BEFORE THE PUBLIC SERVICE COMMISSION OF UTAH

IN THE MATTER OF THE APPLICATION OF DOMINION ENER GY UTAH TO INCREASE DISTRIBUTION RATES AND CHARGES AND MA KE TARIFF MODIFICATIONS	Docket No. 19-057-02

DIRECT TESTIMONY OF

ROBERT B. HEVERT

FOR DOMINION ENERGY UTAH

July 1, 2019

DEU Exhibit 2.0

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GLOSSARY OF FREQUENTLY USED TERMS

TERM	DESCRIPTION
Beta Coefficient	A component of the CAPM that measures the risk of a given stock relative to the risk of the overall market.
Bond Yield Plus Risk Premium Approach	A risk premium model used to estimate the Cost of Equity. The Bond Yield Plus Risk Premium approach assumes that investors require a risk premium over the Cost of Debt as compensation for assuming the greater risk of common equity investment. The model is expressed as a bond yield plus equity risk premium.
Capital Asset Pricing Model ("CAPM")	A risk premium-based model used to estimate the Cost of Equity, assuming the stock is added to a well-diversified portfolio. The CAPM assumes that investors are compensated for the time value of money (represented by the Risk-Free Rate), and risk (represented by the combination of the Beta Coefficient and the Market Risk Premium).
Constant Growth DCF Model	A form of the DCF model that assumes cash flows will grow at a constant rate, in perpetuity. The model simplifies to a form that expresses the Cost of Equity as the sum of the expected dividend yield and the expected growth rate.
Cost of Debt	The contractually defined return to debt holders as the interest rate or yield on debt securities.
Cost of Equity	The return required by investors to invest in equity securities. The terms "Return on Equity" and "Cost of Equity" are used interchangeably.
Discounted Cash Flow ("DCF") Model	A model used to estimate the Cost of Equity based on expected cash flows. The Cost of Equity equals the discount rate that sets the current market price equal to the present value of expected cash flows.
Dividend Yield	For a given stock, the current annualized dividend divided by its current market price.
Empirical Capital Asset Pricing Model ("ECAPM")	Empirical CAPM is a variant of the CAPM model. ECAPM adjusts for the CAPM's tendency to under-estimate returns for companies that have Beta coefficients less than one, and over-estimate returns for relatively high-Beta coefficient stocks.
Expected Earnings	An analysis of actual expected earnings used to corroborate a reasonable ROE range.

TERM	DESCRIPTION
Flotation Costs	Flotation costs are the costs associated with the sale of new issues of common stock. These costs include out-of-pocket expenditures for preparation, filing, underwriting and other issuance costs of common stock.
Gross Domestic Product ("GDP")	The value of all finished goods and services produced within a country during a given period of time (usually measured annually). GDP includes public and private consumption, government expenditures, investments, and net exports (that is, exports minus imports).
Market Return	The expected return on the equity market, taken as a portfolio.
Market Risk Premium	The additional compensation required by investing in the equity market as a portfolio over the Risk-Free rate. The Market Risk Premium is a component of the CAPM.
Proxy Group	A group of publicly traded companies used as the "proxy" for the subject company (in this case, Dominion Energy Utah). Proxy companies are sometimes referred to as "Comparable Companies."
Return on Equity ("ROE")	The return required by investors to invest in equity securities. The terms "Return on Equity" and "Cost of Equity" are used interchangeably. Please note that the ROE in this context is distinct from the accounting measure sometimes referred to as the "Return on Average Common Equity".
Risk-Free Rate	The rate of return on an asset with no risk of default.
Risk Premium	The additional compensation required by investors for taking on additional increments of risk. Risk Premium-based approaches are used in addition to the DCF and CAPM to estimate the Cost of Equity.
Treasury Yield	The return on Treasury securities; the yield on long-term Treasury bonds is considered to be a measure of the Risk-Free Rate.

I. WITNESS IDENTIFICATION AND QUALIFICATIONS

Q. Please state your name, affiliation, and business address.

A. My name is Robert B. Hevert. I am a Partner at ScottMadden, Inc. and 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 direct testimony ("Direct Testimony") before the Public Service Commission of Utah ("Commission") on behalf of Dominion Energy Utah ("DEU" or the "Company").

Q. Please describe your educational background.

A. I hold a Bachelor's degree in Business and Economics from the University of Delaware, and an MBA with a concentration in Finance from the University of Massachusetts. I also hold the Chartered Financial Analyst designation.

Q. Please describe your experience in the energy and utility industries.

A. I have worked in regulated industries for over thirty years, having served as an executive and manager with consulting firms, a financial officer of a publicly traded natural gas utility, and an analyst at a telecommunications utility. In my role as a consultant, I have advised numerous energy and utility clients on a wide range of financial and economic issues including corporate and asset-based transactions, asset and enterprise valuation, transaction due diligence, and strategic matters. As an expert witness, I have provided testimony in more than 250 proceedings regarding various financial and regulatory matters before numerous state utility regulatory agencies, the Federal Energy Regulatory Commission ("FERC"), the Alberta Utilities Commission, and United States Federal

Court. A summary of my professional and educational background, including a list of my testimony in prior proceedings, is included as Attachment A to my Direct Testimony.

II. PURPOSE AND OVERVIEW OF TESTIMONY

Q. What is the purpose of your Direct Testimony?

A. My Direct Testimony presents evidence and provides a recommendation regarding the Company's Return on Equity ("ROE").[1] Additionally, I assess the reasonableness of the Company's proposed capital structure and Cost of Debt to be used for ratemaking purposes. My analyses and conclusions are supported by the data presented in DEU Exhibit 2.01 through DEU Exhibit 2.11, which have been prepared by me or under my direction.

Q. Please summarize your conclusions regarding the appropriate Cost of Equity and capital structure for the Company.

A. My analyses indicate that an ROE in the range of 9.90 percent to 10.75 percent represents the range of equity investors' required return for investment in a natural gas utility such as DEU in today's capital markets. Based on the quantitative and qualitative analyses discussed throughout my Direct Testimony, including the risk profile of the Company, it is my view that 10.50 percent is a reasonable and appropriate estimate of the Company's Cost of Equity. That ROE, together with the Company's proposed capital structure and Cost of Debt, produces an overall rate of return of 7.73 percent.[2]

As to the Company's proposed capital structure, consisting of 55.00 percent common equity and 45.00 percent long-term debt, I conclude that the Company's

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

[2] 7.73% = (10.50% x 55%) + (4.34% x 45%). Please refer to the pre-filed direct testimony of Jordan K. Stephenson.

proposal is consistent with the capital structures that have been in place over several fiscal quarters at comparable utility companies.[3] Given the consistency of its proposal with similarly situated utility companies, I conclude that the Company's proposed capital structure is reasonable and appropriate. Regarding the Cost of Debt, the Company has proposed a rate of 4.34 percent, which I find reasonable and appropriate.

Q. Please provide a brief overview of the analyses that led to your ROE recommendation.

A. Because all financial models are subject to various assumptions and constraints, equity analysts and investors tend to use multiple methods to develop their return requirements. I therefore relied on three widely-accepted approaches to develop my ROE recommendation: (1) the Constant Growth Discounted Cash Flow ("DCF") model; (2) the traditional and empirical forms of the Capital Asset Pricing Model ("CAPM"); and (3) the Bond Yield Plus Risk Premium approach. Those analyses indicate the Company's Cost of Equity currently to be in the range of 9.90 percent to 10.75 percent. That range is corroborated by the Expected Earnings approach which, as I discuss later in my Direct Testimony, is supported by recent FERC orders.

In addition to the methodologies noted above, my estimate also takes into consideration (1) the risk associated with electrification on the natural gas utility sector and (2) factors associated with the Company's planned capital expenditures and the effect, if any, of certain regulatory mechanisms. I also calculated the costs of issuing common stock (that is, "flotation" costs), and considered the changing capital market and business conditions, including changes in Federal Reserve monetary policy. Although

[3] As discussed below, I note that the Company's actual common equity percentage is 60.00 percent. However, I understand that the proposed common equity percentage is the result of a stipulation approved by the Commission. Please refer to the pre-filed direct testimony of Jordan K. Stephenson.

these factors are very relevant to investors, their effect on the Company's Cost of Equity cannot be directly quantified. Therefore, although I did not make any explicit adjustments to my ROE estimates for those factors, I did take them into consideration in determining where the Company's Cost of Equity falls within the range of analytical results. In light of those analyses, I believe my recommended range is reasonable and appropriate.

Q. What are the key factors considered in your analyses and upon which you base your recommended ROE?

A. My analyses and recommendations consider the following key factors:

- The *Hope* and *Bluefield* (as referenced and defined below) decisions that established the standards for determining a fair and reasonable allowed return on equity, including: (1) consistency of the allowed return with other businesses having similar risk; (2) adequacy of the return to provide access to capital and support credit quality; and (3) confidence that the end result leads to just and reasonable rates.
- The effect of the current capital market conditions on investors' return requirements.
- The Company's business risks relative to the proxy group of comparable companies and the implications of those risks in arriving at the appropriate ROE.

As discussed further in Section VI, I considered the results of these methods in the context of general capital market factors. Based on those analyses, I conclude that a range of 9.90 percent to 10.75 percent represents reasonable estimates of the Company's Cost of Equity.

Q. How is the remainder of your Direct Testimony organized?

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

- Section III – Provides a summary of issues regarding Cost of Equity estimation in regulatory proceedings and discusses the regulatory guidelines pertinent to the development of the cost of capital;
- Section IV – Provides an overview of the Cost of Equity analyses;
- Section V – Provides a discussion on specific risk factors and other considerations that have a direct bearing on DEU's Cost of Equity;
- Section VI – Highlights the current capital market conditions and their effect on the Company's Cost of Equity;
- Section VII – Provides my analysis of DEU's proposed capital structure;
- Section VIII – Provides my analysis of DEU's proposed Cost of Debt;
- Section IX – Summarizes my conclusions and recommendations; and
- Section X – Appendix A, which provides the technical details of my analytical approaches.

Q. What are the results of your analyses?

A. The results of my analyses are summarized in Table 1 through Table 3, below.

Table 1: Summary of Constant Growth DCF Results[4]

	Mean	Mean High
30-Day Average	9.66%	13.45%
90-Day Average	9.73%	13.52%
180-Day Average	9.75%	13.55%

[4] DEU Exhibit 2.01.

Table 2: Summary of CAPM Results[5]

CAPM	Bloomberg Derived Market Risk Premium	Value Line Derived Market Risk Premium
Average Bloomberg Beta Coefficient		
Current 30-Year Treasury (2.92%)	8.94%	9.80%
Near Term Projected 30-Year Treasury (3.08%)	9.10%	9.97%
Average Value Line Beta Coefficient		
Current 30-Year Treasury (2.92%)	10.14%	11.18%
Near Term Projected 30-Year Treasury (3.08%)	10.31%	11.35%
Empirical CAPM	**Bloomberg Derived Market Risk Premium**	**Value Line Derived Market Risk Premium**
Average Bloomberg Beta Coefficient		
Current 30-Year Treasury (2.92%)	10.06%	11.09%
Near Term Projected 30-Year Treasury (3.08%)	10.23%	11.25%
Average Value Line Beta Coefficient		
Current 30-Year Treasury (2.92%)	10.96%	12.12%
Near Term Projected 30-Year Treasury (3.08%)	11.13%	12.28%

Table 3: Summary of Bond Yield Plus Risk Premium Results[6]

Bond Yield Plus Risk Premium Approach	
Current 30-Year Treasury (2.92%)	9.87%
Near Term Projected 30-Year Treasury (3.08%)	9.89%
Long Term Projected 30-Year Treasury (4.05%)	10.11%

As shown in Tables 1 through 3, I have performed several analyses to estimate the Company's Cost of Equity. Those results are supported by the results of my Expected Earnings analysis, which range from 9.58 percent to 12.13 percent, with an average of

5 DEU Exhibit 2.05.

6 DEU Exhibit 2.06.

10.73 percent.[7] Based on those analytical results, and in light of the considerations discussed throughout the balance of my Direct Testimony, I believe a reasonable range is from 9.90 percent to 10.75 percent. Within that range, and considering the specific risk profile of DEU, I believe an ROE of 10.50 percent is appropriate.

Q. Are there other factors that should be considered in determining the weight given to the methods and results summarized above?

A. Yes. All models used to estimate the Cost of Equity require certain assumptions, which may become more, or less, relevant as market conditions and data change. Important considerations are the consistency of each model's underlying assumptions with current and expected market conditions, and the reasonableness of its results relative to observable benchmarks.

Risk Premium-based methods (such as the CAPM) provide a measure of risk and directly reflect investors' expectations regarding future market returns. Other Risk Premium approaches (such as the Bond Yield Plus Risk Premium approach) reflect the well-documented finding that the Cost of Equity does not move in lock-step with interest rates. For example, at times interest rates fall because investors can be so risk averse that they would rather accept a very modest return on Treasury securities than take on the risk of equity ownership. In such circumstances, low interest rates suggest an increasing, not a decreasing, Cost of Equity. Therefore, the important analytical issue is understanding each model's fundamental structure and assumptions, and considering its results in the context of current and expected market conditions.

[7] DEU Exhibit 2.07.

As discussed in Section III, below, the ROE should be comparable to returns investors expect to earn on other investments of similar risk. To that point, the mean low results of my Constant Growth DCF model are below any authorized ROE for a natural gas utility since at least 1980 and over 200 basis points below DEU's currently authorized ROE.[8] With those considerations in mind, I believe my recommendation reasonably reflects investors' return requirements in the current market environment.

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

Q. Before addressing the specific aspects of this proceeding, please provide a general overview of the issues surrounding the Cost of Equity in regulatory proceedings.

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

The Cost of Capital (including the costs of both debt and equity) is based on the economic principle of "opportunity costs." Investing in any asset, whether debt or equity securities, implies a forgone opportunity to invest in alternative assets. For an investment to be sensible, its expected return must be at least equal to the return expected on alternative, comparable investment opportunities. If it is not, investors will sell the

[8] Source: S&P Global Market Intelligence, Regulatory Research Associates.

"over-valued" security, and buy the "under-valued" security until the expected returns on the two are aligned.

Although both debt and equity have required costs, they differ in certain fundamental ways. Most noticeably, the Cost of Debt is contractually defined and can be directly observed as the interest rate or yield on debt securities.[9] The Cost of Equity, on the other hand, is neither directly observable nor a contractual obligation. Rather, equity investors have a claim on cash flows only after debt holders are paid; the uncertainty (or risk) associated with those residual cash flows determines the Cost of Equity. Because equity investors bear that additional "residual risk," they require higher returns than debt holders. In that basic sense, equity and debt investors differ: they invest in different securities, face different risks, and require different returns.

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

[9] The observed interest rate may be adjusted to reflect issuance or other directly observable costs.

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

Q. Please summarize the regulatory guidelines established for the purpose of determining the ROE.

A. The United States Supreme Court (the "Court") established the guiding principles for establishing a fair return for capital in two cases: (1) *Bluefield Water Works and Improvement Co. v. Public Service Comm'n of West Virginia*, 262 U.S. 679 (1923) *("Bluefield")*; and (2) *Federal Power Comm'n v. Hope Natural Gas Co.*, 320 U.S. 591 (1944) *("Hope")*. In those cases, the Court recognized that the fair rate of return on common equity should be: (1) comparable to returns investors expect to earn on other investments of similar risk; (2) sufficient to assure confidence in the company's financial integrity; and (3) adequate to maintain and support the company's credit and to attract capital.

Q. Does Utah precedent provide similar guidance?

A. Yes. The Commission has followed the principles set out in *Hope* and *Bluefield* in establishing a fair rate of return, which have been upheld by the Utah Supreme Court.[10] The Commission noted:

[10] *See generally.*, *Utah Power & Light v. Public Serv. Comm'n*, 152 P.2d 542 (Utah 1944) (general discussion of and reliance on *Hope*); *Mountain Fuel Supply Co. v. Public Serv. Comm'n*, 861 P.2d 414, 427 (Utah

> As we have stated many times, these cases counsel us to reach a decision which gives investors the opportunity to earn returns sufficient to attract capital and that are comparable to returns investors require to assume the same degree of risk in other investments they might make. Investors' required return, the opportunity cost of capital, is the utility's cost of capital.[11]

Based on these standards, the authorized ROE should provide the Company with the opportunity to earn a fair and reasonable return, and should enable efficient access to external capital under a variety of market conditions.

Q. Why is it important for a utility to be allowed the opportunity to earn a return adequate to attract equity capital at reasonable terms?

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

1993) (citing *Bluefield* and *Hope* for the proposition that "[t]he primary substantive limitation on the Commission's authority is that it cannot establish a rate of return that is insufficient to assure confidence in the financial integrity of the utility, such that it would undermine its credit and capital.").

[11] Docket No. 97-049-08, *Re U S West Communications, Inc.*, 1997 WL 875832, *438 (Utah PSC 1997).

Q. How is the Cost of Equity estimated in regulatory proceedings?

A. As noted earlier (and as discussed in more detail later in my Direct Testimony), the Cost of Equity is estimated by the use of various financial models. By their nature, those models produce a range of results from which the ROE is estimated. That estimate must be based on a comprehensive review of relevant data and information, and does not necessarily lend itself to a strict mathematical solution. The key consideration in determining the ROE is to ensure the overall analysis reasonably reflects investors' views of the financial markets in general, and of the subject company (in the context of the proxy companies) in particular.

The use of multiple methods, and the consideration given to them, recently was addressed by the FERC. In its November 15, 2018 *Order Directing Briefs,* the FERC determined that "in light of current investor behavior and capital market conditions, relying on the DCF methodology alone will not produce a just and reasonable ROE".[12] In its October 16, 2018 *Order Directing Briefs*, the FERC determined that although it "previously relied solely on the DCF model to produce the evidentiary zone of reasonableness…", it is "…concerned that relying on that methodology alone will not produce just and reasonable results."[13] As the FERC explained, because the Cost of Equity depends on what the market expects, it is important to understand "how investors analyze and compare their investment opportunities."[14] The FERC also explained that, although certain investors may give some weight to the DCF approach, other investors

12 Docket Nos. EL14-12-003 and EL15-45-000, *Order Directing Briefs*, 165 FERC ¶ 61,118 (November 15, 2018) at para. 34.

13 Docket No. EL11-66-001, et al., *Order Directing Briefs*, 165 FERC ¶ 61,030 (October 16, 2018) at para. 30.

14 *Id.*, at para. 33.

"place greater weight on one or more of the other methods…"[15] Those methods include the CAPM, the Risk Premium method, and the Expected Earnings method, all of which I have applied in this proceeding.

The use of multiple models makes intuitive sense when we consider that market prices are set by the buying and selling behavior of multiple investors, whose circumstances, objectives, and constraints vary over time and across market conditions. We cannot assume a single method is the best measure of the factors motivating those decisions for all investors, at all times. Intuition suggests it is more appropriate to use as many methods as we reasonably can, and to reflect the many factors motivating investment decisions as best we can. In this instance, intuition, financial theory,[16] and financial practice reach a common conclusion: we should apply and reasonably consider multiple methods when estimating the Cost of Equity.

Practitioners and academics recognize financial models simply are approximations of investor behavior, not precise quantifications of it. They appreciate that models are tools to be used in the ROE estimation process, and that strict adherence to any single approach, or to the specific results of any single approach, can lead to flawed or misleading conclusions. That position is consistent with the *Hope* and *Bluefield* principle that it is the analytical result, as opposed to the method employed, that

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15 *Id.*, at para. 35. *See,* generally, Docket No. PL19-4-000, *Inquiry Regarding the Commission's Policy for Determining Return on Equity*, March 21, 2019.

16 As Professor Eugene Brigham explains: "Whereas debt and preferred stocks are contractual obligations which have easily determined costs, it is not at all easy to estimate [the Cost of Equity]. However, three methods can be used: (1) the Capital Asset Pricing Model ("CAPM"), (2) the discounted cash flow ("DCF") model, and (3) the bond-yield-plus-risk-premium approach. These methods should not be regarded as mutually exclusive – no one dominates the others, and all are subject to error when used in practice. Therefore, when faced with the task of estimating a company's cost of equity, we generally use all three methods and then choose among them on the basis of our confidence in the data used for each in the specific case at hand." Eugene F. Brigham, Louis C. Gapenski, Financial Management, Theory and Practice, 7th ed., The Dryden Press, 1994, at 341.

is controlling in arriving at ROE determinations. A reasonable ROE estimate, therefore, appropriately considers alternative methods and the reasonableness of their individual and collective results in the context of observable, relevant market information.

IV. COST OF EQUITY ESTIMATION

Q. Please briefly discuss the ROE in the context of the regulated rate of return.

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

Proxy Group Selection

Q. As a preliminary matter, why is it necessary to select a group of proxy companies to determine the Cost of Equity for the Company?

A. Because the ROE is market-based, and given that DEU is not a publicly traded entity, it is necessary to establish a group of comparable, publicly traded companies to serve as its "proxy." Even if the Company were publicly traded, it is possible that transitory events could bias its market value in one way or another over a given period of time. A significant benefit of using a proxy group is that it moderates the effects of anomalous, temporary events associated with any one company.

Q. Please provide a summary profile of DEU.

A. DEU, which is a wholly owned subsidiary of Dominion Energy, Inc. ("DEI"), provides natural gas distribution service to approximately one million customers throughout Utah and Idaho.[17] DEI's and DEU's current long-term issuer credit ratings are as follows:

Table 4: Current Credit Ratings[18]

	S&P	Moody's
Dominion Energy, Inc.	BBB+ (outlook: Stable)	Baa2
DEU	BBB+ (outlook: Stable)	A2

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

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

- Dividend Payments: Because certain of the models used in my analyses assume earnings and dividends grow over time, I excluded companies that do not consistently pay quarterly cash dividends;
- Utility Equity Analyst Coverage: To ensure the growth rates used in my analyses are not biased by a single analyst, all the companies in my proxy group have been covered by at least two utility industry equity analysts;
- Corporate Credit Rating Threshold: All the companies in my proxy group have investment grade senior unsecured bond and/or corporate credit ratings from S&P;
- Gas Distribution Operating Income Threshold: To incorporate companies that are primarily regulated gas distribution utilities, I included companies with at least 60.00 percent of operating income derived from regulated natural gas utility operations; and

17 Company provided this data as of May 2019.

18 Source: S&P Global Market Intelligence.

- Significant Events: I eliminated companies currently known to be party to a merger, or other significant transaction.

Q. Did you include Dominion Energy, Inc. in your proxy group?

A. No. To avoid the circular logic that would otherwise occur, it has been my consistent practice to exclude the subject company (or its parent) from the proxy group. Additionally, DEI is not included in the universe of companies that Value Line classifies as Natural Gas Utilities.

Q. Why did you begin with the universe of companies that Value Line classifies as Natural Gas Utilities?

A. In this proceeding, we are estimating the Cost of Equity for DEU, a wholly owned subsidiary of DEI, that is a rate regulated natural gas distribution company. By applying the screening criteria discussed above, I ensured that the proxy group excludes companies with regulated electric operations, or significant unregulated activities. Consequently, the proxy group contained in Table 5 below contains only companies that, like DEU, are focused on the regulated distribution of natural gas. Because all eight proxy companies are primarily natural gas distribution utilities, they are reasonable proxies for DEU.

Q. What companies met those screening criteria?

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

Table 5: Proxy Group Screening Results

Company	Ticker
Atmos Energy Corporation	ATO
Chesapeake Utilities Corporation[19]	CPK
New Jersey Resources Corporation	NJR
Northwest Natural Holding Company	NWN
ONE Gas, Inc.	OGS
South Jersey Industries, Inc.	SJI
Spire, Inc.	SR
Southwest Gas Corporation	SWX

Q. Do you believe that a proxy group of eight companies is sufficiently large?

A. Yes. Because all analysts use some form of screening process to develop proxy groups, those groups, by definition, are not randomly drawn from a larger population. Consequently, there is no reason to place more reliance on the range of results derived from a larger, but potentially less comparable proxy group simply by virtue of the larger number of observations. Moreover, because I am using market-based data, my analytical results will not necessarily be tightly clustered around a central point. Results that may be somewhat dispersed do not suggest the screening approach is inappropriate or the results less meaningful. Including companies whose fundamental comparability to the subject company is tenuous, simply for the purpose of expanding the number of observations, does not add relevant information to the analysis.

[19] Even though Chesapeake Utilities Corporation is not publicly rated by S&P, its Value Line Financial Strength Rating of B++ is comparable to the rest of the proxy group. CPK also has a National Association of Insurance Commissioners ("NAIC") rating of "NAIC l," which is equivalent to ratings in the "A" category for both Moody's and Standard & Poor's. *See*, Chesapeake Utilities Corporation, 2018 AGA Financial Forum, May 2018, at 28; National Association of Insurance Commissioners, CRP Credit Rating Equivalent to SVO Designations, November 2017.

Cost of Equity Estimation

Q. How have you determined the investor-required ROE?

A. As noted earlier, because the Cost of Equity is not directly observable, it must be estimated based on both quantitative and qualitative information. Although several empirical models have been developed for that purpose, all are subject to limiting assumptions or other constraints. Consequently, many finance texts recommend using multiple approaches to estimate the Cost of Equity as detailed in Appendix A.[20] When faced with the task of estimating the Cost of Equity, analysts and investors are inclined to gather and evaluate as much relevant data as reasonably can be analyzed and, therefore, rely on multiple analytical approaches.

As a practical matter, no individual model is more reliable than all others under all market conditions. Therefore, it is important to use multiple methods to mitigate the effects of assumptions and inputs associated with any single approach. As noted earlier, the use of multiple methods, and the consideration given to them, recently was endorsed by FERC.

Consistent with that approach, I have considered the results of the Constant Growth DCF model, the traditional and empirical forms of the CAPM, and the Bond Yield Plus Risk Premium approach. I also have provided an Expected Earnings analysis, which I have applied as a corroborating method. FERC issued similar guidance, using

[20] *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.

the Expected Earnings analysis in its determination of the "zone of reasonableness", observing that "*investors use those models*".[21]

Q. Please briefly describe the Constant Growth DCF model.

A. The Constant Growth DCF approach defines the Cost of Equity as the sum of (1) the expected dividend yield, and (2) expected long-term growth. As explained in Appendix A, the model often is expressed in the familiar form $k = \frac{D(1+g)}{P_0} + g$, where the expected dividend yield generally equals the expected annual dividend divided by the current stock price, and the growth rate is based on analysts' expectations of earnings growth. The Constant Growth DCF formula, which falls from the longer "present value" structure,[22] requires several simplifying assumptions, including the constancy of inputs in perpetuity.

Under the model's strict assumptions, the growth rate equals the rate of capital appreciation (that is, the growth in the stock price).[23] Given that assumption, it does not matter whether the investor holds the stock in perpetuity, or whether they hold the stock for some period of time, collect the dividends, then sell at the prevailing market price. That result also requires that the ROE result reached today will remain unchanged in perpetuity. So, if market conditions are such that the model produces an unreasonably low (or high) ROE estimate today, it assumes that estimate will be the same ROE investors require every day in the future, regardless of whether or how market conditions change.

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21 Docket No. EL11-66-001, et al., *Order Directing Briefs*, 165 FERC ¶ 61,030 (October 16, 2018) at para. 44 (italics in original).

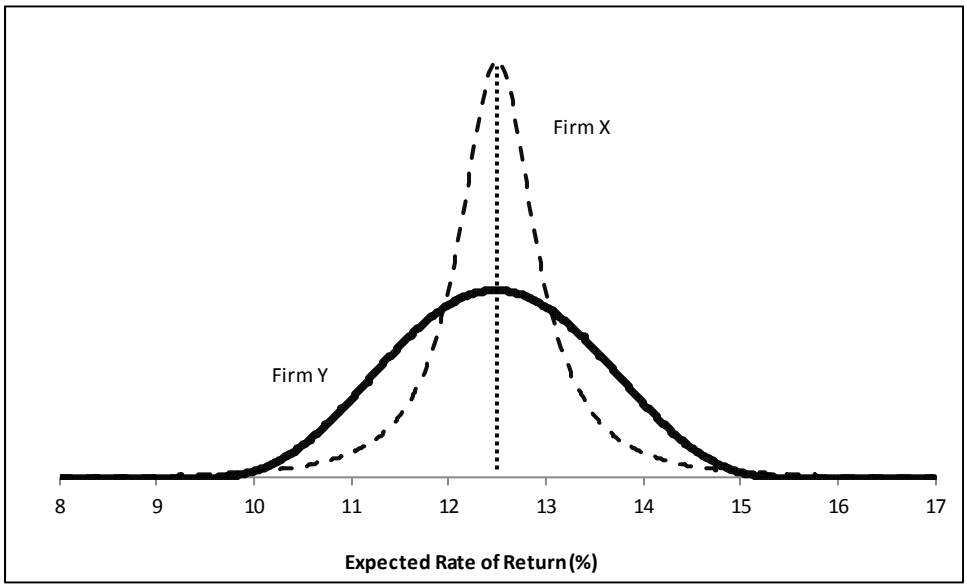
22 *See* Appendix A, part A.

23 As discussed in Appendix A, part A, the model assumes that earnings, dividends, book value, and the stock price all grow at the same constant rate in perpetuity. Additionally, academic research has indicated that analysts forecasts of growth are superior to other measures of growth (*see* Appendix A, part A).

Q. Please briefly describe the Capital Asset Pricing Model.

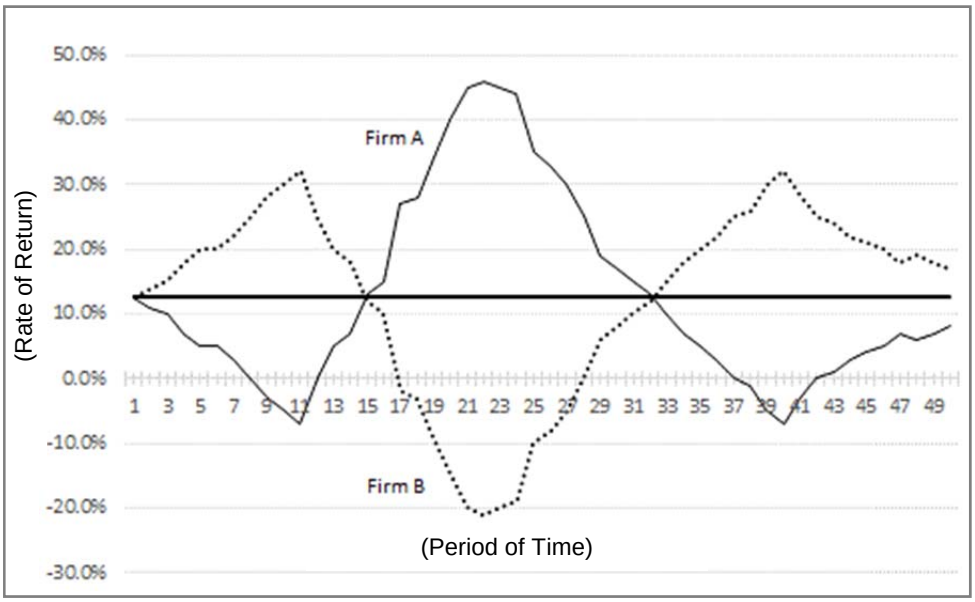
A. Whereas DCF models focus on expected cash flows, Risk Premium-based models such as the CAPM focus on the additional return that investors require for taking on additional risk. In finance, "risk" generally refers to the variation in expected returns, rather than the expected return, itself. Consider two firms, X and Y, with expected returns, and the expected variation in returns noted in Chart 1, below. Although the two have the same expected return (12.50 percent), Firm Y's are far more variable. From that perspective, Firm Y would be considered the riskier investment.

Chart 1: Expected Return and Risk



Now consider two other firms, Firm A and Firm B. Both have expected returns of 12.50 percent, and both are equally risky as measured by their volatility. But as Firm A's returns go up, Firm B's returns go down. That is, the returns are negatively correlated as illustrated in Chart 2, below.

Chart 2: Relative Risk



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

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

Risk-Free Rate + Risk Premium = Cost of Equity [1]

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

Risk-Free Rate + (Beta Coefficient x Market Risk Premium) = Cost of Equity [2]

Given that the correlation between the proxy group companies and the S&P 500 has declined since 2014, while the relative risk has increased,[24] the CAPM in the form presented here may not adequately reflect the expected systematic risk, and therefore, the returns required by investors in low-Beta companies. As such, I have considered the Empirical CAPM ("ECAPM") approach, which is a variant of the CAPM approach. The ECAPM adjusts for the CAPM's tendency to under-estimate returns for companies that (like utilities) have Beta coefficients less than one, and over-estimate returns for relatively high-Beta coefficient stocks.

Q. Please briefly describe the Bond Yield Plus Risk Premium approach.

A. This approach is based on the basic financial principle that equity investors bear the risk associated with ownership and, therefore, require a premium over the return they would have earned as a bondholder. That is, because returns to equity holders are more risky than returns to bondholders, equity investors must be compensated for bearing that

[24] *See* Chart 9, below.

additional risk (that difference often is referred to as the "Equity Risk Premium"). Bond Yield Plus Risk Premium approaches estimate the Cost of Equity as the sum of the Equity Risk Premium and the yield on a particular class of bonds.

Bond Yield + Equity Risk Premium = Cost of Equity [3]

Q. Please summarize your analytical results.

A. The results of the models described above are provided in Tables 6 and 7, below.[25]

Table 6: Summary of DCF Results[26]

	Mean Low	Mean	Mean High
30-Day Average	7.47%	9.66%	13.45%
90-Day Average	7.54%	9.73%	13.52%
180-Day Average	7.57%	9.75%	13.55%

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

[26] DEU Exhibit 2.01.

Table 7: Summary of Risk Premium Results[27]

CAPM	Bloomberg Derived Market Risk Premium	Value Line Derived Market Risk Premium
Average Bloomberg Beta Coefficient		
Current 30-Year Treasury (2.92%)	8.94%	9.80%
Near Term Projected 30-Year Treasury (3.08%)	9.10%	9.97%
Average Value Line Beta Coefficient		
Current 30-Year Treasury (2.92%)	10.14%	11.18%
Near Term Projected 30-Year Treasury (3.08%)	10.31%	11.35%
Empirical CAPM	**Bloomberg Derived Market Risk Premium**	**Value Line Derived Market Risk Premium**
Average Bloomberg Beta Coefficient		
Current 30-Year Treasury (2.92%)	10.06%	11.09%
Near Term Projected 30-Year Treasury (3.08%)	10.23%	11.25%
Average Value Line Beta Coefficient		
Current 30-Year Treasury (2.92%)	10.96%	12.12%
Near Term Projected 30-Year Treasury (3.08%)	11.13%	12.28%
Bond Yield Plus Risk Premium Approach		
Current 30-Year Treasury (2.92%)	9.87%	
Near Term Projected 30-Year Treasury (3.08%)	9.89%	
Long-Term Projected 30-Year Treasury (4.05%)	10.11%	

Q. Please briefly describe the Expected Earnings analysis.

A. The Expected Earnings analysis is based on the principle of opportunity costs. By taking historical returns on book equity and comparing those to authorized ROEs, investors are able to directly compare returns from investments of similar risk. In addition to historical returns, Value Line also provides projected returns on book equity. I have relied solely

[27] DEU Exhibit 2.05 and DEU Exhibit 2.06.

on forward-looking projections in the Expected Earnings analysis.[28] Those results range from 9.58 percent to 12.13 percent, with an average of 10.73 percent.[29] As noted earlier, I used those results to assess the reasonableness of the DCF, CAPM, and Bond-Yield Plus Risk Premium results.[30]

V. BUSINESS RISKS AND OTHER CONSIDERATIONS

Electrification

Q. What is Electrification?

A. Electrification is the conversion of fossil-fuel based transportation (i.e., gasoline powered vehicles) and end-use heating and appliance loads (such as oil and natural gas-fired heating systems) to electricity.

Q. Please explain the risk of Electrification on the natural gas utility sector?

A. As noted in a recent ICF study for the American Gas Association, as states and local municipalities contemplate "deep decarbonization" of their economies as the electric grid becomes less carbon-intensive, policy-makers and environmental advocates are considering electrification as an option for further reducing greenhouse gas emissions.[31] If successful, these policies could affect the natural gas utility sector by drastically reducing demand for natural gas, leaving natural gas utilities at risk of holding stranded assets.[32]

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28 As described more fully in Appendix A, an adjustment is necessary to accurately reflect the average invested capital over the period in question.

29 DEU Exhibit 2.07.

30 *See* Docket Nos. EL14-12-003 and EL15-45-000, *Order Directing Briefs.* (November 15, 2018).

31 *Implications of Policy Driven Residential Electrification*, An American Gas Association Study prepared by ICF, July 2018, at 1.

32 McKinsey & Company, "Are US gas utilities nearing the end of their golden age?", September 2018, https://www.mckinsey.com/industries/electric-power-and-natural-gas/our-insights/are-us-gas-utilities-nearing-the-end-of-their-golden-age

Regulatory Mechanisms and Capital Spending

Q. How common are revenue stabilization and cost recovery mechanisms within the industry?

A. There is little question that revenue stabilization and cost recovery structures are becoming increasingly common. The increased interest in such mechanisms has generally resulted from the growing cost of maintaining system reliability, coupled with the flat or declining sales volume brought on by energy efficiency and relatively slow economic growth. Adjustment mechanisms to recover purchased gas costs, energy efficiency and demand-side program costs, new infrastructure investment, and other expenses are common.[33] In addition, full or partial decoupling mechanisms have been implemented by natural gas utilities in 36 jurisdictions.[34] Consequently, the implementation of alternative regulation mechanisms has become an increasingly visible issue to investors.

Q. Does the Company have a specific capital cost recovery mechanism in place?

A. Yes. The Company currently has in place the Infrastructure Rate Adjustment Tracker ("Infrastructure Tracker") to recover the costs of replacement infrastructure not included in base rates (such as high-pressure feeder lines and intermediate high pressure lines) approved by the Commission and as required to ensure public safety and provide reliable service.

33 DEU Exhibit 2.08.

34 *See*, *e.g.*, *Adjustment Clauses: A State-by-State Overview*, Regulatory Research Associates, September 28, 2018; ACEEE Utility Business Model database, https://database.aceee.org/state/utility-business-model.

Q. Are infrastructure replacement surcharges common among the proxy group companies?

A. Yes, they are. As Mr. Mendenhall has shown, these mechanisms are used in nearly every state by the majority of natural gas utilities. In addition, DEU Exhibit 2.08 provides a summary of alternative regulation mechanisms and cost recovery mechanisms currently in effect at each natural gas utility subsidiary of the proxy group companies. As DEU Exhibit 2.08 demonstrates, all of the proxy companies have a capital cost recovery mechanisms such as the infrastructure replacement surcharge in place in at least one operating company. Under the comparable earnings standard, the allowed Return on Equity should represent a return commensurate with the returns on investments of similar risk. To the extent the proxy companies have mechanisms in place to address revenue shortfalls or infrastructure replacement cost recovery, the Company's use of an Infrastructure Tracker make it more comparable to its peers.

Q. Have you also considered the effect of the Company's future test year on its Cost of Equity?

A. Yes, I have. DEU Exhibit 2.08 demonstrates that a number of the proxy companies operate in jurisdictions that provide for future or partially forecast test years, or that permit Construction Work In Progress ("CWIP") to be included in rate base.[35] As to their prevalence, Value Line believes that the use of such regulatory mechanisms "is likely to increase as utilities request similar mechanisms in additional states."[36] Similarly, S&P has noted that it has "seen many state commissions approve alternative ratemaking

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35 Source: Regulatory Research Associates. *See* DEU Exhibit 2.08. I note that many jurisdictions with Historical Test years allow for adjustments for future known and measurable changes.

36 *See* Paul E. Debbas, CFA, *What Electric Utilities Are Doing About Regulatory Lag*, Value Line, May 23, 2012.

techniques to traditional base rate case applications, which help utilities sustain cash flow measures, earning power, and ultimately, credit quality."[37] Consequently, the use of a forecast test year does not reduce the Company's risk relative to the proxy group.

Q. Do the Company's cost recovery mechanisms reduce its Cost of Equity?

A. No, they do not. The principal analytical issue is whether the Company is sufficiently less risky than its peers as a direct result of its recovery mechanisms that investors would specifically and measurably reduce their return requirements. As such, the fact that the Company's existing recovery mechanisms may, to a degree, stabilize the Company's revenues will not affect its Cost of Equity unless it can be demonstrated that (1) the Company is materially less risky than the proxy group by virtue of those mechanisms; and (2) investors are likely to react to the incremental effect of those mechanisms. Because revenue stabilization and cost recovery mechanisms are common among the proxy companies, there is no reason to assume that DEU would be materially less risky, or that its Cost of Equity would be lower than its peers' as a result of its recovery mechanisms.

Q. Is the timeliness of recovery afforded by the Company's capital cost recovery mechanisms of concern to investors?

A. Yes. Although the capital recovery mechanisms discussed above are generally viewed positively by the investment community, of concern is the effect of the regulatory lag given the Company's proposed capital spending program. DEU currently plans to invest nearly $1.10 billion in its Utah territory from 2019 to 2023.[38] That amount includes pipeline replacement and reliability system enhancements to maintain safe, sufficient, and

[37] S&P RatingsDirect, *Industry Economic and Ratings Outlook: U.S. Regulated Utilities Expected To Continue On Stable Trajectory In 2013*, January 25, 2013.

[38] Company provided data. Excludes projected capital spending on its proposed Liquefied Natural Gas plant.

reliable service. As the Company moves forward with its capital spending plans, timely recovery of its capital costs is critical to mitigate the delay of capital recovery and execute its capital spending program.

Q. How do those considerations apply to DEU and its capital spending plans?

A. It is clear DEU's capital expenditure program is significant. It also is clear that the financial community recognizes the need for timely cost recovery for those capital expenditures. From a credit perspective, the additional pressure on cash flows associated with high levels of capital expenditures exerts corresponding pressure on credit metrics and, therefore, credit ratings. S&P has noted several long-term challenges for utilities' financial health including: heavy construction programs to address demand growth; declining capacity margins; and aging infrastructure and regulatory responsiveness to mounting requests for rate increases.[39] More recently, S&P noted that:

> We assume that capital spending will remain a focus of most utility managements and strain credit metrics. It provides growth when sales are diminished by ongoing demanded efficiency from regulators and other trends, and it is welcomed by policymakers that appreciate the economic stimulus and the benefits of safer, more reliable service. The speed with which the regulatory process turns the new spending into higher rates to begin to pay for it is an important factor in our assumptions and the forecast. Any extended lag between spending and recovery can exacerbate the negative effect on credit metrics and therefore ratings.[40]

[39] *See* Standard & Poor's, *Industry Report Card: Utility Sectors in the Americas Remain Stable, While Challenges Beset European, Australian, and New Zealand Counterparts*, RatingsDirect, June 27, 2008, at 4.

[40] *See* Standard & Poor's Rating Services, *Industry Top Trends 2017: Utilities*, RatingsDirect, February 16, 2017, at 4.

Q. What are your conclusions regarding the effect of the Company's capital investment plan and the associated recovery mechanisms?

A. DEU's capital expenditure plan is significant. As discussed earlier in my Direct Testimony, the allowed ROE should enable the subject utility to finance capital expenditures and working capital requirements at reasonable rates, and to maintain its financial integrity in a variety of economic and capital market conditions. A return that is adequate to attract capital at reasonable terms enables the utility to provide safe, reliable service while maintaining its financial soundness.

The ratemaking process is based on the principle that, in order for investors and companies to commit the capital needed to provide safe and reliable utility services, the utility must have the opportunity to recover the return of, and the market-required return on, invested capital. Regulatory commissions recognize that, because utility operations are capital intensive, their decisions should enable the utility to attract capital at reasonable terms; doing so balances the long-term interests of the utility and its ratepayers.

Further, the financial community carefully monitors the current and expected financial condition of utility companies, as well as the regulatory environment in which those companies operate. In that respect, the regulatory environment is one of the most important factors considered in both debt and equity investors' assessments of risk. That is especially important during periods in which the utility expects to make significant capital investments and, therefore, may require access to capital markets.

The Company's capital recovery mechanisms are important to continue to provide retained earnings as a funding source for the Company to mitigate equity capital market

risk. Although the Company's recovery mechanisms may be credit supportive, they are not necessarily credit enhancing. Consequently, the Commission's decision in this proceeding will directly affect the Company's ability to fund capital investments with operating cash flows, and the financial community's view of its financial profile.

Flotation Costs

Q. What are flotation costs?

A. Flotation costs are the expenses incurred in connection with the sale of new shares of equity. As discussed below, such costs include out-of-pocket expenditures for the preparation, filing, underwriting, and other issuance costs of common stock.

Q. Why is it important to recognize flotation costs in the allowed ROE?

A. In order to attract and retain new investors, a regulated utility must have the opportunity to earn a return that is both competitive and compensatory. To the extent that a company is denied the opportunity to recover prudently incurred flotation costs, actual returns will fall short of expected (or required) returns, thereby diminishing its ability to attract adequate capital on reasonable terms.

Q. Are flotation costs part of a utility's invested costs or part of the utility's expenses?

A. Flotation costs are part of the invested costs of the utility, which are properly reflected on the balance sheet under "paid in capital." They are not current expenses, and therefore, are not reflected on the income statement. Rather, like investments in rate base or the issuance costs of long-term debt, flotation costs are incurred over time. As a result, the great majority of a utility's flotation costs are incurred prior to the test year, but remain part of the cost structure that exists during the test year and beyond, and should be recognized for ratemaking purposes. Therefore, recovery of flotation costs is appropriate

even if no new issuances are planned in the near future because failure to allow such cost recovery may deny DEU the opportunity to earn its required rate of return in the future.

Q. Is the need to consider flotation costs eliminated because DEU is a wholly owned subsidiary of Dominion Energy, Inc.?

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

Q. Do the DCF and CAPM models already incorporate investor expectations of a return in order to compensate for flotation costs?

A. No. The models used to estimate the appropriate ROE assume no "friction" or transaction costs, as these costs are not reflected in the market price (in the case of the DCF model) or risk premium (in the case of the CAPM and the Bond Yield Plus Risk Premium model). Therefore, it is appropriate to consider flotation costs when determining where within the range of reasonable results DEU's return should be set.

Q. Is the need to consider flotation costs recognized by the academic and financial communities?

A. Yes. The need to reimburse investors for equity issuance costs is recognized by the academic and financial communities in the same spirit that investors are reimbursed for the costs of issuing debt. For example, Dr. Morin notes that "[t]he costs of issuing [common stock] are just as real as operating and maintenance expenses or costs incurred to build utility plants, and fair regulatory treatment must permit the recovery of these costs."[41] Dr. Morin further notes that "equity capital raised in a given stock issue remains on the utility's common equity account and continues to provide benefits to ratepayers indefinitely."[42] This treatment is consistent with the philosophy of a fair rate of return. As explained by Dr. Shannon Pratt:

> Flotation costs occur when a company issues new stock. The business usually incurs several kinds of flotation or transaction costs, which reduce the actual proceeds received by the business. Some of these are direct out-of-pocket outlays, such as fees paid to underwriters, legal expenses, and prospectus preparation costs. Because of this reduction in proceeds, the business's required returns must be greater to compensate for the additional costs. Flotation costs can be accounted for either by amortizing the cost, thus reducing the net cash flow to discount, or by incorporating the cost into the cost of equity capital. Since flotation costs typically are not applied to operating cash flow, they must be incorporated into the cost of equity capital.[43]

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

> Although the cost of capital estimation techniques set forth later in this book are applicable to rate setting, certain adjustments may be necessary.

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41 Roger A. Morin, PhD, New Regulatory Finance, Public Utility Reports, Inc., 2006, at 321.

42 *Id.*, at 327.

43 Shannon P. Pratt, Roger J. Grabowski, Cost of Capital: Applications and Examples, 4th ed. (John Wiley & Sons, Inc., 2010), at 586.

One such adjustment is for flotation costs (amounts that must be paid to underwriters by the issuer to attract and retain capital).[44]

Q. Have you estimated the effects of flotation costs?

A. Yes, I modified the DCF calculation to derive the dividend yield that would reimburse investors for direct issuance costs. Based on the weighted average issuance costs shown in DEU Exhibit 2.09, a reasonable estimate of flotation costs is approximately 0.05 percent (five basis points).

Q. Are you proposing to adjust your recommended ROE by five basis points to reflect the effect of flotation costs on DEU's ROE?

A. No, I am not. Rather, I have considered the effect of flotation costs, in addition to the Company's other business risks, in determining where the Company's ROE should be set within the reasonable range of results.

VI. CAPITAL MARKET ENVIRONMENT

Q. Do economic conditions influence the required Cost of Capital and required return on common equity?

A. Yes. The models used to estimate the Cost of Equity are meant to reflect, and therefore are influenced by, current and expected capital market conditions. Therefore, it is important to assess the reasonableness of any financial model's results in the context of observable market data. To the extent a given model's assumptions are misaligned with such data, or its results are inconsistent with basic financial principles, it is important to consider whether alternative estimation techniques are likely to provide more meaningful and reliable results.

[44] Morningstar, Inc., Ibbotson SBBI 2013 Valuation Yearbook, at 25.

Q. Do you have any general observations regarding the relationship between current capital market conditions and the Company's Cost of Equity?

A. Yes. Although the Federal Reserve completed its Quantitative Easing initiative in October 2014, it was not until December 2015 that it raised the Federal Funds rate and began the process of monetary policy normalization.[45] A significant analytical issue is how investors likely will react as that process continues, and eventually is completed. For example, increasing interest rates may be seen as an indication of expanding macroeconomic growth, in which case we reasonably could expect the growth rate component of the DCF model to increase. At the same time, sectors that historically have included dividend-paying companies lost value, as increasing interest rates provide investors with alternative sources of current income, increasing dividend yields. Those dynamics likely affect other models in different ways, increasing the risk of focusing on a single method. A more reasoned approach is to understand the relationships among capital market and macroeconomic variables, and to consider how those factors may affect different models and their results.

Q. Does your recommendation also consider the current capital market environment?

A. Yes, it does. From an analytical perspective, it is important that the inputs and assumptions used to arrive at an ROE recommendation, including assessments of capital market conditions, are consistent with the recommendation itself. Although all analyses require an element of judgment, the application of that judgment must be made in the context of the quantitative and qualitative information available to the analyst and the capital market environment in which the analyses were undertaken.

[45] *See,* Federal Reserve Press Release, December 16, 2015.

Q. Has market volatility changed with the Federal Reserve's move toward monetary policy normalization?

A. Yes, it has. A visible and widely reported measure of expected volatility is the Chicago Board Options Exchange ("Cboe") Volatility Index, often referred to as the VIX. As Cboe explains, the VIX "is a calculation designed to produce a measure of constant, 30-day expected volatility of the U.S. stock market, derived from real-time, mid-quote prices of S&P 500® Index (SPX℠) call and put options."[46] Simply, the VIX is a market-based measure of expected volatility. Because volatility is a measure of risk, increases in the VIX, or in its volatility, are a broad indicator of expected increases in market risk.

Although the VIX is not expressed as a percentage, it should be understood as such. That is, if the VIX stood at 15.00, it would be interpreted as an expected standard deviation in annual market returns of 15.00 percent over the coming 30 days. Since 2000, the VIX has averaged about 19.63, which is highly consistent with the long-term standard deviation on annual market returns (19.80 percent, as reported by Duff & Phelps).[47]

Table 8, below, demonstrates the increase in market uncertainty from 2017 to 2019. As the table notes, the standard deviation (that is, the volatility of volatility) from 2018 through 2019 is about 3.40 times higher than its 2017 level (1.36).

[46] Source: http://www.cboe.com/vix.

[47] Source: Duff & Phelps, 2019 SBBI Yearbook, at 6-17.

Table 8: VIX Levels and Volatility[48]

VIX Level and Volatility	
Long-term Average	19.63
2018-2019 Average	16.39
2018-2019 Maximum	37.32
2018-2019 Minimum	9.15
2018-2019 Standard Deviation	4.58
2017 Average	11.09
2017 Maximum	16.04
2017 Minimum	9.14
2017 Standard Deviation	1.36

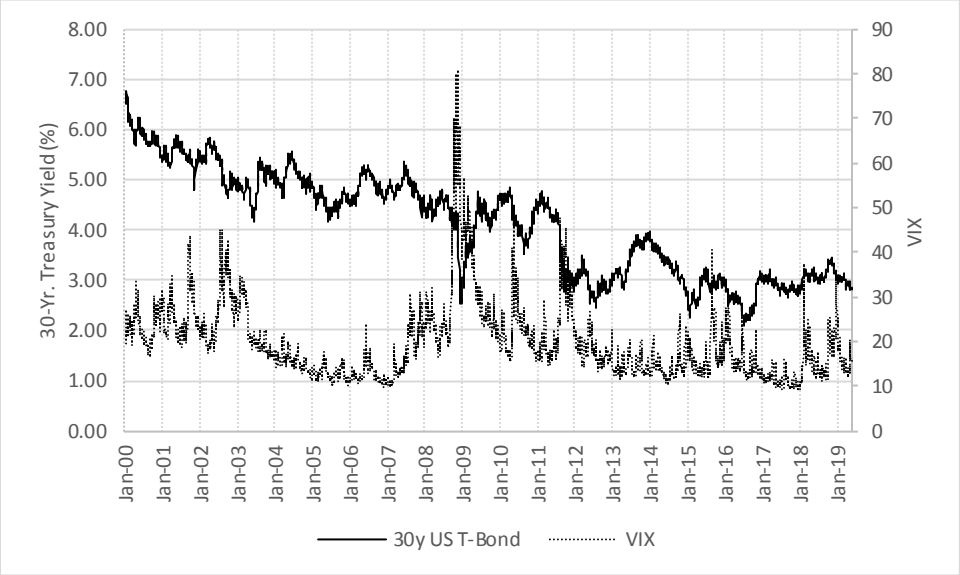
The increase in volatility is not surprising as market participants reassess the Federal Reserve's long-term objective of monetary policy normalization, and the increasing risks associated with federal trade policy initiatives.

Q. Is there a relationship between equity market volatility and interest rates?

A. Yes, there is. Significant and abrupt increases in volatility tend to be associated with declines in Treasury yields. That relationship makes intuitive sense; as investors see increasing risk, their objectives may shift principally to capital preservation (that is, avoiding a capital loss). A means of doing so is to allocate capital to the relative safety of Treasury securities, in a "flight to safety". Because Treasury yields are inversely related to Treasury bond prices, as investors bid up the prices of bonds, they bid down the yields. As Chart 3, below demonstrates, decreases in the 30-year Treasury yield are coincident with significant increases in the VIX.

[48] Source: Bloomberg Professional.

Chart 3: 30-Year Treasury Yields vs. VIX (1/2000 – 5/2019)[49]



In those instances, the fall in yields does not reflect a reduction in required returns, it reflects an increase in risk aversion and, therefore, an increase in required equity returns.

Q. Is market volatility expected to increase from its current levels?

A. Yes, it is. One means of assessing market expectations regarding the future level of volatility is to review Cboe's "Term Structure of Volatility." As Cboe points out:

> The implied volatility term structure observed in SPX options markets is analogous to the term structure of interest rates observed in fixed income markets. Similar to the calculation of forward rates of interest, it is possible to observe the option market's expectation of future market volatility through use of the SPX implied volatility term structure.[50]

Cboe's term structure data is upward sloping, indicating market expectations of increasing volatility. The expected VIX value in June 2020 is about 18.55, suggesting investors see a reversion to long-term average volatility over the coming months.[51]

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49 Sources: S&P Global Market Intelligence; and Bloomberg Professional.

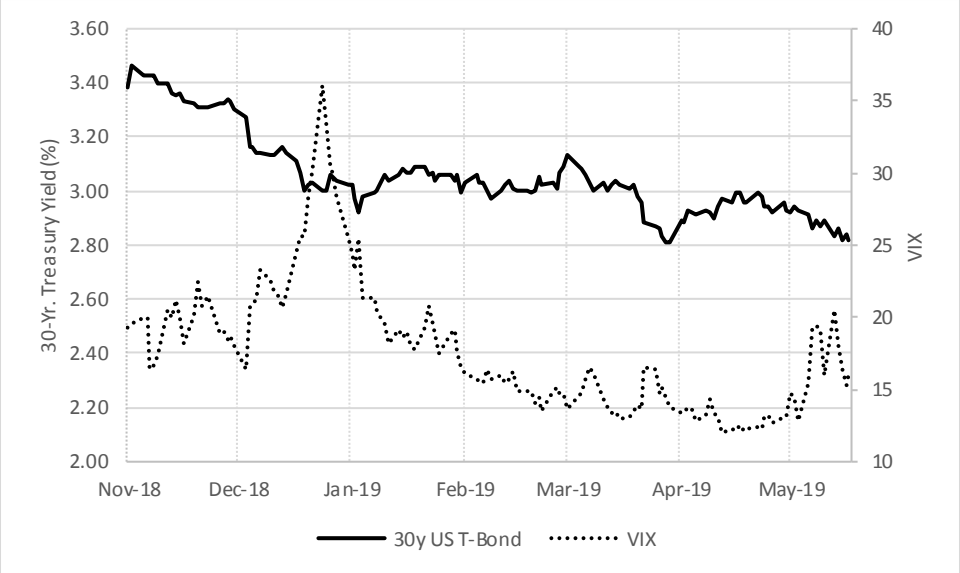
50 Source: http://www.cboe.com/trading-tools/strategy-planning-tools/term-structure-data.

51 Source: http://www.cboe.com/trading-tools/strategy-planning-tools/term-structure-data, accessed June 4, 2019.

Q. Have recent declines in Treasury yields been associated with increases in market volatility?

A. Yes, they have. Since November 2018, the periods during which Treasury yields fell coincided with increases in the VIX (*see,* Chart 4, below).

Chart 4: 30-Year Treasury Yields vs. VIX (11/2018 – 5/2019)[52]



Q. What conclusions do you draw from those analyses?

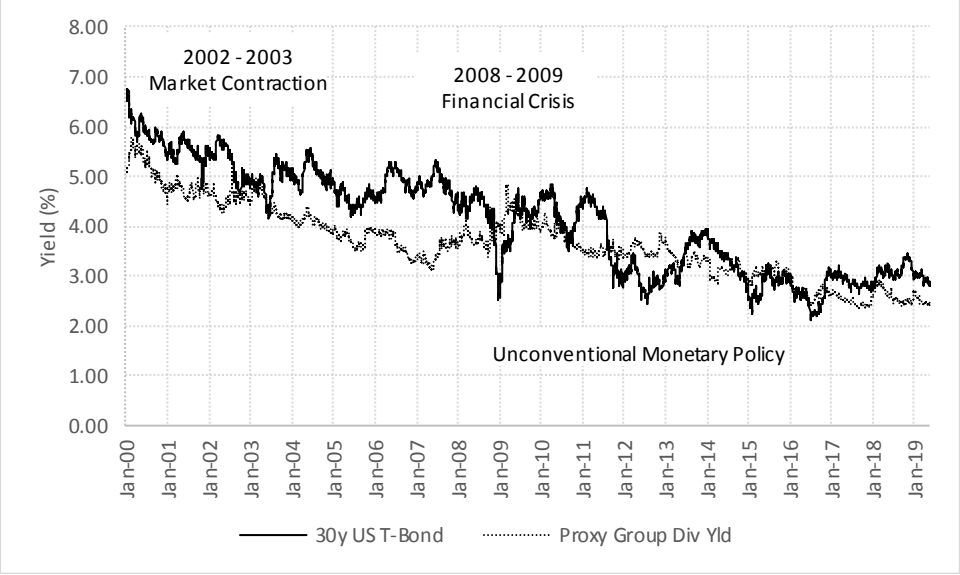
A. It is important to consider whether changes in long-term interest rates reflect fundamental changes in investor sentiment, or whether they reflect potentially transitory factors. The recent, sudden decline in interest appears to be related to the increase in equity market volatility, which may be event-driven rather than a fundamental change. To be clear, I am not suggesting that rates should be set based on temporary events. Rather, in my view, the analytical results should be reviewed within the context of the market environment. Because the methods used to estimate the Cost of Equity are forward-looking, it is important to consider those distinctions in assessing model results.

52 Sources: S&P Global Market Intelligence; and Bloomberg Professional.

Q. Have natural gas utility dividend yields closely followed long-term Treasury yields?

A. Although they have been directionally related over time, the fundamental relationship between Treasury yields and natural gas utility[53] dividend yields changed after the 2008/2009 financial crisis. From 2000 through 2008, Treasury yields generally exceeded natural gas utility dividend yields; the exception was the 2002-2003 market contraction. Then, in 2008-2009, investors sought the safety of Treasury securities, accepting lower Treasury yields in exchange for a greater likelihood of capital preservation. Once the contraction ended (in latter half of 2009), the relationship fluctuated as the Federal Reserve implemented and maintained "unconventional" monetary policies in reaction to the financial crisis (*i.e.*, Quantitative Easing) with the intended consequence of lowering long-term interest rates (*see,* Chart 5, below). As the Federal Reserve began to "normalize" its monetary policy, the relationship was restored.

Chart 5: Utility Dividend Yields and 30-Year Treasury Yields[54]



53 Defined as the proxy group calculated as an index.

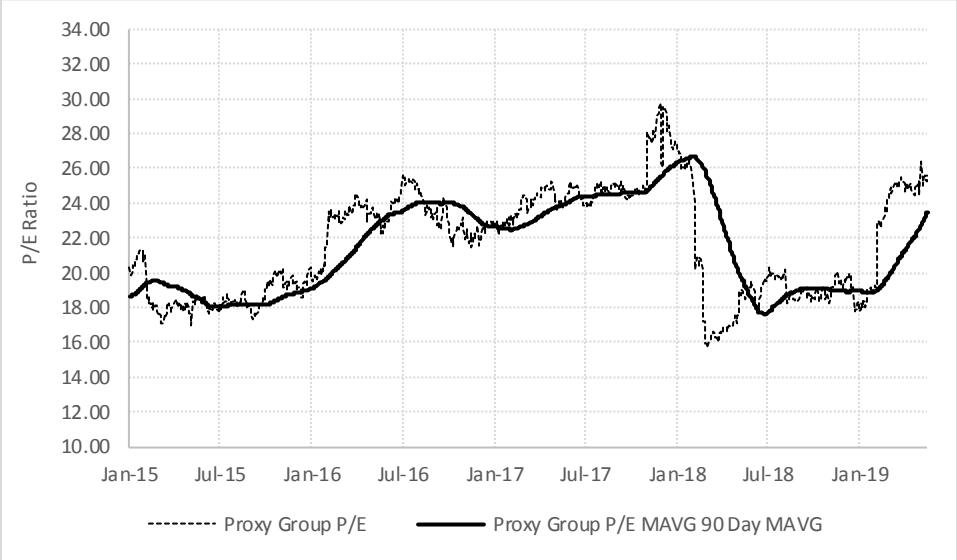
54 Proxy Group Dividend Yield calculated as an index. Source: S&P Global Market Intelligence

Further, as Treasury yields fell in response to central bank policies, dividend yields did not fall to the same degree; the yield spread widened (*see,* Chart 5, above). That data suggests that, although utility prices are sensitive to long-term Treasury yields, the relationship is not unbounded.

Q. Is that relationship also seen in utility price/earnings ratios?

A. Yes, it is. Looking to the period following the Federal Reserve's Quantitative Easing policy, the proxy group P/E ratio have varied, often reverting once it has largely breached its 90-day moving average (*see,* Chart 6, below).

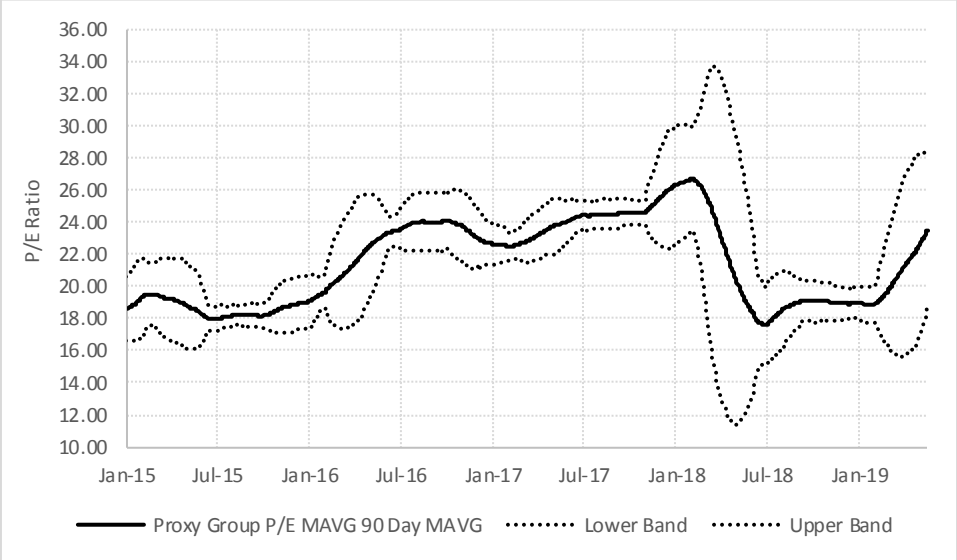
Chart 6: Proxy Group Average Price/Earnings Ratio[55]



From a somewhat different perspective, the proxy group's P/E ratio has traded within a two-standard deviation range, although that range recently has widened, indicating increasing variability in the group's valuation (*see,* Chart 7, below).

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

Chart 7: Proxy Group Average P/E Ratio Bands[56]



That data supports the conclusion discussed earlier, that utility stock prices are sensitive to changes in interest rates, to a degree. The "reach for yield" that sometimes occurs when interest rates fall has a limit; investors will not accept the incremental risk of capital losses when utility valuation levels become "stretched". That also may be the case when investors see interest rates reacting to market volatility that is event-driven, rather than a fundamental change in the capital market environment or investor risk tolerances. The increasing variability can be seen in Chart 7 (above), when the bands around the 90-day moving average P/E ratios widen. During those periods, the risk of capital loss increases, implying a further limit on valuation levels.

[56] Calculated as an index. Bands represent two standard deviations calculated over 90 days. Source: S&P Global Market Intelligence.

Q. What conclusions do you draw from your analyses of the current capital market environment, and how do those conclusions affect your ROE recommendation?

A. Because certain models used to estimate the Cost of Equity require long-term assumptions, it is important to understand whether those assumptions hold. The current market environment is one in which changes in interest rates may be associated with events, more than they are a function of fundamental economic conditions. Further, utility valuations have a limit, even when investors look to them for an alternate source of income as interest rates fall.

On balance, it remains important to consider changes in market conditions, the likely causes of those changes, and how model results are affected by them. Those assessments necessarily involve the application of reasoned and experience judgment. As discussed throughout my testimony, that judgment supports my recommended range of 9.90 percent to 10.75 percent.

VII. CAPITAL STRUCTURE

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

A. While the Company's actual projected 2020 common equity is 60.00 percent, the Company has proposed a capital structure of 55.00 percent common equity and 45.00 percent long-term debt.

Q. How does the capital structure affect the Cost of Equity?

A. The capital structure relates to a company's financial risk, which represents the risk that a company may not have adequate cash flows to meet its financial obligations, and is a function of the percentage of debt (or financial leverage) in its capital structure. As the percentage of debt in the capital structure increases, so do the fixed obligations for the

repayment of that debt. Consequently, as the degree of financial leverage increases, the risk of financial distress (*i.e.*, financial risk) also increases. That risk is particularly relevant given the long-lived nature of utility assets. The average useful life of the DEI's gas distribution utility plant in service is more than 40 years.[57] Because equity is perpetual and helps extend the average tenor of the securities financing the rate base, it is appropriate to consider the ratios of long-term debt and equity in determining the capital structure. Lastly, because the capital structure can affect the subject company's overall level of risk,[58] it is an important consideration in establishing a just and reasonable rate of return.

Q. Please discuss your analysis of the capital structures of the proxy group companies.

A. Because it is appropriate to normalize the relative relationship between the capital components over a period of time when making the comparison to the Company's capital structure, I calculated the average capital structure for each of the proxy group companies over the last eight quarters. As shown in DEU Exhibit 2.10, the mean of the proxy group actual capital structures is 54.29 percent common equity and 45.71 percent long-term debt. The common equity ratios (on a company-specific basis) range from 42.20 percent to 66.27 percent. Based on that review, it is apparent that the Company's actual and proposed capital structure are generally consistent with the capital structures of the proxy group companies.

Q. What is your conclusion regarding an appropriate capital structure for DEU?

A. Considering the proxy group companies' average common equity ratios range from 42.20 percent to 66.27 percent, I believe that DEU's actual common equity ratio of 60.00

[57] *See* Dominion Energy, Inc., SEC Form 10-K for the year ended December 31, 2018, at 101.

[58] *See* Roger A. Morin, New Regulatory Finance, Public Utility Reports, Inc., 2006, at 45-46.

821 percent and proposed common equity ratio of 55.00 percent are appropriate as each is
822 consistent with the proxy group companies.

823 ## VIII. COST OF DEBT

824 **Q. What Cost of Debt has the Company requested in this proceeding?**

825 A. The Company has proposed a Cost of Debt of 4.34 percent, as discussed by Mr.
826 Stephenson in his pre-filed direct testimony provided as DEU Exhibit 3.0.

827 **Q. Please discuss your analysis of the Company's Cost of Debt.**

828 A. To test the reasonableness of the Company's proposed Cost of Debt, I reviewed the yield
829 on equivalent debt at the time of issuance. As shown in DEU Exhibit 2.11, I compared
830 the cost of each individual issuance to the Moody's A and BBB Utility Index at the time
831 of the issuance.[59] The expected Cost of Debt, based on the Moody's A and BBB Utility
832 Bond Index (the "Moody's Index") ranges from 4.50 percent to 4.90 percent, indicating
833 that its 4.34 percent proposed weighted average Cost of Debt is reasonable.

834 ## IX. CONCLUSIONS AND RECOMMENDATION

835 **Q. What is your conclusion regarding the Company's Cost of Equity and capital**
836 **structure?**

837 A. As discussed throughout my Direct Testimony, and in keeping with the *Hope* and
838 *Bluefield* standards described earlier, it is prudent and appropriate to consider multiple
839 methodologies to arrive at an ROE recommendation for DEU. As discussed in Appendix
840 A and as shown in DEU Exhibit 2.01 through DEU Exhibit 2.11, I have performed
841 several analyses to estimate DEU's Cost of Equity. In light of those results, and taking
842 into consideration other relevant and observable market data, including certain risk

59 DEU Exhibit 2.11.

factors the Company faces, I believe that an ROE in the range of 9.90 percent to 10.75 percent represents the range of returns required by equity investors under current and expected market conditions. Within that range, I conclude that an ROE of 10.50 percent represents an appropriate estimate of the Cost of Equity for DEU considering its risk profile. Specifically, my recommendation also considers (but does not make specific adjustments for) (1) the risk associated with electrification; (2) the Company's planned capital expenditures and the effect, if any, of certain regulatory mechanisms; and (3) the direct costs associated with equity issuances. Lastly, I conclude that the Company's proposed capital structure, which includes 55.00 percent common equity and 45.00 percent long-term debt, and proposed Cost of Debt of 4.34 percent, are reasonable and appropriate.

Q. Does this conclude your Direct Testimony?

A. Yes, it does.

X. APPENDIX A

A. Constant Growth Discounted Cash Flow Model

Q. Please more fully describe the Constant Growth DCF approach.

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

$$P = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \ldots + \frac{D_\infty}{(1+k)^\infty} \qquad [4]$$

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

$$k = \frac{D_0 (1+g)}{P} + g \qquad [5]$$

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

Q. What assumptions are inherent in the Constant Growth DCF model?

A. The Constant Growth DCF model assumes: (1) earnings, book value, and dividends all grow at the same, constant rate in perpetuity; (2) a constant dividend payout ratio in perpetuity; (3) the observed P/E ratio will remain constant in perpetuity; and (4) estimated Cost of Equity will remain constant, also in perpetuity.

Q. What market data did you use to calculate the dividend yield in your Constant Growth DCF model?

A. The dividend yield is based on each proxy company's current annualized dividend and average closing stock price over the 30-, 90-, and 180-trading day periods as of May 17, 2019, as explained more fully below.

Q. Why did you use three averaging periods to calculate an average stock price?

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

Q. Did you make any adjustments to the dividend yield to account for periodic growth in dividends?

A. Yes, I did. Because utility companies tend to increase their quarterly dividends at different times throughout the year, it is reasonable to assume that dividend increases will be evenly distributed over calendar quarters. Given that assumption, it is appropriate to calculate the expected dividend yield by applying one-half of the long-term growth rate to the current dividend yield. That adjustment ensures that the expected dividend yield is, on average, representative of the coming twelve-month period, and does not overstate the dividends to be paid during that time.

Q. Is it important to select appropriate measures of long-term growth in applying the DCF model?

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

Q. Please summarize the findings of academic research on the appropriate measure for estimating equity returns using the DCF model.

A. The relationship between various growth rates and stock valuation metrics has been the subject of much academic research.[60] As noted over 40 years ago by Charles Phillips in The Economics of Regulation:

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

[60] *See, for example*, Robert S. Harris, *Using Analysts' Growth Forecasts to Estimate Shareholder Required Rate of Return*, Financial Management, Spring 1986.

increased emphasis in rate cases.[61]

Phillips' conclusion continues to hold true. Subsequent academic research has clearly and consistently indicated that measures of earnings and cash flow are strongly related to returns, and that analysts' forecasts of growth are superior to other measures of growth in predicting stock prices.[62] For example, Vander Weide and Carleton state that, "[our] results…are consistent with the hypothesis that investors use analysts' forecasts, rather than historically oriented growth calculations, in making stock buy-and-sell decisions."[63] Other research specifically has noted the importance of analysts' growth estimates in determining the Cost of Equity, and in the valuation of equity securities. Dr. Robert Harris noted that "a growing body of knowledge shows that analysts' earnings forecasts are indeed reflected in stock prices."[64] Citing Cragg and Malkiel, Dr. Harris notes that those authors "found that the evaluations of companies that analysts make are the sorts of ones on which market valuation is based."[65] As Brigham, Shome and Vinson noted, "evidence in the current literature indicates that (i) analysts' forecasts are superior to forecasts based solely on time series data; and (ii) investors do rely on analysts' forecasts."[66]

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61 Charles F. Phillips, Jr., The Economics of Regulation, Revised Edition, 1969, Richard D. Irwin, Inc., at 285.

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

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

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

65 *Id*.

66 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.

To that point, the research of Carleton and Vander Weide found earnings growth projections had a statistically significant relationship to stock valuation levels, whereas dividend growth rates did not.[67] Those findings suggest that investors form their investment decisions based on expectations of growth in earnings, not dividends. Consequently, earnings growth not dividend growth, is the appropriate estimate in the Constant Growth DCF model.

Q. Please summarize your inputs to the Constant Growth DCF model.

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

- The average daily closing prices for the 30-, 90-, and 180-trading days ended May 17, 2019 for the term P_0; and
- The annualized dividend per share as of May 17, 2019 for the term D_0.

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

- The Zacks consensus long-term earnings growth estimates;
- The First Call consensus long-term earnings growth estimates;
- The Value Line long-term earnings growth estimates; and
- An estimate of retention growth.

As explained below, I calculated a low, mean, and high DCF result for each proxy company (*see,* DEU Exhibit 2.01).

Q. Please describe the retention growth estimate as applied in your DCF model.

A. The Retention Growth model, which is a generally recognized and widely taught method of estimating long-term growth, is an alternative approach to the use of analysts' earnings

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

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

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

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

where $\frac{M}{B}$ is the Market-to-Book ratio. In this form, the "sv" term reflects an element of growth as the product of (a) the growth in shares outstanding, and (b) that portion of the market-to-book ratio that exceeds unity. As shown in DEU Exhibit 2.02, all components of the Retention Growth model may be derived from data provided by Value Line.

Q. How did you calculate the mean high and mean low DCF results?

A. For each proxy company, I calculated the high DCF result by combining the maximum EPS growth rate estimate as reported by Value Line, Zacks, and First Call with the subject company's dividend yield. The mean high result simply is the average of those estimates. I used the same approach to calculate the low DCF result, using instead the

minimum of the Value Line, Zacks, and First Call estimate for each proxy company, and calculating the average result for those estimates.

Q. What are the results of your Constant Growth DCF analysis?

A. My Constant Growth DCF results are summarized in Table 9 below (*see also,* DEU Exhibit 2.01).

Table 9: Mean Constant Growth DCF Results[68]

	Mean Low	Mean	Mean High
30-Day Average	7.47%	9.66%	13.45%
90-Day Average	7.54%	9.73%	13.52%
180-Day Average	7.57%	9.75%	13.55%

B. CAPM Analysis and Empirical CAPM Analysis

Q. Please briefly describe the general form of the CAPM analysis.

A. The CAPM analysis 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 [6], the CAPM is defined by four components, each of which theoretically must be a forward-looking estimate:

$$K_e = r_f + \beta(r_m - r_f) \qquad [7]$$

where:

K_e = the required market ROE for a security;

β = the Beta coefficient of that security;

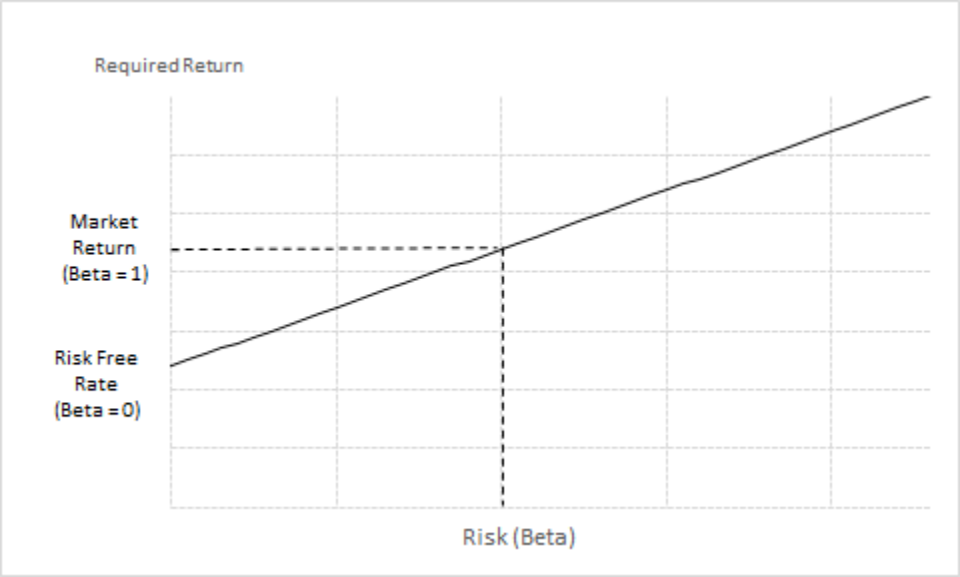
r_f = the risk-free rate of return; and

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

[68] DEU Exhibit 2.01.

Equation [6] describes the Security Market Line ("SML"), or the CAPM risk-return relationship, which is graphically depicted in Chart 8, below. The intercept is the risk-free rate (r_f), which has a Beta coefficient of zero, the slope is the expected Market Risk Premium ($r_m - r_f$). By definition, r_m, the return on the market has a Beta coefficient of 1.00. Under the CAPM, the expected Equity Risk Premium for a given security is proportional to its Beta coefficient.

Chart 8: Security Market Line



In Equation [6], the term ($r_m - r_f$) represents the Market Risk Premium.[69] According to the theory underlying the CAPM, because unsystematic risk can be diversified away by adding securities to investment portfolios, the market will not compensate investors for bearing that risk. Therefore, investors should be concerned only with systematic or non-diversifiable risk. Non-diversifiable risk is measured by the Beta coefficient, which is defined as:

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

[69] The Market Risk Premium is defined as the incremental return of the market portfolio over the risk-free rate.

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

Intuitively, companies with higher Beta coefficients have had more volatile returns, and have moved more closely with the overall market. The implication is that a company with a Beta coefficient of 1.00 is as risky as the overall market; companies with Beta coefficients less than 1.00 are less risky, and those whose Beta coefficients are greater than 1.00 have greater risk than the overall market.

Q. What assumptions did you include in your CAPM analysis?

A. Because utility assets represent long duration investments, I used two different measures of the risk-free rate: (1) the current 30-day average yield on 30-year Treasury bonds (2.92 percent)[70]; and (2) the near-term projected 30-year Treasury yield (3.08 percent).[71]

Q. Why have you relied on the 30-year Treasury yield for your CAPM analysis?

A. In determining the risk-free rate, it is important to select the term (or maturity) that best matches the life of the underlying investment. Natural gas distribution utilities typically are long-duration investments and as such, the 30-year Treasury yield is most suitable for the purpose of calculating the Cost of Equity.

70 Source: Bloomberg Professional.

71 Source: Blue Chip Financial Forecast, Vol. 38, No. 5, May 1, 2019, at 2.

Q. Please describe your *ex-ante* (*i.e.*, forward-looking) approach to estimating the Market Risk Premium.

A. The approach is based on the market required return, less the current 30-year Treasury yield. To estimate the market required return, I calculated the market capitalization weighted average ROE based on the Constant Growth DCF model. To do so, I relied on data from two sources: (1) Bloomberg; and (2) Value Line. With respect to Bloomberg-derived growth estimates, I calculated the expected dividend yield (using the same one-half growth rate assumption described earlier), and combined that amount with the projected earnings growth rate to arrive at the market capitalization weighted average DCF result. I performed that calculation for each of the S&P 500 companies for which Bloomberg provided consensus growth rates. I then subtracted the current 30-year Treasury yield from that amount to arrive at the market DCF-derived *ex-ante* market risk premium estimate. In the case of Value Line, I performed the same calculation, again using all companies for which five-year earnings growth rates were available. The results of those calculations are provided in DEU Exhibit 2.03.

Q. How did you apply your expected Market Risk Premium and risk-free rate estimates?

A. I relied on the *ex-ante* Market Risk Premia discussed above, together with the current and near-term projected 30-year Treasury yields as inputs to my CAPM analyses.

Q. What Beta coefficient did you use in your CAPM model?

A. As shown in DEU Exhibit 2.04, I considered Beta coefficients reported by two sources, Bloomberg and Value Line. Although both services adjust their calculated (or "raw") Beta coefficients to reflect the tendency to regress to the market mean of 1.00, Value

Line calculates the Beta coefficient over a five-year period, whereas Bloomberg's calculation is based on two years of data.

Q. What are the results of your CAPM analysis?

A. As shown in Table 10, below, the CAPM analyses suggest an ROE range of 8.94 percent to 11.35 percent (*see also,* DEU Exhibit 2.05).

Table 10: Summary of CAPM Results[72]

	Bloomberg Derived Market Risk Premium	**Value Line Derived Market Risk Premium**
Average Bloomberg Beta Coefficient		
Current 30-Year Treasury (2.92%)	8.94%	9.80%
Near Term Projected 30-Year Treasury (3.08%)	9.10%	9.97%
Average Value Line Beta Coefficient		
Current 30-Year Treasury (2.92%)	10.14%	11.18%
Near Term Projected 30-Year Treasury (3.08%)	10.31%	11.35%

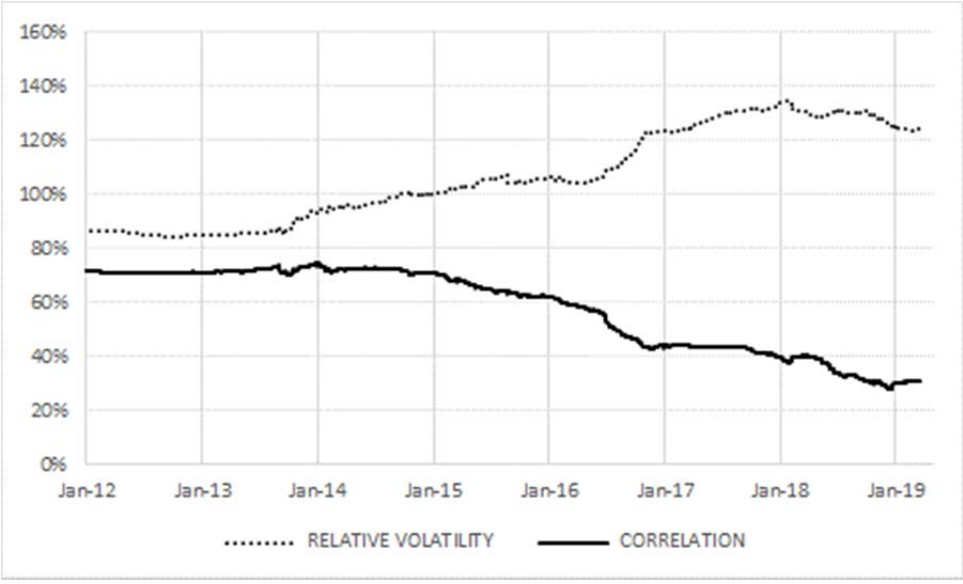
Q. Does the recent decline in the proxy group average Beta coefficient imply a decrease in risk relative to the market?

A. Not necessarily. Although the proxy group average Beta coefficient reported by Bloomberg has fallen from approximately 0.72 in 2014 to 0.57 in May 2019, as Chart 9, below, demonstrates, when the Beta coefficient is deconstructed into its components shown in Equation [7] above, we see that the correlation between the proxy group companies and the S&P 500 has declined, while the relative risk has increased. Given that the correlation between the proxy group companies and the S&P 500 has declined since 2014, while the relative risk has increased, the CAPM in the form presented here

72 DEU Exhibit 2.05.

may not adequately reflect the expected systematic risk, and therefore, the returns required by investors in low-Beta coefficient companies such as utilities.

Chart 9: Components of Beta Coefficients Over Time[73]



Q. Did you consider another form of the CAPM in your analysis?

A. Yes. I also included the ECAPM approach, which calculates the product of the adjusted Beta coefficient and the Market Risk Premium, and applies a weight of 75.00 percent to that result. The model then applies a 25.00 percent weight to the Market Risk Premium, without any effect from the Beta coefficient.[74] The results of the two calculations are summed, along with the risk-free rate, to produce the ECAPM result, as noted in Equation [8] below:

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

where:

k_e = the required market ROE.

[73] Calculated as an index. Source: S&P Global Market Intelligence.

[74] *See, e.g.,* Roger A. Morin, New Regulatory Finance, 189-90 (2006).

β = Adjusted Beta coefficient of an individual security.

r_f = the risk-free rate of return.

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

Q. What is the benefit of the ECAPM approach?

A. The ECAPM addresses the tendency of the CAPM to under-estimate the Cost of Equity for companies, such as regulated utilities, with low Beta coefficients. As discussed below, the ECAPM recognizes the results of academic research indicating that the risk-return relationship is different (in essence, flatter) than estimated by the CAPM, and that the CAPM under-estimates the alpha, or the constant return term.[75]

Numerous tests of the CAPM have measured the extent to which security returns and Beta coefficients are related as predicted by the CAPM. The ECAPM method reflects the finding that the actual Security Market Line (SML) described by the CAPM formula is not as steeply sloped as the predicted SML.[76] Fama and French state that "[t]he returns on the low beta portfolios are too high, and the returns on the high beta portfolios are too low."[77] Similarly, Morin states:

> With few exceptions, the empirical studies agree that . . . low-beta securities earn returns somewhat higher than the CAPM would predict, and high-beta securities earn less than predicted. . . .
>
> Therefore, the empirical evidence suggests that the expected return on a security is related to its risk by the following approximation:
>
> $$K = R_F + x(R_M - R_F) + (1-x)\ \beta(R_M - R_F)$$
>
> where x is a fraction to be determined empirically. The value of x that

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

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

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

best explains the observed relationship Return = 0.0829 + 0.0520 β is between 0.25 and 0.30. If x = 0.25, the equation becomes:

$$K = R_F + 0.25(R_M - R_F) + 0.75\,\beta(R_M - R_F)$$ [78]

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

> Some have argued that the use of the ECAPM is inconsistent with the use of adjusted betas, such as those supplied by Value Line and Bloomberg. This is because the reason for using the ECAPM is to allow for the tendency of betas to regress toward the mean value of 1.00 over time, and, since Value Line betas are already adjusted for such trend, an ECAPM analysis results in double-counting. This argument is erroneous. Fundamentally, the ECAPM is not an adjustment, increase or decrease, in beta. This is obvious from the fact that the expected return on high beta securities is actually lower than that produced by the CAPM estimate. The ECAPM is a formal recognition that the observed risk-return tradeoff is flatter than predicted by the CAPM based on myriad empirical evidence. The ECAPM and the use of adjusted betas comprised two separate features of asset pricing. Even if a company's beta is estimated accurately, the CAPM still understates the return for low-beta stocks. Even if the ECAPM is used, the return for low-beta securities is understated if the betas are understated. Referring back to Figure 6-1, the ECAPM is a return (vertical axis) adjustment and not a beta (horizontal axis) adjustment. Both adjustments are necessary. [79]

Therefore, it is appropriate to rely on adjusted Beta coefficients in both the CAPM and ECAPM. As with the CAPM, my application of the ECAPM uses the Market DCF-

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[78] Roger A. Morin, New Regulatory Finance, 175, 190 (2006).

[79] *Id.,* at 191.

derived *ex-ante* Market Risk Premium estimate, the current yield on 30-year Treasury securities as the risk-free rate, and two estimates of the Beta coefficient. The results of my ECAPM analyses are shown in DEU Exhibit 2.05 and summarized in Table 11, below.

Table 11: Summary of ECAPM Results[80]

	Bloomberg Derived Market Risk Premium	**Value Line Derived Market Risk Premium**
Average Bloomberg Beta Coefficient		
Current 30-Year Treasury (2.92%)	10.06%	11.09%
Near Term Projected 30-Year Treasury (3.08%)	10.23%	11.25%
Average Value Line Beta Coefficient		
Current 30-Year Treasury (2.92%)	10.96%	12.12%
Near Term Projected 30-Year Treasury (3.08%)	11.13%	12.28%

C. Bond Yield Plus Risk Premium Approach

Q. Please generally describe the Bond Yield Plus Risk Premium approach.

A. This approach is based on the basic financial principle that because equity investors bear the residual risk associated with ownership, they require a premium over the return they would have earned as a bondholder. That is, because returns to equity holders are more risky than returns to bondholders, equity investors must be compensated for bearing that additional risk. Risk premium approaches, therefore, estimate the Cost of Equity as the sum of the equity risk premium and the yield on a particular class of bonds. As noted in my discussion of the CAPM, because the equity risk premium is not directly observable, it typically is estimated using a variety of approaches, some of which incorporate *ex-ante*,

80 DEU Exhibit 2.05.

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

Q. Please explain how you performed your Bond Yield Plus Risk Premium analysis.

A. As suggested above, I first defined the Risk Premium as the difference between the authorized ROE and the then-prevailing level of the long-term (*i.e.*, 30-year) Treasury yield. I then gathered data for 1,120 natural gas utility rate proceedings between January 1980 and May 17, 2019. In addition to the authorized ROE, I also calculated the average period between the filing of the case and the date of the final order (the "lag period"). To reflect the prevailing level of interest rates during the pendency of the proceedings, I calculated the average 30-year Treasury yield over the average lag period (approximately 187 days).

Because the data covers multiple economic cycles, the analysis also may be used to assess the stability of the Equity Risk Premium. Prior research, for example, has shown that the Equity Risk Premium is inversely related to the level of interest rates. That analysis is particularly relevant given the relatively low, but increasing level of current Treasury yields.

Q. How did you model the relationship between interest rates and the Equity Risk Premium?

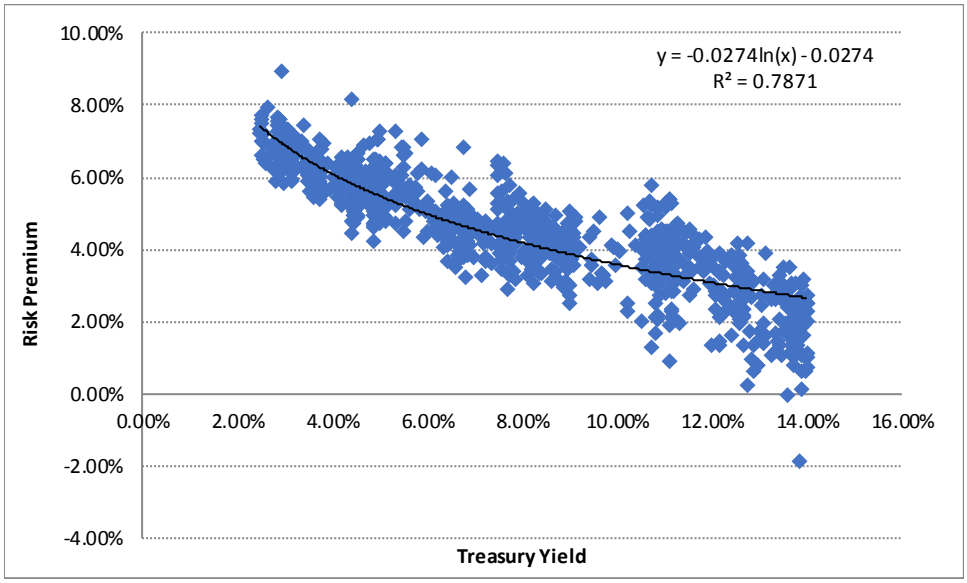
A. The basic method used was regression analysis, in which the observed Equity Risk Premium is the dependent variable, and the average 30-year Treasury yield is the independent variable. Relative to the long-term historical average, the analytical period includes interest rates and authorized ROEs that are quite high during one period (*i.e.*, the

1980s) and that are quite low during another (*i.e.*, the post-Lehman bankruptcy period). To account for that variability, I used the semi-log regression, in which the Equity Risk Premium is expressed as a function of the natural log of the 30-year Treasury yield:

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

As shown on Chart 10, below, the semi-log form is useful when measuring an absolute change in the dependent variable (in this case, the Risk Premium) relative to a proportional change in the independent variable (the 30-year Treasury yield).

Chart 10: Equity Risk Premium[81]



As Chart 10 illustrates, the Equity Risk Premium increases as interest rates fall. That finding, that there is an inverse relationship between interest rates and the Equity Risk Premium is supported by published research. For example, Dr. Roger Morin notes that: "… [p]ublished studies by Brigham, Shome, and Vinson (1985), Harris (1986), Harris and Marston (1992, 1993), Carleton, Chambers, and Lakonishok (1983), Morin (2005), McShane (2005), and others demonstrate that, beginning in 1980, risk premiums

81 DEU Exhibit 2.06.

varied inversely with the level of interest rates - rising when rates fell and declining when interest rates rose."[82] Consequently, simply applying the long-term average Equity Risk Premium of 4.70 percent would significantly understate the Cost of Equity and produce results well below any reasonable estimate. Based on the regression coefficients in Chart 10, however, the implied ROE is between 9.87 percent and 10.11 percent (*see,* Table 12, below, and DEU Exhibit 2.06).

Table 12: Summary of Bond Yield Plus Risk Premium Results[83]

	Return on Equity
Current 30-Year Treasury (2.92%)	9.87%
Near-Term Projected 30-Year Treasury (3.08%)	9.89%
Long-Term Projected 30-Year Treasury (4.05%)	10.11%

D. Expected Earnings Analysis

Q. Please describe the Expected Earnings analysis.

A. The Expected Earnings analysis is based on the principle of opportunity costs. Because investors may invest in, and earn returns on alternative investments of similar risk, those rates of return can provide a useful benchmark in determining the appropriate rate of return for a firm. Further, because those results are based solely on the returns expected by investors, exclusive of market-data or models, the Expected Earnings approach provides a direct comparison.

Q. Please explain how the Expected Earnings analysis is conducted.

A. The Expected Earnings analysis typically takes the actual earnings on book value of investment for each of the members of the proxy group and compares those values to the

82 Roger A: Morin, New Regulatory Finance, Public Utilities Reports, Inc., 2006, at 128 [clarification added]

83 DEU Exhibit 2.06.

rate of return in question. Although the traditional approach uses data based on historical accounting records, it is common to use forecasted data in conducting the analysis. Projected returns on book investment are provided by various industry publications (*e.g.,* Value Line), which I have used in my analysis.

I relied on Value Line's projected Return on Common for the period 2022-2024, and adjusted those projected returns to account for the fact that they reflect common shares outstanding at the end of the period, rather than the average shares outstanding over the course of the year.[84] The results range from 9.58 percent to 12.13 percent, with an average value of 10.73 percent and median value of 10.41 percent (*see,* DEU Exhibit 2.07).

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

Constant Growth Discounted Cash Flow Model
30 Day Average Stock Price

Company	Ticker	[1] Annualized Dividend	[2] Average Stock Price	[3] Dividend Yield	[4] Expected Dividend Yield	[5] Zacks Earnings Growth	[6] First Call Earnings Growth	[7] Value Line Earnings Growth	[8] Retention Growth Estimate	[9] Average Earnings Growth	[10] Low ROE	[11] Mean ROE	[12] High ROE
Atmos Energy Corporation	ATO	$2.10	$101.11	2.08%	2.16%	6.50%	6.45%	7.50%	10.09%	7.64%	8.59%	9.79%	12.27%
Chesapeake Utilities Corporation	CPK	$1.62	$92.44	1.75%	1.82%	6.00%	6.00%	9.00%	10.63%	7.91%	7.81%	9.73%	12.48%
New Jersey Resources Corporation	NJR	$1.17	$49.40	2.37%	2.43%	7.00%	6.00%	2.50%	5.48%	5.25%	4.90%	7.68%	9.45%
Northwest Natural Holding Company	NWN	$1.90	$66.82	2.84%	2.99%	4.50%	4.00%	25.50%	6.42%	10.11%	6.90%	13.09%	28.71%
ONE Gas, Inc.	OGS	$2.00	$87.48	2.29%	2.36%	5.90%	5.00%	9.00%	5.27%	6.29%	7.34%	8.65%	11.39%
South Jersey Industries, Inc.	SJI	$1.15	$31.97	3.60%	3.73%	7.20%	5.90%	9.50%	7.05%	7.41%	9.60%	11.14%	13.27%
Spire Inc.	SR	$2.37	$83.36	2.84%	2.91%	3.80%	2.82%	5.50%	5.85%	4.49%	5.70%	7.40%	8.78%
Southwest Gas Corporation	SWX	$2.18	$82.86	2.63%	2.72%	6.20%	6.30%	8.50%	7.18%	7.04%	8.91%	9.77%	11.24%
Proxy Group Mean				2.55%	2.64%	5.89%	5.31%	9.63%	7.25%	7.02%	7.47%	9.66%	13.45%
Proxy Group Median				2.50%	2.58%	6.10%	5.95%	8.75%	6.73%	7.23%	7.57%	9.75%	11.83%

Notes:
[1] Source: Bloomberg Professional
[2] Source: Bloomberg Professional, equals indicated number of trading day average as of May 17, 2019
[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 RBH-2, Value Line
[9] Equals Average([5], [6], [7], [8])
[10] Equals [3] x (1 + 0.5 x Minimum([5], [6], [7], [8])) + Minimum([5], [6], [7], [8])
[11] Equals [4] + [9]
[12] Equals [3] x (1 + 0.5 x Maximum([5], [6], [7], [8])) + Maximum([5], [6], [7], [8])

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Constant Growth Discounted Cash Flow Model
90 Day Average Stock Price

Company	Ticker	[1] Annualized Dividend	[2] Average Stock Price	[3] Dividend Yield	[4] Expected Dividend Yield	[5] Zacks Earnings Growth	[6] First Call Earnings Growth	[7] Value Line Earnings Growth	[8] Retention Growth Estimate	[9] Average Earnings Growth	[10] Low ROE	[11] Mean ROE	[12] High ROE
Atmos Energy Corporation	ATO	$2.10	$99.20	2.12%	2.20%	6.50%	6.45%	7.50%	10.09%	7.64%	8.64%	9.83%	12.32%
Chesapeake Utilities Corporation	CPK	$1.62	$90.61	1.79%	1.86%	6.00%	6.00%	9.00%	10.63%	7.91%	7.84%	9.77%	12.52%
New Jersey Resources Corporation	NJR	$1.17	$48.43	2.42%	2.48%	7.00%	6.00%	2.50%	5.48%	5.25%	4.95%	7.73%	9.50%
Northwest Natural Holding Company	NWN	$1.90	$64.40	2.95%	3.10%	4.50%	4.00%	25.50%	6.42%	10.11%	7.01%	13.20%	28.83%
ONE Gas, Inc.	OGS	$2.00	$85.70	2.33%	2.41%	5.90%	5.00%	9.00%	5.27%	6.29%	7.39%	8.70%	11.44%
South Jersey Industries, Inc.	SJI	$1.15	$31.06	3.70%	3.84%	7.20%	5.90%	9.50%	7.05%	7.41%	9.71%	11.25%	13.38%
Spire Inc.	SR	$2.37	$80.20	2.96%	3.02%	3.80%	2.82%	5.50%	5.85%	4.49%	5.82%	7.51%	8.89%
Southwest Gas Corporation	SWX	$2.18	$81.30	2.68%	2.78%	6.20%	6.30%	8.50%	7.18%	7.04%	8.96%	9.82%	11.30%
Proxy Group Mean				2.62%	2.71%	5.89%	5.31%	9.63%	7.25%	7.02%	7.54%	9.73%	13.52%
Proxy Group Median				2.55%	2.63%	6.10%	5.95%	8.75%	6.73%	7.23%	7.62%	9.79%	11.88%

Notes:
[1] Source: Bloomberg Professional
[2] Source: Bloomberg Professional, equals indicated number of trading day average as of May 17, 2019
[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 RBH-2, Value Line
[9] Equals Average([5], [6], [7], [8])
[10] Equals [3] x (1 + 0.5 x Minimum([5], [6], [7], [8])) + Minimum([5], [6], [7], [8])
[11] Equals [4] + [9]
[12] Equals [3] x (1 + 0.5 x Maximum([5], [6], [7], [8])) + Maximum([5], [6], [7], [8])

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Constant Growth Discounted Cash Flow Model
180 Day Average Stock Price

Company	Ticker	[1] Annualized Dividend	[2] Average Stock Price	[3] Dividend Yield	[4] Expected Dividend Yield	[5] Zacks Earnings Growth	[6] First Call Earnings Growth	[7] Value Line Earnings Growth	[8] Retention Growth Estimate	[9] Average Earnings Growth	[10] Low ROE	[11] Mean ROE	[12] High ROE
Atmos Energy Corporation	ATO	$2.10	$97.00	2.16%	2.25%	6.50%	6.45%	7.50%	10.09%	7.64%	8.68%	9.88%	12.37%
Chesapeake Utilities Corporation	CPK	$1.62	$87.42	1.85%	1.93%	6.00%	6.00%	9.00%	10.63%	7.91%	7.91%	9.83%	12.59%
New Jersey Resources Corporation	NJR	$1.17	$47.63	2.46%	2.52%	7.00%	6.00%	2.50%	5.48%	5.25%	4.99%	7.77%	9.54%
Northwest Natural Gas Company	NWN	$1.90	$65.43	2.90%	3.05%	4.50%	4.00%	25.50%	6.42%	10.11%	6.96%	13.16%	28.77%
ONE Gas, Inc.	OGS	$2.00	$83.74	2.39%	2.46%	5.90%	5.00%	9.00%	5.27%	6.29%	7.45%	8.76%	11.50%
South Jersey Industries, Inc.	SJI	$1.15	$31.60	3.64%	3.77%	7.20%	5.90%	9.50%	7.05%	7.41%	9.65%	11.19%	13.31%
Spire Inc.	SR	$2.37	$77.74	3.05%	3.12%	3.80%	2.82%	5.50%	5.85%	4.49%	5.91%	7.61%	8.99%
Southwest Gas Corporation	SWX	$2.18	$80.58	2.71%	2.80%	6.20%	6.30%	8.50%	7.18%	7.04%	8.99%	9.85%	11.32%
Proxy Group Mean				2.65%	2.74%	5.89%	5.31%	9.63%	7.25%	7.02%	7.57%	9.75%	13.55%
Proxy Group Median				2.58%	2.66%	6.10%	5.95%	8.75%	6.73%	7.23%	7.68%	9.84%	11.93%

Notes:
[1] Source: Bloomberg Professional
[2] Source: Bloomberg Professional, equals indicated number of trading day average as of May 17, 2019
[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 RBH-2, Value Line
[9] Equals Average([5], [6], [7], [8])
[10] Equals [3] x (1 + 0.5 x Minimum([5], [6], [7], [8])) + Minimum([5], [6], [7], [8])
[11] Equals [4] + [9]
[12] Equals [3] x (1 + 0.5 x Maximum([5], [6], [7], [8])) + Maximum([5], [6], [7], [8])

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Retention Growth Estimate

Company	Ticker	[1] Projected Earnings per share 2022-2024	[2] Projected Dividend Declared per share 2022-24	[3] Retention Ratio (B)	[4] Projected Book Value per Share 2022-24	[5] Return on Book Value (R)	[6] B x R	[7] Projected Common Shares Outstanding 2019	[8] Projected Common Shares Outstanding 2022-24	[9] Common Shares Growth Rate	[10] 2019 High Price	[11] 2019 Low Price	[12] 2019 Price Midpoint	[13] Projected Book Value per Share 2019	[14] Market/ Book Ratio	[15] "S"	[16] "V"	[17] S x V	[18] BR + SV
Atmos Energy Corporation	ATO	5.60	2.70	51.79%	56.05	9.99%	5.17%	120.00	145.00	4.84%	$ 98.40	$ 89.20	$ 93.80	46.55	2.02	9.76%	50.37%	4.92%	10.09%
Chesapeake Utilities Corporation	CPK	5.00	2.15	57.00%	49.00	10.20%	5.82%	17.50	20.00	3.39%	$ 91.50	$ 77.60	$ 84.55	34.95	2.42	8.21%	58.66%	4.82%	10.63%
New Jersey Resources Corporation	NJR	2.40	1.33	44.58%	21.40	11.21%	5.00%	88.00	89.00	0.28%	$ 48.60	$ 43.90	$ 46.25	17.05	2.71	0.77%	63.14%	0.48%	5.48%
Northwest Natural Holding Company	NWN	3.50	2.20	37.14%	29.40	11.90%	4.42%	30.00	32.00	1.63%	$ 64.50	$ 57.20	$ 60.85	27.30	2.23	3.63%	55.14%	2.00%	6.42%
ONE Gas, Inc.	OGS	4.75	2.65	44.21%	47.90	9.92%	4.38%	53.00	55.00	0.93%	$ 84.70	$ 75.80	$ 80.25	41.05	1.95	1.82%	48.85%	0.89%	5.27%
South Jersey Industries, Inc.	SJI	2.50	1.40	44.00%	20.40	12.25%	5.39%	90.00	98.00	2.15%	$ 31.40	$ 26.60	$ 29.00	16.40	1.77	3.80%	43.45%	1.65%	7.05%
Spire Inc.	SR	5.00	2.67	46.60%	47.80	10.46%	4.87%	52.00	55.00	1.41%	$ 79.50	$ 71.70	$ 75.60	44.70	1.69	2.39%	40.87%	0.98%	5.85%
Southwest Gas Corporation	SWX	5.75	2.60	54.78%	53.90	10.67%	5.84%	54.00	58.00	1.80%	$ 82.90	$ 73.30	$ 78.10	44.90	1.74	3.14%	42.51%	1.33%	7.18%
																		Average	7.25%

Notes:
[1] Source: Value Line
[2] Source: Value Line
[3] Equals 1 - [2] / [1]
[4] Source: Value Line
[5] Equals [1] / [4]
[6] Equals [3] x [5]
[7] Source: Value Line
[8] Source: Value Line
[9] Equals ([8] / [7]) ^ 0.25 - 1
[10] Source: Value Line
[11] Source: Value Line
[12] Equals Average ([10], [11])
[13] Source: Value Line
[14] Equals [12] / [13]
[15] Equals [9] x [14]
[16] Equals 1 - (1 / [14])
[17] Equals [15] x [16]
[18] Equals [6] + [17]

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

[1] S&P 500 Est. Required Market Return	[2] Current 30-Year Treasury (30-day average)	[3] Implied Market Risk Premium
13.42%	2.92%	10.51%

Company	Ticker	[4] Market Capitalization	[5] Weight in Index	[6] Estimated Dividend Yield	[7] Long-Term Growth Est.	[8] DCF Result	[9] Weighted DCF Result
Agilent Technologies Inc	A	21,907.87	0.09%	0.95%	11.00%	12.01%	0.0105%
American Airlines Group Inc	AAL	14,119.07	0.06%	1.52%	14.51%	16.14%	0.0091%
Advance Auto Parts Inc	AAP	11,329.22	0.05%	0.15%	15.47%	15.64%	0.0071%
Apple Inc	AAPL	869,603.18	3.46%	1.58%	9.35%	11.01%	0.3810%
AbbVie Inc	ABBV	117,468.27	0.47%	5.34%	5.12%	10.60%	0.0496%
AmerisourceBergen Corp	ABC	16,337.05	0.07%	2.07%	4.99%	7.11%	0.0046%
ABIOMED Inc	ABMD	11,753.64	0.05%	0.00%	29.00%	29.00%	0.0136%
Abbott Laboratories	ABT	134,024.85	0.53%	1.62%	9.70%	11.39%	0.0608%
Accenture PLC	ACN	113,915.81	0.45%	1.65%	10.33%	12.07%	0.0547%
Adobe Inc	ADBE	136,553.07	0.54%	0.00%	17.12%	17.12%	0.0931%
Analog Devices Inc	ADI	37,137.13	0.15%	2.06%	11.98%	14.16%	0.0209%
Archer-Daniels-Midland Co	ADM	22,787.52	0.09%	3.48%	0.60%	4.09%	0.0037%
Automatic Data Processing Inc	ADP	70,385.11	0.28%	1.78%	13.50%	15.40%	0.0431%
Alliance Data Systems Corp	ADS	7,629.66	0.03%	1.70%	12.47%	14.27%	0.0043%
Autodesk Inc	ADSK	38,381.78	0.15%	0.00%	60.74%	60.74%	0.0928%
Ameren Corp	AEE	18,335.25	0.07%	2.61%	5.81%	8.50%	0.0062%
American Electric Power Co Inc	AEP	42,361.44	0.17%	3.15%	6.19%	9.44%	0.0159%
AES Corp/VA	AES	10,845.30	0.04%	3.39%	8.01%	11.53%	0.0050%
Aflac Inc	AFL	38,898.58	0.15%	2.09%	3.43%	5.55%	0.0086%
Allergan PLC	AGN	45,957.83	0.18%	2.11%	5.84%	8.02%	0.0147%
American International Group Inc	AIG	45,549.00	0.18%	2.50%	11.00%	13.64%	0.0247%
Apartment Investment & Management Co	AIV	7,502.44	0.03%	4.01%	8.75%	12.93%	0.0039%
Assurant Inc	AIZ	5,824.11	N/A	2.62%	N/A	N/A	N/A
Arthur J Gallagher & Co	AJG	15,440.75	0.06%	2.06%	9.83%	11.99%	0.0074%
Akamai Technologies Inc	AKAM	12,725.71	0.05%	0.00%	13.70%	13.70%	0.0069%
Albemarle Corp	ALB	7,179.63	0.03%	2.10%	13.41%	15.65%	0.0045%
Align Technology Inc	ALGN	25,810.38	0.10%	0.00%	20.92%	20.92%	0.0215%
Alaska Air Group Inc	ALK	7,700.67	0.03%	2.24%	11.77%	14.14%	0.0043%
Allstate Corp/The	ALL	31,858.34	0.13%	2.02%	9.00%	11.11%	0.0141%
Allegion PLC	ALLE	9,438.73	0.04%	1.06%	10.15%	11.26%	0.0042%
Alexion Pharmaceuticals Inc	ALXN	29,352.65	0.12%	0.00%	16.37%	16.37%	0.0191%
Applied Materials Inc	AMAT	40,539.06	0.16%	1.94%	9.69%	11.73%	0.0189%
Advanced Micro Devices Inc	AMD	29,744.02	0.12%	0.00%	13.35%	13.35%	0.0158%
AMETEK Inc	AME	19,571.53	0.08%	0.66%	9.06%	9.75%	0.0076%
Affiliated Managers Group Inc	AMG	4,552.65	0.02%	1.44%	9.10%	10.60%	0.0019%
Amgen Inc	AMGN	103,634.17	0.41%	3.38%	5.20%	8.67%	0.0358%
Ameriprise Financial Inc	AMP	19,254.10	0.08%	2.65%	3.20%	5.89%	0.0045%
American Tower Corp	AMT	89,478.80	0.36%	1.85%	20.09%	22.13%	0.0788%
Amazon.com Inc	AMZN	920,168.09	3.66%	0.00%	37.11%	37.11%	1.3593%
Arista Networks Inc	ANET	19,164.83	0.08%	0.00%	21.32%	21.32%	0.0163%
ANSYS Inc	ANSS	15,739.10	0.06%	0.00%	12.70%	12.70%	0.0080%
Anthem Inc	ANTM	68,174.87	0.27%	1.21%	14.18%	15.48%	0.0420%
Aon PLC	AON	43,423.78	0.17%	0.95%	9.95%	10.95%	0.0189%
AO Smith Corp	AOS	7,331.57	0.03%	1.97%	8.00%	10.05%	0.0029%
Apache Corp	APA	11,431.75	0.05%	3.29%	1.07%	4.37%	0.0020%
Anadarko Petroleum Corp	APC	36,458.85	0.15%	1.49%	16.91%	18.52%	0.0269%
Air Products & Chemicals Inc	APD	46,210.23	0.18%	2.17%	12.30%	14.61%	0.0269%
Amphenol Corp	APH	27,369.85	0.11%	0.98%	10.13%	11.16%	0.0122%
Aptiv PLC	APTV	18,989.57	0.08%	1.23%	8.89%	10.17%	0.0077%
Alexandria Real Estate Equities Inc	ARE	16,522.49	0.07%	2.69%	4.76%	7.51%	0.0049%
Arconic Inc	ARNC	9,851.89	0.04%	0.41%	9.90%	10.33%	0.0041%
Atmos Energy Corp	ATO	12,010.01	0.05%	2.05%	7.00%	9.12%	0.0044%
Activision Blizzard Inc	ATVI	35,535.05	0.14%	0.80%	6.99%	7.81%	0.0110%
AvalonBay Communities Inc	AVB	28,318.38	0.11%	2.98%	5.65%	8.71%	0.0098%
Broadcom Inc	AVGO	114,751.70	0.46%	3.66%	13.03%	16.93%	0.0773%
Avery Dennison Corp	AVY	8,581.72	0.03%	2.06%	5.55%	7.67%	0.0026%
American Water Works Co Inc	AWK	20,225.33	0.08%	1.76%	8.72%	10.56%	0.0085%
American Express Co	AXP	99,433.04	0.40%	1.36%	12.95%	14.40%	0.0570%
AutoZone Inc	AZO	24,491.61	0.10%	0.00%	13.45%	13.45%	0.0131%
Boeing Co/The	BA	199,745.05	0.80%	2.28%	12.26%	14.67%	0.1167%
Bank of America Corp	BAC	270,032.97	1.07%	2.41%	10.10%	12.63%	0.1358%
Baxter International Inc	BAX	38,834.69	0.15%	1.05%	12.13%	13.24%	0.0205%
BB&T Corp	BBT	36,672.25	0.15%	3.56%	8.48%	12.19%	0.0178%
Best Buy Co Inc	BBY	18,467.47	0.07%	2.87%	6.81%	9.78%	0.0072%
Becton Dickinson and Co	BDX	61,595.98	0.25%	1.41%	11.13%	12.61%	0.0309%
Franklin Resources Inc	BEN	16,861.13	0.07%	3.12%	10.00%	13.28%	0.0089%

Company	Ticker	[4] Market Capitalization	[5] Weight in Index	[6] Estimated Dividend Yield	[7] Long-Term Growth Est.	[8] DCF Result	[9] Weighted DCF Result
Brown-Forman Corp	BF/B	24,755.29	0.10%	1.26%	9.91%	11.23%	0.0111%
Baker Hughes a GE Co	BHGE	23,760.00	0.09%	2.89%	43.55%	47.07%	0.0445%
Biogen Inc	BIIB	44,455.88	0.18%	0.00%	5.18%	5.18%	0.0092%
Bank of New York Mellon Corp/The	BK	44,122.40	0.18%	2.60%	7.33%	10.03%	0.0176%
Booking Holdings Inc	BKNG	77,374.19	0.31%	0.00%	12.84%	12.84%	0.0395%
BlackRock Inc	BLK	68,657.46	0.27%	3.02%	9.00%	12.15%	0.0332%
Ball Corp	BLL	20,945.02	0.08%	0.80%	6.77%	7.59%	0.0063%
Bristol-Myers Squibb Co	BMY	76,633.70	0.31%	3.51%	9.09%	12.76%	0.0389%
Broadridge Financial Solutions Inc	BR	14,127.14	N/A	1.59%	N/A	N/A	N/A
Berkshire Hathaway Inc	BRK/B	499,652.45	1.99%	0.00%	-1.60%	-1.60%	-0.0318%
Boston Scientific Corp	BSX	51,899.15	0.21%	0.00%	9.08%	9.08%	0.0188%
BorgWarner Inc	BWA	7,515.48	0.03%	1.87%	4.37%	6.28%	0.0019%
Boston Properties Inc	BXP	20,651.58	0.08%	2.90%	4.91%	7.88%	0.0065%
Citigroup Inc	C	150,472.27	0.60%	3.01%	12.72%	15.92%	0.0954%
Conagra Brands Inc	CAG	14,130.40	0.06%	2.90%	6.25%	9.24%	0.0052%
Cardinal Health Inc	CAH	13,421.63	0.05%	4.35%	14.02%	18.68%	0.0100%
Caterpillar Inc	CAT	70,203.44	0.28%	3.12%	13.23%	16.55%	0.0462%
Chubb Ltd	CB	66,386.68	0.26%	2.09%	10.60%	12.80%	0.0338%
Cboe Global Markets Inc	CBOE	11,809.66	0.05%	1.24%	5.35%	6.61%	0.0031%
CBRE Group Inc	CBRE	15,905.93	0.06%	0.00%	6.10%	6.10%	0.0039%
CBS Corp	CBS	18,136.17	0.07%	1.58%	15.05%	16.75%	0.0121%
Crown Castle International Corp	CCI	52,903.07	0.21%	3.60%	16.33%	20.23%	0.0426%
Carnival Corp	CCL	36,677.85	0.15%	3.83%	10.23%	14.25%	0.0208%
Cadence Design Systems Inc	CDNS	19,295.52	0.08%	0.00%	9.35%	9.35%	0.0072%
Celanese Corp	CE	12,868.89	0.05%	2.36%	7.95%	10.40%	0.0053%
Celgene Corp	CELG	67,295.86	0.27%	0.00%	19.24%	19.24%	0.0515%
Cerner Corp	CERN	22,284.80	0.09%	0.29%	13.63%	13.94%	0.0124%
CF Industries Holdings Inc	CF	9,389.17	0.04%	2.84%	20.27%	23.39%	0.0087%
Citizens Financial Group Inc	CFG	15,932.44	0.06%	3.84%	8.04%	12.03%	0.0076%
Church & Dwight Co Inc	CHD	18,190.67	0.07%	1.25%	7.75%	9.05%	0.0066%
CH Robinson Worldwide Inc	CHRW	11,228.17	0.04%	2.46%	8.93%	11.51%	0.0051%
Charter Communications Inc	CHTR	96,300.27	0.38%	0.00%	44.24%	44.24%	0.1696%
Cigna Corp	CI	58,796.05	0.23%	0.06%	11.09%	11.16%	0.0261%
Cincinnati Financial Corp	CINF	15,952.45	N/A	2.25%	N/A	N/A	N/A
Colgate-Palmolive Co	CL	61,787.32	0.25%	2.39%	4.15%	6.59%	0.0162%
Clorox Co/The	CLX	18,729.44	0.07%	2.64%	4.72%	7.42%	0.0055%
Comerica Inc	CMA	11,332.36	0.05%	3.74%	12.60%	16.57%	0.0075%
Comcast Corp	CMCSA	197,618.96	0.79%	1.92%	11.47%	13.50%	0.1062%
CME Group Inc	CME	65,813.71	0.26%	2.65%	6.91%	9.65%	0.0253%
Chipotle Mexican Grill Inc	CMG	19,840.41	0.08%	0.00%	19.37%	19.37%	0.0153%
Cummins Inc	CMI	25,079.07	0.10%	2.93%	7.15%	10.18%	0.0102%
CMS Energy Corp	CMS	16,020.74	0.06%	2.71%	6.28%	9.07%	0.0058%
Centene Corp	CNC	23,162.46	0.09%	0.00%	13.90%	13.90%	0.0128%
CenterPoint Energy Inc	CNP	14,927.88	0.06%	3.92%	5.98%	10.02%	0.0060%
Capital One Financial Corp	COF	42,517.27	0.17%	1.82%	5.20%	7.06%	0.0120%
Cabot Oil & Gas Corp	COG	11,077.40	0.04%	1.28%	28.35%	29.81%	0.0131%
Cooper Cos Inc/The	COO	14,453.29	0.06%	0.02%	5.23%	5.25%	0.0030%
ConocoPhillips	COP	70,183.93	0.28%	2.00%	5.00%	7.05%	0.0197%
Costco Wholesale Corp	COST	109,244.26	0.43%	0.96%	10.42%	11.43%	0.0497%
Coty Inc	COTY	10,143.87	0.04%	3.67%	8.33%	12.15%	0.0049%
Campbell Soup Co	CPB	11,782.75	0.05%	3.60%	1.42%	5.05%	0.0024%
Capri Holdings Ltd	CPRI	6,025.33	0.02%	0.00%	7.06%	7.06%	0.0017%
Copart Inc	CPRT	14,970.31	0.06%	0.00%	20.00%	20.00%	0.0119%
salesforce.com Inc	CRM	119,756.70	0.48%	0.00%	22.30%	22.30%	0.1063%
Cisco Systems Inc	CSCO	248,054.26	0.99%	2.42%	6.96%	9.46%	0.0935%
CSX Corp	CSX	63,438.43	0.25%	1.18%	11.71%	12.96%	0.0327%
Cintas Corp	CTAS	23,363.22	0.09%	0.92%	12.12%	13.09%	0.0122%
CenturyLink Inc	CTL	11,546.42	0.05%	9.44%	1.78%	11.31%	0.0052%
Cognizant Technology Solutions Corp	CTSH	33,838.18	0.13%	1.36%	11.05%	12.48%	0.0168%
Citrix Systems Inc	CTXS	12,612.25	0.05%	1.46%	37.42%	39.15%	0.0197%
CVS Health Corp	CVS	68,695.99	0.27%	3.77%	7.67%	11.57%	0.0317%
Chevron Corp	CVX	229,558.98	0.91%	3.93%	3.93%	7.93%	0.0725%
Concho Resources Inc	CXO	22,647.07	0.09%	0.44%	11.85%	12.32%	0.0111%
Dominion Energy Inc	D	60,658.74	0.24%	4.84%	5.16%	10.13%	0.0245%
Delta Air Lines Inc	DAL	35,933.53	0.14%	2.64%	12.72%	15.52%	0.0222%
Deere & Co	DE	42,939.29	0.17%	2.33%	9.62%	12.06%	0.0206%
Discover Financial Services	DFS	25,021.01	0.10%	2.13%	7.15%	9.35%	0.0093%
Dollar General Corp	DG	31,150.62	0.12%	1.07%	11.45%	12.57%	0.0156%
Quest Diagnostics Inc	DGX	13,065.29	0.05%	2.16%	7.13%	9.37%	0.0049%
DR Horton Inc	DHI	16,621.30	0.07%	1.34%	12.92%	14.35%	0.0095%
Danaher Corp	DHR	93,858.90	0.37%	0.51%	8.69%	9.22%	0.0345%
Walt Disney Co/The	DIS	243,031.34	0.97%	1.31%	7.08%	8.43%	0.0816%
Discovery Inc	DISCA	19,476.11	0.08%	0.00%	13.35%	13.35%	0.0104%
DISH Network Corp	DISH	16,575.68	0.07%	0.00%	-16.48%	-16.48%	-0.0109%
Digital Realty Trust Inc	DLR	25,690.90	0.10%	3.66%	17.36%	21.34%	0.0218%
Dollar Tree Inc	DLTR	23,945.22	0.10%	0.00%	9.56%	9.56%	0.0091%

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Dover Corp	DOV	13,726.37	0.05%	2.10%	10.30%	12.51%	0.0068%
Dow Inc	DOW	37,922.20	N/A	4.94%	N/A	N/A	N/A
Duke Realty Corp	DRE	11,045.22	0.04%	2.83%	4.12%	7.01%	0.0031%
Darden Restaurants Inc	DRI	14,739.88	0.06%	2.50%	10.70%	13.33%	0.0078%
DTE Energy Co	DTE	23,350.42	0.09%	2.99%	8.50%	11.61%	0.0108%
Duke Energy Corp	DUK	63,481.60	0.25%	4.35%	4.98%	9.44%	0.0238%
DaVita Inc	DVA	8,191.87	0.03%	0.00%	18.90%	18.90%	0.0062%
Devon Energy Corp	DVN	12,709.27	0.05%	1.13%	13.45%	14.66%	0.0074%
DowDuPont Inc	DWDP	69,570.63	0.28%	3.99%	15.27%	19.56%	0.0542%
DXC Technology Co	DXC	15,111.72	0.06%	1.36%	5.63%	7.02%	0.0042%
Electronic Arts Inc	EA	29,138.67	0.12%	0.00%	11.87%	11.87%	0.0138%
eBay Inc	EBAY	32,159.36	0.13%	1.51%	9.76%	11.34%	0.0145%
Ecolab Inc	ECL	52,324.60	0.21%	1.02%	13.13%	14.22%	0.0296%
Consolidated Edison Inc	ED	28,942.48	0.12%	3.40%	4.27%	7.74%	0.0089%
Equifax Inc	EFX	14,634.20	0.06%	1.29%	11.63%	13.00%	0.0076%
Edison International	EIX	19,535.64	0.08%	4.10%	5.55%	9.76%	0.0076%
Estee Lauder Cos Inc/The	EL	60,657.08	0.24%	0.99%	12.42%	13.47%	0.0325%
Eastman Chemical Co	EMN	9,884.33	0.04%	3.44%	6.50%	10.05%	0.0040%
Emerson Electric Co	EMR	39,866.02	0.16%	3.03%	8.84%	12.00%	0.0190%
EOG Resources Inc	EOG	53,981.80	0.21%	1.02%	9.80%	10.87%	0.0234%
Equinix Inc	EQIX	41,217.86	0.16%	2.00%	18.37%	20.56%	0.0337%
Equity Residential	EQR	28,390.44	0.11%	2.94%	6.72%	9.75%	0.0110%
Eversource Energy	ES	23,342.91	0.09%	2.91%	5.73%	8.73%	0.0081%
Essex Property Trust Inc	ESS	18,796.25	0.07%	2.73%	6.57%	9.39%	0.0070%
E*TRADE Financial Corp	ETFC	11,734.41	0.05%	1.02%	12.73%	13.82%	0.0065%
Eaton Corp PLC	ETN	33,319.13	0.13%	3.61%	8.95%	12.72%	0.0169%
Entergy Corp	ETR	18,591.90	0.07%	3.75%	-1.18%	2.55%	0.0019%
Evergy Inc	EVRG	14,833.08	0.06%	3.28%	7.64%	11.04%	0.0065%
Edwards Lifesciences Corp	EW	36,095.80	0.14%	0.00%	14.00%	14.00%	0.0201%
Exelon Corp	EXC	47,508.26	0.19%	2.96%	3.46%	6.46%	0.0122%
Expeditors International of Washington I	EXPD	12,820.57	0.05%	1.29%	9.80%	11.15%	0.0057%
Expedia Group Inc	EXPE	17,300.38	0.07%	1.09%	17.75%	18.94%	0.0130%
Extra Space Storage Inc	EXR	13,508.81	0.05%	3.35%	5.32%	8.75%	0.0047%
Ford Motor Co	F	41,052.43	0.16%	5.83%	-4.77%	0.93%	0.0015%
Diamondback Energy Inc	FANG	18,281.91	0.07%	0.63%	20.66%	21.35%	0.0155%
Fastenal Co	FAST	18,372.82	0.07%	2.69%	14.70%	17.59%	0.0129%
Facebook Inc	FB	528,975.91	2.11%	0.00%	19.37%	19.37%	0.4079%
Fortune Brands Home & Security Inc	FBHS	7,384.30	0.03%	1.66%	9.47%	11.20%	0.0033%
Freeport-McMoRan Inc	FCX	15,043.08	0.06%	1.93%	-8.10%	-6.25%	-0.0037%
FedEx Corp	FDX	44,276.84	0.18%	1.53%	14.00%	15.64%	0.0276%
FirstEnergy Corp	FE	22,570.35	0.09%	3.58%	0.35%	3.94%	0.0035%
F5 Networks Inc	FFIV	8,370.47	0.03%	0.00%	9.95%	9.95%	0.0033%
Fidelity National Information Services I	FIS	38,424.64	0.15%	1.18%	8.53%	9.76%	0.0149%
Fiserv Inc	FISV	34,260.00	0.14%	0.00%	10.55%	10.55%	0.0144%
Fifth Third Bancorp	FITB	20,034.05	0.08%	3.54%	6.00%	9.64%	0.0077%
Foot Locker Inc	FL	6,199.55	0.02%	2.78%	6.08%	8.95%	0.0022%
FLIR Systems Inc	FLIR	6,708.76	N/A	1.37%	N/A	N/A	N/A
Fluor Corp	FLR	4,143.25	0.02%	2.84%	16.54%	19.61%	0.0032%
Flowserve Corp	FLS	6,488.73	0.03%	1.57%	19.15%	20.88%	0.0054%
FleetCor Technologies Inc	FLT	23,208.44	0.09%	0.00%	19.67%	19.67%	0.0182%
FMC Corp	FMC	9,904.61	0.04%	1.99%	9.33%	11.42%	0.0045%
Fox Corp	FOXA	23,027.57	0.09%	0.28%	0.79%	1.07%	0.0010%
First Republic Bank/CA	FRC	16,658.46	0.07%	0.76%	12.14%	12.94%	0.0086%
Federal Realty Investment Trust	FRT	9,820.93	0.04%	3.17%	5.40%	8.65%	0.0034%
TechnipFMC PLC	FTI	10,063.50	0.04%	2.32%	17.52%	20.05%	0.0080%
Fortinet Inc	FTNT	14,108.24	0.06%	0.00%	24.04%	24.04%	0.0135%
Fortive Corp	FTV	26,982.20	0.11%	0.38%	11.68%	12.09%	0.0130%
General Dynamics Corp	GD	48,059.63	0.19%	2.40%	8.76%	11.26%	0.0215%
General Electric Co	GE	87,208.08	0.35%	0.40%	8.87%	9.28%	0.0322%
Gilead Sciences Inc	GILD	84,380.37	0.34%	3.78%	7.57%	11.49%	0.0386%
General Mills Inc	GIS	31,376.63	0.12%	3.76%	5.93%	9.80%	0.0122%
Corning Inc	GLW	23,472.00	0.09%	2.69%	9.84%	12.66%	0.0118%
General Motors Co	GM	52,480.54	0.21%	4.15%	5.98%	10.25%	0.0214%
Alphabet Inc	GOOGL	809,010.74	3.22%	0.00%	13.44%	13.44%	0.4328%
Genuine Parts Co	GPC	14,327.41	0.06%	3.12%	6.29%	9.50%	0.0054%
Global Payments Inc	GPN	23,547.49	0.09%	0.02%	16.73%	16.76%	0.0157%
Gap Inc/The	GPS	8,444.43	0.03%	4.39%	6.53%	11.07%	0.0037%
Garmin Ltd	GRMN	14,834.65	0.06%	2.98%	7.28%	10.36%	0.0061%
Goldman Sachs Group Inc/The	GS	75,110.31	0.30%	1.73%	1.14%	2.87%	0.0086%
WW Grainger Inc	GWW	14,808.98	0.06%	2.09%	12.47%	14.69%	0.0087%
Halliburton Co	HAL	22,006.78	0.09%	2.89%	13.40%	16.48%	0.0144%
Hasbro Inc	HAS	12,226.73	0.05%	2.79%	10.85%	13.80%	0.0067%
Huntington Bancshares Inc/OH	HBAN	13,833.94	0.06%	4.43%	8.24%	12.84%	0.0071%
Hanesbrands Inc	HBI	6,079.94	0.02%	3.71%	3.25%	7.02%	0.0017%
HCA Healthcare Inc	HCA	42,278.39	0.17%	1.00%	10.84%	11.89%	0.0200%
HCP Inc	HCP	15,109.04	0.06%	4.68%	2.68%	7.43%	0.0045%

Company	Ticker	[4] Market Capitalization	[5] Weight in Index	[6] Estimated Dividend Yield	[7] Long-Term Growth Est.	[8] DCF Result	[9] Weighted DCF Result
Home Depot Inc/The	HD	212,365.92	0.85%	2.81%	9.46%	12.41%	0.1049%
Hess Corp	HES	19,932.89	0.08%	1.62%	-9.23%	-7.68%	-0.0061%
HollyFrontier Corp	HFC	7,332.67	0.03%	3.12%	0.43%	3.56%	0.0010%
Hartford Financial Services Group Inc/Th	HIG	19,369.12	0.08%	2.31%	9.50%	11.92%	0.0092%
Huntington Ingalls Industries Inc	HII	8,601.32	0.03%	1.67%	40.00%	42.00%	0.0144%
Hilton Worldwide Holdings Inc	HLT	27,048.45	0.11%	0.66%	13.10%	13.80%	0.0149%
Harley-Davidson Inc	HOG	5,497.56	0.02%	4.52%	8.60%	13.31%	0.0029%
Hologic Inc	HOLX	12,027.41	0.05%	0.00%	8.39%	8.39%	0.0040%
Honeywell International Inc	HON	123,786.46	0.49%	1.96%	8.18%	10.21%	0.0503%
Helmerich & Payne Inc	HP	6,070.33	0.02%	5.13%	107.13%	115.01%	0.0278%
Hewlett Packard Enterprise Co	HPE	20,034.93	0.08%	3.15%	6.09%	9.33%	0.0074%
HP Inc	HPQ	29,167.20	0.12%	3.34%	3.08%	6.47%	0.0075%
H&R Block Inc	HRB	5,492.98	0.02%	3.71%	10.00%	13.90%	0.0030%
Hormel Foods Corp	HRL	21,314.54	0.08%	2.10%	5.80%	7.96%	0.0068%
Harris Corp	HRS	21,693.77	N/A	1.49%	N/A	N/A	N/A
Henry Schein Inc	HSIC	10,125.14	0.04%	0.00%	1.50%	1.50%	0.0006%
Host Hotels & Resorts Inc	HST	14,210.34	0.06%	4.43%	15.05%	19.80%	0.0112%
Hershey Co/The	HSY	26,914.26	0.11%	2.32%	7.07%	9.47%	0.0101%
Humana Inc	HUM	33,464.38	0.13%	0.85%	13.35%	14.25%	0.0190%
International Business Machines Corp	IBM	119,093.87	0.47%	4.82%	1.92%	6.79%	0.0322%
Intercontinental Exchange Inc	ICE	45,797.12	0.18%	1.34%	9.35%	10.76%	0.0196%
IDEXX Laboratories Inc	IDXX	21,463.74	0.09%	0.00%	18.30%	18.30%	0.0156%
International Flavors & Fragrances Inc	IFF	14,581.48	0.06%	2.10%	7.80%	9.98%	0.0058%
Illumina Inc	ILMN	45,221.61	0.18%	0.00%	27.09%	27.09%	0.0488%
Incyte Corp	INCY	16,554.66	0.07%	0.00%	44.66%	44.66%	0.0294%
IHS Markit Ltd	INFO	22,793.54	0.09%	0.00%	9.53%	9.53%	0.0086%
Intel Corp	INTC	200,972.53	0.80%	2.77%	8.52%	11.41%	0.0913%
Intuit Inc	INTU	63,589.47	0.25%	0.74%	16.03%	16.83%	0.0426%
International Paper Co	IP	17,907.84	0.07%	4.47%	4.77%	9.34%	0.0067%
Interpublic Group of Cos Inc/The	IPG	8,719.99	0.03%	4.17%	11.75%	16.16%	0.0056%
IPG Photonics Corp	IPGP	7,123.93	0.03%	0.00%	10.49%	10.49%	0.0030%
IQVIA Holdings Inc	IQV	26,365.16	0.10%	0.00%	17.28%	17.28%	0.0181%
Ingersoll-Rand PLC	IR	29,136.74	0.12%	1.79%	9.16%	11.03%	0.0128%
Iron Mountain Inc	IRM	9,206.00	0.04%	7.65%	7.62%	15.56%	0.0057%
Intuitive Surgical Inc	ISRG	56,586.01	0.23%	0.00%	12.05%	12.05%	0.0272%
Gartner Inc	IT	13,830.68	0.06%	0.00%	14.00%	14.00%	0.0077%
Illinois Tool Works Inc	ITW	49,061.73	0.20%	2.66%	7.27%	10.03%	0.0196%
Invesco Ltd	IVZ	8,193.53	0.03%	6.05%	7.12%	13.39%	0.0044%
JB Hunt Transport Services Inc	JBHT	10,441.11	0.04%	1.07%	13.13%	14.26%	0.0059%
Johnson Controls International plc	JCI	34,979.78	0.14%	2.76%	7.80%	10.67%	0.0149%
Jacobs Engineering Group Inc	JEC	10,456.04	0.04%	0.76%	13.05%	13.86%	0.0058%
Jefferies Financial Group Inc	JEF	5,396.62	N/A	2.70%	N/A	N/A	N/A
Jack Henry & Associates Inc	JKHY	10,480.40	0.04%	1.12%	9.03%	10.20%	0.0043%
Johnson & Johnson	JNJ	368,017.31	1.47%	2.72%	6.73%	9.54%	0.1398%
Juniper Networks Inc	JNPR	8,670.11	0.03%	3.00%	7.92%	11.04%	0.0038%
JPMorgan Chase & Co	JPM	359,334.89	1.43%	3.06%	6.80%	9.96%	0.1425%
Nordstrom Inc	JWN	5,747.20	0.02%	4.17%	8.56%	12.90%	0.0030%
Kellogg Co	K	19,415.14	0.08%	4.00%	2.52%	6.57%	0.0051%
KeyCorp	KEY	16,888.83	0.07%	4.25%	7.17%	11.58%	0.0078%
Keysight Technologies Inc	KEYS	15,388.76	0.06%	0.00%	17.00%	17.00%	0.0104%
Kraft Heinz Co/The	KHC	39,668.21	0.16%	4.92%	1.12%	6.06%	0.0096%
Kimco Realty Corp	KIM	7,634.71	0.03%	6.24%	3.77%	10.12%	0.0031%
KLA-Tencor Corp	KLAC	17,551.96	0.07%	2.74%	8.55%	11.41%	0.0080%
Kimberly-Clark Corp	KMB	44,325.53	0.18%	3.19%	4.33%	7.59%	0.0134%
Kinder Morgan Inc/DE	KMI	45,750.24	0.18%	4.92%	13.90%	19.16%	0.0349%
CarMax Inc	KMX	12,695.37	0.05%	0.00%	10.39%	10.39%	0.0052%
Coca-Cola Co/The	KO	209,892.86	0.84%	3.22%	6.22%	9.54%	0.0797%
Kroger Co/The	KR	19,537.84	0.08%	2.39%	6.39%	8.85%	0.0069%
Kohl's Corp	KSS	10,377.36	0.04%	4.21%	5.83%	10.16%	0.0042%
Kansas City Southern	KSU	12,266.58	0.05%	1.24%	12.67%	13.98%	0.0068%
Loews Corp	L	15,787.10	N/A	0.48%	N/A	N/A	N/A
L Brands Inc	LB	6,175.79	0.02%	5.36%	9.32%	14.92%	0.0037%
Leggett & Platt Inc	LEG	4,926.51	0.02%	4.16%	10.00%	14.36%	0.0028%
Lennar Corp	LEN	16,768.28	0.07%	0.30%	10.99%	11.31%	0.0075%
Laboratory Corp of America Holdings	LH	16,223.68	0.06%	0.00%	7.28%	7.28%	0.0047%
Linde PLC	LIN	102,582.81	0.41%	1.87%	15.05%	17.06%	0.0696%
LKQ Corp	LKQ	8,509.24	0.03%	0.00%	12.90%	12.90%	0.0044%
L3 Technologies Inc	LLL	18,864.89	0.08%	1.36%	9.70%	11.13%	0.0084%
Eli Lilly & Co	LLY	112,626.09	0.45%	2.14%	12.88%	15.16%	0.0680%
Lockheed Martin Corp	LMT	95,495.29	0.38%	2.65%	7.82%	10.57%	0.0402%
Lincoln National Corp	LNC	12,949.97	0.05%	2.36%	9.00%	11.46%	0.0059%
Alliant Energy Corp	LNT	11,418.67	0.05%	2.96%	5.37%	8.41%	0.0038%
Lowe's Cos Inc	LOW	86,771.49	0.35%	1.88%	15.42%	17.45%	0.0603%
Lam Research Corp	LRCX	29,109.73	0.12%	2.15%	9.10%	11.34%	0.0131%
Southwest Airlines Co	LUV	28,369.71	0.11%	1.28%	4.31%	5.62%	0.0063%
Lamb Weston Holdings Inc	LW	9,892.50	0.04%	1.16%	11.83%	13.06%	0.0051%

Company	Ticker	[4] Market Capitalization	[5] Weight in Index	[6] Estimated Dividend Yield	[7] Long-Term Growth Est.	[8] DCF Result	[9] Weighted DCF Result
LyondellBasell Industries NV	LYB	29,681.73	0.12%	5.20%	6.20%	11.56%	0.0137%
Macy's Inc	M	6,724.75	0.03%	6.93%	1.88%	8.87%	0.0024%
Mastercard Inc	MA	257,959.58	1.03%	0.49%	17.28%	17.81%	0.1829%
Mid-America Apartment Communities Inc	MAA	13,115.19	0.05%	3.36%	7.00%	10.48%	0.0055%
Macerich Co/The	MAC	5,895.30	0.02%	7.25%	0.10%	7.35%	0.0017%
Marriott International Inc/MD	MAR	43,591.57	0.17%	1.36%	8.26%	9.68%	0.0168%
Masco Corp	MAS	11,022.76	0.04%	1.26%	12.33%	13.67%	0.0060%
Mattel Inc	MAT	3,740.95	0.01%	0.00%	9.00%	9.00%	0.0013%
McDonald's Corp	MCD	152,115.70	0.61%	2.36%	8.72%	11.19%	0.0677%
Microchip Technology Inc	MCHP	19,730.04	0.08%	1.76%	10.34%	12.19%	0.0096%
McKesson Corp	MCK	23,745.19	0.09%	1.29%	4.01%	5.32%	0.0050%
Moody's Corp	MCO	35,252.33	0.14%	1.02%	7.05%	8.11%	0.0114%
Mondelez International Inc	MDLZ	75,233.96	0.30%	2.04%	6.89%	9.00%	0.0269%
Medtronic PLC	MDT	117,659.17	0.47%	2.26%	6.80%	9.14%	0.0428%
MetLife Inc	MET	44,980.98	0.18%	3.66%	9.27%	13.11%	0.0235%
MGM Resorts International	MGM	13,908.14	0.06%	2.00%	14.17%	16.31%	0.0090%
Mohawk Industries Inc	MHK	10,044.10	0.04%	0.00%	6.82%	6.82%	0.0027%
McCormick & Co Inc/MD	MKC	20,466.14	0.08%	1.43%	6.20%	7.68%	0.0063%
Martin Marietta Materials Inc	MLM	13,591.16	0.05%	0.91%	13.91%	14.88%	0.0081%
Marsh & McLennan Cos Inc	MMC	48,588.41	0.19%	1.82%	11.73%	13.66%	0.0264%
3M Co	MMM	97,467.99	0.39%	3.35%	7.10%	10.57%	0.0410%
Monster Beverage Corp	MNST	34,587.75	0.14%	0.00%	14.35%	14.35%	0.0198%
Altria Group Inc	MO	97,942.65	0.39%	6.30%	6.53%	13.03%	0.0508%
Mosaic Co/The	MOS	8,795.97	0.04%	0.81%	13.60%	14.47%	0.0051%
Marathon Petroleum Corp	MPC	34,423.01	0.14%	4.12%	8.96%	13.26%	0.0182%
Merck & Co Inc	MRK	202,676.01	0.81%	2.79%	9.01%	11.93%	0.0962%
Marathon Oil Corp	MRO	12,653.16	0.05%	1.29%	0.45%	1.75%	0.0009%
Morgan Stanley	MS	73,816.45	0.29%	2.96%	9.49%	12.59%	0.0370%
MSCI Inc	MSCI	19,036.61	0.08%	1.00%	9.25%	10.30%	0.0078%
Microsoft Corp	MSFT	981,377.09	3.91%	1.41%	11.85%	13.34%	0.5213%
Motorola Solutions Inc	MSI	24,215.34	0.10%	1.56%	5.50%	7.10%	0.0068%
M&T Bank Corp	MTB	22,375.98	0.09%	2.61%	7.28%	9.99%	0.0089%
Mettler-Toledo International Inc	MTD	18,017.60	0.07%	0.00%	12.97%	12.97%	0.0093%
Micron Technology Inc	MU	39,907.13	0.16%	0.00%	-1.90%	-1.90%	-0.0030%
Maxim Integrated Products Inc	MXIM	14,599.26	0.06%	3.42%	8.97%	12.54%	0.0073%
Mylan NV	MYL	10,123.18	0.04%	0.00%	4.71%	4.71%	0.0019%
Noble Energy Inc	NBL	11,405.82	0.05%	1.89%	14.93%	16.96%	0.0077%
Norwegian Cruise Line Holdings Ltd	NCLH	12,260.31	0.05%	0.24%	10.86%	11.11%	0.0054%
Nasdaq Inc	NDAQ	14,963.12	0.06%	2.03%	14.34%	16.51%	0.0098%
NextEra Energy Inc	NEE	95,298.55	0.38%	2.51%	4.99%	7.56%	0.0287%
Newmont Goldcorp Corp	NEM	25,343.07	0.10%	1.82%	5.10%	6.97%	0.0070%
Netflix Inc	NFLX	154,972.61	0.62%	0.00%	31.93%	31.93%	0.1970%
NiSource Inc	NI	10,555.09	0.04%	2.84%	5.24%	8.15%	0.0034%
NIKE Inc	NKE	132,922.86	0.53%	1.00%	17.51%	18.60%	0.0984%
Nektar Therapeutics	NKTR	5,581.31	0.02%	0.00%	-2.40%	-2.40%	-0.0005%
Nielsen Holdings PLC	NLSN	8,389.66	0.03%	5.48%	12.00%	17.81%	0.0059%
Northrop Grumman Corp	NOC	52,075.86	0.21%	1.70%	5.95%	7.70%	0.0160%
National Oilwell Varco Inc	NOV	9,242.79	0.04%	0.84%	83.89%	85.07%	0.0313%
NRG Energy Inc	NRG	9,505.31	0.04%	0.34%	33.17%	33.56%	0.0127%
Norfolk Southern Corp	NSC	54,129.61	0.22%	1.70%	13.88%	15.69%	0.0338%
NetApp Inc	NTAP	17,063.49	0.07%	2.31%	13.23%	15.69%	0.0107%
Northern Trust Corp	NTRS	20,335.35	0.08%	2.63%	9.68%	12.44%	0.0101%
Nucor Corp	NUE	16,242.03	0.06%	3.01%	0.75%	3.77%	0.0024%
NVIDIA Corp	NVDA	95,326.77	0.38%	0.41%	9.76%	10.19%	0.0387%
Newell Brands Inc	NWL	6,541.13	0.03%	5.94%	-11.58%	-5.98%	-0.0016%
News Corp	NWSA	6,706.64	0.03%	1.80%	-10.26%	-8.56%	-0.0023%
Realty Income Corp	O	21,807.36	0.09%	3.93%	4.71%	8.73%	0.0076%
ONEOK Inc	OKE	28,137.59	0.11%	5.22%	12.97%	18.54%	0.0208%
Omnicom Group Inc	OMC	17,505.53	0.07%	3.27%	4.06%	7.39%	0.0052%
Oracle Corp	ORCL	186,262.14	0.74%	1.52%	7.71%	9.29%	0.0689%
O'Reilly Automotive Inc	ORLY	27,633.25	0.11%	0.00%	15.17%	15.17%	0.0167%
Occidental Petroleum Corp	OXY	39,465.55	0.16%	5.94%	9.90%	16.13%	0.0253%
Paychex Inc	PAYX	31,004.81	0.12%	2.63%	8.77%	11.51%	0.0142%
People's United Financial Inc	PBCT	6,449.46	0.03%	4.38%	2.00%	6.42%	0.0016%
PACCAR Inc	PCAR	23,987.74	0.10%	3.87%	5.00%	8.97%	0.0086%
Public Service Enterprise Group Inc	PEG	30,543.16	0.12%	3.11%	6.07%	9.28%	0.0113%
PepsiCo Inc	PEP	182,951.75	0.73%	2.91%	5.45%	8.44%	0.0615%
Pfizer Inc	PFE	230,570.26	0.92%	3.45%	5.09%	8.63%	0.0792%
Principal Financial Group Inc	PFG	15,250.51	0.06%	4.03%	4.60%	8.73%	0.0053%
Procter & Gamble Co/The	PG	269,520.03	1.07%	2.71%	7.15%	9.95%	0.1067%
Progressive Corp/The	PGR	45,388.48	0.18%	3.55%	6.23%	9.89%	0.0179%
Parker-Hannifin Corp	PH	21,027.26	0.08%	1.88%	9.02%	10.98%	0.0092%
PulteGroup Inc	PHM	9,001.41	0.04%	1.35%	8.80%	10.20%	0.0037%
Packaging Corp of America	PKG	9,150.80	0.04%	3.30%	8.25%	11.69%	0.0043%
PerkinElmer Inc	PKI	9,532.34	0.04%	0.33%	14.67%	15.02%	0.0057%
Prologis Inc	PLD	48,317.94	0.19%	2.74%	7.04%	9.88%	0.0190%

Company	Ticker	[4] Market Capitalization	[5] Weight in Index	[6] Estimated Dividend Yield	[7] Long-Term Growth Est.	[8] DCF Result	[9] Weighted DCF Result
Philip Morris International Inc	PM	135,059.24	0.54%	5.43%	7.28%	12.90%	0.0694%
PNC Financial Services Group Inc/The	PNC	58,786.25	0.23%	3.15%	7.48%	10.75%	0.0252%
Pentair PLC	PNR	6,189.83	0.02%	2.00%	7.20%	9.27%	0.0023%
Pinnacle West Capital Corp	PNW	10,785.36	0.04%	3.14%	5.29%	8.52%	0.0037%
PPG Industries Inc	PPG	26,384.42	0.11%	1.75%	8.70%	10.53%	0.0111%
PPL Corp	PPL	21,489.64	0.09%	5.59%	5.00%	10.73%	0.0092%
Perrigo Co PLC	PRGO	6,754.69	0.03%	1.52%	-0.40%	1.12%	0.0003%
Prudential Financial Inc	PRU	40,116.86	0.16%	4.04%	11.43%	15.71%	0.0251%
Public Storage	PSA	40,160.98	0.16%	3.51%	5.23%	8.83%	0.0141%
Phillips 66	PSX	38,465.67	0.15%	4.04%	0.61%	4.67%	0.0071%
PVH Corp	PVH	8,158.22	0.03%	0.14%	8.86%	9.01%	0.0029%
Quanta Services Inc	PWR	5,002.70	0.02%	0.46%	22.00%	22.51%	0.0045%
Pioneer Natural Resources Co	PXD	25,982.73	0.10%	0.47%	26.38%	26.91%	0.0278%
PayPal Holdings Inc	PYPL	132,532.44	0.53%	0.00%	19.69%	19.69%	0.1039%
QUALCOMM Inc	QCOM	99,079.46	0.39%	3.11%	16.15%	19.51%	0.0769%
Qorvo Inc	QRVO	7,849.87	0.03%	0.26%	9.55%	9.82%	0.0031%
Royal Caribbean Cruises Ltd	RCL	26,180.83	0.10%	2.29%	12.11%	14.53%	0.0151%
Everest Re Group Ltd	RE	10,112.53	0.04%	2.27%	10.00%	12.38%	0.0050%
Regency Centers Corp	REG	11,228.15	0.04%	3.45%	4.32%	7.84%	0.0035%
Regeneron Pharmaceuticals Inc	REGN	33,433.25	0.13%	0.00%	11.81%	11.81%	0.0157%
Regions Financial Corp	RF	14,590.44	0.06%	4.19%	9.49%	13.88%	0.0081%
Robert Half International Inc	RHI	6,639.22	0.03%	2.24%	9.05%	11.39%	0.0030%
Red Hat Inc	RHT	32,975.47	0.13%	0.00%	20.30%	20.30%	0.0266%
Raymond James Financial Inc	RJF	11,827.65	0.05%	1.55%	17.00%	18.68%	0.0088%
Ralph Lauren Corp	RL	8,784.07	0.03%	2.44%	7.84%	10.37%	0.0036%
ResMed Inc	RMD	16,171.82	0.06%	1.32%	12.30%	13.70%	0.0088%
Rockwell Automation Inc	ROK	18,975.80	0.08%	2.39%	11.59%	14.12%	0.0107%
Rollins Inc	ROL	12,079.30	0.05%	1.51%	10.00%	11.59%	0.0056%
Roper Technologies Inc	ROP	37,237.39	0.15%	0.54%	12.93%	13.50%	0.0200%
Ross Stores Inc	ROST	35,715.29	0.14%	1.06%	9.52%	10.63%	0.0151%
Republic Services Inc	RSG	27,280.15	0.11%	1.79%	13.26%	15.17%	0.0165%
Raytheon Co	RTN	49,556.76	0.20%	2.09%	9.31%	11.49%	0.0227%
SBA Communications Corp	SBAC	23,780.47	0.09%	0.00%	26.25%	26.25%	0.0249%
Starbucks Corp	SBUX	95,575.79	0.38%	1.89%	12.72%	14.72%	0.0560%
Charles Schwab Corp/The	SCHW	57,685.76	0.23%	1.57%	11.14%	12.80%	0.0294%
Sealed Air Corp	SEE	6,489.73	0.03%	1.58%	5.73%	7.36%	0.0019%
Sherwin-Williams Co/The	SHW	40,220.32	0.16%	0.99%	9.46%	10.49%	0.0168%
SVB Financial Group	SIVB	11,954.29	0.05%	0.01%	11.00%	11.01%	0.0052%
JM Smucker Co/The	SJM	14,434.44	0.06%	2.62%	3.20%	5.86%	0.0034%
Schlumberger Ltd	SLB	54,047.47	0.22%	5.12%	32.45%	38.40%	0.0826%
SL Green Realty Corp	SLG	7,415.20	0.03%	3.93%	-0.84%	3.07%	0.0009%
Snap-on Inc	SNA	9,038.68	0.04%	2.33%	7.35%	9.77%	0.0035%
Synopsys Inc	SNPS	18,169.15	0.07%	0.00%	13.25%	13.25%	0.0096%
Southern Co/The	SO	56,017.64	0.22%	4.59%	4.20%	8.88%	0.0198%
Simon Property Group Inc	SPG	53,907.02	0.21%	4.76%	4.87%	9.74%	0.0209%
S&P Global Inc	SPGI	52,425.83	0.21%	1.06%	9.20%	10.31%	0.0215%
Sempra Energy	SRE	35,767.07	0.14%	2.97%	9.68%	12.80%	0.0182%
SunTrust Banks Inc	STI	27,481.68	0.11%	3.40%	6.22%	9.73%	0.0106%
State Street Corp	STT	22,535.37	0.09%	3.33%	7.27%	10.71%	0.0096%
Seagate Technology PLC	STX	12,518.83	0.05%	5.57%	4.60%	10.30%	0.0051%
Constellation Brands Inc	STZ	39,252.71	0.16%	1.45%	8.35%	9.87%	0.0154%
Stanley Black & Decker Inc	SWK	20,434.14	0.08%	1.99%	10.00%	12.09%	0.0098%
Skyworks Solutions Inc	SWKS	12,159.36	0.05%	2.19%	11.22%	13.54%	0.0066%
Synchrony Financial	SYF	24,064.04	0.10%	2.60%	4.03%	6.69%	0.0064%
Stryker Corp	SYK	68,833.39	0.27%	1.24%	8.23%	9.52%	0.0261%
Symantec Corp	SYMC	12,682.07	0.05%	1.58%	7.32%	8.96%	0.0045%
Sysco Corp	SYY	38,512.17	0.15%	2.01%	12.73%	14.87%	0.0228%
AT&T Inc	T	232,076.40	0.92%	6.43%	4.79%	11.38%	0.1051%
Molson Coors Brewing Co	TAP	12,719.33	0.05%	3.55%	-0.23%	3.31%	0.0017%
TransDigm Group Inc	TDG	24,343.11	0.10%	0.00%	10.85%	10.85%	0.0105%
TE Connectivity Ltd	TEL	30,162.99	0.12%	1.99%	9.93%	12.02%	0.0144%
Teleflex Inc	TFX	13,661.61	0.05%	0.46%	12.45%	12.94%	0.0070%
Target Corp	TGT	36,544.58	0.15%	3.72%	5.84%	9.67%	0.0141%
Tiffany & Co	TIF	11,658.64	0.05%	2.42%	9.25%	11.78%	0.0055%
TJX Cos Inc/The	TJX	64,430.29	0.26%	1.69%	10.05%	11.83%	0.0303%
Torchmark Corp	TMK	9,607.70	0.04%	0.77%	7.91%	8.71%	0.0033%
Thermo Fisher Scientific Inc	TMO	104,687.06	0.42%	0.28%	10.83%	11.13%	0.0464%
Tapestry Inc	TPR	8,930.38	0.04%	4.39%	9.48%	14.08%	0.0050%
TripAdvisor Inc	TRIP	6,254.92	0.02%	0.00%	9.34%	9.34%	0.0023%
T Rowe Price Group Inc	TROW	24,683.30	0.10%	2.86%	7.10%	10.06%	0.0099%
Travelers Cos Inc/The	TRV	38,628.84	0.15%	2.19%	13.06%	15.39%	0.0237%
Tractor Supply Co	TSCO	12,146.22	0.05%	1.33%	11.20%	12.60%	0.0061%
Tyson Foods Inc	TSN	30,093.54	0.12%	1.82%	3.10%	4.94%	0.0059%
Total System Services Inc	TSS	17,924.34	0.07%	0.53%	12.14%	12.70%	0.0091%
Take-Two Interactive Software Inc	TTWO	12,003.68	0.05%	0.00%	8.80%	8.80%	0.0042%
Twitter Inc	TWTR	28,823.67	0.11%	0.00%	31.76%	31.76%	0.0364%

Company	Ticker	[4] Market Capitalization	[5] Weight in Index	[6] Estimated Dividend Yield	[7] Long-Term Growth Est.	[8] DCF Result	[9] Weighted DCF Result
Texas Instruments Inc	TXN	100,191.04	0.40%	2.93%	9.87%	12.95%	0.0516%
Textron Inc	TXT	11,428.63	0.05%	0.16%	11.67%	11.84%	0.0054%
Under Armour Inc	UAA	9,927.04	0.04%	0.00%	32.66%	32.66%	0.0129%
United Continental Holdings Inc	UAL	21,538.10	0.09%	0.00%	13.81%	13.81%	0.0118%
UDR Inc	UDR	12,644.13	0.05%	3.03%	5.43%	8.55%	0.0043%
Universal Health Services Inc	UHS	10,986.27	0.04%	0.33%	9.38%	9.73%	0.0043%
Ulta Beauty Inc	ULTA	20,118.68	0.08%	0.00%	21.60%	21.60%	0.0173%
UnitedHealth Group Inc	UNH	229,393.82	0.91%	1.59%	13.38%	15.07%	0.1376%
Unum Group	UNM	7,371.33	0.03%	3.07%	9.00%	12.21%	0.0036%
Union Pacific Corp	UNP	123,602.70	0.49%	2.06%	13.06%	15.25%	0.0750%
United Parcel Service Inc	UPS	85,559.11	0.34%	3.84%	8.79%	12.80%	0.0436%
United Rentals Inc	URI	9,932.58	0.04%	0.00%	17.76%	17.76%	0.0070%
US Bancorp	USB	82,086.73	0.33%	3.06%	6.70%	9.86%	0.0322%
United Technologies Corp	UTX	115,331.48	0.46%	2.22%	8.87%	11.19%	0.0514%
Visa Inc	V	327,534.55	1.30%	0.61%	15.54%	16.20%	0.2113%
Varian Medical Systems Inc	VAR	11,882.06	0.05%	0.00%	8.50%	8.50%	0.0040%
VF Corp	VFC	35,920.97	0.14%	1.99%	-15.89%	-14.06%	-0.0201%
Viacom Inc	VIAB	11,715.13	0.05%	2.83%	3.51%	6.38%	0.0030%
Valero Energy Corp	VLO	34,927.28	0.14%	4.29%	13.71%	18.30%	0.0254%
Vulcan Materials Co	VMC	17,165.37	0.07%	0.93%	16.30%	17.31%	0.0118%
Vornado Realty Trust	VNO	12,779.11	0.05%	3.88%	4.23%	8.18%	0.0042%
Verisk Analytics Inc	VRSK	23,235.61	0.09%	0.52%	9.46%	10.01%	0.0093%
VeriSign Inc	VRSN	23,276.51	0.09%	0.00%	8.80%	8.80%	0.0082%
Vertex Pharmaceuticals Inc	VRTX	43,215.36	0.17%	0.00%	47.12%	47.12%	0.0811%
Ventas Inc	VTR	23,284.53	0.09%	4.89%	3.95%	8.93%	0.0083%
Verizon Communications Inc	VZ	240,260.24	0.96%	4.18%	2.42%	6.65%	0.0636%
Wabtec Corp	WAB	12,396.95	0.05%	0.00%	15.00%	15.00%	0.0074%
Waters Corp	WAT	14,464.75	0.06%	0.00%	9.90%	9.90%	0.0057%
Walgreens Boots Alliance Inc	WBA	47,790.41	0.19%	3.44%	5.66%	9.20%	0.0175%
WellCare Health Plans Inc	WCG	13,818.35	0.06%	0.00%	17.22%	17.22%	0.0095%
Western Digital Corp	WDC	13,076.49	0.05%	4.48%	-5.24%	-0.87%	-0.0005%
WEC Energy Group Inc	WEC	25,518.97	0.10%	2.91%	5.88%	8.88%	0.0090%
Welltower Inc	WELL	32,411.45	0.13%	4.35%	6.72%	11.21%	0.0145%
Wells Fargo & Co	WFC	205,391.47	0.82%	4.04%	10.36%	14.61%	0.1194%
Whirlpool Corp	WHR	8,147.33	0.03%	3.68%	4.97%	8.74%	0.0028%
Willis Towers Watson PLC	WLTW	22,745.57	0.09%	1.43%	13.97%	15.50%	0.0140%
Waste Management Inc	WM	45,929.24	0.18%	1.88%	7.51%	9.46%	0.0173%
Williams Cos Inc/The	WMB	33,323.68	0.13%	5.55%	3.90%	9.55%	0.0127%
Walmart Inc	WMT	289,178.19	1.15%	2.11%	3.96%	6.12%	0.0704%
Westrock Co	WRK	9,423.19	0.04%	4.94%	3.17%	8.19%	0.0031%
Western Union Co/The	WU	8,321.29	0.03%	4.03%	3.72%	7.82%	0.0026%
Weyerhaeuser Co	WY	18,135.54	0.07%	5.59%	7.10%	12.89%	0.0093%
Wynn Resorts Ltd	WYNN	13,072.29	0.05%	2.83%	23.23%	26.39%	0.0137%
Cimarex Energy Co	XEC	6,953.25	0.03%	1.13%	63.78%	65.28%	0.0181%
Xcel Energy Inc	XEL	29,959.13	0.12%	2.78%	5.57%	8.43%	0.0101%
Xilinx Inc	XLNX	26,600.66	0.11%	1.41%	9.60%	11.08%	0.0117%
Exxon Mobil Corp	XOM	321,182.34	1.28%	4.49%	16.98%	21.85%	0.2794%
DENTSPLY SIRONA Inc	XRAY	12,735.40	0.05%	0.63%	12.57%	13.24%	0.0067%
Xerox Corp	XRX	7,255.44	0.03%	3.14%	6.50%	9.74%	0.0028%
Xylem Inc/NY	XYL	13,534.56	0.05%	1.28%	13.97%	15.33%	0.0083%
Yum! Brands Inc	YUM	30,995.28	0.12%	1.66%	12.20%	13.96%	0.0172%
Zimmer Biomet Holdings Inc	ZBH	23,842.62	0.09%	0.85%	4.33%	5.20%	0.0049%
Zions Bancorp NA	ZION	8,233.70	0.03%	2.88%	7.60%	10.59%	0.0035%
Zoetis Inc	ZTS	48,808.57	0.19%	0.62%	10.81%	11.46%	0.0223%
Total Market Capitalization:		25,119,974.22					13.42%

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

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

[1] S&P 500 Est. Required Market Return	[2] Current 30-Year Treasury (30-day average)	[3] Implied Market Risk Premium
14.93%	2.92%	12.02%

Company	Ticker	[4] Market Capitalization	[5] Weight in Index	[6] Estimated Dividend Yield	[7] Long-Term Growth Est.	[8] DCF Result	[9] Weighted DCF Result
Agilent Technologies Inc	A	24,486.00	0.11%	0.86%	9.50%	10.40%	0.0110%
American Airlines Group Inc	AAL	15,081.13	0.06%	1.18%	1.00%	2.19%	0.0014%
Advance Auto Parts Inc	AAP	11,585.63	0.05%	0.15%	14.00%	14.16%	0.0071%
Apple Inc	AAPL	924,774.10	3.98%	1.53%	12.50%	14.13%	0.5628%
AbbVie Inc	ABBV	122,960.50	0.53%	5.49%	12.50%	18.33%	0.0971%
AmerisourceBergen Corp	ABC	16,641.02	0.07%	2.07%	8.00%	10.15%	0.0073%
ABIOMED Inc	ABMD	11,802.49	0.05%	0.00%	24.50%	24.50%	0.0125%
Abbott Laboratories	ABT	134,818.70	0.58%	1.68%	10.00%	11.76%	0.0683%
Accenture PLC	ACN	111,403.90	0.48%	1.75%	9.00%	10.83%	0.0520%
Adobe Inc	ADBE	134,724.50	0.58%	0.00%	19.50%	19.50%	0.1132%
Analog Devices Inc	ADI	40,717.11	0.18%	1.95%	10.00%	12.05%	0.0211%
Archer-Daniels-Midland Co	ADM	23,833.60	0.10%	3.29%	9.50%	12.95%	0.0133%
Automatic Data Processing Inc	ADP	69,928.23	0.30%	2.16%	13.50%	15.81%	0.0476%
Alliance Data Systems Corp	ADS	7,735.69	0.03%	1.70%	13.50%	15.31%	0.0051%
Autodesk Inc	ADSK	37,609.55	N/A	0.00%	N/A	N/A	N/A
Ameren Corp	AEE	17,579.55	0.08%	2.73%	6.50%	9.32%	0.0071%
American Electric Power Co Inc	AEP	40,890.38	0.18%	3.33%	4.00%	7.40%	0.0130%
AES Corp/VA	AES	10,698.76	N/A	3.41%	N/A	N/A	N/A
Aflac Inc	AFL	38,134.39	0.16%	2.16%	7.50%	9.74%	0.0160%
Allergan PLC	AGN	47,295.68	0.20%	2.11%	4.00%	6.15%	0.0125%
American International Group Inc	AIG	44,049.74	N/A	2.52%	N/A	N/A	N/A
Apartment Investment & Management Co	AIV	7,539.92	0.03%	3.16%	-3.00%	0.11%	0.0000%
Assurant Inc	AIZ	5,919.74	0.03%	2.51%	6.50%	9.09%	0.0023%
Arthur J Gallagher & Co	AJG	15,235.37	0.07%	2.09%	15.50%	17.75%	0.0117%
Akamai Technologies Inc	AKAM	12,405.21	0.05%	0.00%	18.00%	18.00%	0.0096%
Albemarle Corp	ALB	7,693.03	0.03%	2.03%	5.50%	7.59%	0.0025%
Align Technology Inc	ALGN	25,860.00	0.11%	0.00%	27.00%	27.00%	0.0301%
Alaska Air Group Inc	ALK	7,447.29	0.03%	2.32%	3.50%	5.86%	0.0019%
Allstate Corp/The	ALL	31,337.48	0.14%	2.12%	11.50%	13.74%	0.0186%
Allegion PLC	ALLE	9,418.61	0.04%	1.08%	8.50%	9.63%	0.0039%
Alexion Pharmaceuticals Inc	ALXN	29,542.83	0.13%	0.00%	21.00%	21.00%	0.0267%
Applied Materials Inc	AMAT	38,868.15	0.17%	2.05%	8.50%	10.64%	0.0178%
Advanced Micro Devices Inc	AMD	29,441.22	0.13%	0.00%	30.50%	30.50%	0.0387%
AMETEK Inc	AME	19,469.01	0.08%	0.66%	10.50%	11.19%	0.0094%
Affiliated Managers Group Inc	AMG	4,905.16	0.02%	1.39%	10.00%	11.46%	0.0024%
Amgen Inc	AMGN	106,211.30	0.46%	3.38%	7.00%	10.50%	0.0480%
Ameriprise Financial Inc	AMP	19,165.50	0.08%	2.72%	13.00%	15.90%	0.0131%
American Tower Corp	AMT	85,087.67	0.37%	1.87%	9.50%	11.46%	0.0420%
Amazon.com Inc	AMZN	934,736.10	4.03%	0.00%	39.00%	39.00%	1.5707%
Arista Networks Inc	ANET	20,445.82	0.09%	0.00%	11.00%	11.00%	0.0097%
ANSYS Inc	ANSS	15,979.60	0.07%	0.00%	11.00%	11.00%	0.0076%
Anthem Inc	ANTM	68,469.03	0.30%	1.20%	18.00%	19.31%	0.0570%
Aon PLC	AON	42,521.26	0.18%	1.00%	10.00%	11.05%	0.0202%
AO Smith Corp	AOS	7,123.19	0.03%	1.74%	9.50%	11.32%	0.0035%
Apache Corp	APA	11,675.76	0.05%	3.22%	50.00%	54.03%	0.0272%
Anadarko Petroleum Corp	APC	35,917.07	N/A	1.64%	N/A	N/A	N/A
Air Products & Chemicals Inc	APD	45,003.99	0.19%	2.27%	9.00%	11.37%	0.0221%
Amphenol Corp	APH	28,089.48	0.12%	0.98%	10.50%	11.53%	0.0140%
Aptiv PLC	APTV	20,088.31	0.09%	1.13%	11.00%	12.19%	0.0106%
Alexandria Real Estate Equities Inc	ARE	15,630.49	N/A	2.76%	N/A	N/A	N/A
Arconic Inc	ARNC	9,910.22	N/A	0.36%	N/A	N/A	N/A
Atmos Energy Corp	ATO	11,780.19	0.05%	2.16%	7.50%	9.74%	0.0049%
Activision Blizzard Inc	ATVI	35,722.70	0.15%	0.79%	9.50%	10.33%	0.0159%
AvalonBay Communities Inc	AVB	27,415.80	0.12%	3.11%	4.00%	7.17%	0.0085%
Broadcom Inc	AVGO	120,407.80	0.52%	3.49%	33.50%	37.57%	0.1949%
Avery Dennison Corp	AVY	8,907.47	0.04%	2.20%	11.50%	13.83%	0.0053%
American Water Works Co Inc	AWK	19,184.92	0.08%	1.88%	9.50%	11.47%	0.0095%
American Express Co	AXP	98,146.62	0.42%	1.46%	10.00%	11.53%	0.0488%
AutoZone Inc	AZO	25,069.81	0.11%	0.00%	13.50%	13.50%	0.0146%
Boeing Co/The	BA	199,520.70	0.86%	2.32%	17.50%	20.02%	0.1721%
Bank of America Corp	BAC	287,274.40	1.24%	2.22%	10.50%	12.84%	0.1589%
Baxter International Inc	BAX	38,763.65	0.17%	1.16%	10.50%	11.72%	0.0196%
BB&T Corp	BBT	37,913.04	0.16%	3.56%	8.00%	11.70%	0.0191%
Best Buy Co Inc	BBY	19,662.88	0.08%	2.77%	10.50%	13.42%	0.0114%
Becton Dickinson and Co	BDX	61,830.68	0.27%	1.36%	10.00%	11.43%	0.0304%
Franklin Resources Inc	BEN	17,125.20	0.07%	3.26%	7.50%	10.88%	0.0080%

Company	Ticker	[4] Market Capitalization	[5] Weight in Index	[6] Estimated Dividend Yield	[7] Long-Term Growth Est.	[8] DCF Result	[9] Weighted DCF Result
Brown-Forman Corp	BF/B	25,161.16	0.11%	1.28%	13.50%	14.87%	0.0161%
Baker Hughes a GE Co	BHGE	11,598.93	N/A	3.18%	N/A	N/A	N/A
Biogen Inc	BIIB	44,298.73	0.19%	0.00%	5.50%	5.50%	0.0105%
Bank of New York Mellon Corp/The	BK	45,750.16	0.20%	2.34%	8.50%	10.94%	0.0216%
Booking Holdings Inc	BKNG	79,218.52	0.34%	0.00%	11.50%	11.50%	0.0393%
BlackRock Inc	BLK	73,735.77	0.32%	2.84%	9.50%	12.47%	0.0396%
Ball Corp	BLL	20,860.83	0.09%	0.96%	21.00%	22.06%	0.0198%
Bristol-Myers Squibb Co	BMY	77,254.40	0.33%	3.47%	11.50%	15.17%	0.0505%
Broadridge Financial Solutions Inc	BR	13,556.71	0.06%	1.72%	11.00%	12.81%	0.0075%
Berkshire Hathaway Inc	BRK/B	-	N/A	0.00%	N/A	N/A	N/A
Boston Scientific Corp	BSX	51,326.45	0.22%	0.00%	16.00%	16.00%	0.0354%
BorgWarner Inc	BWA	7,996.32	0.03%	1.76%	8.00%	9.83%	0.0034%
Boston Properties Inc	BXP	20,196.51	0.09%	2.94%	4.50%	7.51%	0.0065%
Citigroup Inc	C	156,392.20	0.67%	2.93%	10.00%	13.08%	0.0881%
Conagra Brands Inc	CAG	14,203.29	0.06%	3.01%	5.50%	8.59%	0.0053%
Cardinal Health Inc	CAH	14,941.72	0.06%	3.89%	17.00%	21.22%	0.0137%
Caterpillar Inc	CAT	75,007.31	0.32%	3.14%	13.00%	16.34%	0.0528%
Chubb Ltd	CB	65,505.30	0.28%	2.05%	8.50%	10.64%	0.0300%
Cboe Global Markets Inc	CBOE	11,564.97	0.05%	1.20%	14.50%	15.79%	0.0079%
CBRE Group Inc	CBRE	16,377.34	0.07%	0.00%	10.50%	10.50%	0.0074%
CBS Corp	CBS	18,243.72	0.08%	1.48%	9.50%	11.05%	0.0087%
Crown Castle International Corp	CCI	51,596.48	0.22%	3.71%	10.50%	14.40%	0.0320%
Carnival Corp	CCL	28,426.38	0.12%	3.71%	10.00%	13.90%	0.0170%
Cadence Design Systems Inc	CDNS	19,306.76	0.08%	0.00%	12.50%	12.50%	0.0104%
Celanese Corp	CE	13,117.00	0.06%	2.39%	11.00%	13.52%	0.0076%
Celgene Corp	CELG	67,287.26	0.29%	0.00%	13.50%	13.50%	0.0391%
Cerner Corp	CERN	22,292.71	0.10%	0.00%	7.50%	7.50%	0.0072%
CF Industries Holdings Inc	CF	9,115.71	N/A	2.97%	N/A	N/A	N/A
Citizens Financial Group Inc	CFG	16,517.21	0.07%	3.63%	12.00%	15.85%	0.0113%
Church & Dwight Co Inc	CHD	17,876.69	0.08%	1.25%	8.50%	9.80%	0.0076%
CH Robinson Worldwide Inc	CHRW	11,317.98	0.05%	2.42%	9.50%	12.03%	0.0059%
Charter Communications Inc	CHTR	83,628.32	0.36%	0.00%	16.00%	16.00%	0.0577%
Cigna Corp	CI	37,957.21	0.16%	0.03%	15.50%	15.53%	0.0254%
Cincinnati Financial Corp	CINF	15,480.65	0.07%	2.36%	7.00%	9.44%	0.0063%
Colgate-Palmolive Co	CL	60,825.79	0.26%	2.43%	6.00%	8.50%	0.0223%
Clorox Co/The	CLX	18,794.42	0.08%	2.69%	6.50%	9.28%	0.0075%
Comerica Inc	CMA	11,845.96	0.05%	3.52%	15.50%	19.29%	0.0098%
Comcast Corp	CMCSA	194,793.10	0.84%	1.96%	12.00%	14.08%	0.1182%
CME Group Inc	CME	64,266.45	0.28%	1.67%	3.00%	4.70%	0.0130%
Chipotle Mexican Grill Inc	CMG	19,547.61	0.08%	0.00%	16.50%	16.50%	0.0139%
Cummins Inc	CMI	26,041.05	0.11%	2.76%	8.00%	10.87%	0.0122%
CMS Energy Corp	CMS	15,433.28	0.07%	2.87%	7.00%	9.97%	0.0066%
Centene Corp	CNC	22,624.31	0.10%	0.00%	15.50%	15.50%	0.0151%
CenterPoint Energy Inc	CNP	14,660.01	0.06%	3.97%	12.50%	16.72%	0.0106%
Capital One Financial Corp	COF	42,357.65	0.18%	1.77%	6.00%	7.82%	0.0143%
Cabot Oil & Gas Corp	COG	10,982.14	N/A	1.39%	N/A	N/A	N/A
Cooper Cos Inc/The	COO	14,367.00	0.06%	0.02%	14.50%	14.52%	0.0090%
ConocoPhillips	COP	69,551.03	0.30%	1.98%	37.00%	39.35%	0.1179%
Costco Wholesale Corp	COST	107,124.10	0.46%	1.07%	8.50%	9.62%	0.0444%
Coty Inc	COTY	8,693.70	0.04%	4.32%	9.00%	13.51%	0.0051%
Campbell Soup Co	CPB	11,726.96	0.05%	3.59%	1.00%	4.61%	0.0023%
Capri Holdings Ltd	CPRI	6,390.81	0.03%	0.00%	7.50%	7.50%	0.0021%
Copart Inc	CPRT	15,041.61	0.06%	0.00%	12.50%	12.50%	0.0081%
salesforce.com Inc	CRM	119,577.10	0.52%	0.00%	57.00%	57.00%	0.2937%
Cisco Systems Inc	CSCO	234,118.10	1.01%	2.65%	8.00%	10.76%	0.1085%
CSX Corp	CSX	68,426.42	0.29%	1.23%	16.50%	17.83%	0.0526%
Cintas Corp	CTAS	23,243.49	0.10%	1.02%	15.50%	16.60%	0.0166%
CenturyLink Inc	CTL	11,730.61	0.05%	9.21%	0.50%	9.73%	0.0049%
Cognizant Technology Solutions Corp	CTSH	33,627.90	0.14%	1.35%	5.00%	6.38%	0.0092%
Citrix Systems Inc	CTXS	12,732.01	0.05%	1.45%	7.00%	8.50%	0.0047%
CVS Health Corp	CVS	71,844.30	0.31%	3.61%	8.00%	11.75%	0.0364%
Chevron Corp	CVX	230,604.90	0.99%	3.93%	25.00%	29.42%	0.2923%
Concho Resources Inc	CXO	22,250.55	0.10%	0.45%	30.00%	30.52%	0.0293%
Dominion Energy Inc	D	58,794.62	0.25%	5.07%	6.50%	11.73%	0.0297%
Delta Air Lines Inc	DAL	37,066.22	0.16%	2.63%	9.50%	12.25%	0.0196%
Deere & Co	DE	49,519.30	0.21%	1.96%	14.00%	16.10%	0.0343%
Discover Financial Services	DFS	25,705.49	0.11%	2.03%	7.50%	9.61%	0.0106%
Dollar General Corp	DG	32,324.22	0.14%	1.04%	12.50%	13.61%	0.0189%
Quest Diagnostics Inc	DGX	13,231.16	0.06%	2.15%	8.50%	10.74%	0.0061%
DR Horton Inc	DHI	16,276.06	0.07%	1.42%	5.00%	6.46%	0.0045%
Danaher Corp	DHR	94,013.17	0.41%	0.52%	12.50%	13.05%	0.0529%
Walt Disney Co/The	DIS	200,385.00	0.86%	1.32%	6.50%	7.86%	0.0679%
Discovery Inc	DISCA	14,933.83	0.06%	0.00%	15.00%	15.00%	0.0097%
DISH Network Corp	DISH	16,275.04	0.07%	0.00%	-2.00%	-2.00%	-0.0014%
Digital Realty Trust Inc	DLR	24,163.27	0.10%	3.74%	5.00%	8.83%	0.0092%
Dollar Tree Inc	DLTR	25,139.15	0.11%	0.00%	15.50%	15.50%	0.0168%

Company	Ticker	[4] Market Capitalization	[5] Weight in Index	[6] Estimated Dividend Yield	[7] Long-Term Growth Est.	[8] DCF Result	[9] Weighted DCF Result
Dover Corp	DOV	13,986.46	0.06%	2.00%	11.00%	13.11%	0.0079%
Dow Inc	DOW	-	N/A	5.38%	N/A	N/A	N/A
Duke Realty Corp	DRE	10,851.19	0.05%	2.92%	7.00%	10.02%	0.0047%
Darden Restaurants Inc	DRI	14,800.16	0.06%	2.68%	12.00%	14.84%	0.0095%
DTE Energy Co	DTE	22,645.00	0.10%	3.16%	5.00%	8.24%	0.0080%
Duke Energy Corp	DUK	63,212.24	0.27%	4.37%	6.00%	10.50%	0.0286%
DaVita Inc	DVA	8,715.82	0.04%	0.00%	9.50%	9.50%	0.0036%
Devon Energy Corp	DVN	12,984.38	0.06%	1.15%	19.00%	20.26%	0.0113%
DowDuPont Inc	DWDP	69,613.27	N/A	0.00%	N/A	N/A	N/A
DXC Technology Co	DXC	16,041.49	0.07%	1.28%	14.50%	15.87%	0.0110%
Electronic Arts Inc	EA	28,089.32	0.12%	0.00%	10.00%	10.00%	0.0121%
eBay Inc	EBAY	32,955.12	0.14%	1.52%	10.00%	11.60%	0.0165%
Ecolab Inc	ECL	52,092.15	0.22%	1.02%	9.00%	10.07%	0.0226%
Consolidated Edison Inc	ED	27,468.00	0.12%	3.58%	3.00%	6.63%	0.0079%
Equifax Inc	EFX	14,356.22	0.06%	1.31%	7.50%	8.86%	0.0055%
Edison International	EIX	19,496.53	0.08%	4.09%	15.00%	19.40%	0.0163%
Estee Lauder Cos Inc/The	EL	59,811.93	0.26%	1.05%	12.50%	13.62%	0.0351%
Eastman Chemical Co	EMN	10,489.34	0.05%	3.28%	8.00%	11.41%	0.0052%
Emerson Electric Co	EMR	42,030.56	0.18%	2.95%	12.00%	15.13%	0.0274%
EOG Resources Inc	EOG	54,688.89	N/A	1.22%	N/A	N/A	N/A
Equinix Inc	EQIX	40,066.93	0.17%	2.11%	25.00%	27.37%	0.0473%
Equity Residential	EQR	27,535.11	0.12%	3.06%	-12.00%	-9.12%	-0.0108%
Eversource Energy	ES	22,357.10	0.10%	3.08%	5.50%	8.66%	0.0083%
Essex Property Trust Inc	ESS	18,501.07	0.08%	2.82%	2.00%	4.85%	0.0039%
E*TRADE Financial Corp	ETFC	12,344.47	0.05%	1.12%	17.50%	18.72%	0.0100%
Eaton Corp PLC	ETN	34,254.18	0.15%	3.51%	9.00%	12.67%	0.0187%
Entergy Corp	ETR	17,910.98	N/A	3.90%	N/A	N/A	N/A
Evergy Inc	EVRG	13,941.13	N/A	3.41%	N/A	N/A	N/A
Edwards Lifesciences Corp	EW	37,791.25	0.16%	0.00%	15.00%	15.00%	0.0244%
Exelon Corp	EXC	47,345.96	0.20%	3.02%	10.50%	13.68%	0.0279%
Expeditors International of Washington I	EXPD	12,748.30	0.05%	1.35%	8.50%	9.91%	0.0054%
Expedia Group Inc	EXPE	17,744.44	0.08%	1.07%	24.00%	25.20%	0.0193%
Extra Space Storage Inc	EXR	13,078.27	0.06%	3.52%	6.00%	9.63%	0.0054%
Ford Motor Co	F	39,970.68	0.17%	5.88%	3.50%	9.48%	0.0163%
Diamondback Energy Inc	FANG	17,780.91	0.08%	0.69%	17.00%	17.75%	0.0136%
Fastenal Co	FAST	18,896.42	0.08%	2.61%	9.50%	12.23%	0.0100%
Facebook Inc	FB	538,499.10	2.32%	0.00%	16.50%	16.50%	0.3828%
Fortune Brands Home & Security Inc	FBHS	9,788.42	0.04%	1.63%	11.50%	13.22%	0.0056%
Freeport-McMoRan Inc	FCX	16,367.28	0.07%	1.77%	22.50%	24.47%	0.0173%
FedEx Corp	FDX	46,788.85	0.20%	1.64%	7.50%	9.20%	0.0186%
FirstEnergy Corp	FE	21,172.80	0.09%	3.77%	8.00%	11.92%	0.0109%
F5 Networks Inc	FFIV	8,765.02	0.04%	0.00%	12.00%	12.00%	0.0045%
Fidelity National Information Services I	FIS	37,426.01	0.16%	1.21%	18.00%	19.32%	0.0312%
Fiserv Inc	FISV	33,223.89	0.14%	0.00%	10.50%	10.50%	0.0150%
Fifth Third Bancorp	FITB	17,995.71	0.08%	3.38%	7.00%	10.50%	0.0081%
Foot Locker Inc	FL	6,422.50	0.03%	2.67%	12.00%	14.83%	0.0041%
FLIR Systems Inc	FLIR	7,012.68	0.03%	1.33%	12.00%	13.41%	0.0041%
Fluor Corp	FLR	4,190.66	0.02%	2.81%	17.00%	20.05%	0.0036%
Flowserve Corp	FLS	6,419.53	0.03%	1.55%	13.50%	15.15%	0.0042%
FleetCor Technologies Inc	FLT	23,597.21	0.10%	0.00%	12.50%	12.50%	0.0127%
FMC Corp	FMC	10,544.12	0.05%	2.07%	15.00%	17.23%	0.0078%
Fox Corp	FOXA	N/A	N/A	0.00%	N/A	N/A	N/A
First Republic Bank/CA	FRC	16,983.26	0.07%	0.74%	10.50%	11.28%	0.0083%
Federal Realty Investment Trust	FRT	9,432.39	0.04%	3.19%	4.00%	7.25%	0.0029%
TechnipFMC PLC	FTI	N/A	N/A	0.00%	N/A	N/A	N/A
Fortinet Inc	FTNT	13,964.97	0.06%	0.00%	25.00%	25.00%	0.0150%
Fortive Corp	FTV	27,557.10	N/A	0.34%	N/A	N/A	N/A
General Dynamics Corp	GD	49,700.43	0.21%	2.37%	6.00%	8.44%	0.0181%
General Electric Co	GE	87,370.37	0.38%	0.40%	3.50%	3.91%	0.0147%
Gilead Sciences Inc	GILD	84,778.66	0.37%	3.81%	-5.50%	-1.79%	-0.0066%
General Mills Inc	GIS	30,774.03	0.13%	3.85%	4.00%	7.93%	0.0105%
Corning Inc	GLW	23,952.66	0.10%	2.61%	16.00%	18.82%	0.0194%
General Motors Co	GM	53,303.21	0.23%	4.15%	2.50%	6.70%	0.0154%
Alphabet Inc	GOOGL	N/A	N/A	0.00%	N/A	N/A	N/A
Genuine Parts Co	GPC	14,390.23	0.06%	3.10%	8.50%	11.73%	0.0073%
Global Payments Inc	GPN	22,951.98	0.10%	0.03%	17.50%	17.53%	0.0173%
Gap Inc/The	GPS	9,442.44	0.04%	3.88%	6.00%	10.00%	0.0041%
Garmin Ltd	GRMN	14,914.38	0.06%	2.90%	10.00%	13.05%	0.0084%
Goldman Sachs Group Inc/The	GS	74,254.69	0.32%	1.69%	8.50%	10.26%	0.0328%
WW Grainger Inc	GWW	15,160.61	0.07%	2.11%	8.50%	10.70%	0.0070%
Halliburton Co	HAL	22,663.28	0.10%	2.77%	24.50%	27.61%	0.0270%
Hasbro Inc	HAS	12,644.30	0.05%	2.71%	7.50%	10.31%	0.0056%
Huntington Bancshares Inc/OH	HBAN	14,210.66	0.06%	4.27%	12.50%	17.04%	0.0104%
Hanesbrands Inc	HBI	6,332.97	0.03%	3.43%	4.00%	7.50%	0.0020%
HCA Healthcare Inc	HCA	42,660.05	0.18%	1.28%	12.00%	13.36%	0.0246%
HCP Inc	HCP	14,083.08	0.06%	4.93%	32.50%	38.23%	0.0232%

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Home Depot Inc/The	HD	220,070.00	0.95%	2.80%	11.00%	13.95%	0.1323%
Hess Corp	HES	19,248.82	N/A	1.58%	N/A	N/A	N/A
HollyFrontier Corp	HFC	7,438.52	0.03%	3.15%	22.50%	26.00%	0.0083%
Hartford Financial Services Group Inc/Th	HIG	18,834.08	0.08%	2.29%	11.00%	13.42%	0.0109%
Huntington Ingalls Industries Inc	HII	8,627.01	0.04%	1.66%	7.00%	8.72%	0.0032%
Hilton Worldwide Holdings Inc	HLT	26,587.36	0.11%	0.66%	17.00%	17.72%	0.0203%
Harley-Davidson Inc	HOG	5,718.67	0.02%	4.17%	8.50%	12.85%	0.0032%
Hologic Inc	HOLX	12,195.68	0.05%	0.00%	18.50%	18.50%	0.0097%
Honeywell International Inc	HON	124,000.00	0.53%	1.93%	8.00%	10.01%	0.0535%
Helmerich & Payne Inc	HP	6,394.04	N/A	4.86%	N/A	N/A	N/A
Hewlett Packard Enterprise Co	HPE	20,973.16	0.09%	3.09%	5.50%	8.67%	0.0078%
HP Inc	HPQ	29,694.49	0.13%	3.37%	8.00%	11.50%	0.0147%
H&R Block Inc	HRB	5,495.10	0.02%	3.88%	7.00%	11.02%	0.0026%
Hormel Foods Corp	HRL	21,105.06	0.09%	2.18%	9.00%	11.28%	0.0103%
Harris Corp	HRS	21,392.28	0.09%	1.53%	11.50%	13.12%	0.0121%
Henry Schein Inc	HSIC	10,319.46	0.04%	0.00%	7.00%	7.00%	0.0031%
Host Hotels & Resorts Inc	HST	14,050.29	0.06%	4.21%	4.00%	8.29%	0.0050%
Hershey Co/The	HSY	26,182.56	0.11%	2.30%	6.00%	8.37%	0.0094%
Humana Inc	HUM	33,458.30	0.14%	0.90%	13.50%	14.46%	0.0208%
International Business Machines Corp	IBM	120,788.10	0.52%	4.79%	2.00%	6.84%	0.0356%
Intercontinental Exchange Inc	ICE	45,652.00	0.20%	1.36%	10.50%	11.93%	0.0235%
IDEXX Laboratories Inc	IDXX	21,188.46	0.09%	0.00%	13.00%	13.00%	0.0119%
International Flavors & Fragrances Inc	IFF	14,505.06	0.06%	2.22%	8.00%	10.31%	0.0064%
Illumina Inc	ILMN	46,653.39	0.20%	0.00%	14.00%	14.00%	0.0281%
Incyte Corp	INCY	17,578.61	N/A	0.00%	N/A	N/A	N/A
IHS Markit Ltd	INFO	22,271.28	0.10%	0.00%	15.50%	15.50%	0.0149%
Intel Corp	INTC	208,717.80	0.90%	2.70%	12.50%	15.37%	0.1382%
Intuit Inc	INTU	62,523.24	0.27%	0.78%	13.00%	13.83%	0.0373%
International Paper Co	IP	18,238.29	0.08%	4.38%	12.00%	16.64%	0.0131%
Interpublic Group of Cos Inc/The	IPG	8,878.67	0.04%	4.23%	11.00%	15.46%	0.0059%
IPG Photonics Corp	IPGP	8,158.45	0.04%	0.00%	11.00%	11.00%	0.0039%
IQVIA Holdings Inc	IQV	26,255.21	0.11%	0.00%	12.50%	12.50%	0.0141%
Ingersoll-Rand PLC	IR	29,310.34	0.13%	1.74%	12.00%	13.84%	0.0175%
Iron Mountain Inc	IRM	8,883.13	0.04%	7.88%	6.50%	14.64%	0.0056%
Intuitive Surgical Inc	ISRG	57,245.32	0.25%	0.00%	14.00%	14.00%	0.0345%
Gartner Inc	IT	13,780.00	0.06%	0.00%	13.50%	13.50%	0.0080%
Illinois Tool Works Inc	ITW	49,378.25	0.21%	2.64%	10.00%	12.77%	0.0272%
Invesco Ltd	IVZ	8,341.86	0.04%	5.96%	7.00%	13.17%	0.0047%
JB Hunt Transport Services Inc	JBHT	10,373.70	0.04%	1.09%	11.50%	12.65%	0.0057%
Johnson Controls International plc	JCI	35,554.55	0.15%	2.63%	2.00%	4.66%	0.0071%
Jacobs Engineering Group Inc	JEC	10,727.65	0.05%	0.87%	12.50%	13.42%	0.0062%
Jefferies Financial Group Inc	JEF	5,849.92	0.03%	2.55%	18.50%	21.29%	0.0054%
Jack Henry & Associates Inc	JKHY	10,313.88	0.04%	1.20%	10.50%	11.76%	0.0052%
Johnson & Johnson	JNJ	368,416.40	1.59%	2.78%	12.00%	14.95%	0.2373%
Juniper Networks Inc	JNPR	9,303.36	0.04%	2.88%	5.00%	7.95%	0.0032%
JPMorgan Chase & Co	JPM	368,589.20	1.59%	2.90%	8.50%	11.52%	0.1830%
Nordstrom Inc	JWN	6,272.48	0.03%	3.72%	6.50%	10.34%	0.0028%
Kellogg Co	K	19,648.60	0.08%	3.95%	4.50%	8.54%	0.0072%
KeyCorp	KEY	17,517.99	0.08%	4.22%	10.50%	14.94%	0.0113%
Keysight Technologies Inc	KEYS	16,215.77	0.07%	0.00%	16.00%	16.00%	0.0112%
Kraft Heinz Co/The	KHC	39,715.02	0.17%	4.97%	3.50%	8.56%	0.0146%
Kimco Realty Corp	KIM	7,589.22	0.03%	6.33%	5.00%	11.49%	0.0038%
KLA-Tencor Corp	KLAC	18,445.69	0.08%	2.63%	11.50%	14.28%	0.0114%
Kimberly-Clark Corp	KMB	43,455.69	0.19%	3.26%	7.00%	10.37%	0.0194%
Kinder Morgan Inc/DE	KMI	44,637.63	0.19%	5.07%	34.50%	40.44%	0.0778%
CarMax Inc	KMX	13,490.28	0.06%	0.00%	11.50%	11.50%	0.0067%
Coca-Cola Co/The	KO	202,303.20	0.87%	3.38%	6.50%	9.99%	0.0871%
Kroger Co/The	KR	20,237.28	0.09%	2.45%	4.50%	7.01%	0.0061%
Kohl's Corp	KSS	11,281.05	0.05%	3.92%	11.00%	15.14%	0.0074%
Kansas City Southern	KSU	12,291.00	0.05%	1.18%	12.00%	13.25%	0.0070%
Loews Corp	L	15,914.07	0.07%	0.50%	12.00%	12.53%	0.0086%
L Brands Inc	LB	6,668.75	0.03%	4.95%	-4.00%	0.85%	0.0002%
Leggett & Platt Inc	LEG	5,006.60	0.02%	4.20%	9.00%	13.39%	0.0029%
Lennar Corp	LEN	16,733.95	0.07%	0.31%	9.00%	9.32%	0.0067%
Laboratory Corp of America Holdings	LH	16,376.30	0.07%	0.00%	8.50%	8.50%	0.0060%
Linde PLC	LIN	49,899.84	N/A	2.02%	N/A	N/A	N/A
LKQ Corp	LKQ	8,609.17	0.04%	0.00%	10.50%	10.50%	0.0039%
L3 Technologies Inc	LLL	18,609.86	0.08%	1.45%	7.00%	8.50%	0.0068%
Eli Lilly & Co	LLY	112,422.20	0.48%	2.23%	11.50%	13.86%	0.0671%
Lockheed Martin Corp	LMT	95,882.43	0.41%	2.65%	14.00%	16.84%	0.0696%
Lincoln National Corp	LNC	13,381.03	0.06%	2.34%	9.00%	11.45%	0.0066%
Alliant Energy Corp	LNT	10,986.59	0.05%	3.07%	6.50%	9.67%	0.0046%
Lowe's Cos Inc	LOW	85,669.73	0.37%	1.98%	12.00%	14.10%	0.0520%
Lam Research Corp	LRCX	29,771.86	0.13%	2.22%	10.50%	12.84%	0.0165%
Southwest Airlines Co	LUV	28,489.19	0.12%	1.22%	11.50%	12.79%	0.0157%
Lamb Weston Holdings Inc	LW	10,046.27	N/A	1.17%	N/A	N/A	N/A

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LyondellBasell Industries NV	LYB	30,799.64	0.13%	4.88%	5.50%	10.51%	0.0140%
Macy's Inc	M	6,980.70	0.03%	6.65%	3.50%	10.27%	0.0031%
Mastercard Inc	MA	251,197.40	1.08%	0.54%	16.00%	16.58%	0.1795%
Mid-America Apartment Communities Inc	MAA	12,482.99	0.05%	3.50%	-3.00%	0.45%	0.0002%
Macerich Co/The	MAC	5,732.20	0.02%	7.49%	3.00%	10.60%	0.0026%
Marriott International Inc/MD	MAR	46,212.88	0.20%	1.21%	12.50%	13.79%	0.0274%
Masco Corp	MAS	11,104.96	0.05%	1.32%	10.50%	11.89%	0.0057%
Mattel Inc	MAT	3,987.06	0.02%	0.00%	18.50%	18.50%	0.0032%
McDonald's Corp	MCD	150,977.90	0.65%	2.39%	9.50%	12.00%	0.0781%
Microchip Technology Inc	MCHP	21,179.75	0.09%	1.69%	13.00%	14.80%	0.0135%
McKesson Corp	MCK	25,843.20	0.11%	1.16%	9.00%	10.21%	0.0114%
Moody's Corp	MCO	37,134.38	0.16%	1.06%	11.50%	12.62%	0.0202%
Mondelez International Inc	MDLZ	74,142.57	0.32%	2.14%	8.50%	10.73%	0.0343%
Medtronic PLC	MDT	118,159.90	0.51%	2.37%	7.50%	9.96%	0.0507%
MetLife Inc	MET	45,514.95	0.20%	3.71%	7.50%	11.35%	0.0223%
MGM Resorts International	MGM	13,724.33	0.06%	2.04%	22.50%	24.77%	0.0146%
Mohawk Industries Inc	MHK	9,620.54	0.04%	0.00%	4.00%	4.00%	0.0017%
McCormick & Co Inc/MD	MKC	20,452.00	0.09%	1.49%	8.50%	10.05%	0.0089%
Martin Marietta Materials Inc	MLM	13,579.14	0.06%	0.91%	10.00%	10.96%	0.0064%
Marsh & McLennan Cos Inc	MMC	47,302.08	0.20%	1.77%	9.50%	11.35%	0.0231%
3M Co	MMM	101,036.10	0.44%	3.29%	8.50%	11.93%	0.0519%
Monster Beverage Corp	MNST	33,656.43	0.15%	0.00%	13.50%	13.50%	0.0196%
Altria Group Inc	MO	97,312.48	0.42%	6.16%	8.50%	14.92%	0.0626%
Mosaic Co/The	MOS	9,123.89	0.04%	0.89%	22.00%	22.99%	0.0090%
Marathon Petroleum Corp	MPC	36,012.80	0.16%	4.00%	13.50%	17.77%	0.0276%
Merck & Co Inc	MRK	202,332.00	0.87%	2.81%	8.50%	11.43%	0.0996%
Marathon Oil Corp	MRO	12,521.40	N/A	1.70%	N/A	N/A	N/A
Morgan Stanley	MS	79,373.15	0.34%	2.58%	10.00%	12.71%	0.0435%
MSCI Inc	MSCI	18,787.69	0.08%	1.18%	19.50%	20.80%	0.0168%
Microsoft Corp	MSFT	962,083.00	4.15%	1.47%	13.50%	15.07%	0.6247%
Motorola Solutions Inc	MSI	23,933.91	0.10%	1.57%	12.50%	14.17%	0.0146%
M&T Bank Corp	MTB	23,007.89	0.10%	2.41%	9.50%	12.02%	0.0119%
Mettler-Toledo International Inc	MTD	18,483.90	0.08%	0.00%	10.00%	10.00%	0.0080%
Micron Technology Inc	MU	46,260.05	0.20%	0.00%	11.50%	11.50%	0.0229%
Maxim Integrated Products Inc	MXIM	15,555.47	0.07%	3.22%	8.00%	11.35%	0.0076%
Mylan NV	MYL	11,754.45	0.05%	0.00%	6.50%	6.50%	0.0033%
Noble Energy Inc	NBL	11,736.82	N/A	1.97%	N/A	N/A	N/A
Norwegian Cruise Line Holdings Ltd	NCLH	12,534.52	0.05%	0.00%	16.00%	16.00%	0.0086%
Nasdaq Inc	NDAQ	15,056.44	0.06%	2.06%	8.00%	10.14%	0.0066%
NextEra Energy Inc	NEE	90,344.18	0.39%	2.74%	10.00%	12.88%	0.0501%
Newmont Goldcorp Corp	NEM	16,072.41	0.07%	1.87%	2.50%	4.39%	0.0030%
Netflix Inc	NFLX	158,591.40	0.68%	0.00%	32.00%	32.00%	0.2187%
NiSource Inc	NI	10,261.31	0.04%	2.91%	15.00%	18.13%	0.0080%
NIKE Inc	NKE	130,527.50	0.56%	1.06%	14.50%	15.64%	0.0879%
Nektar Therapeutics	NKTR	6,151.64	N/A	0.00%	N/A	N/A	N/A
Nielsen Holdings PLC	NLSN	8,627.84	0.04%	5.77%	5.00%	10.91%	0.0041%
Northrop Grumman Corp	NOC	50,112.83	0.22%	1.63%	9.50%	11.21%	0.0242%
National Oilwell Varco Inc	NOV	9,627.83	N/A	0.80%	N/A	N/A	N/A
NRG Energy Inc	NRG	9,813.29	N/A	0.33%	N/A	N/A	N/A
Norfolk Southern Corp	NSC	53,914.17	0.23%	1.70%	13.50%	15.31%	0.0356%
NetApp Inc	NTAP	16,929.38	0.07%	2.33%	18.50%	21.05%	0.0154%
Northern Trust Corp	NTRS	21,108.14	0.09%	2.48%	10.00%	12.60%	0.0115%
Nucor Corp	NUE	17,238.70	0.07%	2.83%	21.50%	24.63%	0.0183%
NVIDIA Corp	NVDA	103,815.90	0.45%	0.38%	18.00%	18.41%	0.0824%
Newell Brands Inc	NWL	6,498.82	0.03%	5.99%	5.50%	11.65%	0.0033%
News Corp	NWSA	6,685.29	N/A	1.75%	N/A	N/A	N/A
Realty Income Corp	O	19,144.65	0.08%	4.08%	4.50%	8.67%	0.0072%
ONEOK Inc	OKE	27,258.21	0.12%	5.56%	18.50%	24.57%	0.0289%
Omnicom Group Inc	OMC	17,459.32	0.08%	3.34%	6.50%	9.95%	0.0075%
Oracle Corp	ORCL	186,782.80	0.80%	1.77%	10.00%	11.86%	0.0954%
O'Reilly Automotive Inc	ORLY	28,752.68	0.12%	0.00%	12.00%	12.00%	0.0149%
Occidental Petroleum Corp	OXY	42,127.97	N/A	5.57%	N/A	N/A	N/A
Paychex Inc	PAYX	30,301.01	0.13%	2.94%	10.50%	13.59%	0.0177%
People's United Financial Inc	PBCT	6,425.42	0.03%	4.17%	9.00%	13.36%	0.0037%
PACCAR Inc	PCAR	23,911.96	0.10%	4.78%	7.50%	12.46%	0.0128%
Public Service Enterprise Group Inc	PEG	29,378.16	0.13%	3.26%	6.00%	9.36%	0.0118%
PepsiCo Inc	PEP	176,699.50	0.76%	3.03%	6.50%	9.63%	0.0733%
Pfizer Inc	PFE	232,338.90	1.00%	3.54%	11.00%	14.73%	0.1475%
Principal Financial Group Inc	PFG	15,621.25	0.07%	3.87%	5.50%	9.48%	0.0064%
Procter & Gamble Co/The	PG	261,468.30	1.13%	2.86%	8.50%	11.48%	0.1293%
Progressive Corp/The	PGR	42,486.13	0.18%	0.55%	20.00%	20.61%	0.0377%
Parker-Hannifin Corp	PH	22,035.51	0.09%	2.05%	11.50%	13.67%	0.0130%
PulteGroup Inc	PHM	8,741.88	0.04%	1.43%	7.50%	8.98%	0.0034%
Packaging Corp of America	PKG	9,255.33	0.04%	3.27%	6.00%	9.37%	0.0037%
PerkinElmer Inc	PKI	10,274.05	0.04%	0.30%	11.00%	11.32%	0.0050%
Prologis Inc	PLD	46,994.54	0.20%	2.89%	6.50%	9.48%	0.0192%

Company	Ticker	[4] Market Capitalization	[5] Weight in Index	[6] Estimated Dividend Yield	[7] Long-Term Growth Est.	[8] DCF Result	[9] Weighted DCF Result
Philip Morris International Inc	PM	130,661.90	0.56%	5.43%	7.00%	12.62%	0.0710%
PNC Financial Services Group Inc/The	PNC	59,636.88	0.26%	2.88%	8.00%	11.00%	0.0283%
Pentair PLC	PNR	6,482.05	0.03%	1.91%	6.50%	8.47%	0.0024%
Pinnacle West Capital Corp	PNW	10,393.48	0.04%	3.28%	5.00%	8.36%	0.0037%
PPG Industries Inc	PPG	26,646.45	0.11%	1.70%	7.50%	9.26%	0.0106%
PPL Corp	PPL	21,828.69	0.09%	5.45%	1.50%	6.99%	0.0066%
Perrigo Co PLC	PRGO	7,151.06	0.03%	1.60%	2.50%	4.12%	0.0013%
Prudential Financial Inc	PRU	41,412.09	0.18%	3.97%	7.00%	11.11%	0.0198%
Public Storage	PSA	38,750.10	0.17%	3.77%	5.50%	9.37%	0.0157%
Phillips 66	PSX	38,892.00	0.17%	4.20%	12.50%	16.96%	0.0284%
PVH Corp	PVH	9,097.37	0.04%	0.12%	9.50%	9.63%	0.0038%
Quanta Services Inc	PWR	5,329.46	0.02%	0.43%	18.50%	18.97%	0.0044%
Pioneer Natural Resources Co	PXD	26,001.15	0.11%	0.42%	37.50%	38.00%	0.0426%
PayPal Holdings Inc	PYPL	128,603.60	0.55%	0.00%	19.00%	19.00%	0.1053%
QUALCOMM Inc	QCOM	101,708.90	0.44%	3.22%	10.50%	13.89%	0.0609%
Qorvo Inc	QRVO	9,243.52	N/A	0.00%	N/A	N/A	N/A
Royal Caribbean Cruises Ltd	RCL	26,682.00	0.11%	2.20%	12.50%	14.84%	0.0171%
Everest Re Group Ltd	RE	9,985.34	0.04%	2.36%	9.00%	11.47%	0.0049%
Regency Centers Corp	REG	10,977.63	0.05%	3.58%	16.00%	19.87%	0.0094%
Regeneron Pharmaceuticals Inc	REGN	34,904.03	0.15%	0.00%	12.00%	12.00%	0.0180%
Regions Financial Corp	RF	15,123.11	0.07%	3.89%	10.50%	14.59%	0.0095%
Robert Half International Inc	RHI	6,797.54	0.03%	2.19%	9.50%	11.79%	0.0035%
Red Hat Inc	RHT	32,646.30	0.14%	0.00%	15.50%	15.50%	0.0218%
Raymond James Financial Inc	RJF	12,254.71	0.05%	1.60%	10.00%	11.68%	0.0062%
Ralph Lauren Corp	RL	9,878.45	0.04%	1.99%	7.50%	9.56%	0.0041%
ResMed Inc	RMD	16,061.92	0.07%	1.32%	14.50%	15.92%	0.0110%
Rockwell Automation Inc	ROK	20,003.18	0.09%	2.33%	9.50%	11.94%	0.0103%
Rollins Inc	ROL	11,948.29	0.05%	1.15%	13.50%	14.73%	0.0076%
Roper Technologies Inc	ROP	36,597.72	0.16%	0.53%	11.50%	12.06%	0.0190%
Ross Stores Inc	ROST	35,996.34	0.16%	1.08%	11.00%	12.14%	0.0188%
Republic Services Inc	RSG	29,165.97	0.13%	1.88%	12.00%	13.99%	0.0176%
Raytheon Co	RTN	50,397.20	0.22%	2.10%	10.00%	12.21%	0.0265%
SBA Communications Corp	SBAC	23,468.53	0.10%	0.00%	35.50%	35.50%	0.0359%
Starbucks Corp	SBUX	94,258.99	0.41%	2.00%	13.50%	15.64%	0.0635%
Charles Schwab Corp/The	SCHW	61,142.25	0.26%	1.48%	12.00%	13.57%	0.0357%
Sealed Air Corp	SEE	6,678.69	0.03%	1.49%	22.50%	24.16%	0.0070%
Sherwin-Williams Co/The	SHW	40,799.98	0.18%	1.02%	12.00%	13.08%	0.0230%
SVB Financial Group	SIVB	13,088.35	0.06%	0.00%	19.50%	19.50%	0.0110%
JM Smucker Co/The	SJM	14,334.25	0.06%	2.75%	5.50%	8.33%	0.0051%
Schlumberger Ltd	SLB	55,778.86	0.24%	4.97%	24.00%	29.57%	0.0711%
SL Green Realty Corp	SLG	7,893.46	0.03%	4.14%	4.00%	8.22%	0.0028%
Snap-on Inc	SNA	9,420.55	0.04%	2.34%	7.00%	9.42%	0.0038%
Synopsys Inc	SNPS	17,748.91	0.08%	0.00%	10.00%	10.00%	0.0076%
Southern Co/The	SO	54,469.90	0.23%	4.78%	3.50%	8.36%	0.0196%
Simon Property Group Inc	SPG	54,070.09	0.23%	5.01%	5.50%	10.65%	0.0248%
S&P Global Inc	SPGI	52,448.83	0.23%	1.07%	13.00%	14.14%	0.0320%
Sempra Energy	SRE	34,581.54	0.15%	3.13%	11.00%	14.30%	0.0213%
SunTrust Banks Inc	STI	28,131.40	0.12%	3.16%	10.00%	13.32%	0.0161%
State Street Corp	STT	24,313.57	0.10%	3.01%	6.00%	9.10%	0.0095%
Seagate Technology PLC	STX	13,176.89	0.06%	5.30%	6.00%	11.46%	0.0065%
Constellation Brands Inc	STZ	38,330.84	0.17%	1.51%	9.50%	11.08%	0.0183%
Stanley Black & Decker Inc	SWK	21,596.34	0.09%	1.89%	9.50%	11.48%	0.0107%
Skyworks Solutions Inc	SWKS	14,444.63	0.06%	1.82%	9.00%	10.90%	0.0068%
Synchrony Financial	SYF	23,696.03	0.10%	2.56%	10.00%	12.69%	0.0130%
Stryker Corp	SYK	70,280.02	0.30%	1.11%	15.00%	16.19%	0.0490%
Symantec Corp	SYMC	14,166.63	0.06%	1.35%	9.00%	10.41%	0.0064%
Sysco Corp	SYY	37,499.10	0.16%	2.12%	12.00%	14.25%	0.0230%
AT&T Inc	T	221,689.70	0.96%	6.75%	5.50%	12.44%	0.1188%
Molson Coors Brewing Co	TAP	12,626.94	0.05%	3.00%	5.50%	8.58%	0.0047%
TransDigm Group Inc	TDG	25,139.30	0.11%	0.00%	6.50%	6.50%	0.0070%
TE Connectivity Ltd	TEL	30,657.92	0.13%	2.02%	8.00%	10.10%	0.0133%
Teleflex Inc	TFX	14,260.31	0.06%	0.45%	15.00%	15.48%	0.0095%
Target Corp	TGT	38,889.03	0.17%	3.41%	8.00%	11.55%	0.0193%
Tiffany & Co	TIF	12,747.78	0.05%	2.29%	10.50%	12.91%	0.0071%
TJX Cos Inc/The	TJX	66,392.52	0.29%	1.71%	13.50%	15.33%	0.0438%
Torchmark Corp	TMK	9,645.79	0.04%	0.79%	10.00%	10.83%	0.0045%
Thermo Fisher Scientific Inc	TMO	107,594.90	0.46%	0.28%	9.50%	9.79%	0.0454%
Tapestry Inc	TPR	9,677.74	0.04%	4.05%	12.00%	16.29%	0.0068%
TripAdvisor Inc	TRIP	6,733.71	0.03%	0.00%	18.00%	18.00%	0.0052%
T Rowe Price Group Inc	TROW	24,314.67	0.10%	3.00%	10.00%	13.15%	0.0138%
Travelers Cos Inc/The	TRV	37,400.57	0.16%	2.31%	6.50%	8.89%	0.0143%
Tractor Supply Co	TSCO	12,484.93	0.05%	1.37%	10.50%	11.94%	0.0064%
Tyson Foods Inc	TSN	28,526.04	0.12%	1.99%	6.50%	8.55%	0.0105%
Total System Services Inc	TSS	17,719.07	0.08%	0.52%	10.00%	10.55%	0.0081%
Take-Two Interactive Software Inc	TTWO	11,549.16	0.05%	0.00%	28.00%	28.00%	0.0139%
Twitter Inc	TWTR	29,787.35	N/A	0.00%	N/A	N/A	N/A

Company	Ticker	[4] Market Capitalization	[5] Weight in Index	[6] Estimated Dividend Yield	[7] Long-Term Growth Est.	[8] DCF Result	[9] Weighted DCF Result
Texas Instruments Inc	TXN	105,286.30	0.45%	2.75%	6.00%	8.83%	0.0401%
Textron Inc	TXT	11,833.62	0.05%	0.16%	13.00%	13.17%	0.0067%
Under Armour Inc	UAA	9,974.33	0.04%	0.00%	12.00%	12.00%	0.0052%
United Continental Holdings Inc	UAL	22,230.47	0.10%	0.00%	8.50%	8.50%	0.0081%
UDR Inc	UDR	11,706.50	0.05%	3.13%	1.50%	4.65%	0.0023%
Universal Health Services Inc	UHS	11,225.88	0.05%	0.33%	10.50%	10.85%	0.0052%
Ulta Beauty Inc	ULTA	20,695.40	0.09%	0.00%	19.00%	19.00%	0.0169%
UnitedHealth Group Inc	UNH	226,785.40	0.98%	1.51%	13.50%	15.11%	0.1477%
Unum Group	UNM	7,681.00	0.03%	2.91%	9.00%	12.04%	0.0040%
Union Pacific Corp	UNP	124,426.10	0.54%	2.00%	14.50%	16.65%	0.0892%
United Parcel Service Inc	UPS	86,745.75	0.37%	3.85%	8.50%	12.51%	0.0468%
United Rentals Inc	URI	10,544.39	0.05%	0.00%	14.50%	14.50%	0.0066%
US Bancorp	USB	83,341.81	0.36%	2.96%	7.00%	10.06%	0.0361%
United Technologies Corp	UTX	118,013.10	0.51%	2.15%	9.00%	11.25%	0.0572%
Visa Inc	V	321,377.90	1.38%	0.68%	15.00%	15.73%	0.2178%
Varian Medical Systems Inc	VAR	12,283.73	0.05%	0.00%	10.00%	10.00%	0.0053%
VF Corp	VFC	37,190.18	0.16%	2.17%	10.00%	12.28%	0.0197%
Viacom Inc	VIAB	11,488.35	0.05%	2.81%	6.00%	8.89%	0.0044%
Valero Energy Corp	VLO	34,104.22	0.15%	4.40%	9.00%	13.60%	0.0200%
Vulcan Materials Co	VMC	16,958.98	0.07%	0.97%	14.00%	15.04%	0.0110%
Vornado Realty Trust	VNO	12,639.82	0.05%	3.98%	-3.50%	0.41%	0.0002%
Verisk Analytics Inc	VRSK	22,993.25	0.10%	0.71%	9.50%	10.24%	0.0101%
VeriSign Inc	VRSN	23,129.62	0.10%	0.00%	10.50%	10.50%	0.0105%
Vertex Pharmaceuticals Inc	VRTX	43,556.60	N/A	0.00%	N/A	N/A	N/A
Ventas Inc	VTR	21,911.49	0.09%	5.24%	3.00%	8.32%	0.0079%
Verizon Communications Inc	VZ	233,584.80	1.01%	4.29%	4.50%	8.89%	0.0894%
Wabtec Corp	WAB	11,648.00	0.05%	0.67%	13.50%	14.22%	0.0071%
Waters Corp	WAT	15,204.08	0.07%	0.00%	10.50%	10.50%	0.0069%
Walgreens Boots Alliance Inc	WBA	53,113.63	0.23%	3.29%	10.00%	13.45%	0.0308%
WellCare Health Plans Inc	WCG	13,394.92	0.06%	0.00%	23.00%	23.00%	0.0133%
Western Digital Corp	WDC	13,601.06	0.06%	4.31%	1.50%	5.84%	0.0034%
WEC Energy Group Inc	WEC	24,436.98	0.11%	3.10%	6.00%	9.19%	0.0097%
Welltower Inc	WELL	28,281.22	0.12%	4.61%	8.00%	12.79%	0.0156%
Wells Fargo & Co	WFC	210,888.40	0.91%	3.94%	5.00%	9.04%	0.0821%
Whirlpool Corp	WHR	8,431.29	0.04%	3.59%	6.50%	10.21%	0.0037%
Willis Towers Watson PLC	WLTW	22,561.35	0.10%	1.49%	16.50%	18.11%	0.0176%
Waste Management Inc	WM	44,689.77	0.19%	1.95%	9.00%	11.04%	0.0213%
Williams Cos Inc/The	WMB	33,592.16	0.14%	5.64%	19.00%	25.18%	0.0364%
Walmart Inc	WMT	289,189.60	1.25%	2.15%	7.00%	9.23%	0.1149%
Westrock Co	WRK	9,543.84	0.04%	4.90%	9.50%	14.63%	0.0060%
Western Union Co/The	WU	8,311.68	0.04%	4.17%	6.00%	10.30%	0.0037%
Weyerhaeuser Co	WY	19,152.39	0.08%	5.30%	17.50%	23.26%	0.0192%
Wynn Resorts Ltd	WYNN	14,677.29	0.06%	2.20%	18.00%	20.40%	0.0129%
Cimarex Energy Co	XEC	6,449.38	0.03%	1.19%	32.50%	33.88%	0.0094%
Xcel Energy Inc	XEL	28,852.29	0.12%	2.94%	5.50%	8.52%	0.0106%
Xilinx Inc	XLNX	29,544.24	0.13%	1.27%	11.00%	12.34%	0.0157%
Exxon Mobil Corp	XOM	324,821.10	1.40%	4.53%	14.00%	18.85%	0.2638%
DENTSPLY SIRONA Inc	XRAY	12,306.76	0.05%	0.64%	3.00%	3.65%	0.0019%
Xerox Corp	XRX	7,283.64	0.03%	3.11%	9.00%	12.25%	0.0038%
Xylem Inc/NY	XYL	14,226.49	0.06%	1.21%	14.00%	15.29%	0.0094%
Yum! Brands Inc	YUM	30,826.44	0.13%	1.67%	10.00%	11.75%	0.0156%
Zimmer Biomet Holdings Inc	ZBH	24,967.17	0.11%	0.80%	4.50%	5.32%	0.0057%
Zions Bancorp NA	ZION	8,804.43	0.04%	2.61%	10.00%	12.74%	0.0048%
Zoetis Inc	ZTS	48,702.57	0.21%	0.65%	13.00%	13.69%	0.0287%
Total Market Capitalization:		23,208,889.99					14.93%

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

Bloomberg and Value Line Beta Coefficients

Company	Ticker	[1] Bloomberg	[2] Value Line
Atmos Energy Corporation	ATO	0.495	0.600
Chesapeake Utilities Corporation	CPK	0.604	0.700
New Jersey Resources Corporation	NJR	0.615	0.700
Northwest Natural Holding Company	NWN	0.584	0.650
ONE Gas, Inc.	OGS	0.527	0.650
South Jersey Industries, Inc.	SJI	0.714	0.850
Spire Inc.	SR	0.467	0.650
Southwest Gas Corporation	SWX	0.579	0.700
Mean		0.573	0.688

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

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

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
			Ex-Ante Market Risk Premium		CAPM Result		ECAPM Result	
	Risk-Free Rate	Average Beta Coefficient	Bloomberg Market DCF Derived	Value Line Market DCF Derived	Bloomberg Market DCF Derived	Value Line Market DCF Derived	Bloomberg Market DCF Derived	Value Line Market DCF Derived
PROXY GROUP AVERAGE BLOOMBERG BETA COEFFICIENT								
Current 30-Year Treasury [9]	2.92%	0.573	10.51%	12.02%	8.94%	9.80%	10.06%	11.09%
Near Term Projected 30-Year Treasury [10]	3.08%	0.573	10.51%	12.02%	9.10%	9.97%	10.23%	11.25%
Mean					9.02%	9.89%	10.14%	11.17%

			Ex-Ante Market Risk Premium		CAPM Result		ECAPM Result	
	Risk-Free Rate	Average Beta Coefficient	Bloomberg Market DCF Derived	Value Line Market DCF Derived	Bloomberg Market DCF Derived	Value Line Market DCF Derived	Bloomberg Market DCF Derived	Value Line Market DCF Derived
PROXY GROUP AVERAGE VALUE LINE AVERAGE BETA COEFFICIENT								
Current 30-Year Treasury [9]	2.92%	0.688	10.51%	12.02%	10.14%	11.18%	10.96%	12.12%
Near Term Projected 30-Year Treasury [10]	3.08%	0.688	10.51%	12.02%	10.31%	11.35%	11.13%	12.28%
Mean					10.22%	11.26%	11.04%	12.20%

Notes:
[1] See Notes [9] and [10]
[2] Source: Schedule RBH-4
[3] Source: Schedule RBH-3
[4] Source: Schedule RBH-3
[5] Equals Col. [1] + (Col. [2] x Col. [3])
[6] Equals Col. [1] + (Col. [2] x Col. [4])
[7] Equals Col. [1] + (0.75 x Col. [2] x Col. [3]) + (0.25 x Col. [3])
[8] Equals Col. [1] + (0.75 x Col. [2] x Col. [4]) + (0.25 x Col. [4])
[9] Source: Bloomberg Professional
[10] Source: Blue Chip Financial Forecasts, Vol. 38, No. 5, May 1, 2019, at 2

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Docket No. 19-057-02
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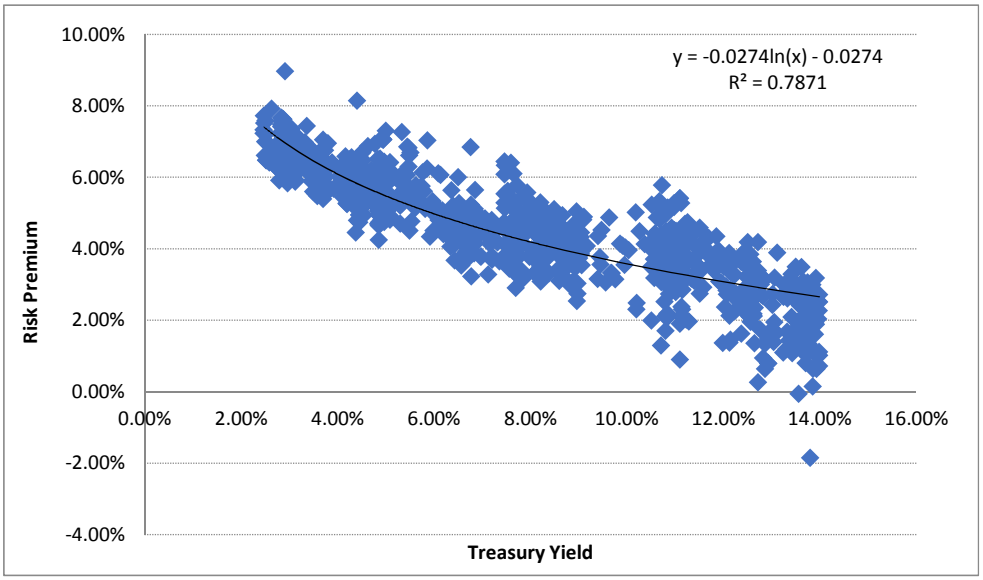
Bond Yield Plus Risk Premium

	[1]	[2]	[3]	[4]	[5]
	Constant	Slope	30-Year Treasury Yield	Risk Premium	Return on Equity
	-2.74%	-2.74%			
Current 30-Year Treasury			2.92%	6.96%	9.87%
Near Term Projected 30-Year Treasury			3.08%	6.81%	9.89%
Long Term Projected 30-Year Treasury			4.05%	6.06%	10.11%



Notes:

[1] Constant of regression equation
[2] Slope of regression equation
[3] Source: Current = Bloomberg Professional
Near Term Projected = Blue Chip Financial Forecasts, Vol. 38, No. 5, May 1, 2019, at 2.
Long Term Projected = Blue Chip Financial Forecasts, Vol. 37, No. 12, December 1, 2018, at 14
[4] Equals [1] + ln([3]) x [2]
[5] Equals [3] + [4]
[6] Source: S&P Global Market Intelligence
[7] Source: S&P Global Market Intelligence
[8] Source: Bloomberg Professional, equals 187-trading day average (i.e. lag period)
[9] Equals [7] - [8]

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
1/3/1980	12.55%	9.40%	3.15%
1/4/1980	13.75%	9.40%	4.35%
1/14/1980	13.20%	9.45%	3.75%
1/18/1980	14.00%	9.48%	4.52%
1/31/1980	12.61%	9.56%	3.05%
2/8/1980	14.50%	9.63%	4.87%
2/14/1980	13.00%	9.68%	3.32%
2/15/1980	13.00%	9.69%	3.31%
2/29/1980	14.00%	9.86%	4.14%
3/5/1980	14.00%	9.91%	4.09%
3/7/1980	13.50%	9.95%	3.55%
3/14/1980	14.00%	10.04%	3.96%
3/27/1980	12.69%	10.21%	2.48%
4/1/1980	14.75%	10.27%	4.48%
4/29/1980	12.50%	10.51%	1.99%
5/7/1980	14.27%	10.56%	3.71%
5/8/1980	13.75%	10.57%	3.18%
5/19/1980	15.50%	10.63%	4.87%
5/27/1980	14.60%	10.66%	3.94%
5/29/1980	16.00%	10.68%	5.32%
6/10/1980	13.78%	10.72%	3.06%
6/25/1980	14.25%	10.74%	3.51%
7/9/1980	14.51%	10.78%	3.73%
7/17/1980	12.90%	10.79%	2.11%
7/18/1980	13.80%	10.80%	3.00%
7/22/1980	14.10%	10.80%	3.30%
7/23/1980	14.19%	10.79%	3.40%
8/1/1980	12.50%	10.80%	1.70%
8/11/1980	14.85%	10.82%	4.03%
8/21/1980	13.03%	10.85%	2.18%
8/28/1980	13.61%	10.88%	2.73%
8/28/1980	14.00%	10.88%	3.12%
9/4/1980	14.00%	10.90%	3.10%
9/24/1980	15.00%	10.99%	4.01%
10/9/1980	14.50%	11.06%	3.44%
10/9/1980	14.50%	11.06%	3.44%
10/24/1980	14.00%	11.09%	2.91%
10/27/1980	15.20%	11.10%	4.10%
10/27/1980	15.20%	11.10%	4.10%
10/28/1980	12.00%	11.10%	0.90%
10/28/1980	13.00%	11.10%	1.90%
10/31/1980	14.50%	11.12%	3.38%
11/4/1980	15.00%	11.12%	3.88%
11/6/1980	14.35%	11.13%	3.22%
11/10/1980	13.25%	11.14%	2.11%
11/17/1980	15.50%	11.14%	4.36%
11/19/1980	13.50%	11.13%	2.37%
12/5/1980	14.60%	11.13%	3.47%
12/8/1980	16.40%	11.13%	5.27%
12/12/1980	15.45%	11.14%	4.31%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
12/17/1980	14.20%	11.15%	3.05%
12/17/1980	14.40%	11.15%	3.25%
12/18/1980	14.00%	11.16%	2.84%
12/22/1980	13.45%	11.15%	2.30%
12/26/1980	14.00%	11.14%	2.86%
12/30/1980	14.50%	11.13%	3.37%
12/31/1980	14.56%	11.13%	3.43%
1/7/1981	14.30%	11.13%	3.17%
1/12/1981	14.95%	11.14%	3.81%
1/26/1981	15.25%	11.20%	4.05%
1/30/1981	13.25%	11.24%	2.01%
2/11/1981	14.50%	11.34%	3.16%
2/20/1981	14.50%	11.40%	3.10%
3/12/1981	15.65%	11.61%	4.04%
3/25/1981	15.30%	11.75%	3.55%
4/1/1981	15.30%	11.83%	3.47%
4/9/1981	15.00%	11.92%	3.08%
4/29/1981	13.50%	12.13%	1.37%
4/29/1981	14.25%	12.13%	2.12%
4/30/1981	13.60%	12.15%	1.45%
4/30/1981	15.00%	12.15%	2.85%
5/21/1981	14.00%	12.38%	1.62%
6/3/1981	14.67%	12.46%	2.21%
6/22/1981	16.00%	12.58%	3.42%
6/25/1981	14.75%	12.61%	2.14%
7/2/1981	14.00%	12.65%	1.35%
7/10/1981	16.00%	12.70%	3.30%
7/14/1981	16.90%	12.72%	4.18%
7/21/1981	15.78%	12.78%	3.00%
7/27/1981	13.77%	12.83%	0.94%
7/27/1981	15.50%	12.83%	2.67%
7/31/1981	13.50%	12.87%	0.63%
7/31/1981	14.20%	12.87%	1.33%
8/12/1981	13.72%	12.94%	0.78%
8/12/1981	13.72%	12.94%	0.78%
8/12/1981	14.41%	12.94%	1.47%
8/25/1981	15.45%	13.02%	2.43%
8/27/1981	14.43%	13.05%	1.38%
8/28/1981	15.00%	13.06%	1.94%
9/23/1981	14.34%	13.25%	1.09%
9/24/1981	16.25%	13.26%	2.99%
9/29/1981	14.50%	13.31%	1.19%
9/30/1981	15.94%	13.33%	2.61%
10/2/1981	14.80%	13.37%	1.43%
10/12/1981	16.25%	13.43%	2.82%
10/20/1981	15.25%	13.51%	1.74%
10/20/1981	16.50%	13.51%	2.99%
10/20/1981	17.00%	13.51%	3.49%
10/23/1981	15.50%	13.55%	1.95%
10/26/1981	13.50%	13.56%	-0.06%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
10/29/1981	16.50%	13.60%	2.90%
11/4/1981	15.33%	13.63%	1.70%
11/6/1981	15.17%	13.64%	1.53%
11/12/1981	15.00%	13.65%	1.35%
11/25/1981	15.25%	13.66%	1.59%
11/25/1981	16.10%	13.66%	2.44%
11/25/1981	16.10%	13.66%	2.44%
11/30/1981	16.75%	13.66%	3.09%
12/1/1981	15.70%	13.66%	2.04%
12/1/1981	16.00%	13.66%	2.34%
12/15/1981	15.81%	13.70%	2.11%
12/17/1981	14.75%	13.71%	1.04%
12/22/1981	15.70%	13.72%	1.98%
12/22/1981	16.00%	13.72%	2.28%
12/30/1981	16.00%	13.75%	2.25%
12/30/1981	16.25%	13.75%	2.50%
1/4/1982	15.50%	13.75%	1.75%
1/14/1982	11.95%	13.81%	-1.86%
1/25/1982	16.25%	13.84%	2.41%
1/27/1982	16.84%	13.85%	2.99%
1/31/1982	14.00%	13.86%	0.14%
2/2/1982	16.24%	13.86%	2.38%
2/8/1982	15.50%	13.88%	1.62%
2/9/1982	14.95%	13.88%	1.07%
2/9/1982	15.75%	13.88%	1.87%
2/11/1982	16.00%	13.89%	2.11%
3/1/1982	15.96%	13.91%	2.05%
3/3/1982	15.00%	13.92%	1.08%
3/8/1982	17.10%	13.92%	3.18%
3/26/1982	16.00%	13.97%	2.03%
3/31/1982	16.25%	13.98%	2.27%
4/1/1982	16.50%	13.98%	2.52%
4/6/1982	15.00%	13.99%	1.01%
4/9/1982	16.50%	13.99%	2.51%
4/12/1982	15.10%	13.99%	1.11%
4/12/1982	16.70%	13.99%	2.71%
4/18/1982	14.70%	13.99%	0.71%
4/27/1982	15.00%	13.97%	1.03%
5/10/1982	14.57%	13.94%	0.63%
5/14/1982	15.80%	13.92%	1.88%
5/20/1982	15.82%	13.91%	1.91%
5/21/1982	15.50%	13.90%	1.60%
5/25/1982	16.25%	13.89%	2.36%
6/2/1982	14.50%	13.86%	0.64%
6/7/1982	16.00%	13.85%	2.15%
6/23/1982	15.50%	13.81%	1.69%
6/25/1982	16.50%	13.81%	2.69%
7/1/1982	15.55%	13.79%	1.76%
7/1/1982	16.00%	13.79%	2.21%
7/2/1982	15.10%	13.78%	1.32%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
7/13/1982	16.80%	13.75%	3.05%
7/22/1982	14.50%	13.71%	0.79%
7/28/1982	16.10%	13.67%	2.43%
7/30/1982	14.82%	13.66%	1.16%
8/4/1982	15.58%	13.64%	1.94%
8/6/1982	16.50%	13.63%	2.87%
8/11/1982	17.11%	13.62%	3.49%
8/25/1982	16.00%	13.59%	2.41%
8/30/1982	16.25%	13.58%	2.67%
9/3/1982	15.50%	13.57%	1.93%
9/9/1982	16.04%	13.55%	2.49%
9/15/1982	16.04%	13.52%	2.52%
9/17/1982	15.25%	13.51%	1.74%
9/29/1982	14.50%	13.43%	1.07%
9/30/1982	14.74%	13.42%	1.32%
9/30/1982	15.50%	13.42%	2.08%
9/30/1982	16.50%	13.42%	3.08%
9/30/1982	16.70%	13.42%	3.28%
10/1/1982	16.50%	13.40%	3.10%
10/8/1982	15.00%	13.33%	1.67%
10/15/1982	15.90%	13.25%	2.65%
10/19/1982	15.90%	13.22%	2.68%
10/27/1982	17.00%	13.12%	3.88%
10/28/1982	14.75%	13.10%	1.65%
11/2/1982	16.25%	13.07%	3.18%
11/4/1982	15.75%	13.02%	2.73%
11/5/1982	14.73%	13.00%	1.73%
11/17/1982	16.00%	12.86%	3.14%
11/23/1982	15.50%	12.79%	2.71%
11/24/1982	14.50%	12.77%	1.73%
11/24/1982	16.02%	12.77%	3.25%
11/30/1982	12.98%	12.72%	0.26%
11/30/1982	15.50%	12.72%	2.78%
11/30/1982	15.50%	12.72%	2.78%
11/30/1982	15.65%	12.72%	2.93%
11/30/1982	16.00%	12.72%	3.28%
11/30/1982	16.10%	12.72%	3.38%
12/3/1982	15.33%	12.68%	2.65%
12/8/1982	15.75%	12.63%	3.12%
12/13/1982	16.00%	12.58%	3.42%
12/14/1982	16.40%	12.56%	3.84%
12/17/1982	16.25%	12.52%	3.73%
12/20/1982	15.00%	12.50%	2.50%
12/21/1982	15.70%	12.49%	3.21%
12/28/1982	15.25%	12.42%	2.83%
12/28/1982	15.25%	12.42%	2.83%
12/29/1982	16.25%	12.40%	3.85%
12/29/1982	16.25%	12.40%	3.85%
1/11/1983	15.90%	12.25%	3.65%
1/12/1983	15.50%	12.24%	3.26%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
1/18/1983	15.00%	12.18%	2.82%
1/24/1983	15.50%	12.13%	3.37%
1/24/1983	16.00%	12.13%	3.87%
1/28/1983	14.90%	12.07%	2.83%
1/31/1983	15.00%	12.06%	2.94%
2/10/1983	15.00%	11.97%	3.03%
2/25/1983	15.70%	11.83%	3.87%
3/2/1983	15.25%	11.78%	3.47%
3/16/1983	16.00%	11.61%	4.39%
3/21/1983	14.96%	11.55%	3.41%
3/23/1983	15.40%	11.52%	3.88%
3/23/1983	16.10%	11.52%	4.58%
3/24/1983	15.00%	11.50%	3.50%
4/12/1983	13.25%	11.29%	1.96%
4/29/1983	15.05%	11.08%	3.97%
5/3/1983	15.40%	11.05%	4.35%
5/9/1983	15.50%	10.99%	4.51%
5/19/1983	14.85%	10.89%	3.96%
5/31/1983	14.00%	10.83%	3.17%
6/2/1983	14.50%	10.81%	3.69%
6/7/1983	14.50%	10.79%	3.71%
6/9/1983	14.85%	10.78%	4.07%
6/20/1983	14.15%	10.73%	3.42%
6/20/1983	16.50%	10.73%	5.77%
6/27/1983	14.50%	10.71%	3.79%
6/30/1983	14.80%	10.70%	4.10%
6/30/1983	15.90%	10.70%	5.20%
7/1/1983	14.80%	10.69%	4.11%
7/5/1983	15.00%	10.69%	4.31%
7/8/1983	15.50%	10.69%	4.81%
7/19/1983	15.00%	10.70%	4.30%
7/19/1983	15.10%	10.70%	4.40%
8/18/1983	15.30%	10.81%	4.49%
8/19/1983	15.79%	10.82%	4.97%
8/29/1983	16.00%	10.85%	5.15%
8/31/1983	14.75%	10.87%	3.88%
8/31/1983	15.25%	10.87%	4.38%
9/8/1983	14.75%	10.90%	3.85%
9/16/1983	15.51%	10.93%	4.58%
9/26/1983	14.50%	10.96%	3.54%
9/28/1983	14.25%	10.97%	3.28%
9/30/1983	16.15%	10.98%	5.17%
9/30/1983	16.25%	10.98%	5.27%
10/1/1983	16.25%	10.98%	5.27%
10/13/1983	15.52%	11.02%	4.50%
10/19/1983	15.20%	11.04%	4.16%
10/26/1983	14.75%	11.07%	3.68%
10/27/1983	14.88%	11.07%	3.81%
10/27/1983	15.33%	11.07%	4.26%
11/9/1983	14.82%	11.10%	3.72%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
11/9/1983	16.51%	11.10%	5.41%
11/9/1983	16.51%	11.10%	5.41%
12/1/1983	14.50%	11.17%	3.33%
12/8/1983	15.90%	11.21%	4.69%
12/9/1983	15.30%	11.21%	4.09%
12/12/1983	14.50%	11.22%	3.28%
12/12/1983	15.50%	11.22%	4.28%
12/20/1983	15.40%	11.26%	4.14%
12/20/1983	16.00%	11.26%	4.74%
12/22/1983	15.75%	11.27%	4.48%
12/29/1983	15.00%	11.30%	3.70%
12/30/1983	15.00%	11.30%	3.70%
1/10/1984	15.90%	11.34%	4.56%
1/13/1984	15.50%	11.37%	4.13%
1/18/1984	15.53%	11.39%	4.14%
1/26/1984	15.90%	11.42%	4.48%
2/14/1984	14.25%	11.52%	2.73%
2/28/1984	14.50%	11.59%	2.91%
3/20/1984	16.00%	11.70%	4.30%
3/23/1984	15.50%	11.73%	3.77%
4/9/1984	15.20%	11.81%	3.39%
4/18/1984	16.20%	11.86%	4.34%
4/27/1984	15.85%	11.90%	3.95%
5/15/1984	13.35%	11.99%	1.36%
5/16/1984	15.00%	12.00%	3.00%
5/22/1984	14.40%	12.04%	2.36%
6/13/1984	15.50%	12.19%	3.31%
7/10/1984	16.00%	12.37%	3.63%
8/7/1984	16.69%	12.51%	4.18%
8/9/1984	15.33%	12.52%	2.81%
8/17/1984	14.82%	12.54%	2.28%
8/21/1984	14.64%	12.55%	2.09%
8/27/1984	14.52%	12.57%	1.95%
8/28/1984	14.75%	12.57%	2.18%
8/30/1984	15.60%	12.58%	3.02%
9/12/1984	15.60%	12.60%	3.00%
9/12/1984	15.90%	12.60%	3.30%
9/25/1984	16.25%	12.62%	3.63%
10/2/1984	14.80%	12.63%	2.17%
10/9/1984	14.75%	12.64%	2.11%
10/10/1984	15.50%	12.64%	2.86%
10/18/1984	15.00%	12.65%	2.35%
10/24/1984	15.50%	12.65%	2.85%
11/7/1984	15.00%	12.64%	2.36%
11/20/1984	15.92%	12.63%	3.29%
11/30/1984	15.50%	12.60%	2.90%
12/18/1984	15.00%	12.55%	2.45%
12/20/1984	15.00%	12.54%	2.46%
12/28/1984	15.75%	12.51%	3.24%
12/28/1984	16.25%	12.51%	3.74%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
1/2/1985	16.00%	12.50%	3.50%
1/31/1985	14.75%	12.37%	2.38%
2/7/1985	14.85%	12.32%	2.53%
2/15/1985	15.00%	12.26%	2.74%
2/20/1985	14.50%	12.24%	2.26%
2/22/1985	14.86%	12.24%	2.62%
3/14/1985	15.50%	12.15%	3.35%
3/28/1985	14.80%	12.08%	2.72%
4/9/1985	15.50%	12.01%	3.49%
4/16/1985	15.70%	11.96%	3.74%
6/10/1985	15.75%	11.58%	4.17%
6/26/1985	14.82%	11.46%	3.36%
7/9/1985	15.00%	11.38%	3.62%
7/26/1985	14.50%	11.26%	3.24%
8/29/1985	14.50%	11.11%	3.39%
8/30/1985	14.38%	11.10%	3.28%
9/12/1985	15.25%	11.07%	4.18%
9/23/1985	15.30%	11.03%	4.27%
9/25/1985	14.50%	11.02%	3.48%
9/26/1985	13.80%	11.01%	2.79%
9/26/1985	14.50%	11.01%	3.49%
10/25/1985	15.25%	10.91%	4.34%
11/8/1985	12.94%	10.85%	2.09%
11/20/1985	14.90%	10.81%	4.09%
11/25/1985	13.30%	10.79%	2.51%
12/6/1985	12.00%	10.71%	1.29%
12/11/1985	14.90%	10.67%	4.23%
12/20/1985	14.88%	10.58%	4.30%
12/20/1985	15.00%	10.58%	4.42%
12/20/1985	15.00%	10.58%	4.42%
12/30/1985	15.75%	10.52%	5.23%
12/31/1985	14.00%	10.51%	3.49%
12/31/1985	14.50%	10.51%	3.99%
1/17/1986	14.50%	10.37%	4.13%
2/11/1986	12.50%	10.20%	2.30%
2/12/1986	15.20%	10.19%	5.01%
3/11/1986	14.00%	9.97%	4.03%
4/2/1986	12.90%	9.76%	3.14%
4/28/1986	13.01%	9.46%	3.55%
5/21/1986	13.25%	9.17%	4.08%
5/28/1986	14.00%	9.11%	4.89%
5/29/1986	13.90%	9.10%	4.80%
6/2/1986	13.00%	9.07%	3.93%
6/11/1986	14.00%	8.96%	5.04%
6/13/1986	13.55%	8.93%	4.62%
6/27/1986	11.88%	8.76%	3.12%
7/14/1986	12.60%	8.57%	4.03%
7/30/1986	13.30%	8.37%	4.93%
8/14/1986	13.50%	8.21%	5.29%
9/5/1986	13.30%	8.01%	5.29%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
9/23/1986	12.75%	7.90%	4.85%
10/30/1986	13.00%	7.66%	5.34%
10/31/1986	13.75%	7.65%	6.10%
11/10/1986	14.00%	7.60%	6.40%
11/19/1986	13.75%	7.56%	6.19%
11/25/1986	13.15%	7.54%	5.61%
12/22/1986	13.80%	7.47%	6.33%
12/30/1986	13.90%	7.47%	6.43%
1/20/1987	12.75%	7.47%	5.28%
1/23/1987	13.55%	7.47%	6.08%
1/27/1987	12.16%	7.47%	4.69%
2/13/1987	12.60%	7.47%	5.13%
2/24/1987	12.00%	7.47%	4.53%
3/30/1987	12.20%	7.46%	4.74%
3/31/1987	13.00%	7.47%	5.53%
5/5/1987	12.85%	7.60%	5.25%
5/28/1987	13.50%	7.73%	5.77%
6/15/1987	13.20%	7.81%	5.39%
6/30/1987	12.60%	7.85%	4.75%
7/10/1987	12.90%	7.88%	5.02%
7/27/1987	13.50%	7.94%	5.56%
8/25/1987	11.40%	8.09%	3.31%
9/18/1987	13.00%	8.28%	4.72%
10/20/1987	12.60%	8.55%	4.05%
10/20/1987	12.98%	8.55%	4.43%
11/12/1987	12.75%	8.68%	4.07%
11/13/1987	12.75%	8.69%	4.06%
11/24/1987	12.50%	8.74%	3.76%
12/8/1987	12.50%	8.82%	3.68%
12/22/1987	12.00%	8.91%	3.09%
12/31/1987	12.85%	8.95%	3.90%
12/31/1987	13.25%	8.95%	4.30%
1/15/1988	13.15%	8.99%	4.16%
1/20/1988	12.75%	8.99%	3.76%
1/29/1988	13.20%	8.99%	4.21%
2/4/1988	12.60%	8.99%	3.61%
3/23/1988	13.00%	8.95%	4.05%
5/27/1988	13.18%	9.02%	4.16%
6/14/1988	13.50%	9.00%	4.50%
6/17/1988	11.72%	8.98%	2.74%
6/24/1988	11.50%	8.97%	2.53%
7/1/1988	12.75%	8.94%	3.81%
7/8/1988	12.00%	8.93%	3.07%
7/18/1988	12.00%	8.90%	3.10%
7/20/1988	13.40%	8.89%	4.51%
8/8/1988	12.74%	8.90%	3.84%
9/20/1988	12.90%	8.93%	3.97%
9/26/1988	12.40%	8.93%	3.47%
9/27/1988	13.65%	8.93%	4.72%
9/30/1988	13.25%	8.94%	4.31%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
10/13/1988	13.10%	8.93%	4.17%
10/21/1988	12.80%	8.94%	3.86%
10/25/1988	13.25%	8.94%	4.31%
10/26/1988	13.50%	8.94%	4.56%
10/27/1988	12.95%	8.95%	4.00%
10/28/1988	13.00%	8.95%	4.05%
11/15/1988	12.00%	8.98%	3.02%
11/29/1988	12.75%	9.02%	3.73%
12/19/1988	13.00%	9.05%	3.95%
12/21/1988	12.90%	9.05%	3.85%
12/22/1988	13.50%	9.06%	4.44%
1/26/1989	12.60%	9.06%	3.54%
1/27/1989	13.00%	9.06%	3.94%
2/8/1989	13.37%	9.05%	4.32%
3/8/1989	13.00%	9.04%	3.96%
5/4/1989	13.00%	9.04%	3.96%
6/8/1989	13.50%	8.96%	4.54%
7/19/1989	11.80%	8.84%	2.96%
7/25/1989	12.80%	8.82%	3.98%
7/31/1989	13.00%	8.81%	4.19%
8/14/1989	12.50%	8.76%	3.74%
8/22/1989	12.80%	8.73%	4.07%
8/23/1989	12.90%	8.72%	4.18%
9/21/1989	12.10%	8.62%	3.48%
10/6/1989	13.00%	8.57%	4.43%
10/17/1989	12.41%	8.54%	3.87%
10/18/1989	13.25%	8.54%	4.71%
10/20/1989	12.90%	8.53%	4.37%
10/31/1989	13.60%	8.49%	5.11%
11/3/1989	12.93%	8.48%	4.45%
11/5/1989	13.20%	8.48%	4.72%
11/9/1989	12.60%	8.45%	4.15%
11/9/1989	13.00%	8.45%	4.55%
11/28/1989	12.75%	8.37%	4.38%
12/7/1989	13.25%	8.32%	4.93%
12/15/1989	13.00%	8.27%	4.73%
12/20/1989	12.90%	8.25%	4.65%
12/21/1989	12.80%	8.25%	4.55%
12/21/1989	12.90%	8.25%	4.65%
12/27/1989	12.50%	8.23%	4.27%
1/9/1990	13.00%	8.19%	4.81%
1/18/1990	12.50%	8.16%	4.34%
1/26/1990	12.10%	8.14%	3.96%
3/21/1990	12.80%	8.15%	4.65%
3/28/1990	13.00%	8.16%	4.84%
4/5/1990	12.20%	8.17%	4.03%
4/12/1990	13.25%	8.19%	5.06%
4/30/1990	12.45%	8.24%	4.21%
5/31/1990	12.40%	8.31%	4.09%
6/15/1990	13.20%	8.33%	4.87%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
6/27/1990	12.90%	8.34%	4.56%
6/29/1990	13.25%	8.35%	4.90%
7/6/1990	12.10%	8.36%	3.74%
7/19/1990	11.70%	8.39%	3.31%
8/31/1990	12.50%	8.53%	3.97%
8/31/1990	12.50%	8.53%	3.97%
9/13/1990	12.50%	8.58%	3.92%
9/18/1990	12.75%	8.60%	4.15%
9/20/1990	12.50%	8.61%	3.89%
10/2/1990	13.00%	8.65%	4.35%
10/17/1990	11.90%	8.68%	3.22%
10/31/1990	12.95%	8.70%	4.25%
11/9/1990	13.25%	8.71%	4.54%
11/19/1990	13.00%	8.70%	4.30%
11/21/1990	12.10%	8.70%	3.40%
11/21/1990	12.50%	8.70%	3.80%
11/28/1990	12.75%	8.70%	4.05%
11/29/1990	12.75%	8.70%	4.05%
12/18/1990	13.10%	8.68%	4.42%
12/20/1990	12.50%	8.67%	3.83%
12/21/1990	12.50%	8.67%	3.83%
12/21/1990	13.00%	8.67%	4.33%
12/21/1990	13.60%	8.67%	4.93%
1/3/1991	13.02%	8.66%	4.36%
1/16/1991	13.25%	8.63%	4.62%
1/25/1991	11.70%	8.60%	3.10%
2/15/1991	12.70%	8.56%	4.14%
2/15/1991	12.80%	8.56%	4.24%
4/3/1991	13.00%	8.51%	4.49%
4/30/1991	12.45%	8.47%	3.98%
4/30/1991	13.00%	8.47%	4.53%
6/25/1991	11.70%	8.34%	3.36%
6/28/1991	12.50%	8.33%	4.17%
7/1/1991	11.70%	8.33%	3.37%
7/19/1991	12.10%	8.30%	3.80%
7/19/1991	12.30%	8.30%	4.00%
7/22/1991	12.90%	8.30%	4.60%
8/15/1991	12.25%	8.27%	3.98%
8/29/1991	13.30%	8.26%	5.04%
9/27/1991	12.50%	8.23%	4.27%
9/30/1991	12.40%	8.23%	4.17%
10/3/1991	11.30%	8.22%	3.08%
10/9/1991	11.70%	8.21%	3.49%
10/15/1991	13.40%	8.20%	5.20%
11/1/1991	12.90%	8.20%	4.70%
11/8/1991	12.75%	8.20%	4.55%
11/26/1991	11.60%	8.18%	3.42%
11/26/1991	12.00%	8.18%	3.82%
11/27/1991	12.70%	8.18%	4.52%
12/6/1991	12.70%	8.16%	4.54%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
12/10/1991	11.75%	8.15%	3.60%
12/19/1991	12.60%	8.14%	4.46%
12/19/1991	12.80%	8.14%	4.66%
12/30/1991	12.10%	8.11%	3.99%
1/22/1992	12.84%	8.05%	4.79%
1/31/1992	12.00%	8.03%	3.97%
2/20/1992	13.00%	8.00%	5.00%
2/27/1992	11.75%	7.98%	3.77%
3/18/1992	12.50%	7.94%	4.56%
5/15/1992	12.75%	7.86%	4.89%
6/24/1992	12.20%	7.85%	4.35%
6/29/1992	11.00%	7.85%	3.15%
7/14/1992	12.00%	7.83%	4.17%
7/22/1992	11.20%	7.82%	3.38%
8/10/1992	12.10%	7.79%	4.31%
8/26/1992	12.43%	7.75%	4.68%
9/30/1992	11.60%	7.72%	3.88%
10/6/1992	12.25%	7.72%	4.53%
10/13/1992	12.75%	7.71%	5.04%
10/23/1992	11.65%	7.71%	3.94%
10/28/1992	12.25%	7.71%	4.54%
10/29/1992	12.75%	7.70%	5.05%
10/30/1992	11.40%	7.70%	3.70%
11/9/1992	10.60%	7.70%	2.90%
11/25/1992	11.00%	7.67%	3.33%
11/25/1992	12.00%	7.67%	4.33%
12/3/1992	11.85%	7.66%	4.19%
12/16/1992	11.90%	7.63%	4.27%
12/22/1992	12.30%	7.62%	4.68%
12/22/1992	12.40%	7.62%	4.78%
12/30/1992	12.00%	7.61%	4.39%
12/31/1992	12.00%	7.60%	4.40%
1/12/1993	12.00%	7.58%	4.42%
1/12/1993	12.00%	7.58%	4.42%
2/2/1993	11.40%	7.53%	3.87%
2/22/1993	11.60%	7.47%	4.13%
4/23/1993	11.75%	7.27%	4.48%
5/3/1993	11.50%	7.25%	4.25%
5/3/1993	11.75%	7.25%	4.50%
6/3/1993	12.00%	7.20%	4.80%
6/7/1993	11.50%	7.20%	4.30%
6/22/1993	11.75%	7.16%	4.59%
7/21/1993	11.78%	7.06%	4.72%
7/21/1993	11.90%	7.06%	4.84%
7/23/1993	11.50%	7.05%	4.45%
7/29/1993	11.50%	7.03%	4.47%
8/12/1993	10.75%	6.97%	3.78%
8/24/1993	11.50%	6.91%	4.59%
8/31/1993	11.90%	6.88%	5.02%
9/1/1993	11.25%	6.87%	4.38%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
9/1/1993	11.47%	6.87%	4.60%
9/27/1993	10.50%	6.74%	3.76%
9/29/1993	11.00%	6.72%	4.28%
9/30/1993	11.60%	6.71%	4.89%
10/8/1993	11.50%	6.67%	4.83%
10/14/1993	11.20%	6.65%	4.55%
10/15/1993	11.75%	6.64%	5.11%
10/25/1993	11.55%	6.60%	4.95%
10/28/1993	11.50%	6.58%	4.92%
10/29/1993	10.10%	6.57%	3.53%
10/29/1993	10.20%	6.57%	3.63%
10/29/1993	11.25%	6.57%	4.68%
11/2/1993	10.80%	6.56%	4.24%
11/12/1993	11.80%	6.53%	5.27%
11/23/1993	12.50%	6.50%	6.00%
11/26/1993	11.00%	6.50%	4.50%
12/1/1993	11.45%	6.49%	4.96%
12/16/1993	10.60%	6.45%	4.15%
12/16/1993	11.20%	6.45%	4.75%
12/21/1993	11.30%	6.44%	4.86%
12/22/1993	11.00%	6.44%	4.56%
12/23/1993	10.10%	6.43%	3.67%
1/5/1994	11.50%	6.41%	5.09%
1/10/1994	11.00%	6.40%	4.60%
1/25/1994	12.00%	6.37%	5.63%
2/2/1994	10.40%	6.35%	4.05%
2/9/1994	10.70%	6.33%	4.37%
4/6/1994	11.24%	6.34%	4.90%
4/25/1994	11.00%	6.39%	4.61%
6/16/1994	10.50%	6.64%	3.86%
6/23/1994	10.60%	6.68%	3.92%
7/19/1994	10.70%	6.84%	3.86%
9/29/1994	10.90%	7.21%	3.69%
9/29/1994	11.00%	7.21%	3.79%
10/7/1994	11.87%	7.26%	4.61%
10/18/1994	11.50%	7.32%	4.18%
10/18/1994	11.50%	7.32%	4.18%
10/24/1994	11.00%	7.36%	3.64%
11/22/1994	12.12%	7.53%	4.59%
11/29/1994	11.30%	7.55%	3.75%
12/1/1994	11.00%	7.57%	3.43%
12/8/1994	11.50%	7.59%	3.91%
12/8/1994	11.70%	7.59%	4.11%
12/12/1994	11.82%	7.60%	4.22%
12/14/1994	11.50%	7.61%	3.89%
12/19/1994	11.50%	7.62%	3.88%
4/19/1995	11.00%	7.72%	3.28%
9/11/1995	11.30%	7.16%	4.14%
9/15/1995	10.40%	7.13%	3.27%
9/29/1995	11.50%	7.06%	4.44%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
10/13/1995	10.76%	6.98%	3.78%
11/7/1995	12.50%	6.86%	5.64%
11/8/1995	11.10%	6.85%	4.25%
11/8/1995	11.30%	6.85%	4.45%
11/17/1995	10.90%	6.80%	4.10%
11/20/1995	11.40%	6.80%	4.60%
11/27/1995	13.60%	6.76%	6.84%
12/14/1995	11.30%	6.67%	4.63%
12/20/1995	11.60%	6.64%	4.96%
1/31/1996	11.30%	6.45%	4.85%
3/11/1996	11.60%	6.40%	5.20%
4/3/1996	11.13%	6.40%	4.73%
4/15/1996	10.50%	6.40%	4.10%
4/17/1996	10.77%	6.40%	4.37%
4/26/1996	10.60%	6.40%	4.20%
5/10/1996	11.00%	6.40%	4.60%
5/13/1996	11.25%	6.40%	4.85%
7/3/1996	11.25%	6.49%	4.76%
7/22/1996	11.25%	6.54%	4.71%
10/3/1996	10.00%	6.77%	3.23%
10/29/1996	11.30%	6.85%	4.45%
11/26/1996	11.30%	6.86%	4.44%
11/27/1996	11.30%	6.86%	4.44%
11/29/1996	11.00%	6.86%	4.14%
12/12/1996	11.96%	6.85%	5.11%
12/17/1996	11.50%	6.85%	4.65%
1/22/1997	11.30%	6.83%	4.47%
1/27/1997	11.25%	6.83%	4.42%
1/31/1997	11.25%	6.83%	4.42%
2/13/1997	11.00%	6.82%	4.18%
2/13/1997	11.80%	6.82%	4.98%
2/20/1997	11.80%	6.81%	4.99%
3/27/1997	10.75%	6.79%	3.96%
4/29/1997	11.70%	6.81%	4.89%
7/17/1997	12.00%	6.77%	5.23%
10/29/1997	10.75%	6.70%	4.05%
10/31/1997	11.25%	6.70%	4.55%
12/24/1997	10.75%	6.53%	4.22%
4/28/1998	10.90%	6.10%	4.80%
4/30/1998	12.20%	6.10%	6.10%
6/30/1998	11.00%	5.94%	5.06%
8/26/1998	10.93%	5.82%	5.11%
9/3/1998	11.40%	5.80%	5.60%
9/15/1998	11.90%	5.77%	6.13%
10/7/1998	11.06%	5.70%	5.36%
10/30/1998	11.40%	5.63%	5.77%
12/10/1998	12.20%	5.51%	6.69%
12/17/1998	12.10%	5.49%	6.61%
2/19/1999	11.15%	5.31%	5.84%
3/1/1999	10.65%	5.31%	5.34%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
3/1/1999	10.65%	5.31%	5.34%
6/8/1999	11.25%	5.36%	5.89%
11/12/1999	10.25%	5.92%	4.33%
12/14/1999	10.50%	6.00%	4.50%
1/28/2000	10.71%	6.16%	4.55%
2/17/2000	10.60%	6.20%	4.40%
5/25/2000	10.80%	6.20%	4.60%
6/19/2000	11.05%	6.18%	4.87%
6/22/2000	11.25%	6.18%	5.07%
7/17/2000	11.06%	6.15%	4.91%
7/20/2000	12.20%	6.14%	6.06%
8/11/2000	11.00%	6.11%	4.89%
9/27/2000	11.25%	6.00%	5.25%
9/29/2000	11.16%	5.99%	5.17%
10/5/2000	11.30%	5.98%	5.32%
11/28/2000	12.90%	5.87%	7.03%
11/30/2000	12.10%	5.86%	6.24%
2/5/2001	11.50%	5.75%	5.75%
3/15/2001	11.25%	5.66%	5.59%
5/8/2001	10.75%	5.61%	5.14%
10/24/2001	10.30%	5.54%	4.76%
10/24/2001	11.00%	5.54%	5.46%
1/9/2002	10.00%	5.50%	4.50%
1/30/2002	11.00%	5.47%	5.53%
1/31/2002	11.00%	5.47%	5.53%
4/17/2002	11.50%	5.44%	6.06%
4/29/2002	11.00%	5.44%	5.56%
6/11/2002	11.77%	5.47%	6.30%
6/20/2002	12.30%	5.48%	6.82%
8/28/2002	11.00%	5.49%	5.51%
9/11/2002	11.20%	5.45%	5.75%
9/12/2002	12.30%	5.45%	6.85%
10/28/2002	11.30%	5.34%	5.96%
10/30/2002	10.60%	5.34%	5.26%
11/1/2002	12.60%	5.34%	7.26%
11/7/2002	11.40%	5.33%	6.07%
11/8/2002	10.75%	5.33%	5.42%
11/20/2002	10.00%	5.30%	4.70%
11/20/2002	10.50%	5.30%	5.20%
12/4/2002	10.75%	5.26%	5.49%
12/30/2002	11.20%	5.18%	6.02%
1/6/2003	11.25%	5.16%	6.09%
2/28/2003	12.30%	5.00%	7.30%
3/7/2003	9.96%	4.98%	4.98%
3/12/2003	11.40%	4.97%	6.43%
3/20/2003	12.00%	4.95%	7.05%
4/3/2003	12.00%	4.92%	7.08%
5/2/2003	11.40%	4.88%	6.52%
5/15/2003	11.05%	4.87%	6.18%
6/26/2003	11.00%	4.80%	6.20%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
7/1/2003	11.00%	4.80%	6.20%
7/29/2003	11.71%	4.78%	6.93%
8/22/2003	10.20%	4.81%	5.39%
9/17/2003	9.90%	4.85%	5.05%
9/25/2003	10.25%	4.85%	5.40%
10/17/2003	10.54%	4.87%	5.67%
10/22/2003	10.46%	4.87%	5.59%
10/22/2003	10.71%	4.87%	5.84%
10/30/2003	11.00%	4.88%	6.12%
10/31/2003	10.20%	4.88%	5.32%
10/31/2003	10.75%	4.88%	5.87%
11/10/2003	10.60%	4.89%	5.71%
12/9/2003	10.50%	4.93%	5.57%
12/18/2003	10.50%	4.94%	5.56%
12/19/2003	12.00%	4.94%	7.06%
12/19/2003	12.00%	4.94%	7.06%
1/13/2004	10.25%	4.95%	5.30%
1/13/2004	12.00%	4.95%	7.05%
2/9/2004	11.25%	4.99%	6.26%
3/16/2004	10.90%	5.05%	5.85%
3/16/2004	10.90%	5.05%	5.85%
5/25/2004	10.00%	5.06%	4.94%
6/2/2004	11.22%	5.07%	6.15%
6/30/2004	10.50%	5.10%	5.40%
7/8/2004	10.00%	5.10%	4.90%
7/22/2004	10.25%	5.10%	5.15%
8/26/2004	10.50%	5.10%	5.40%
8/26/2004	10.50%	5.10%	5.40%
9/9/2004	10.40%	5.10%	5.30%
9/21/2004	10.50%	5.09%	5.41%
9/27/2004	10.30%	5.09%	5.21%
9/27/2004	10.50%	5.09%	5.41%
10/20/2004	10.20%	5.08%	5.12%
11/30/2004	10.60%	5.08%	5.52%
12/8/2004	9.90%	5.09%	4.81%
12/21/2004	11.50%	5.09%	6.41%
12/22/2004	11.50%	5.09%	6.41%
12/28/2004	10.25%	5.09%	5.16%
2/18/2005	10.30%	4.95%	5.35%
3/29/2005	11.00%	4.86%	6.14%
4/13/2005	10.60%	4.83%	5.77%
4/28/2005	11.00%	4.80%	6.20%
5/17/2005	10.00%	4.76%	5.24%
6/8/2005	10.18%	4.71%	5.47%
6/10/2005	10.90%	4.71%	6.19%
7/6/2005	10.50%	4.65%	5.85%
7/19/2005	11.50%	4.63%	6.87%
8/11/2005	10.40%	4.60%	5.80%
9/19/2005	9.45%	4.53%	4.92%
9/30/2005	10.51%	4.52%	5.99%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
10/4/2005	9.90%	4.52%	5.38%
10/4/2005	10.75%	4.52%	6.23%
10/14/2005	10.40%	4.51%	5.89%
10/31/2005	10.25%	4.53%	5.72%
11/2/2005	9.70%	4.53%	5.17%
11/30/2005	10.00%	4.53%	5.47%
12/9/2005	9.70%	4.53%	5.17%
12/12/2005	11.00%	4.53%	6.47%
12/20/2005	10.13%	4.52%	5.61%
12/21/2005	10.40%	4.52%	5.88%
12/21/2005	11.00%	4.52%	6.48%
12/22/2005	10.20%	4.52%	5.68%
12/22/2005	11.00%	4.52%	6.48%
12/28/2005	10.00%	4.52%	5.48%
1/5/2006	11.00%	4.52%	6.48%
1/25/2006	11.20%	4.52%	6.68%
1/25/2006	11.20%	4.52%	6.68%
2/3/2006	10.50%	4.52%	5.98%
2/15/2006	9.50%	4.53%	4.97%
4/26/2006	10.60%	4.65%	5.95%
7/24/2006	9.60%	4.87%	4.73%
7/24/2006	10.00%	4.87%	5.13%
9/20/2006	11.00%	4.93%	6.07%
9/26/2006	10.75%	4.94%	5.81%
10/20/2006	9.80%	4.96%	4.84%
11/2/2006	9.71%	4.97%	4.74%
11/9/2006	10.00%	4.98%	5.02%
11/21/2006	11.00%	4.98%	6.02%
12/5/2006	10.20%	4.97%	5.23%
1/5/2007	10.40%	4.95%	5.45%
1/9/2007	11.00%	4.94%	6.06%
1/11/2007	10.90%	4.94%	5.96%
1/19/2007	10.80%	4.93%	5.87%
1/26/2007	10.00%	4.92%	5.08%
2/8/2007	10.40%	4.91%	5.49%
3/14/2007	10.10%	4.85%	5.25%
3/20/2007	10.25%	4.84%	5.41%
3/21/2007	11.35%	4.84%	6.51%
3/22/2007	10.50%	4.84%	5.66%
3/29/2007	10.00%	4.83%	5.17%
6/13/2007	10.75%	4.82%	5.93%
6/29/2007	9.53%	4.84%	4.69%
6/29/2007	10.10%	4.84%	5.26%
7/3/2007	10.25%	4.85%	5.40%
7/13/2007	9.50%	4.86%	4.64%
7/24/2007	10.40%	4.87%	5.53%
8/1/2007	10.15%	4.88%	5.27%
8/29/2007	10.50%	4.91%	5.59%
9/10/2007	9.71%	4.92%	4.79%
9/19/2007	10.00%	4.91%	5.09%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
9/25/2007	9.70%	4.92%	4.78%
10/8/2007	10.48%	4.92%	5.56%
10/19/2007	10.50%	4.91%	5.59%
10/25/2007	9.65%	4.91%	4.74%
11/15/2007	10.00%	4.89%	5.11%
11/20/2007	9.90%	4.89%	5.01%
11/27/2007	10.00%	4.89%	5.11%
11/29/2007	10.90%	4.88%	6.02%
12/14/2007	10.80%	4.87%	5.93%
12/18/2007	10.40%	4.86%	5.54%
12/19/2007	9.80%	4.86%	4.94%
12/19/2007	9.80%	4.86%	4.94%
12/19/2007	10.20%	4.86%	5.34%
12/21/2007	9.10%	4.86%	4.24%
1/8/2008	10.75%	4.83%	5.92%
1/17/2008	10.75%	4.81%	5.94%
1/17/2008	10.75%	4.81%	5.94%
2/5/2008	9.99%	4.77%	5.22%
2/5/2008	10.19%	4.77%	5.42%
2/13/2008	10.20%	4.76%	5.44%
3/31/2008	10.00%	4.63%	5.37%
5/28/2008	10.50%	4.53%	5.97%
6/24/2008	10.00%	4.52%	5.48%
6/27/2008	10.00%	4.52%	5.48%
7/31/2008	10.70%	4.50%	6.20%
7/31/2008	10.82%	4.50%	6.32%
8/27/2008	10.25%	4.50%	5.75%
9/2/2008	10.25%	4.50%	5.75%
9/19/2008	10.70%	4.48%	6.22%
9/24/2008	10.68%	4.48%	6.20%
9/24/2008	10.68%	4.48%	6.20%
9/24/2008	10.68%	4.48%	6.20%
9/30/2008	10.20%	4.48%	5.72%
10/3/2008	10.30%	4.48%	5.82%
10/8/2008	10.15%	4.47%	5.68%
10/20/2008	10.06%	4.47%	5.59%
10/24/2008	10.60%	4.46%	6.14%
10/24/2008	10.60%	4.46%	6.14%
11/21/2008	10.50%	4.42%	6.08%
11/21/2008	10.50%	4.42%	6.08%
11/21/2008	10.50%	4.42%	6.08%
11/24/2008	10.50%	4.41%	6.09%
12/3/2008	10.39%	4.38%	6.01%
12/24/2008	10.00%	4.26%	5.74%
12/26/2008	10.10%	4.24%	5.86%
12/29/2008	10.20%	4.23%	5.97%
1/13/2009	10.45%	4.14%	6.31%
2/2/2009	10.05%	4.03%	6.02%
3/9/2009	10.30%	3.89%	6.41%
3/25/2009	10.17%	3.83%	6.34%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
4/2/2009	10.75%	3.80%	6.95%
5/5/2009	10.75%	3.71%	7.04%
5/15/2009	10.20%	3.70%	6.50%
5/29/2009	9.54%	3.70%	5.84%
6/3/2009	10.10%	3.70%	6.40%
6/22/2009	10.00%	3.73%	6.27%
6/29/2009	10.21%	3.73%	6.48%
6/30/2009	9.31%	3.74%	5.57%
7/17/2009	9.26%	3.75%	5.51%
7/17/2009	10.50%	3.75%	6.75%
10/16/2009	10.40%	4.09%	6.31%
10/26/2009	10.10%	4.11%	5.99%
10/28/2009	10.15%	4.12%	6.03%
10/28/2009	10.15%	4.12%	6.03%
10/30/2009	9.95%	4.13%	5.82%
11/20/2009	9.45%	4.19%	5.26%
12/14/2009	10.50%	4.25%	6.25%
12/16/2009	10.75%	4.26%	6.49%
12/17/2009	10.30%	4.26%	6.04%
12/18/2009	10.40%	4.27%	6.13%
12/18/2009	10.40%	4.27%	6.13%
12/18/2009	10.50%	4.27%	6.23%
12/22/2009	10.20%	4.28%	5.92%
12/22/2009	10.40%	4.28%	6.12%
12/28/2009	10.85%	4.30%	6.55%
12/29/2009	10.38%	4.30%	6.08%
1/11/2010	10.24%	4.34%	5.90%
1/21/2010	10.23%	4.37%	5.86%
1/21/2010	10.33%	4.37%	5.96%
1/26/2010	10.40%	4.37%	6.03%
2/10/2010	10.00%	4.39%	5.61%
2/23/2010	10.50%	4.40%	6.10%
3/9/2010	9.60%	4.40%	5.20%
3/24/2010	10.13%	4.42%	5.71%
3/31/2010	10.70%	4.43%	6.27%
4/1/2010	9.50%	4.43%	5.07%
4/2/2010	10.10%	4.44%	5.66%
4/8/2010	10.35%	4.44%	5.91%
4/29/2010	9.19%	4.46%	4.73%
4/29/2010	9.40%	4.46%	4.94%
4/29/2010	9.40%	4.46%	4.94%
5/17/2010	10.55%	4.46%	6.09%
5/24/2010	10.05%	4.46%	5.59%
6/3/2010	11.00%	4.46%	6.54%
6/16/2010	10.00%	4.46%	5.54%
6/18/2010	10.30%	4.46%	5.84%
8/9/2010	12.55%	4.41%	8.14%
8/17/2010	10.10%	4.40%	5.70%
9/16/2010	9.60%	4.31%	5.29%
9/16/2010	10.00%	4.31%	5.69%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
9/16/2010	10.00%	4.31%	5.69%
9/16/2010	10.30%	4.31%	5.99%
10/21/2010	10.40%	4.20%	6.20%
11/2/2010	9.75%	4.17%	5.58%
11/2/2010	9.75%	4.17%	5.58%
11/3/2010	10.75%	4.17%	6.58%
11/19/2010	10.20%	4.14%	6.06%
12/1/2010	10.00%	4.12%	5.88%
12/6/2010	9.56%	4.12%	5.44%
12/6/2010	10.09%	4.12%	5.97%
12/9/2010	10.25%	4.12%	6.13%
12/14/2010	10.33%	4.11%	6.22%
12/17/2010	10.10%	4.11%	5.99%
12/20/2010	10.10%	4.11%	5.99%
12/23/2010	9.92%	4.10%	5.82%
1/6/2011	10.35%	4.09%	6.26%
1/12/2011	10.30%	4.08%	6.22%
1/13/2011	10.30%	4.08%	6.22%
3/10/2011	10.10%	4.16%	5.94%
3/31/2011	9.45%	4.20%	5.25%
4/18/2011	10.05%	4.24%	5.81%
5/26/2011	10.50%	4.32%	6.18%
6/21/2011	10.00%	4.36%	5.64%
6/29/2011	8.83%	4.38%	4.45%
8/1/2011	9.20%	4.41%	4.79%
9/1/2011	10.10%	4.32%	5.78%
11/14/2011	9.60%	3.93%	5.67%
12/13/2011	9.50%	3.76%	5.74%
12/20/2011	10.00%	3.71%	6.29%
12/22/2011	10.40%	3.70%	6.70%
1/10/2012	9.06%	3.59%	5.47%
1/10/2012	9.45%	3.59%	5.86%
1/10/2012	9.45%	3.59%	5.86%
1/23/2012	10.20%	3.52%	6.68%
1/31/2012	10.00%	3.48%	6.52%
4/24/2012	9.50%	3.15%	6.35%
4/24/2012	9.75%	3.15%	6.60%
5/7/2012	9.80%	3.13%	6.67%
5/22/2012	9.60%	3.10%	6.50%
5/24/2012	9.70%	3.09%	6.61%
6/7/2012	10.30%	3.06%	7.24%
6/15/2012	10.40%	3.05%	7.35%
6/18/2012	9.60%	3.05%	6.55%
7/2/2012	9.75%	3.04%	6.71%
10/24/2012	10.30%	2.92%	7.38%
10/26/2012	9.50%	2.92%	6.58%
10/31/2012	9.30%	2.91%	6.39%
10/31/2012	9.90%	2.91%	6.99%
10/31/2012	10.00%	2.91%	7.09%
11/1/2012	9.45%	2.91%	6.54%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
11/8/2012	10.10%	2.91%	7.19%
11/9/2012	10.30%	2.90%	7.40%
11/26/2012	10.00%	2.88%	7.12%
11/28/2012	10.40%	2.88%	7.52%
11/28/2012	10.50%	2.88%	7.62%
12/4/2012	10.00%	2.87%	7.13%
12/4/2012	10.50%	2.87%	7.63%
12/20/2012	9.50%	2.84%	6.66%
12/20/2012	10.10%	2.84%	7.26%
12/20/2012	10.25%	2.84%	7.41%
12/20/2012	10.30%	2.84%	7.46%
12/20/2012	10.40%	2.84%	7.56%
12/20/2012	10.50%	2.84%	7.66%
12/26/2012	9.80%	2.83%	6.97%
2/22/2013	9.60%	2.86%	6.74%
3/14/2013	9.30%	2.89%	6.41%
3/27/2013	9.80%	2.92%	6.88%
4/23/2013	9.80%	2.96%	6.84%
5/10/2013	9.25%	2.96%	6.29%
6/13/2013	9.40%	3.02%	6.38%
6/18/2013	9.28%	3.02%	6.26%
6/18/2013	9.28%	3.02%	6.26%
6/25/2013	9.80%	3.04%	6.76%
9/23/2013	9.60%	3.33%	6.27%
11/6/2013	10.20%	3.42%	6.78%
11/13/2013	9.84%	3.44%	6.40%
11/14/2013	10.25%	3.45%	6.80%
11/22/2013	9.50%	3.47%	6.03%
12/5/2013	10.20%	3.50%	6.70%
12/13/2013	9.60%	3.52%	6.08%
12/16/2013	9.73%	3.53%	6.20%
12/17/2013	10.00%	3.53%	6.47%
12/18/2013	9.08%	3.54%	5.54%
12/23/2013	9.72%	3.55%	6.17%
12/30/2013	10.00%	3.58%	6.42%
1/21/2014	9.65%	3.66%	5.99%
1/22/2014	9.18%	3.66%	5.52%
2/20/2014	9.30%	3.72%	5.58%
2/21/2014	9.85%	3.72%	6.13%
2/28/2014	9.55%	3.73%	5.82%
3/16/2014	9.72%	3.74%	5.98%
4/21/2014	9.50%	3.73%	5.77%
4/22/2014	9.80%	3.73%	6.07%
5/8/2014	9.10%	3.71%	5.39%
5/8/2014	9.59%	3.71%	5.88%
6/6/2014	10.40%	3.66%	6.74%
6/12/2014	10.10%	3.66%	6.44%
6/12/2014	10.10%	3.66%	6.44%
6/12/2014	10.10%	3.66%	6.44%
7/7/2014	9.30%	3.63%	5.67%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
7/25/2014	9.30%	3.60%	5.70%
7/31/2014	9.90%	3.59%	6.31%
9/4/2014	9.10%	3.50%	5.60%
9/24/2014	9.35%	3.46%	5.89%
9/30/2014	9.75%	3.44%	6.31%
10/29/2014	10.80%	3.37%	7.43%
11/6/2014	10.20%	3.35%	6.85%
11/14/2014	10.20%	3.33%	6.87%
11/14/2014	10.30%	3.33%	6.97%
11/26/2014	10.20%	3.30%	6.90%
12/3/2014	10.00%	3.28%	6.72%
1/13/2015	10.30%	3.16%	7.14%
1/21/2015	9.05%	3.13%	5.92%
1/21/2015	9.05%	3.13%	5.92%
4/9/2015	9.50%	2.88%	6.62%
5/11/2015	9.80%	2.81%	6.99%
6/17/2015	9.00%	2.79%	6.21%
8/21/2015	9.75%	2.78%	6.97%
10/7/2015	9.55%	2.82%	6.73%
10/13/2015	9.75%	2.83%	6.92%
10/15/2015	9.00%	2.84%	6.16%
10/30/2015	9.80%	2.87%	6.93%
11/19/2015	10.00%	2.90%	7.10%
12/3/2015	10.00%	2.91%	7.09%
12/9/2015	9.60%	2.92%	6.68%
12/11/2015	9.90%	2.93%	6.97%
12/18/2015	9.50%	2.94%	6.56%
1/6/2016	9.50%	2.97%	6.53%
1/6/2016	9.50%	2.97%	6.53%
1/28/2016	9.40%	2.97%	6.43%
2/10/2016	9.60%	2.95%	6.65%
2/16/2016	9.50%	2.94%	6.56%
2/29/2016	9.40%	2.92%	6.48%
4/29/2016	9.80%	2.83%	6.97%
5/5/2016	9.49%	2.82%	6.67%
6/1/2016	9.55%	2.80%	6.75%
6/3/2016	9.65%	2.79%	6.86%
6/15/2016	9.00%	2.77%	6.23%
6/15/2016	9.00%	2.77%	6.23%
9/2/2016	9.50%	2.56%	6.94%
9/23/2016	9.75%	2.51%	7.24%
9/27/2016	9.50%	2.51%	6.99%
9/29/2016	9.11%	2.50%	6.61%
10/13/2016	10.20%	2.48%	7.72%
10/28/2016	9.70%	2.47%	7.23%
11/9/2016	9.80%	2.47%	7.33%
11/18/2016	10.00%	2.49%	7.51%
12/9/2016	10.10%	2.51%	7.59%
12/15/2016	9.00%	2.52%	6.48%
12/15/2016	9.00%	2.52%	6.48%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
12/20/2016	9.75%	2.53%	7.22%
12/22/2016	9.50%	2.54%	6.96%
1/24/2017	9.00%	2.59%	6.41%
2/21/2017	10.55%	2.63%	7.92%
3/1/2017	9.25%	2.65%	6.60%
4/11/2017	9.50%	2.77%	6.73%
4/20/2017	8.70%	2.79%	5.91%
4/28/2017	9.50%	2.82%	6.68%
5/23/2017	9.60%	2.88%	6.72%
6/6/2017	9.70%	2.91%	6.79%
6/22/2017	9.70%	2.94%	6.76%
6/30/2017	9.60%	2.95%	6.65%
7/20/2017	9.55%	2.97%	6.58%
7/31/2017	10.10%	2.98%	7.12%
9/13/2017	9.40%	2.93%	6.47%
9/19/2017	9.70%	2.92%	6.78%
9/22/2017	11.88%	2.92%	8.96%
9/27/2017	10.20%	2.92%	7.28%
10/20/2017	9.60%	2.90%	6.70%
10/26/2017	10.20%	2.90%	7.30%
10/30/2017	10.05%	2.90%	7.15%
12/5/2017	9.50%	2.86%	6.64%
12/7/2017	9.80%	2.85%	6.95%
12/13/2017	9.25%	2.85%	6.40%
12/28/2017	9.50%	2.84%	6.66%
1/31/2018	9.80%	2.83%	6.97%
2/21/2018	9.80%	2.84%	6.96%
2/21/2018	9.80%	2.84%	6.96%
2/28/2018	9.50%	2.85%	6.65%
3/15/2018	9.00%	2.87%	6.13%
3/26/2018	10.19%	2.88%	7.31%
4/26/2018	9.50%	2.91%	6.59%
4/27/2018	9.30%	2.91%	6.39%
5/2/2018	9.50%	2.91%	6.59%
5/3/2018	9.70%	2.91%	6.79%
5/29/2018	9.40%	2.95%	6.45%
6/6/2018	9.80%	2.96%	6.84%
6/14/2018	8.80%	2.97%	5.83%
7/16/2018	9.60%	2.98%	6.62%
7/20/2018	9.40%	2.99%	6.41%
8/24/2018	9.28%	3.02%	6.26%
8/28/2018	10.00%	3.03%	6.97%
9/13/2018	10.00%	3.04%	6.96%
9/14/2018	10.00%	3.05%	6.95%
9/19/2018	9.85%	3.05%	6.80%
9/20/2018	9.80%	3.06%	6.74%
9/26/2018	9.40%	3.06%	6.34%
9/26/2018	10.20%	3.06%	7.14%
9/28/2018	9.50%	3.07%	6.43%
9/28/2018	9.50%	3.07%	6.43%

[6] Date of Natural Gas Rate Case	[7] Return on Equity	[8] 30-Year Treasury Yield	[9] Risk Premium
10/5/2018	9.61%	3.08%	6.53%
10/15/2018	9.80%	3.09%	6.71%
10/26/2018	9.40%	3.11%	6.29%
10/29/2018	9.60%	3.11%	6.49%
11/1/2018	9.87%	3.11%	6.76%
11/8/2018	9.70%	3.12%	6.58%
11/8/2018	9.70%	3.12%	6.58%
12/11/2018	9.70%	3.14%	6.56%
12/12/2018	9.30%	3.14%	6.16%
12/13/2018	9.60%	3.14%	6.46%
12/19/2018	9.30%	3.15%	6.15%
12/21/2018	9.35%	3.15%	6.20%
12/24/2018	9.25%	3.15%	6.10%
12/24/2018	9.25%	3.15%	6.10%
1/4/2019	9.80%	3.14%	6.66%
1/18/2019	9.70%	3.14%	6.56%
3/14/2019	9.00%	3.12%	5.88%
3/27/2019	9.70%	3.12%	6.58%
4/30/2019	9.73%	3.11%	6.62%
5/7/2019	9.65%	3.10%	6.55%
		Average:	4.70%
		Count:	1,120

Expected Earnings Analysis

Company	Ticker	[1] Expected ROE 2022-24	[2] Shares Outstanding 2019	[3] Shares Outstanding 2022-24	[4] Shares Outstanding % Increase	[5] Adjustment Factor	[6] Adjusted ROE
Atmos Energy Corporation	ATO	10.0%	120.00	145.00	4.84%	1.024	10.24%
Chesapeake Utilities Corporation	CPK	10.0%	17.50	20.00	3.39%	1.017	10.17%
New Jersey Resources Corporation	NJR	11.0%	88.00	89.00	0.28%	1.001	11.02%
Northwest Natural Holding Company	NWN	12.0%	30.00	32.00	1.63%	1.008	12.10%
ONE Gas, Inc.	OGS	10.0%	53.00	55.00	0.93%	1.005	10.05%
South Jersey Industries, Inc.	SJI	12.0%	90.00	98.00	2.15%	1.011	12.13%
Spire Inc.	SR	10.5%	52.00	55.00	1.41%	1.007	10.57%
Southwest Gas Corporation	SWX	9.5%	54.00	58.00	1.80%	1.009	9.58%
						Median	10.41%
						Average	10.73%

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

Summary of Adjustment Clauses & Alternative Regulation/Incentive Plans

			Adjustment Clauses					Alternative Regulation / Incentive Plans						
Company	Parent	State	Fuel/ Purchased Power	Decoupling (F/P) [1]	Capital Investment [2]	Energy Efficiency [3]	Other [4]	Formula-Based Rates	Price Freeze/ Cap	Future Test Year Allowed in Jurisdiction	CWIP in Rate Base	Earnings Sharing/PBR	Formula-Based ROE	Service Quality/ Performance
Atmos Energy	ATO	Colorado	✓		✓	✓				✓	✓			
Atmos Energy	ATO	Kansas	✓	P	✓		✓			✓				
Atmos Energy	ATO	Kentucky	✓	P	✓	✓				✓	✓	✓		
Atmos Energy	ATO	Louisiana	✓	P	✓			✓			✓	✓		
Atmos Energy	ATO	Mississippi	✓	P	✓	✓	✓	✓		✓	✓		✓	✓
Atmos Energy	ATO	Tennessee	✓	P	✓			✓		✓	✓	✓		
Atmos Energy	ATO	Texas	✓	P	✓	✓	✓	✓						
Atmos Energy	ATO	Virginia	✓	P	✓						✓			
Chesapeake Utilities	CPK	Delaware	✓				✓				✓			
Chesapeake Utilities	CPK	Maryland	✓	P		✓	✓				✓			
Florida Public Utilities Company	CPK	Florida	✓		✓	✓	✓			✓	✓			
New Jersey Natural Gas	NJR	New Jersey	✓	F	✓	✓	✓							
Northwest Natural Gas	NWN	Oregon	✓	P	✓	✓	✓			✓		✓		
Northwest Natural Gas	NWN	Washington	✓			✓	✓				✓			
Kansas Gas Service	OGS	Kansas	✓	P	✓		✓			✓				
Oklahoma Natural Gas	OGS	Oklahoma	✓	P	✓	✓	✓	✓			✓	✓		
Texas Gas Service	OGS	Texas	✓	P	✓	✓	✓	✓						
Elizabethtown Gas	SJI	New Jersey	✓	P		✓	✓							
South Jersey Gas	SJI	New Jersey	✓	F	✓	✓	✓							
Alabama Gas Corporation	SR	Alabama	✓	P	✓		✓	✓			✓			
Spire Gulf Inc. (Mobile Gas Corporation)	SR	Alabama	✓	P	✓		✓	✓			✓			
Spire Missouri East	SR	Missouri	✓	P	✓		✓							
Spire Missouri West	SR	Missouri	✓	P	✓		✓							
Southwest Gas Corporation	SWX	Arizona	✓	F	✓	✓	✓		✓					
Southwest Gas Corporation	SWX	California	✓	F	✓	✓	✓		✓	✓	✓			
Southwest Gas Corporation	SWX	Nevada	✓	F	✓	✓	✓			✓	✓			
Dominion Energy Utah	D	Utah	✓	F	✓	✓	✓		✓	✓				

Notes:

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

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

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

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

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

Sources: Operating company tariffs; Regulatory Research Associates, *Alternative Regulation/Incentive Plans: A State-by-State Overview* , November 19, 2013; Regulatory Research Associates, *Adjustment Clauses: A State-by-State Overview,* September 28, 2018; Regulatory Research Associates, *Rate Freezes: Their historical context and prevalence today,* October 15, 2018; Edison Electric Institute, *Alternative Regulation for Emerging Utility Challenges: 2015 Update,* November 11, 2015.

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

Company	Date	Shares Issued	Offering Price	Underwriting Discount	Offering Expense	Net Proceeds Per Share	Total Flotation Costs	Gross Equity Issue Before Costs	Net Proceeds	Flotation Cost Percentage
Dominion Energy, Inc.	3/27/2018	23,000,000	$67.85	$0.5242	$450,000	$67.31	$12,506,600	$1,560,550,000	$1,548,043,400	0.801%
Dominion Energy, Inc.	4/4/2016	10,200,000	$74.58	$0.4200	$200,000	$74.14	$4,484,000	$760,716,000	$756,232,000	0.589%
Atmos Energy Corporation	11/28/2018	7,008,087	$92.75	$0.9769	$1,000,000	$91.63	$7,846,200	$650,000,069	$642,153,869	1.207%
Atmos Energy Corporation	11/28/2017	4,558,404	$86.79	NA	NA	NA	$8,692,258	$403,692,258	$395,000,000	2.153%
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	11/15/2006	690,345	$30.10	$1.1250	$225,000	$28.65	$1,001,638	$20,779,385	$19,777,746	4.820%
Northwest Natural Gas Company	11/10/2016	1,012,000	$54.63	$2.0500	$250,000	$52.33	$2,324,600	$55,285,560	$52,960,960	4.205%
Northwest Natural Gas Company	3/30/2004	1,290,000	$31.00	$1.0100	$175,000	$29.85	$1,477,900	$39,990,000	$38,512,100	3.696%
South Jersey Industries, Inc.	4/18/2018	12,669,491	$29.50	$1.0325	$700,000	$28.41	$13,781,249	$373,749,985	$359,968,735	3.687%
South Jersey Industries, Inc.	5/12/2016	8,050,000	$26.25	$0.9188	$330,000	$25.29	$7,725,938	$211,312,500	$203,586,563	3.656%
Spire Inc.	5/7/2018	2,300,000	$68.75	$2.1094	$325,000	$66.50	$5,176,574	$158,125,000	$152,948,426	3.274%
Spire Inc.	5/12/2016	2,185,000	$63.05	$2.0491	$300,000	$60.86	$4,777,284	$137,764,250	$132,986,967	3.468%
Southwest Gas Corporation	11/27/2018	3,565,000	$75.50	$2.5481	$600,000	$72.78	$9,683,977	$269,157,500	$259,473,524	3.598%
Mean							$6,297,935	$361,609,422		
								WEIGHTED AVERAGE FLOTATION COSTS:		1.742%

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

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
					Expected Dividend Yield								
Company	Ticker	Annualized Dividend	Average Stock Price	Dividend Yield	Current	Adjusted for Flot. Costs	Zacks Earnings Growth	First Call Earnings Growth	Value Line Earnings Growth	Value Line Retention Growth	Average Earnings Growth	DCF k(e)	Flotation Adjusted DCF k(e)
Atmos Energy Corporation	ATO	$2.10	$101.11	2.08%	2.16%	2.19%	6.50%	6.45%	7.50%	10.09%	7.64%	9.79%	9.83%
Chesapeake Utilities Corporation	CPK	$1.62	$92.44	1.75%	1.82%	1.85%	6.00%	6.00%	9.00%	10.63%	7.91%	9.73%	9.76%
New Jersey Resources Corporation	NJR	$1.17	$49.40	2.37%	2.43%	2.47%	7.00%	6.00%	2.50%	5.48%	5.25%	7.68%	7.72%
Northwest Natural Gas Company	NWN	$1.90	$66.82	2.84%	2.99%	3.04%	4.50%	4.00%	25.50%	6.42%	10.11%	13.09%	13.15%
ONE Gas, Inc.	OGS	$2.00	$87.48	2.29%	2.36%	2.40%	5.90%	5.00%	9.00%	5.27%	6.29%	8.65%	8.69%
South Jersey Industries, Inc.	SJI	$1.15	$31.97	3.60%	3.73%	3.80%	7.20%	5.90%	9.50%	7.05%	7.41%	11.14%	11.21%
Spire Inc.	SR	$2.37	$83.36	2.84%	2.91%	2.96%	3.80%	2.82%	5.50%	5.85%	4.49%	7.40%	7.45%
Southwest Gas Corporation	SWX	$2.18	$82.86	2.63%	2.72%	2.77%	6.20%	6.30%	8.50%	7.18%	7.04%	9.77%	9.82%
PROXY GROUP MEAN												9.66%	9.70%

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

DCF Result Adjusted For Flotation Costs:	9.70%
DCF Result Unadjusted For Flotation Costs:	9.66%
Difference (Flotation Cost Adjustment):	0.05% [13]

[1] Source: Bloomberg Professional
[2] Source: Bloomberg Professional
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.5 x [10])
[5] Equals [4] / (1 - 1.742%)
[6] Source: Zacks
[7] Source: Yahoo! Finance
[8] Source: Value Line
[9] Source: Schedule RBH-2, Value Line
[10] Equals Average([6], [7], [8], [9])
[11] Equals [4] + [10]
[12] Equals [5] + [10]
[13] Equals average [12] - average [11]

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Common Equity

Company	Ticker	Q1 2019	Q4 2018	Q3 2018	Q2 2018	Q1 2018	Q4 2017	Q3 2017	Q2 2017	Average
Atmos Energy Corporation	ATO	60.12%	59.37%	60.85%	60.80%	60.61%	59.80%	55.97%	55.99%	59.19%
Chesapeake Utilities Corporation	CPK	59.50%	61.25%	66.92%	66.88%	68.59%	70.16%	68.49%	68.36%	66.27%
New Jersey Resources Corporation	NJR	54.61%	53.34%	52.11%	53.49%	55.77%	53.59%	51.55%	54.23%	53.59%
Northwest Natural Holding Company	NWN	51.67%	50.88%	47.67%	50.03%	50.45%	48.78%	52.07%	54.58%	50.77%
ONE Gas, Inc.	OGS	61.38%	61.38%	62.81%	62.88%	62.87%	62.16%	61.82%	61.84%	62.14%
South Jersey Industries, Inc.	SJI	38.16%	30.84%	30.88%	31.98%	50.85%	50.12%	50.62%	54.16%	42.20%
Spire Inc.	SR	51.60%	51.32%	52.08%	51.42%	49.70%	49.33%	48.73%	51.30%	50.69%
Southwest Gas Corporation	SWX	51.58%	51.27%	47.43%	48.29%	48.16%	49.87%	49.36%	50.05%	49.50%
Average		53.58%	52.46%	52.59%	53.22%	55.88%	55.48%	54.83%	56.32%	54.29%

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Long-Term Debt

Company	Ticker	Q1 2019	Q4 2018	Q3 2018	Q2 2018	Q1 2018	Q4 2017	Q3 2017	Q2 2017	Average
Atmos Energy Corporation	ATO	39.88%	40.63%	39.15%	39.20%	39.39%	40.20%	44.03%	44.01%	40.81%
Chesapeake Utilities Corporation	CPK	40.50%	38.75%	33.08%	33.12%	31.41%	29.84%	31.51%	31.64%	33.73%
New Jersey Resources Corporation	NJR	45.39%	46.66%	47.89%	46.51%	44.23%	46.41%	48.45%	45.77%	46.41%
Northwest Natural Holding Company	NWN	48.33%	49.12%	52.33%	49.97%	49.55%	51.22%	47.93%	45.42%	49.23%
ONE Gas, Inc.	OGS	38.62%	38.62%	37.19%	37.12%	37.13%	37.84%	38.18%	38.16%	37.86%
South Jersey Industries, Inc.	SJI	61.84%	69.16%	69.12%	68.02%	49.15%	49.88%	49.38%	45.84%	57.80%
Spire Inc.	SR	48.40%	48.68%	47.92%	48.58%	50.30%	50.67%	51.27%	48.70%	49.31%
Southwest Gas Corporation	SWX	48.42%	48.73%	52.57%	51.71%	51.84%	50.13%	50.64%	49.95%	50.50%
Average		46.42%	47.54%	47.41%	46.78%	44.12%	44.52%	45.17%	43.68%	45.71%

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Cost of Long-Term Debt Comparison

Issue	Initial Offering	Date of Offering	Date of Maturity	Years to Maturity	Coupon	Issuance Costs	Net Proceeds	Yield	Bloomberg Fair Value Curve BFV Term	Bloomberg Fair Value Curve Utility A-Rated	Bloomberg Fair Value Curve Utility BBB-Rated
Issue											
Series E 3/18 Notes	$ 70,000,000	3/25/2003	3/15/2018	15	5.31%	$ 739,077	$ 69,260,923	5.41%	15	6.10%	6.50%
Series F 4/18 Notes	$ 50,000,000	3/27/2008	4/1/2018	10	6.30%	$ 536,213	$ 49,463,787	6.45%	10	5.25%	5.76%
Series F 4/38 Notes	$ 100,000,000	3/27/2008	4/1/2038	30	7.20%	$ 1,129,213	$ 98,870,787	7.29%	30	6.13%	6.34%
Series F 12/24 Notes	$ 40,000,000	12/14/2012	12/1/2024	12	2.98%	$ 326,567	$ 39,673,433	3.06%	12	2.92%	3.54%
Series F 12/27 Notes	$ 110,000,000	12/14/2012	12/1/2027	15	3.28%	$ 882,942	$109,117,058	3.35%	15	3.40%	3.88%
Series A 12/43 Notes	$ 90,000,000	12/20/2013	12/1/2043	30	4.78%	$ 607,329	$ 89,392,671	4.82%	30	4.69%	5.18%
Series B 12/48 Notes	$ 60,000,000	12/20/2013	12/1/2048	35	4.83%	$ 404,886	$ 59,595,114	4.87%	35	4.69%	5.18%
12/46 Notes	$ 50,000,000	12/15/2016	12/1/2046	30	3.62%	$ 341,052	$ 49,658,948	3.66%	30	4.25%	4.67%
12/51 Notes	$ 50,000,000	12/15/2016	12/1/2051	35	3.67%	$ 341,052	$ 49,658,948	3.70%	35	4.25%	4.67%
Series A 11/32 Notes	$ 100,000,000	11/15/2017	11/15/2032	15	3.38%	$ 722,822	$ 99,277,178	3.44%	15	3.89%	4.17%
Series A 4/30 Notes	$ 50,000,000	4/2/2018	4/1/2030	12	3.30%	$ 450,000	$ 49,550,000	3.39%	12	3.88%	4.25%
Series B 11/47 Notes	$ 100,000,000	4/2/2018	11/15/2047	30	3.97%	$ 450,000	$ 99,550,000	4.00%	30	4.13%	4.44%
										Bloomberg Fair Value Curve A-Rated	Bloomberg Fair Value Curve BBB-Rated
TOTAL	$ 870,000,000		Weighted Averages:		4.45%			4.52%		4.50%	4.90%

Notes:
Sources: Company provided data and Bloomberg Professional. Weighted average cost of debt does not include underwriting fees or other amortized costs.
Bloomberg Fair Value Curve yields are 30-day averages.