decile Size Premium	\$ 116.155	5.59%
Difference from Proxy Group Median		4.61%

Notes:

[1] Algonquin Power & Utilities Corporation, Annual Information Form, March 30, 2017, at 43.

[2] Requested Rate Base x Equity Ratio

[3] Source: SNL Financial

[4] Source: Bloomberg Professional Services, 30-day average

[5] Source: Bloomberg Professional Services, 30-day average

[6] Source: Duff & Phelps, *2017 Valuation Handbook*, Appendix 3

RRA Regulatory Risk Ranking

Company	State of Operation		RRA Rank [1]	Numeric Conversion [2]
Atmos Energy Corporation	CO	Colorado	Average / 2	5
	GA	Georgia	Above Average / 2	8
	IA	Iowa	Average / 1	6
	IL	Illinois	Average / 2	5
	KS	Kansas	Below Average / 1	3
	KY	Kentucky	Average / 1	6
	LA	Louisiana	Average / 2	5
	MO	Missouri	Below Average / 1	3
	MS	Mississippi	Above Average / 3	7
	TN	Tennessee	Above Average / 3	7
	TX	Texas	Average / 2	5
VA	Virginia	Above Average / 2	8	
Black Hills Corporation	AR	Arkansas	Average / 1	6
	CO	Colorado	Average / 2	5
	IA	Iowa	Average / 1	6
	KS	Kansas	Below Average / 1	3
	MT	Montana	Average / 3	4
	NE	Nebraska	Average / 1	6
	SD	South Dakota	Average / 2	5
	WY	Wyoming	Average / 3	4
Chesapeake Utilities	DE	Delaware	Average / 3	4
	FL	Florida	Above Average / 2	8
	MD	Maryland	Below Average / 3	1
New Jersey Resources Corporation	NJR	New Jersey	Below Average / 2	2
Northwest Natural Gas Company	OR	Oregon	Average / 2	5
	WA	Washington	Average / 3	4
One Gas Inc	KS	Kansas	Below Average / 1	3
	OK	Oklahoma	Average / 3	4
	TX	Texas	Average / 2	5
South Jersey Industries, Inc.	SJI	New Jersey	Below Average / 2	2
Sempra Energy	CA	California	Above Average / 3	7
Southwest Gas Corporation	AZ	Arizona	Average / 3	4
	CA	California	Above Average / 3	7
	NV	Nevada	Average / 2	5
Spire Inc	AL	Alabama	Above Average / 1	9
	MO	Missouri	Below Average / 1	3
	MS	Mississippi	Above Average / 3	7
Vectren Corporation	IN	Indiana	Average / 1	6
	OH	Ohio	Average / 2	5
Proxy Group Average				5.1
Liberty Utilities	Missouri		Below Average / 1	3

Notes:

[1] Source: RRA, *State Regulatory Evaluations*, Updated May 10, 2017.

[2] Highest risk (Below Average / 3) = 1; lowest risk (Above Average / 1) = 9

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	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%
Atmos Energy Corporation	12/7/2006	6,325,000	\$31.50	\$1.1025	\$400,000	\$30.33	\$7,373,313	\$199,237,500	\$191,864,188	3.701%
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	3.698%
Sempra Energy	10/9/2003	16,500,000	\$28.00	\$0.8400	\$500,000	\$27.13	\$14,360,000	\$462,000,000	\$447,640,000	3.108%
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%
Veclren Corporation	2/20/2007	5,290,000	\$28.33	\$0.9900	\$425,000	\$27.26	\$5,682,100	\$149,865,700	\$144,203,600	3.778%
Veclren Corporation	7/31/2003	7,475,000	\$22.81	\$0.7980	\$300,000	\$21.97	\$6,285,050	\$170,504,750	\$164,239,700	3.674%
Mean							\$7,063,411	\$189,143,769		
							WEIGHTED AVERAGE FLOTATION COSTS:		3.734%	

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
Almos Energy Corporation	ATO	2.18%	2.25%
Black Hills Corporation	BKH	2.65%	2.75%
Chesapeake Utilities	CPK	1.75%	1.81%
Northwest Natural Gas Company	NWN	3.06%	3.18%
One Gas Inc	OGS	2.39%	2.49%
Sempra Energy	SRE	2.98%	3.09%
Southwest Gas	SWX	2.55%	2.65%
Spire Inc	SR	2.95%	3.07%
Veclren Corporation	VVC	2.89%	3.00%
PROXY GROUP MEAN		2.60%	2.70%

Dividend Yield Adjusted For Flotation Costs: 2.70%  
 Dividend Yield Unadjusted For Flotation Costs: 2.60%  
 Difference (Flotation Cost Adjustment): 0.10% [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-2

[2] Equals [1] / (1 - 0.0373)

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