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Direct Testimony and Schedules
Ann E. Bulkley

Before the Minnesota Public Utilities Commission
State of Minnesota

In the Matter of the Application of Minnesota Energy Resource Corporation for Authority to Increase Rates for Natural Gas Utility Service in Minnesota

Docket No. G011/GR-22-504

Exhibit___ (AEB-D)

Return on Equity and Capital Structure

November 1, 2022

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TESTIMONY OF ANN E. BULKLEY

I. Introduction and Qualifications

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

A. My name is Ann E. Bulkley. I am employed by The Brattle Group ("Brattle") as a Principal. My business address is One Beacon Street, Suite 2600, Boston, Massachusetts 02108.

Q. On whose behalf are you submitting this Direct Testimony?

A. I am submitting this Direct Testimony before the Minnesota Public Utilities Commission (the "Commission") on behalf of Minnesota Energy Resources Corporation ("MERC" or the "Company").

Q. Please describe your education and experience.

A. I hold a Bachelor's degree in Economics and Finance from Simmons College and a Master's degree in Economics from Boston University, with more than 30 years of experience consulting to the energy industry. I have advised numerous energy and utility clients on a wide range of financial and economic issues with primary concentrations in valuation and utility rate matters. Many of these assignments have included the determination of the cost of capital for valuation and ratemaking purposes. I have included my resume and a summary of testimony that I have filed in other proceedings as Exhibit ___ (AEB-D), Schedule 1.

Q. Are you sponsoring additional schedules?

A. Yes, I am providing the following additional schedules, which were prepared by me or under my direction, to support my recommendation:

- Exhibit ___ (AEB-D), Schedule 2 – Summary of Results
- Exhibit ___ (AEB-D), Schedule 3 – Proxy Group Selection
- Exhibit ___ (AEB-D), Schedule 4 – Flotation Cost
- Exhibit ___ (AEB-D), Schedule 5 – Constant Growth DCF Model

- Exhibit ___ (AEB-D), Schedule 6 – Two-Stage Growth DCF Model
- Exhibit ___ (AEB-D), Schedule 7 – Capital Asset Pricing Model
- Exhibit ___ (AEB-D), Schedule 8 – Long-Term Beta Coefficient Calculations
- Exhibit ___ (AEB-D), Schedule 9 – Market Return Calculation
- Exhibit ___ (AEB-D), Schedule 10 – Risk Premium Approach
- Exhibit ___ (AEB-D), Schedule 11 – Size Premium Analysis
- Exhibit ___ (AEB-D), Schedule 12 – Capital Expenditures Analysis
- Exhibit ___ (AEB-D), Schedule 13 – Alternative Rate Mechanisms
- Exhibit ___ (AEB-D), Schedule 14 – Capital Structure Analysis

II. Purpose and Overview of Direct Testimony

Q. What is the purpose of your Direct Testimony?

A. The purpose of my Direct Testimony is to present evidence and provide a recommendation regarding the appropriate return on equity ("ROE") for the Company and to provide an assessment of the capital structure to be used for ratemaking purposes. As referenced above, my analyses and recommendations are supported by the data presented in Exhibit___(AEB-D), Schedules 2 through 14.

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

A. As discussed in more detail in Section VII, in developing my ROE recommendation, I applied several Cost of Equity ("COE") estimation methodologies, including the Constant Growth, Two-Stage Growth, and Projected forms of the Discounted Cash Flow ("DCF") model, the Capital Asset Pricing Model ("CAPM"), and the Risk Premium approach. My recommendation also takes into consideration: (1) flotation costs; (2) the regulatory environment in which the Company operates; (3) the Company's small size relative to the proxy group; (4) the Company's capital expenditure requirements; (5) the Company's high degree of customer concentration as compared to the proxy group; and (6) the Company's rate design

as compared to the proxy group. Finally, I considered the Company's proposed capital structure as compared to the capital structures of the proxy companies. While I did not make any specific adjustments to my ROE estimates for any of these factors, I did take them into consideration in aggregate when determining where the Company's ROE falls within the range of analytical results.

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

A. Section III provides a summary of my analyses and conclusions. Section IV reviews the regulatory guidelines pertinent to the development of the cost of capital. Section V discusses current and projected capital market conditions and the effect of those conditions on the Company's cost of equity. Section VI explains my selection of a proxy group of natural gas distribution utilities. Section VII describes my analyses and the analytical basis for the recommendation of the appropriate ROE for MERC. Section VIII provides a discussion of specific regulatory, business, and financial risks that have a direct bearing on the ROE to be authorized for the Company in this case. Section IX discusses the capital structure of the Company compared with the proxy group. Section X presents my conclusions and recommendation for the market cost of equity.

III. Summary of Analysis and Conclusions

Q. Please summarize your conclusions regarding the appropriate ROE and equity ratio for MERC.

A. Based on the analyses presented in my Direct Testimony, I believe that an ROE of 10.30 percent and the Company's proposed capital structure, which is composed of 53.00 percent equity and 47.00 percent debt, are reasonable and appropriate and balance the interests of customers and shareholders. Providing the Company with access to capital on reasonable terms to be able to make investments in the infrastructure necessary to provide customers safe and reliable service at a reasonable cost.

Q. Please summarize the key factors considered in your analyses and upon which you base your recommended ROE.

A. My analyses and recommendations considered the following:

- The *Hope* and *Bluefield* decisions[1] that established the standards for determining a fair and reasonable allowed ROE, including consistency of the allowed return with other businesses having similar risk, adequacy of the return to provide access to capital and support credit quality, and that result must lead to just and reasonable rates.
- The effect of current and projected capital market conditions on investors' return requirements.
- The approaches relied upon by the Commission in establishing allowed ROE, which historically was largely based on the mean result of the Two-Growth DCF analysis using a proxy group of comparable companies.[2] However, in its most recent Orders, the Commission has recognized the short-coming of such a mathematical approach and strict reliance on a single methodology. Instead, the Commission has considered additional factors and analyses.[3]
- The results of several analytical approaches that provide estimates of the Company's cost of equity.
- The Company's regulatory, business, and financial risks relative to the proxy group of comparable companies and the implications of those risks.

Q. Please explain how you considered those factors.

A. I have relied on several analytical approaches to estimate MERC's cost of equity based on a proxy group of publicly-traded companies. As shown in Figure 1, those COE estimation models produce a wide range of results. My conclusion as to the

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1 *Federal Power Commission v. Hope Natural Gas Co.*, 320 U.S. 591 (1944); *Bluefield Waterworks & Improvement Co. v. Public Service Commission of West Virginia*, 262 U.S. 679 (1923).

2 *In the Matter of the Application of CenterPoint Energy Resources Corp. d/b/a CenterPoint Energy Minnesota Gas for Authority to Increase Natural Gas Rates in Minnesota*, Docket No. G008/GR-15-424, Findings of Fact, Conclusions and Order at 43 (June 3, 2016).

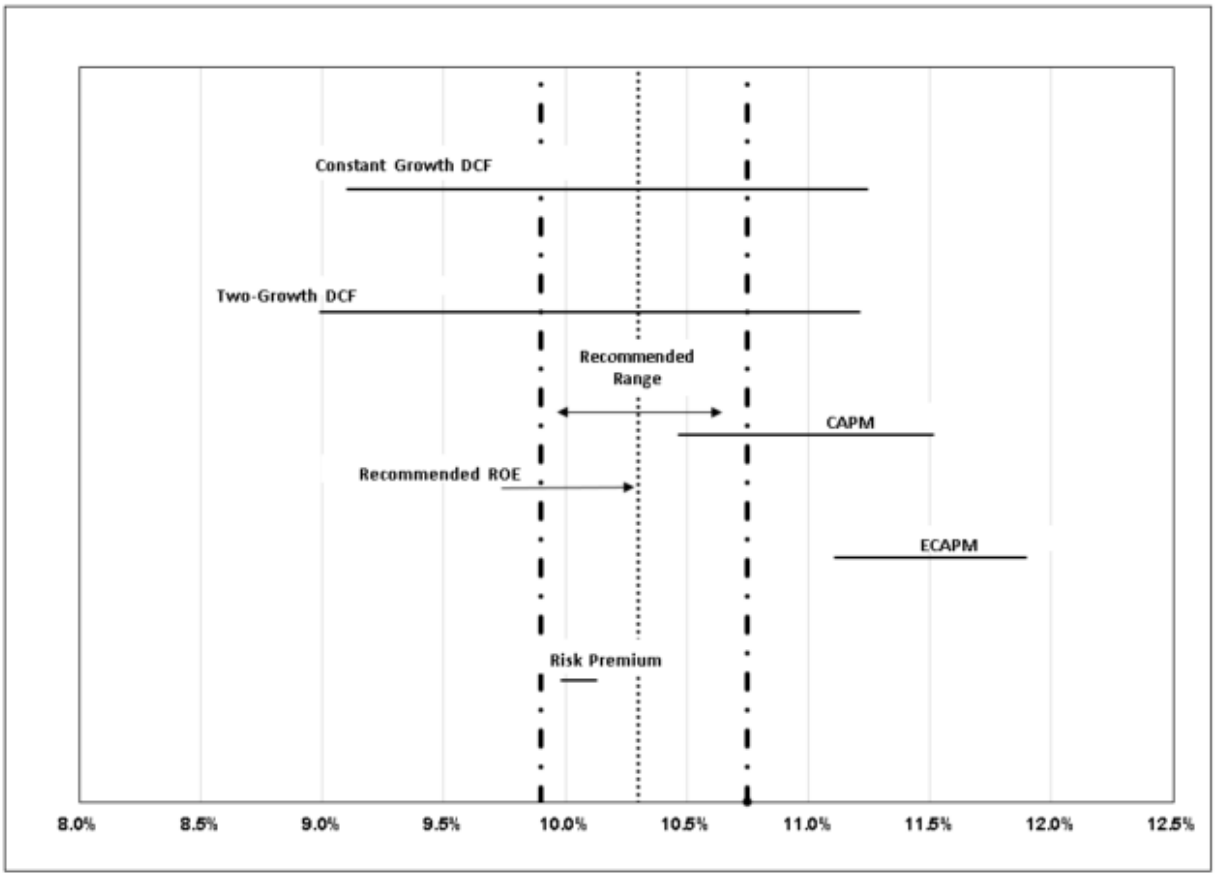
3 Otter Tail Power Company ("Otter Tail") in *In the Matter of the Application of Otter Tail Power Company for Authority to Increase Rates for Electric Service in Minnesota*, Docket No. E017/GR-15-1033, Minnesota Power in *In the Matter of the Application of Minnesota Power for Authority to Increase Rates for Electric Service in Minnesota*, Docket No. E015/GR-16-664, MERC in *In the Matter of the Application of Minnesota Energy Resources Corporation for Authority to Increase Rates for Natural Gas Service in Minnesota*, Docket No. G011/GR-17-563, and Great Plains in *In the Matter of the Petition by Great Plains Natural Gas Co., a Division of Montana-Dakota Utilities, Co., for Authority to Increase Natural Gas Rates in Minnesota*, Docket No. G004/GR-19-511.

appropriate ROE for MERC within that range of results is based on MERC's business and financial risk relative to the proxy group.

Q. Please summarize the results of the COE estimation models that you considered to establish the range of ROEs for MERC.

A. Figure 1 summarizes the range of results established using each of these estimation methodologies.

Figure 1: Summary of Cost of Equity Analytical results



As shown in Figure 1 (and in Exhibit ___ (AEB-D), Schedule 2), the range of the DCF model results is wide, particularly in relation to the results of the other methodologies. While it is common to consider multiple models to estimate the cost of equity, it is particularly important when the range of results varies considerably across methodologies. As a result, my ROE recommendation considers the range

of results of the Constant Growth and Two-Growth DCF models, as well as the results of the CAPM, ECAPM, and Bond Yield Plus Risk Premium analyses. My ROE recommendation also considers MERC's company-specific risk factors and current and prospective capital market conditions.

Q. What is your recommended ROE for MERC?

A. Considering the analytical results presented in Figure 1, as well as the level of regulatory, business, and financial risk faced by MERC relative to the proxy group, I believe an ROE range from 9.90 to 10.50 percent is reasonable. The Company is requesting a return of 10.30 percent, which reflects the relative risk of MERC's natural gas distribution operations in Minnesota as compared to the proxy group and current capital market conditions and is a reasonable estimate of the invested-required ROE for MERC.

Q. Is the approach you employed for determining the Company's ROE consistent with the approach used by the Commission in prior cases?

A. Yes, it is. As discussed above, I developed a full range of ROE estimation models, including the Two-Growth DCF model and Constant Growth DCF model. I also relied on the results of other analytical approaches such as the CAPM, ECAPM and Risk Premium. I also considered current market conditions, and the market conditions that are expected over the period that the rates in this case will be in effect. Finally, the Company's business and financial risk relative to the proxy group factor into my conclusion as to where the Company's ROE falls.[4] The Company selected an ROE of 10.30 percent which, based on these analyses, is reasonable.

[4] *In the Matter of the Application of Otter Tail Power Company for Authority to Increase Rates for Electric Service in Minnesota*, Docket No. E017/GR-15-1033, Findings of Fact, Conclusions and Order at 55 (May 1, 2017); *In the Matter of the Application of Minnesota Energy Resources Corporation for Authority to Increase Rates for Natural Gas Service in Minnesota*, Docket No. G011/GR-17-563, Findings of Fact, Conclusions and Order at 26 (December 26, 2018).

Q. Please summarize the analysis you conducted in determining that MERC's proposed capital structure is reasonable and appropriate.

A. Based on the analysis presented in Section IX of my testimony, I conclude that MERC's proposal to establish a common equity ratio of 53.00 percent is reasonable. To determine if MERC's requested capital structure was reasonable, I reviewed the capital structures of the regulated utility subsidiaries of the proxy companies. As shown in Exhibit ___ (AEB-D), Schedule 14, the results of that analysis demonstrate that the average equity ratios for the regulated utility operating companies of the proxy group range from 44.08 percent to 61.09 percent with an average of 53.46 percent. The Company's requested equity ratio is within the range established by the proxy group companies. This reasonably balances the interests of customers and shareholders by enabling MERC to maintain its financial integrity and therefore its ability to attract capital at reasonable terms and conditions under a variety of economic and financial market conditions. This in turn is beneficial to customers, as this capital enables the Company to invest in the infrastructure needed to provide safe and reliable service to customers. Further, the ability to attract capital at reasonable costs keeps overall costs down for customers.

IV. Regulatory Guidelines

Q. Please describe the guiding principles to be used in establishing the cost of capital for a regulated utility.

A. The United States Supreme Court's precedent-setting *Hope* and *Bluefield* cases established the standards for determining the fairness or reasonableness of a utility's allowed ROE. Among the factors established by the Court in those cases are: (1) consistency with other businesses having similar or comparable risks; (2) adequacy of the return to support credit quality and access to capital; and (3) that the result, as opposed to the methodology employed, is the controlling factor in arriving at just and reasonable rates.[5]

[5] *Hope*, 320 U.S. 591 (1944); *Bluefield*, 262 U.S. 679 (1923).

Q. Has the Commission provided similar guidance in establishing the appropriate return on common equity?

A. Yes. In its most recent fully litigated order in Docket No. E-017/GR-20-719 for Otter Tail,[6] the Commission cited Minnesota Statute Section 216B.16, subd. 6, which states that:

> The commission, in the exercise of its powers under this chapter to determine just and reasonable rates for public utilities, shall give due consideration to the public need for adequate, efficient, and reasonable service and to the need of the public utility for revenue sufficient to enable it to meet the cost of furnishing the service, including adequate provision for depreciation of its utility property used and useful in rendering service to the public, and to earn a fair and reasonable return upon the investment in such property.

Additionally, the Commission stated that it "must set rates at a level that permits stockholders an opportunity to earn a fair and reasonable return on their investment and permits the utility to continue to attract investment."[7] This guidance is in accordance with the *Hope* and *Bluefield* decisions and the principles that I employed to estimate the ROE for the Company, including the principle that an allowed rate of return must be sufficient to enable regulated companies, like MERC, to attract capital on reasonable terms.

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

A. An ROE that is adequate to attract capital at reasonable terms enables the Company to continue to provide safe, reliable gas distribution service while maintaining its financial integrity. To the extent that the Company has the opportunity to earn its market-based cost of capital, neither customers nor shareholders are disadvantaged.

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6 *In the Matter of the Application of Otter Tail Power Company for Authority to Increase Rates for Electric Service in the State of Minnesota*, Docket No. E-017/GR-20-719, Findings of Fact, Conclusions and Order at 30 (February 2, 2022).

7 *Id.*

Q. Is a utility's ability to attract capital also affected by the ROEs that are authorized for other utilities?

A. Yes. Utilities compete directly for capital with other investments of similar risk, which include other natural gas and electric utilities (as well as companies in other industries, whether or not they are rate-regulated). Therefore, the ROE awarded to a utility sends an important signal to investors regarding whether there is regulatory support for financial integrity, dividends, growth, and fair compensation for business and financial risk. The cost of capital represents an opportunity cost to investors. If higher returns are available for other investments of comparable risk, investors have an incentive to direct their capital to those investments. Thus, an authorized ROE significantly below authorized ROEs for other natural gas and electric utilities, over the same time period, can inhibit the utility's ability to attract capital for investment in Minnesota.

Likewise, because MERC is a subsidiary of WEC Energy Group, Inc. ("WEC"), MERC competes with the other WEC subsidiaries for investment capital. In determining how to allocate its finite capital resources, it would be reasonable for WEC to take into account the authorized ROE of each of its subsidiaries in order to ensure its investors have the opportunity to receive an appropriate return. As shown in Figure 2, while MERC's ROE in the last case was an increase over prior cases, it remains the third lowest authorized ROE of the seven WEC subsidiaries. This is particularly important when considering the overall capital market conditions at the time that the decisions were issued. As shown in Figure 2, the ROEs for several of the WEC subsidiaries were set at periods of lower interest rates. Recognizing the correlation between interest rates and the cost of equity, it would be reasonable for investors to expect the return on equity to increase in higher interest rate environments.

Figure 2: Authorized ROEs for WEC Subsidiaries

Company	State	Date Authorized	ROE	Treasury Bond Yields
Michigan Gas Utilities Corp	Michigan	9/9/2021	9.85%	2.95%
North Shore Gas Co.	Illinois	9/8/2021	9.67%	2.95%
Wisconsin Gas LLC	Wisconsin	10/31/2019	10.20%	2.18%
Wisconsin Electric Power Co.	Wisconsin	10/31/2019	10.00%	2.18%
Wisconsin Public Service Corp.	Wisconsin	10/31/2019	10.00%	2.18%
Peoples Gas Light & Coke Co.	Illinois	1/21/2015	9.05%	2.67%
Minnesota Energy Resources	**Minnesota**	**11/8/2018**	**9.70%**	**3.35%**

Q. Has the Commission also considered authorized ROEs in other jurisdictions?

A. Yes. In its 2010 Order regarding Interstate Power and Light Company ("IPL"), the Commission noted a previous Order and explained the following:

> While the probative value of ROEs set in other jurisdictions is limited because the record does not allow the Commission to assess the differing regulatory circumstances affecting those awards, they do provide some window to national context and, as such, can serve a limited function as a check on reasonableness.[8]

Therefore, the Commission has considered the returns that have been authorized nationally as well the returns that have been authorized for other subsidiaries of the subject company's parent company in other jurisdictions. This should also be an important consideration for the Commission in the current case.

Q. What are your conclusions regarding regulatory guidelines?

A. The ratemaking process is premised on the principle that, for investors and companies to commit the capital needed to provide safe and reliable utility services,

[8] *In the Matter of the Application of Interstate Power and Light Company for Authority to Increase Rates for Electric Service in Minnesota*, Docket No. E001/GR-10-276, Findings of Fact, Conclusions and Order at 11 (August 12, 2011).

a utility must have the opportunity to recover the return of, and the market-required return on, its invested capital. Because utility operations are capital-intensive, regulatory decisions should enable the utility to attract capital at reasonable terms under a variety of economic and financial market conditions; doing so balances the long-term interests of the utility and its ratepayers.

The financial community carefully monitors the current and expected financial condition of utility companies, and the regulatory framework in which they operate. In that respect, the regulatory framework is one of the most important factors in both debt and equity investors' assessments of risk. The Commission's order in this proceeding, therefore, should establish rates that provide the Company with the opportunity to earn an ROE that is: (1) adequate to attract capital at reasonable terms under a variety of economic and financial market conditions; (2) sufficient to ensure good financial management and firm integrity; and (3) commensurate with returns on investments in enterprises with similar risk. To the extent MERC is authorized the opportunity to earn its market-based cost of capital, the proper balance is achieved between customers' and shareholders' interests.

V. Capital Market Conditions

Q. Why is it important to analyze capital market conditions?

A. The ROE estimation models rely on market data that are either specific to the proxy group, in the case of the DCF model, or to the expectations of market risk, in the case of the CAPM. The results of the COE estimation models can be affected by prevailing market conditions at the time the analysis is performed. While the ROE that is established in a rate proceeding is intended to be forward-looking, the analyst uses current and projected market data—specifically, stock prices, dividends, growth rates, and interest rates—in the COE estimation models to estimate the required return for the subject company.

As a result, it is important to consider the effect of these conditions on the COE estimation models when determining the appropriate range and recommended ROE

for a future period. If investors do not expect current market conditions to be sustained in the future, it is possible that the COE estimation models will not provide an accurate estimate of investors' required return during that rate period. Therefore, it is very important to consider projected market data to estimate the return for that forward-looking period.

Q. What factors are affecting the cost of equity for regulated utilities in the current and prospective capital markets?

A. The COE for regulated utility companies is being affected by several factors in the current and prospective capital markets, including: 1) persistently high inflation, 2) changes in monetary policy, and 3) rising interest rates. These factors affect the assumptions used in the ROE estimation models. In this section, I discuss each of these factors and how they affect the models used to estimate the cost of equity for regulated utilities.

Q. What effect do current and prospective market conditions have on the COE for MERC?

A. As I discuss in more detail in the remainder of this section, the combination of persistently high inflation, the Federal Reserve's changes in monetary policy, and the dramatic shifts in market conditions resulting from political influences all contribute to an expectation of increased market risk and an increase in the cost of the investor-required return on equity. It is essential that these factors be considered in setting a forward-looking cost of equity. Inflation has recently been at some of the highest levels seen in approximately 40 years. Interest rates, which have increased from the pandemic lows seen in 2020 are expected to continue to increase in direct response to the Federal Reserve's monetary policy. Since there is a strong historical inverse correlation between interest rates and the share prices of utility stocks (share prices of utility stocks typically fall when interest rates rise), it is reasonable to expect that investors' required COE for utility companies will also continue to increase. Therefore, COE estimates based solely on current market

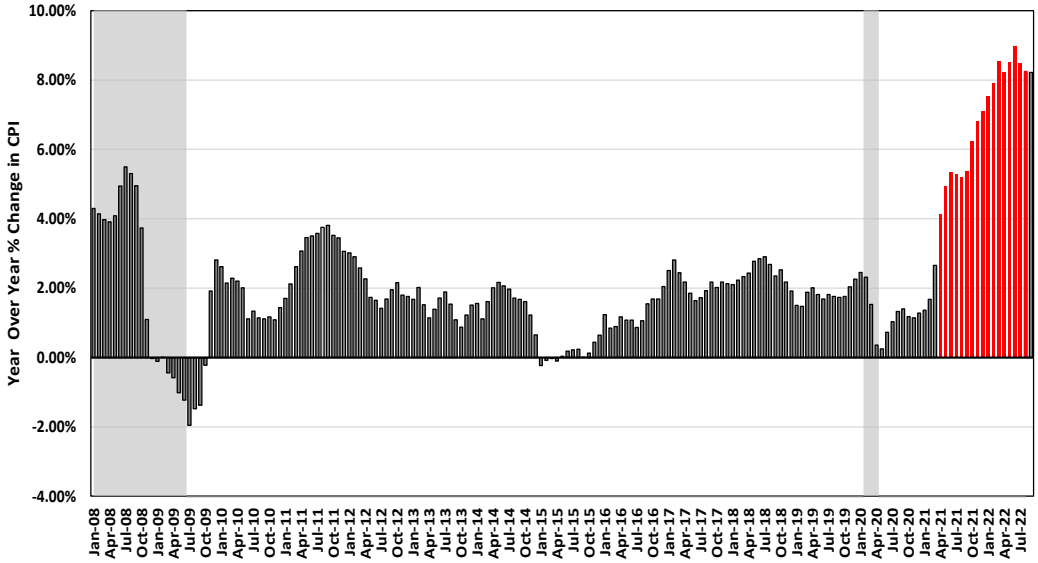
conditions will understate the COE required by investors during the future period that the Company's rates determined in this proceeding will be in effect.

A. Inflationary Expectations in Current and Projected Market Conditions

Q. Has inflation increased significantly over the past year?

A. Yes. As shown in Figure 3, the year over year ("YOY") change in the Consumer Price Index ("CPI") published by the Bureau of Labor statistics has increased steadily, rising from 1.37 percent in January 2021. Since that time, and particularly since the start of 2022, inflation has increased steadily, reaching a high of 9.0 percent YOY change in June 2022, which was the largest 12-month increase since 1981 and significantly greater than any level seen since January 2008. In September, CPI decreased to 8.22 percent, which is still at levels not seen since the 1980s.

Figure 3: Consumer Price Index—YOY Percent Change
January 2008–September 2022[9]



[9] Source: Bureau of Labor Statistics, shaded area indicates a recession.

Q. What are the expectations for inflation over the near-term?

A. The expectation is that inflation will remain elevated over the near-term. This expectation is supported by recent comments of the Chair and Vice Chair of the Federal Reserve. For example, in her speech on September 7, 2022 at the Clearing House and Bank Policy Institute 2022 Annual Conference, Vice Chair Lael Brainard noted that:

> **We are in this for as long as it takes to get inflation down.** So far, we have expeditiously raised the policy rate to the peak of the previous cycle, and the policy rate will need to rise further. As of this month, the maximum monthly reduction in the balance sheet will be nearly double the level of the previous cycle. Together, the increase in the policy rate and the reduction in the balance sheet should help bring demand into alignment with supply. **Monetary policy will need to be restrictive for some time to provide confidence that inflation is moving down to target.** The economic environment is highly uncertain, and the path of policy will be data dependent. While the precise course of action will depend on the evolution of the outlook, I am confident we will achieve a return to 2 percent inflation. Our resolve is firm, our goals are clear, and our tools are up to the task.[10]

Similarly, in his press conference at the Federal Open Market Committee meeting in September 2022, Chair Jerome Powell said that:

> Inflation remains well above our 2 percent longer-run goal. … Price pressures remain evident across a broad range of goods and services. Although gasoline prices have turned down in recent months, they remain well above year-earlier levels, in part reflecting Russia's war against Ukraine, which has boosted prices for energy and food and has created additional upward pressure on inflation. The median projection in the SEP for total PCE inflation is 5.4 percent this year and falls to 2.8 percent next year, 2.3 percent in 2024, and 2 percent in 2025; participants continue to see risks to inflation as weighted to the upside.[11]

[10] Vice Chair Lael Brainard, "Bringing Inflation Down," Clearing House and Bank Policy Institute 2022 Annual Conference, September 7, 2022 (emphasis added).

[11] Transcript, Chair Powell, Press Conference, September 21, 2022.

B. The Use of Monetary Policy to Address Inflation

Q. What policy actions has the Federal Reserve enacted to respond to increased inflation?

A. The dramatic increase in inflation has prompted the Federal Reserve to pursue an aggressive normalization of monetary policy, removing the accommodative policy programs used to mitigate the economic effects of COVID-19. As of the September 21, 2022 meeting, the Federal Reserve has taken the following actions:

- Completed its taper of Treasury bond and mortgage-backed securities purchases;[12]
- Increased the target federal funds rate beginning in March 2022 through a series of four increases from 0.00–0.25 percent to 2.25 percent to 2.50 percent;[13]
- Anticipates ongoing increases in the target range will be appropriate to achieve its goals of maximum employment at the inflation rate of 2 percent over the long-run;[14] and
- Began reducing its holdings of Treasury and mortgage-backed securities on June 1, 2022.[15] The Federal Reserve is reducing the size of its balance sheet by only reinvesting principle payments on owned securities after the total amount of payments received exceeds a defined cap. For Treasury Securities, the cap is set at $60 billion per month. The cap for mortgage-backed securities is set at $35 billion per month.[16]

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[12] Federal Reserve Bank of New York, https://www.newyorkfed.org/markets/domestic-market-operations/monetary-policy-implementation/treasury-securities/treasury-securities-operational-details#monthly-details.

[13] Federal Reserve, Press Release, March 16, 2022; Federal Reserve, Press Release, May 4, 2022; Federal Reserve, Press Release, June 15, 2022; Federal Reserve, Press Release, September 21, 2022.

[14] Federal Reserve, Press Release, September 21, 2022.

[15] Federal Reserve, Press Release, May 4, 2022.

[16] Federal Reserve, Press Release, September 21, 2022.

C. The Effect of Inflation on Interest Rates and the Investor-Required Return

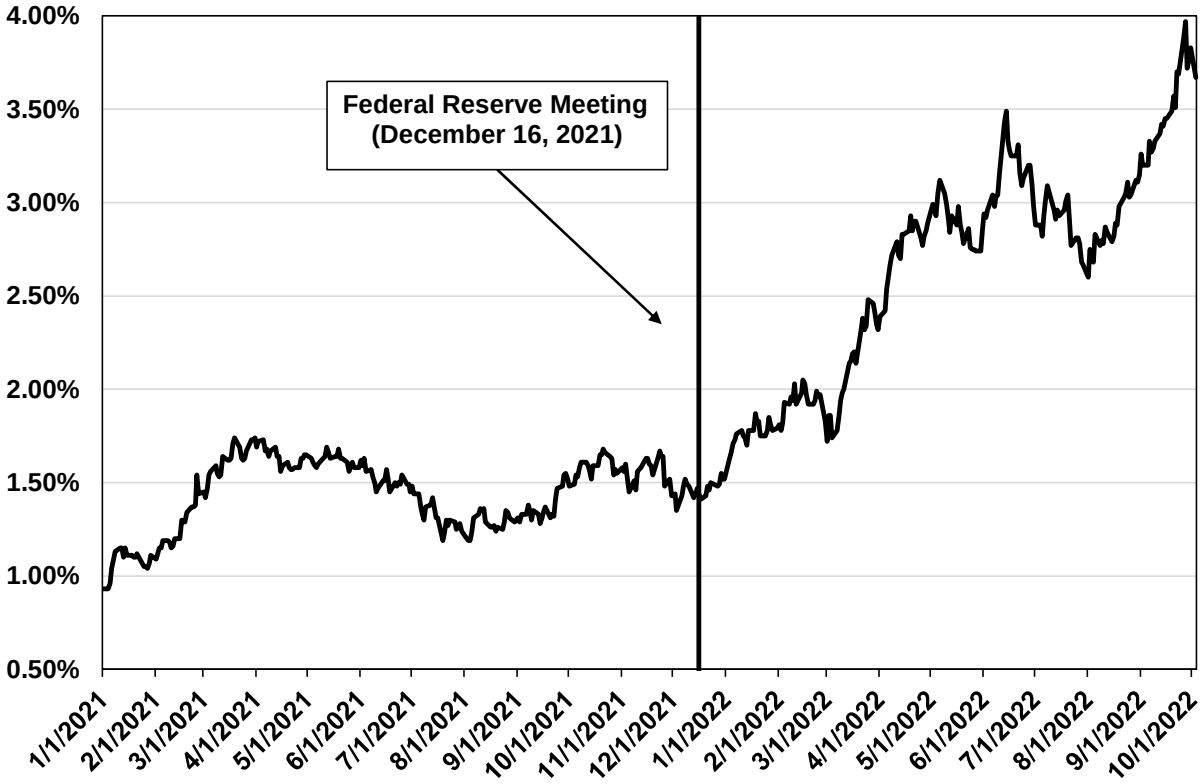
Q. What effect does inflation have on long-term interest rates?

A. Inflation and the Federal Reserve's normalization of monetary policy will likely result in increases in long-term interest rates. Specifically, inflation reduces the purchasing power of the future interest payments an investor expects to receive over the duration of the bond. This risk increases the longer the duration of the bond. As a result, if investors expect increased levels of inflation, they will require higher yields to compensate for the increased risk of inflation, which means interest rates will increase.

Q. Have the yields on long-term government bonds increased in response to inflation and the Federal Reserve's normalization of monetary policy?

A. Yes, they have. At the Federal Open Market Committee ("FOMC") meetings throughout 2022, the Federal Reserve has continued to note its concerns over the sustained increased levels of inflation and has continued to accelerate the process of normalizing monetary policy to combat inflation. As shown in Figure 4 since the Federal Reserve's December 2021 meeting, the yield on 10-year Treasury bond has more than doubled, increasing from 1.47 percent on December 15, 2021 to 3.83 percent on September 30, 2022. The increase is due to the Federal Reserve's announcements at the each of the meetings since December 2021, and the continued increased levels of inflation that are now expected to persist much longer than the Federal Reserve and investors had originally projected.

Figure 4: 10-Year Treasury Bond Yield—Janaury 2021–September 30, 2022[17]



Q. Do recent changes in gross domestic product ("GDP") affect the current outlook for inflation and interest rates?

A. No. While FOMC participants have reduced their projections for economic activity for real GDP growth of 0.2 percent in 2022 and 1.2 percent in 2023, which is well below the median estimate for the longer-run normal GDP growth rate, the Federal Reserve has highlighted that the labor market continues to be extremely tight. Specifically, Chair Powell noted at the September 2022 FOMC meeting that unemployment remained near 50-year lows and job vacancies near historical highs. Therefore, with a tight labor market and persistently high inflation, the Federal

[17] S&P Capital IQ Pro.

Reserve has indicated its need to continue a restrictive monetary policy to moderate demand to better align it with supply.[18]

D. Expected Performance of Utility Stocks and the Investor-Required ROE on Utility Investments

Q. Are utility share prices correlated to changes in the yields on long-term government bonds?

A. Yes. Interest rates and utility share prices are inversely correlated, which means, for example, that an increase in interest rates will result in a decline in the share prices of utilities. For example, Goldman Sachs and Deutsche Bank examined the sensitivity of share prices of different industries to changes in interest rates over the past five years. Both Goldman Sachs and Deutsche Bank found that utilities had one of the strongest negative relationships with bond yields (*i.e.*, increases in bond yields resulted in the decline of utility share prices).[19]

Q. How do equity analysts expect the utilities sector to perform in an increasing interest rate environment?

A. Equity analysts project that utilities will underperform the broader market as interest rates increase. Fidelity recently classified the utility sector as underweight[20] and Morningstar recently noted that a long as inflation persists, the utility sector will underperform.[21] Specifically, Morningstar noted that:

> As long as inflation remains the market's top concern, we expect utilities to underperform. Utilities are the most sensitive to inflation because of their mostly fixed revenue, large capital investment budgets, and borrowing needs. We think long-term investors who want utilities in their portfolios should focus on

[18] Federal Reserve, Transcript of Chair Powell's Press Conference, September 21, 2022.
[19] Lee, Justina. "Wall Street Is Rethinking the Treasury Threat to Big Tech Stocks." Bloomberg.com, 11 Mar. 2021, www.bloomberg.com/news/articles/2021-03-11/wall-street-is-rethinking-the-treasury-threat-to-big-tech-stocks.
[20] Fidelity, "Top sectors to watch in Q2," August 3, 2022.
[21] Miller, Travis, "As Long as Inflation Worries Persist, We Expect Utilities to Underperform: Renewable energy continues to be a long-term boon for the sector," July 6, 2022.

those in constructive regulatory environments with the most protection from inflation.[22]

Q. Have you reviewed any market indicators that may imply that utilities will underperform over the near-term?

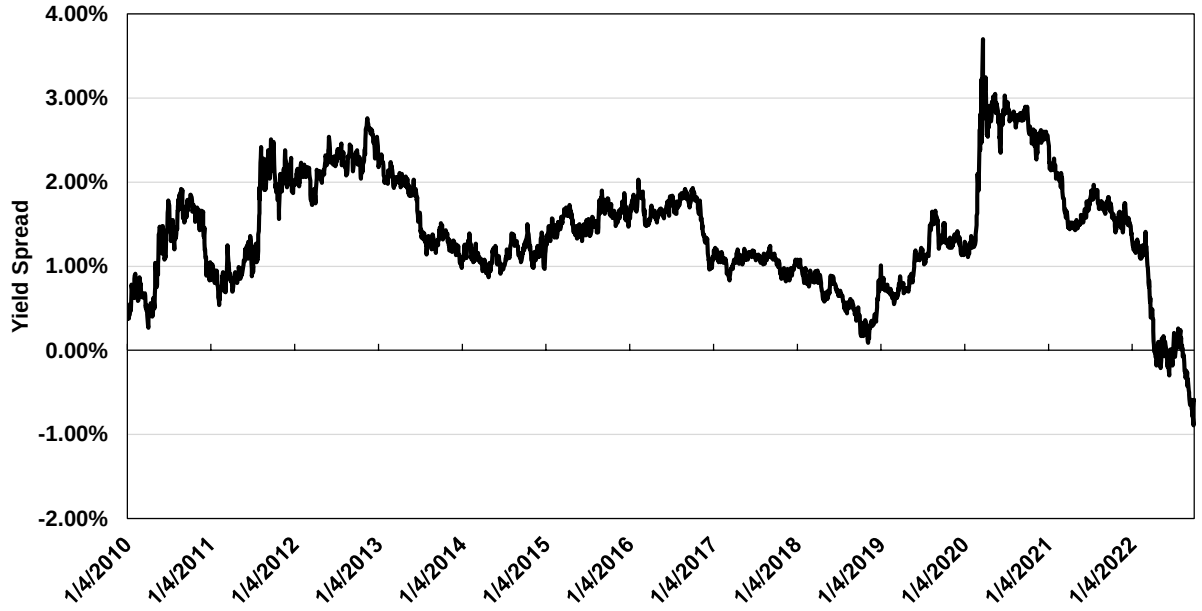
A. Yes, I have. As discussed above, the utility sector is considered a "bond proxy" or a sector that investors view as a "safe haven" alternative to bonds, and changes in utility stock prices are therefore inversely related to changes in interest rates. For example, the utility sector tends to perform well when interest rates are low since the dividend yields for utilities offer investors the prospect of higher returns when compared to the yields on long-term government bonds. Conversely, the utility sector underperforms as the yields on long-term government bonds increase and the spread between the dividend yields on utility stocks and the yields on long-term government bonds decreases. Therefore, I examined the difference ("yield spread") between the dividend yields of utility stocks and the yields on long-term government bonds from January 2010 through August 2022. I selected the dividend yield on the S&P Utilities Index as the measure of the dividend yields for the utility sector and the yield on the 10-year Treasury Bond as the estimate of the yield on long-term government bonds.

As shown in Figure 5, the yield spread as of September 30, 2022, was -0.59 percent indicating that the yield on the 10-year Treasury Bond has exceeded the dividend yield for the S&P Utilities Index. Furthermore, the current yield spread of -0.59 percent is well below the long-term average since January 2010 of 1.41 percent. Given that the yield spread is currently well below the long-term average as well as the expectation that interest rates will continue to increase, it is reasonable to conclude that utility sector will most likely underperform over the near-term. This is because investors that purchased utility stocks as an alternative to the lower yields on long-term government bonds would otherwise be inclined to rotate back into

[22] Ibid.

government bonds, particularly as the yields on long-term government bonds continue to increase, thus resulting in a decrease in the share prices of utilities.

Figure 5: Yield Spread between the Dividend Yield on the S&P Utilities Index and the Yield on the 10-year Treasury Bond – January 2012 – September 2022[23]

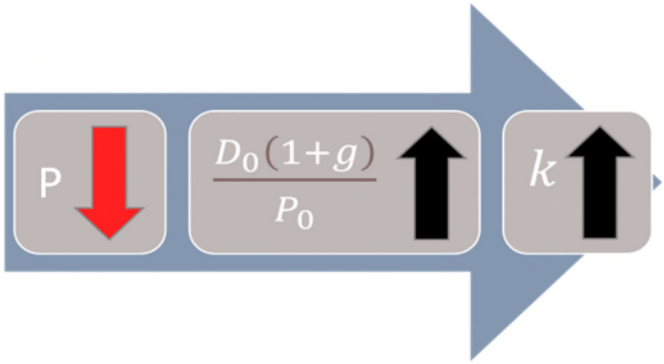


Q. What is the significance of the inverse relationship between interest rates and utility share prices in the current market?

A. As discussed above, the Federal Reserve is currently normalizing monetary policy in response to inflation, which is expected to increase long-term government bond yields. If interest rates increase as expected, then the share prices of utilities will decline. If the prices of utility stocks decline, then the DCF model, which relies on historical averages of share prices, is likely to understate the cost of equity. For example, Figure 6, below summarizes the effect of price on the dividend yield in the Constant Growth DCF model.

[23] S&P Capital IQ Pro.

Figure 6: The Effect of a Decline in Stock Prices on the Constant Growth DCF Model



A decline in stock prices will increase the dividend yields and thus the estimate of the ROE produced by the Constant Growth DCF model. Therefore, this expected change in market conditions supports consideration of the range of ROE results produced by the mean to mean-high DCF results, since the mean DCF results would likely understate the cost of equity during the period that the Company's rates will be in effect. Moreover, prospective market conditions warrant consideration of other ROE estimation models such as the CAPM and ECAPM, which may better reflect expected market conditions. For example, two out of three inputs to the CAPM (*i.e.*, the market risk premium and risk-free rate) are forward-looking.

Q. Have regulatory commissions acknowledged that the DCF model might understate the cost of equity given the current capital market conditions of high inflation and increasing interest rates?

A. Yes. For example, in its May 2022 decision in establishing the cost of equity for Aqua Pennsylvania, Inc., the Pennsylvania Public Utility Commission ("PPUC") specifically concluded that the current capital market conditions of high inflation and increasing interest rates has resulted in the DCF model understating the utility cost of equity, and that weight should be placed on risk premium models, such as the CAPM, in the determination of the ROE:

> To help control rising inflation, the Federal Open Market Committee has signaled that it is ending its policies designed to maintain low interest rates. Aqua Exc. at 9. Because the DCF

model does not directly account for interest rates, consequently, it is slow to respond to interest rate changes. However, I&E's CAPM model uses forecasted yields on ten-year Treasury bonds, and accordingly, its methodology captures forward looking changes in interest rates.

Therefore, our methodology for determining Aqua's ROE shall utilize both I&E's DCF and CAPM methodologies. As noted above, the Commission recognizes the importance of informed judgment and information provided by other ROE models. In the 2012 PPL Order, the Commission considered PPL's CAPM and RP methods, tempered by informed judgment, instead of DCF-only results. We conclude that methodologies other than the DCF can be used as a check upon the reasonableness of the DCF derived ROE calculation. Historically, we have relied primarily upon the DCF methodology in arriving at ROE determinations and have utilized the results of the CAPM as a check upon the reasonableness of the DCF derived equity return. As such, where evidence based on other methods suggests that the DCF-only results may understate the utility's ROE, we will consider those other methods, to some degree, in determining the appropriate range of reasonableness for our equity return determination. In light of the above, we shall determine an appropriate ROE for Aqua using informed judgement based on I&E's DCF and CAPM methodologies.

…..

We have previously determined, above, that we shall utilize I&E's DCF and CAPM methodologies. I&E's DCF and CAPM produce a range of reasonableness for the ROE in this proceeding from 8.90% [DCF] to 9.89% [CAPM]. Based upon our informed judgment, which includes consideration of a variety of factors, including increasing inflation leading to increases in interest rates and capital costs since the rate filing, we determine that a base ROE of 9.75% is reasonable and appropriate for Aqua.[24]

[24] *Penn. Pub. Util. Comm'n et. al. v, Aqua Penn. Wastewater Inc.*, Pennsylvania Public Utility Commission, Docket Nos. R-2021-3027385 and R-2021-3027386, Opinion and Order at 154–55, 177–78 (May 12, 2022).

E. Conclusion

Q. What are your conclusions regarding the effect of current market conditions on the cost of equity for the Company?

A. Over the near term, investors expect long-term interest rates to increase in response to continued elevated levels of inflation and the Federal Reserve's normalization of monetary policy. Because the share prices of utilities are inversely correlated to interest rates, an increase in long-term government bond yields will likely result in a decline in utility share prices, which is the reason a number of equity analysts expect the utility sector to underperform over the near-term. The expected underperformance of utilities means that DCF models using recent historical data likely underestimate investors' required return over the period that rates will be in effect. This change in market conditions also supports the use of other ROE estimation models such as the CAPM and the ECAPM, which may more directly reflect expected market conditions.

VI. Proxy Group Selection

Q. Why have you used a group of proxy companies to estimate the cost of equity for MERC?

A. In this case, we are estimating cost of equity for a gas distribution company that is not a publicly traded entity. Since the cost of equity is a market-based concept, and given that MERC does not make up the entirety of a publicly traded entity, it is necessary to establish a group of companies that is both publicly traded and comparable to MERC in certain fundamental business and financial respects to serve as its "proxy" in the ROE estimation process.

Even if MERC were a publicly-traded entity, it is possible that transitory events could bias its market value over a given period. A significant benefit of using a proxy group is that it moderates the effects of unusual events that may be associated with any one company. The proxy companies used in my analyses all possess a set of operating and risk characteristics that are substantially comparable to the Company,

and thus provide a reasonable basis to derive and estimate the appropriate ROE for MERC.

Q. Please provide a brief profile of MERC.

A. MERC is a natural gas distribution company that is wholly-owned by Integrys Holding, Inc. ("Integrys"), which is ultimately owned by WEC. The Company distributes natural gas to approximately 245,000 customers in 179 communities across Minnesota.[25] As of December 31, 2021, MERC represented approximately 2.0 percent of the total rate base of WEC.[26] MERC's parent company, Integrys, currently has an investment grade long-term rating of A- (Outlook: Stable) from S&P, and Baa1 (Outlook: Stable) from Moody's.[27]

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

A. I began with the group of 10 domestic U.S. utilities that Value Line classifies as Natural Gas Distribution Utilities, and I simultaneously applied the following screening criteria to select companies that:

- pay consistent quarterly cash dividends because companies that do not cannot be analyzed using the Constant Growth DCF model;
- have positive long-term earnings growth forecasts from at least two utility industry equity analysts;
- have investment grade long-term issuer ratings from S&P and/or Moody's;
- are covered by more than one equity analyst;
- derive more than 60 percent of their total operating income from regulated operations;
- derive more than 60 percent of their total regulated operating income from regulated natural gas operations; and
- were not parties to a merger or transformative transaction during the analytical periods relied on.

[25] MERC website: http://www.minnesotaenergyresources.com/company/about.aspx.
[26] WEC Energy Group, Inc. Investor Presentation, September 2022, at 40.
[27] SNL Financial and Moodys.com September 7, 2022.

Q. What is the composition of your proxy group?

A. The screening criteria discussed above is shown in Exhibit ___ (AEB-D), Schedule 3, and resulted in a proxy group consisting of the companies shown in Figure 1: Summary of Cost of Equity Analytical results .

Figure 7: Proxy Group

Company	Ticker
Atmos Energy Corporation	ATO
New Jersey Resources Corporation	NJR
NiSource Inc.	NI
Northwest Natural Gas Company	NWN
ONE Gas, Inc.	OGS
Spire, Inc.	SR

Q. Do your screening criteria result in a proxy group that is risk comparable to MERC?

A. Yes, they do. The overall purpose of developing a set of screening criteria is to select a proxy group of companies that align with the financial and operational characteristics of MERC and that investors would view as comparable to the Company. I developed the screens and thresholds for each screen based on judgment with the intention of balancing the need to maintain a proxy group that is of sufficient size with establishing a proxy group of companies that are comparable in business and financial risk to MERC. This resulted in the group of six companies shown in Figure 7, which have business and financial risks that are substantially comparable to MERC.

VII. Cost of Equity Estimation

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

A. The ROE is the cost rate applied to the equity capital in the rate of return ("ROR"). The ROR for a regulated utility is the weighted average cost of capital, in which the cost rates of the individual sources of capital are weighted by their respective book values. While the costs of debt and preferred stock can be directly observed, the cost of equity is market-based and, therefore, must be estimated based on observable market data.

Q. How is the required COE estimated?

A. The required COE is estimated by using one or more analytical techniques that rely on market-based data to quantify investor expectations regarding required equity returns, adjusted for certain incremental costs and risks. Informed judgment is then applied to determine where the Company's cost of equity falls within the range of results. The key consideration in determining the cost of equity is to ensure that the methodologies employed reasonably reflect investors' views of the financial markets in general, as well as the subject company (in the context of the proxy group), in particular.

Q. What methods did you use to establish your recommended ROE in this proceeding?

A. I considered the results of the Constant Growth DCF model, the Two-Growth DCF model, the CAPM model, the ECAPM model, and the Bond Yield Plus Risk Premium methodology. As discussed in more detail below, a reasonable ROE estimate appropriately considers alternative methodologies and the reasonableness of their individual and collective results.

A. Importance of Multiple Analytical Approaches

Q. Why is it important to use more than one analytical approach?

A. Because the COE is not directly observable, it must be estimated based on both quantitative and qualitative information. When faced with the task of estimating the COE, analysts and investors are inclined to gather and evaluate as much relevant data as reasonably can be analyzed. A number of models have been developed to estimate the COE, and I consider multiple approaches to estimate the COE. As a practical matter, however, all of the models available for estimating the COE are subject to limiting assumptions or other constraints. Consequently, many well-regarded finance texts recommended using multiple approaches when estimating the COE. For example, Copeland, Koller, and Murrin[28] suggest using the CAPM and Arbitrage Pricing Theory model, while Brigham and Gapenski[29] recommend the CAPM, DCF, and "bond yield plus risk premium" approaches.

Q. Do current market conditions require the use of more than one analytical approach

A. Yes. Interest rates have increased and are expected to continue to increase from the lows as a result of the COVID-19 pandemic. Given the inverse relationship between interest rates and utility share prices, the dividend yields of utilities are expected to increase over the near-term. Therefore, the current low dividend yields for utilities result in DCF cost of equity estimates that are understating the forward-looking cost of equity. The CAPM and Bond Yield Plus Risk Premium method offer some balance through the use of projected interest rates. Therefore, it is important to use multiple analytical approaches to ensure that the ROE results reflect the market conditions that are expected during the period that MERC's rates will be in effect. Given the expectation that interest rates will increase, it is important to

[28] Tom Copeland, Tim Koller and Jack Murrin, Valuation: Measuring and Managing the Value of Companies, 3rd Ed. (New York: McKinsey & Company, Inc., 2000), at 214.

[29] Eugene Brigham, Louis Gapenski, Financial Management: Theory and Practice, 7th Ed. (Orlando: Dryden Press, 1994), at 341.

moderate the impact that the current lower interest rates are having on the ROE estimates, especially the DCF analysis, and where possible consider using projected market data in the models to estimate the return for the forward-looking period.

Q. Has the Commission considered the results of multiple COE estimation methodologies?

A. Yes. As I discussed earlier in my testimony, the Commission has considered the results of multiple models in recent Orders including those for MERC, Minnesota Power, Otter Tail, and Great Plains. In its recent order for MERC, the Commission emphasized the importance of considering the results of each model submitted by the witnesses in the case. Specifically, the Commission noted that:

> Not all models are equally probative, and not every application of the same model is equally probative. The Commission examines the results of every model introduced into the record in every case. In this case, the Commission agrees with the ALJ that the DCF model is the best in the record for determining return on equity. The Commission finds that the transparency and objectivity of the DCF model make it the strongest, most credible model, and that the most reasonable way to proceed is to use its results as a baseline and to use the results of other models to check, inform, and refine those results.[30]

In the decision for MERC, the Commission concluded that the results of the DCF models and the other models in the case supported the ROE that was authorized for MERC.[31] Similarly, in the most completed recent case for Minnesota Power, the Commission explained that:

> The recommendations of the parties all fall into a fairly narrow and often overlapping range, though the DCF analyses tend to support a lower ROE in that range, and CAPM and risk premium

[30] *In the Matter of the Application of Minnesota Energy Resources Corporation for Authority to Increase Rates for Natural Gas Service in Minnesota*, Docket No. G011/GR-17-563, Findings of Fact, Conclusions and Order at 27 (December 26, 2018).

[31] *Id.*

models (and blended approaches) tend to support the higher end of the range.[32]

To account for the divergence between the results of the DCF models and the CAPM and Bond Yield Plus Risk Premium analyses, the Commission authorized an ROE towards the higher end of the results of the DCF models.[33] Thus, the Commission recognizes the importance of considering the results of each model presented in the rate case since market conditions can cause the results produced by each of the models to diverge.

Q. What are your conclusions about the results of the DCF and CAPM models?

A. Recent market data that is used as the basis for the assumptions for both models have been affected by market conditions. As a result, relying exclusively on historical assumptions in these models, without considering whether these assumptions are consistent with investors' future expectations, will underestimate the cost of equity that investors would require over the period that the rates in this case are to be in effect. In this instance, relying on the historically low dividend yields that are not expected to continue over the period that the new rates will be in effect will underestimate the COE.

Furthermore, as discussed in Section V above, long-term interest rates have increased since August 2020 and this trend is expected to continue over the near-term as the Federal Reserve continues to raise interest rates to reduce inflation to target levels. Therefore, the use of current averages of Treasury bond yields as the estimate of the risk-free rate in the CAPM is not appropriate since recent market conditions are not expected to continue over the long-term. Instead, analysts should rely on projected yields of Treasury Bonds in the CAPM. The projected Treasury bond yields result in CAPM estimates that are more reflective of the market

[32] *In the Matter of the Application of Minnesota Power for Authority to Increase Rates for Electric Service in Minnesota*, Docket No. E015/GR-16-664, Findings of Fact, Conclusions and Order at 60 (March 12, 2018).

[33] *Id.* at 61.

conditions that investors expect during the period that the Company's rates will be in effect.

B. Constant Growth DCF Model

Q. Please describe the DCF approach.

A. The 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 most general form, the DCF model is expressed as follows:

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

Where P_0 represents the current stock price, $D_1 \ldots D_\infty$ are all expected future dividends, and k is the discount rate, or required ROE. Equation [1] is a standard present value calculation that can be simplified and rearranged into the following form:

$$k = \frac{D_0(1+g)}{P_0} + g \quad [2]$$

Equation [2] is often referred to as the Constant Growth DCF (or CGDCF) model in which the first term is the expected dividend yield and the second term is the expected long-term growth rate.

Q. What assumptions are required for the Constant Growth DCF model?

A. The Constant Growth DCF model requires the following four assumptions: (1) a constant growth rate for earnings and dividends; (2) a stable dividend payout ratio; (3) a constant price-to-earnings ratio; and (4) a discount rate greater than the expected growth rate. To the extent that any of these assumptions is violated, considered judgment and/or specific adjustments should be applied to the results.

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

A. The dividend yield in my Constant Growth DCF model is based on the proxy companies' current annualized dividend and average closing stock prices over the 30-, 90-, and 180-trading days ended September 30, 2022.

Q. Why did you use 30-, 90-, and 180-day averaging periods?

A. In my Constant Growth DCF model, I use an average of recent trading days to calculate the term P_0 in the DCF model to ensure that the COE that results from this methodology is not skewed by anomalous events that may affect stock prices on any given trading day. The averaging period should also be reasonably representative of expected capital market conditions over the long-term. However, the averaging periods that I use rely on historical prices which, as discussed above, are currently at unsustainably high levels that are not expected to continue during the period that MERC's rates will be in effect. The use of current prices in the Constant Growth DCF model is not consistent with the forward-looking market expectations. Therefore, the results of my Constant Growth DCF model using historical data may underestimate the forward-looking cost of equity. As a result, I place more weight on the mean to mean-high results produced by my Constant Growth DCF model.

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 reasonable to apply one-half of the expected annual dividend growth rate for purposes of calculating the expected dividend yield component of the DCF model. This adjustment ensures that the expected first-year dividend yield is, on average,

representative of the coming twelve-month period, and does not overstate the aggregated dividends to be paid during that time.

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

A. In its Constant Growth form, the DCF model (*i.e.*, Equation [2]) assumes a single growth estimate in perpetuity. To reduce the long-term growth rate to a single measure, one must assume that the payout ratio remains constant and that earnings per share, dividends per share, and book value per share all grow at the same constant rate. Over the long run, however, dividend growth can only be sustained by earnings growth. Therefore, it is important to incorporate a variety of sources of long-term earnings growth rates into the Constant Growth DCF model.

Q. Which sources of long-term earnings growth rates did you use?

A. My Constant Growth DCF model incorporates three sources of long-term earnings growth rates: (1) Zacks Investment Research; (2) Thomson First Call (provided by Yahoo! Finance); and (3) Value Line Investment Survey.

C. Two-Growth DCF Model

Q. What other forms of the DCF model have you considered?

A. In order to address some of the limiting assumptions underlying the Constant Growth form of the DCF model, I also considered the results of a Two-Growth form of the DCF model. As with the Constant Growth DCF model, the Two-Growth form defines the COE as the discount rate that sets the current price equal to the discounted value of future cash flows; however, unlike the Constant Growth DCF model, the Two-Growth DCF model removes the effect of earnings growth rates that are considered either too high or too low to be sustainable over the long-term.

Q. Has the Commission previously relied on the result of the Two-Growth DCF model?

A. Yes. As discussed previously, the Commission has historically placed greater weight on the results of the Two-Growth DCF model and used the results of other analytical models such as the CAPM and Bond Yield Risk Premium analyses as a check on the reasonableness of the Two-Growth DCF results. Figure 8 summarizes 17 recent decisions issued by the Commission since 2010 in fully litigated rate cases. As shown in Figure 8, the Commission has relied on the results of the Two-Growth DCF model since 2013. Prior to 2013 the Commission more often considered the results of the Constant Growth DCF model.[34]

Figure 8: Commission's Reliance on the TGDCF Model

Date	Company	Docket No.	Case Type	Reliance on TGDCF (Yes/No)
2022	Otter Tail Power	E-017/GR-20-719	Electric	Yes[35]
2020	Great Plains Natural Gas	G004/GR-19-511	Gas	Yes[36]

[34] *See In the Matter of the Application of Minnesota Energy Resources Corporation for Authority to Increase Rates for Natural Gas Service in Minnesota*, Docket No. G007,011/GR-10-977, Findings of Fact, Conclusions and Order at 23 (July 13, 2012); *In the Matter of the Application of Interstate Power and Light Company for Authority to Increase Rates for Electric Service in Minnesota*, Docket No. E001/GR-10-276, Findings of Fact, Conclusions and Order at 10 (August 12, 2011), Direct Testimony of Eilon Amit at 30-42 (December 3, 2010); *In the Matter of the Application of Otter Tail Power Company for Authority to Increase Rates for Electric Utility Service in Minnesota*, Docket No. E017/GR-10-239, Findings of Fact, Conclusions and Order at 43-44 (April 25, 2011); *In the Matter of the Application of Northern States Power Company, a Minnesota Corporation, for Authority to Increase Rates for Natural Gas Service in Minnesota*, Docket No. G002/GR-09-1153, Findings of Fact, Conclusions and Order at 28-29 (December 6, 2010); *In the Matter of an Application by CenterPoint Energy for Authority to Increase Natural Gas Rates in Minnesota*, Docket No. G008/GR-08-1075, Findings of Fact, Conclusions and Order at 7 (January 11, 2010).

[35] *In the Matter of the Application of Otter Tail Power Company for Authority to Increase Rates for Electric Service in the State of Minnesota*, Docket No. E-017/GR-20-719, Findings of Fact, Conclusions and Order at 34 (February 2, 2022).

[36] *In the Matter of the Petition by Great Plains Natural Gas Co., a Division of Montana-Dakota Utilities, Co., for Authority to Increase Natural Gas Rates in Minnesota*, Docket No. G-004/GR-19-511, Findings of Fact, and Conclusion and Order at 18 (October 26, 2020).

Date	Company	Docket No.	Case Type	Reliance on TGDCF (Yes/No)
2018	MERC	G011/GR-17-563	Gas	Yes[37]
2017	Minnesota Power Company	E015/GR-16-664	Electric	Yes[38]
2016	OTP	E017/GR-15-1033	Electric	Yes[39]
2016	MERC	G011/GR-15-736	Gas	Yes[40]
2016	CenterPoint Energy Minnesota Gas	G008/GR-15-424	Gas	Yes[41]
2016	Great Plains Natural Gas	G004/GR-15-879	Gas	Yes[42]
2014	Northern States Power Co.	E002/GR-13-868	Electric	Yes[43]
2014	CenterPoint Energy Minnesota Gas	G008/GR-13-316	Gas	Yes[44]

[37] *In the Matter of the Application of Minnesota Energy Resources Corporation for Authority to Increase Rates for Natural Gas Service in Minnesota*, Docket No. G011/GR-17-563, Findings of Fact, Conclusions and Order at 27 (December 26, 2018).

[38] *In the Matter of the Application of Minnesota Power for Authority to Increase Rates for Electric Service in Minnesota*, Docket No. E015/GR-16-664, Findings of Fact, Conclusions and Order at 61 (March 12, 2018).

[39] *In the Matter of the Application of Otter Tail Power Company for Authority to Increase Rates for Electric Service in the State of Minnesota*, Docket No. E017/GR-15-1033, Findings of Fact, Conclusions and Order at 55 (August 16, 2016).

[40] *In the Matter of the Application of Minnesota Energy Resources Corporation for Authority to Increase Rates for Natural Gas Service in Minnesota*, Docket No. G011/GR-15-736, Findings of Fact, Conclusions and Order at 27 (October 31, 2016).

[41] *In the Matter of the Application of CenterPoint Energy Resources Corp. d/b/a CenterPoint Energy Minnesota Gas for Authority to Increase Natural Gas Rates in Minnesota*, Docket No. G008/GR-15-424, Findings of Fact, Conclusions and Order at 42-44 (June 3, 2016).

[42] *In the Matter of the Petition by Great Plains Natural Gas Co., a Division of MDU Resources Group, Inc., for Authority to Increase Natural Gas Rates in Minnesota*, Docket No. G004/GR-15-879, Findings of Fact, Conclusions and Order at 23 (September 6, 2016).

[43] *In the Matter of the Application of Northern States Power Company for Authority to Increase Rates for Electric Service in the State of Minnesota*, Docket No. E002/GR-13-868, Findings of Fact, Conclusions and Order at 57 (May 8, 2015).

[44] *In the Matter of an Application by CenterPoint Energy Resources Corp. d/b/a CenterPoint Energy Minnesota Gas For Authority to Increase Natural Gas Rates in Minnesota*, Docket No. E008/GR-13-316, Findings of Fact, Conclusions and Order at 32 (June 9, 2014), Direct Testimony of Eilon Amit at 8-13 (November 26, 2013).

Q. Please generally describe your Two-Growth DCF model.

A. As discussed in the Section above, the Constant Growth DCF model assumes a single growth estimate in perpetuity, which for my Constant Growth DCF model was the long-term earnings growth rates from First Call, Zacks, and Value Line. The earnings growth rates used in my Constant Growth DCF model are developed by analysts for a five-year period and therefore may not reflect the long-term growth rate of a company. As a result, I developed a Two-Growth DCF model to reduce the effect of low or high earnings growth rates on the calculated ROE of a company by utilizing one growth rate to reflect short-term growth and a separate growth rate for long-term growth.

Q. How did you apply the Two-Growth DCF to the companies in your proxy group?

A. I applied the Two-Growth DCF approach to companies that had an earnings growth rate that could be considered unsustainable for the long-term as compared to the proxy group. An earnings growth rate was considered abnormally high or low if the earnings growth rate was outside of the range determined by the average growth rate of the proxy group plus or minus one standard deviation. For the companies with a high or low growth rate, I estimated the companies' ROE by applying the earnings growth rate used in the Constant Growth DCF model for the first five-years (i.e., short-term). For the long-term growth rate, I used the proxy group average growth rate minus one standard deviation in the case of companies with a low growth rate and the proxy group average growth rate plus one standard deviation in the case of companies with a high growth rate. This approach is consistent with the approach applied by the Minnesota Department of Commerce, Division of Energy Resources (the "Department") and adopted by the Commission in many proceedings.

Q. Has the Commission previously discussed the purpose of the Two-Growth DCF model?

A. Yes. In its order in a prior case for the Company, in Docket No. G-011/GR-15-736, the Commission noted:

> The DCF model uses the current dividend yield and the expected growth rate of dividends to determine what rate of return is high enough to induce investment. The model is derived from a formula used by investors to assess the attractiveness of investment opportunities using three inputs—dividends, market equity prices, and earnings/dividend growth rates. Its two basic variants are the Constant-Growth DCF, the classic version, and the Two-Growth DCF, designed for situations in which the short-term, projected earnings growth rates may not be expected to continue in the long run. The two-growth model uses one growth rate for an initial period, followed by a different growth rate for the long term.[45]

In summary, the Commission noted that the purpose of the Two-Growth DCF model is to identify and adjust for growth rates that are not expected to be sustainable in the long-run. This is consistent with my understanding of the Two-Growth DCF model.

Q. Why did you consider the Two-Growth DCF model and not a Multi-Stage DCF model?

A. The Multi-Stage DCF model enables the analyst to specify different growth rates over three time periods. Therefore, the Multi-Stage DCF model: a) addresses the possibility that mean five-year growth rates may not be reasonable in perpetuity and that payout ratios could vary over time; and b) allows for a gradual transition from the first-stage growth rate to the long-term growth rate. However, there are three reasons why I did not consider the Multi-Stage model in this proceeding.

[45] *In the Matter of the Application of Minnesota Energy Resources Corporation for Authority to Increase Rates for Natural Gas Service in Minnesota*, Docket No. G011/GR-15-736, Findings of Fact, Conclusions and Order at 20 (October 31, 2016) (emphasis added).

As noted above, the Commission stated the purpose of the Two-Growth DCF model is to identify and adjust for growth rates that are not expected to be sustainable in the long-run.[46] Therefore, it is not necessary for the analyst to make additional adjustments to the growth rates of the proxy group companies.

Second, as shown in Exhibit___ (AEB-D), Schedule 6, the difference between the first stage and second stage growth rate for my Two-Growth DCF model was 11 basis points (*i.e.*, 6.35 percent (first-stage growth rate) and 6.26 percent (second stage growth rate)). Given the small difference between the first stage and second stage growth rate in my Two-Growth DCF model, it is not necessary to use a Multi-Stage model to gradually transition the short-term and long-term growth rates.

Finally, in its order in Docket No. G-011/GR-15-736 for MERC, the Commission noted that it preferred the DCF model to other models such as the CAPM and the Risk Premium because the DCF model required fewer subjective judgements.[47] According to the Commission, there is a general consensus around two of the three inputs (i.e., stock prices and dividends) to the DCF model and while there may not be general consensus around the third input, projected growth rates, the Commission noted those differences were limited since growth rates are sourced from a small set of "recognized professional resources".[48] The consideration of the Multi-Stage model however would increase the number of subjective judgements in the DCF model, as analysts would debate both the selection of the short-term (i.e. first stage) and long-term (i.e., third stage) growth rates and the timing that is required to move from the first to the third stage. Therefore, the Multi-Stage DCF model requires more judgement on the part of the analyst than the Constant Growth DCF, which relies on analyst growth rates directly, or the Two-Growth DCF wherein

[46] *Id.*
[47] *Id.* at 27.
[48] *Id.*

the second stage growth rate is not determined by the analyst, but rather based on the standard deviation test.

Q. Does the Two-Growth DCF model discussed above address your concern about low dividend yields?

A. No. While the Two-Growth DCF model provides for changes in growth over time, it does not address the low current dividend yields for utility stocks. As discussed earlier, currently low dividend yields are causing the DCF model to understate the cost of equity. Since the DCF model is understating the cost of equity, it is not appropriate to rely on the mean DCF result for the proxy group. As a result, I have considered the range of the mean to mean-high DCF results when determining the recommended ROE for MERC.

D. Flotation Costs

Q. What are flotation costs?

A. 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.

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

A. A regulated utility must have the opportunity to earn an ROE that is both competitive and compensatory to attract and retain new investors. 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 diluting equity share value.

Q. Are flotation costs part of the 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 cost are incurred prior to the test year, but remain part of the cost structure that exists during the test year and beyond, and as such, should be recognized for ratemaking purposes. Therefore, whether an issuance occurs during the test year, or is planned for the test year, is irrelevant, because failure to allow recovery of past flotation costs may deny MERC the opportunity to earn its required ROR in the future.

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

A. Yes. The need to reimburse shareholders for the lost returns associated with 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. This treatment is consistent with the philosophy of a fair ROR. According to Dr. Shannon Pratt:

> Flotation costs occur when new issues of stock or debt are sold to the public. The firm usually incurs several kinds of flotation or transaction costs, which reduce the actual proceeds received by the firm. 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 firm's required returns on these proceeds equate to a higher return to compensate for the additional costs. Flotation costs can be accounted for either by amortizing the cost, thus reducing the cash flow to discount, or by incorporating the cost into the cost of capital. Because flotation costs are not typically applied to operating cash flow, one must incorporate them into the cost of capital.[49]

[49] Shannon P. Pratt, Cost of Capital Estimation and Applications, Second Edition, at 220-221.

Q. Has the Commission previously recognized the need to include flotation costs?

A. Yes. The need to reimburse investors for equity issuance costs has been recognized by the Commission in many, although not all, previous decisions.[50] My examination concludes that flotation costs are properly included in MERC's ROE determination.

Q. How did you calculate the flotation costs for MERC?

A. My flotation cost calculation is based on the costs of issuing equity that were incurred by Integrys in its two most recent common equity issuances. Those issuance costs were applied to my proxy group. Based on the issuance costs provided in Exhibit___ (AEB-D), Schedule 4, flotation costs for MERC are approximately 0.13 percent (i.e., 13 basis points).

Q. What were the results of your DCF analyses?

A. Figure 9 summarizes the results of my DCF analyses. As shown in Figure 9, the mean Constant Growth DCF results range from 9.88 percent to 9.96 percent and the mean high results are in the range of 11.20 to 11.28 percent. The mean Two-Growth DCF results range from 9.80 percent to 9.88 percent and the mean high results are between 11.17 percent and 11.25 percent. While I also summarize the mean low DCF results, I do not believe that the low DCF results provide a

[50] *In the Matter of the Application of Interstate Power and Light Company for Authority to Increase Rates for Electric Service in Minnesota*, Docket No. E001/GR-10-276, Findings of Fact, Conclusions and Order at 9 (August 12, 2011); *In the Matter of the Application of Northern States Power Company d/b/a Xcel Energy for Authority to Increase Rates for Electric Service in Minnesota*, Docket No. E002/GR-10-971, Findings of Fact, Conclusions, and Order at 8 (May 14, 2012); *In the Matter of the Application of Northern States Power Company d/b/a Xcel Energy for Authority to Increase Rates in Electric Service in Minnesota*, Docket No. E002/GR-08-1065, Findings of Fact, Conclusions of Law, and Order at 10-11 (October 23, 2009); *In the Matter of the Application of Otter Tail Corporation d/b/a Otter Tail Power Company for Authority to Increase Rates for Electric Utility Service in Minnesota*, Docket No. E017/GR-07-1178, Findings of Fact, Conclusions of Law, and Order at 57-58 (August 1, 2008); *In the Matter of a Petition by Great Plains Natural Gas Company, a Division of MDU Resources Group, Inc., for Authority to Increase Natural Gas Rates in Minnesota*, Docket No. G004/GR-04-1487, Findings of Fact, Conclusions of Law and Order at 11 (May 1, 2006).

reasonable spread over the expected yields on Treasury bonds to compensate investors for the incremental risk related to an equity investment.

Figure 9: Discounted Cash Flow Results[51]

	Mean Low	Mean	Mean High
Constant Growth DCF[52]			
30-Day Average	9.14%	9.96%	11.28%
90-Day Average	9.06%	9.88%	11.20%
180-Day Average	9.11%	9.92%	11.24%
Two-Stage Growth DCF[53]			
30-Day Average	9.03%	9.88%	11.25%
90-Day Average	8.95%	9.80%	11.17%
180-Day Average	9.00%	9.84%	11.21%

E. CAPM Analysis

Q. Please briefly describe the Capital Asset Pricing Model.

A. The CAPM is a risk premium approach 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. This second component is the product of the market risk premium and the Beta coefficient, which measures the relative riskiness of the security being evaluated.

The CAPM is defined by four components, each of which must theoretically be a forward-looking estimate:

$$K_e = r_f + \beta\left(r_m - r_f\right) \quad [3]$$

Where:

- K_e = the required market ROE;
- β = Beta coefficient of an individual security;
- r_f = the risk-free rate of return; and
- r_m = the required return on the market.

51 Results include 13 basis points for flotation costs.
52 *See* Exhibit ___ (AEB-D), Schedule 5.
53 *See* Exhibit ___ (AEB-D), Schedule 6.

In this specification, the term ($r_m - r_f$) represents the market risk premium. According to the theory underlying the CAPM, since unsystematic risk can be diversified away, investors should only be concerned with systematic or non-diversifiable risk. Non-diversifiable risk is measured by Beta, which is defined as:

$$\beta = \frac{Covariance(r_e, r_m)}{Variance(r_m)} \quad [4]$$

The variance of the market return (i.e., Variance (r_m)) is a measure of the uncertainty of the general market, and the covariance between the return on a specific security and the general market (i.e., Covariance (r_e, r_m)) reflects the extent to which the return on that security will respond to a given change in the general market return. Thus, Beta represents the risk of the security relative to the general market.

Q. What risk-free rate did you use in your CAPM analysis?

A. I relied on three sources for my estimate of the risk-free rate: (1) the current 30-day average yield on 30-year U.S. Treasury bonds (i.e., 3.47 percent);[54] (2) the average projected 30-year U.S. Treasury bond yield for Q1 2023 through Q1 2024 of 3.88 percent;[55] and (3) the average projected 30-year U.S. Treasury bond yield for 2024 through 2028 of 3.80 percent.[56]

Q. Would you place more weight on one of these scenarios?

A. Yes. Based on current market conditions, I place more weight on the results of the projected yields on the 30-year Treasury bonds. As discussed previously, the estimation of the cost of equity in this case should be forward-looking because it is the return that investors would receive over the future rate period. Therefore, the inputs and assumptions used in the CAPM analysis should reflect the expectations of the market at that time. As discussed in Section V, long-term interest rates have

[54] Bloomberg Professional, as of September 30, 2022.
[55] Blue Chip Financial Forecasts, Vol. 41, No. 10, October 1, 2022, at 2.
[56] Blue Chip Financial Forecasts, Vol. 41, No. 6, June 1, 2022, at 14.

increased significantly in 2022 and are expected to continue to increase over the near-term as the economy recovers from the COVID-19 recession and the Federal Reserve begins to normalize monetary policy. Therefore, while I have included the results of a CAPM analysis that relies on the current average risk-free rate, this analysis fails to take into consideration the effect of the market's expectations for interest rate increases on the cost of equity.

Q. What Beta coefficients did you use in your CAPM analysis?

A. As shown on Exhibit___ (AEB-D), Schedule 7, I used the Beta coefficients for the proxy group companies as reported by Bloomberg and Value Line. The Beta coefficients reported by Bloomberg were calculated using ten years of weekly returns relative to the S&P 500 Index. Value Line's calculation is based on five years of weekly returns relative to the New York Stock Exchange Composite Index.

Additionally, as shown in Exhibit___ (AEB-D), Schedule 7 and Exhibit___ (AEB-D), Schedule 8, I also considered an additional CAPM analysis which relies on the long-term average utility Beta coefficient for the companies in my proxy group. The long-term average utility Beta coefficient was calculated as an average of the Value Line Beta coefficients for the companies in my proxy group from 2013 through 2021.

Q. How did you estimate the market risk premium in the CAPM?

A. I estimated the Market Risk Premium ("MRP") as the difference between the implied expected equity market return and the risk-free rate. As shown in Exhibit___ (AEB-D), Schedule 11, the expected return on the S&P 500 Index is calculated using the Constant Growth DCF model discussed earlier in my testimony for the companies in the S&P 500 Index for which dividend yields and Value Line long-term earnings projections are available. Based on an estimated market capitalization-weighted dividend yield of 1.98 percent and a weighted long-term growth rate of 10.95 percent, the estimated required market return for the S&P 500 Index is 13.04 percent. The implied market risk premium over the current 30-day average of the 30-year U.S.

Treasury bond yield, and projected yields on the 30-year U.S. Treasury bond, ranges from 9.16 percent to 9.58 percent.

Q. Has the Commission considered the use of a forward-looking MRP?

A. Yes, they have. For example, the Department relied on a forward-looking market return (estimated using a Constant Growth DCF model) in the CAPM for Great Plains (Docket No. G-004/GR-19-511). Specifically, the Department used the dividend yield reported by S&P for the S&P 500 and the three- to five-year earnings growth estimate for the State Street Global Advisors S&P 500 exchange traded fund ("ETF"), which resulted in a projected market return of 13.44 percent.[57] The Department has historically relied on the Constant Growth DCF model to estimate a forward-looking market return for the CAPM, and that market return has been considered by the Commission in prior proceedings.[58]

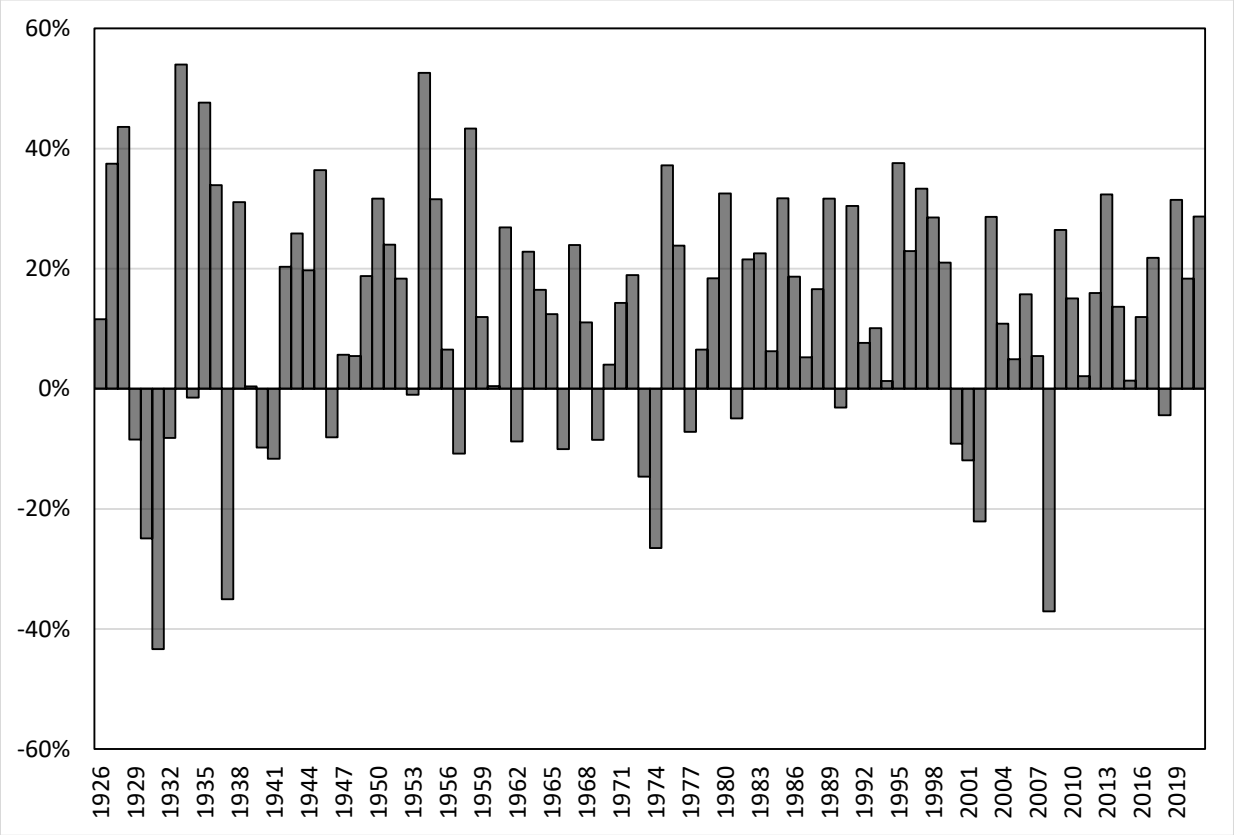
Q. How does the current expected market return of 13.04 percent compare to observed historical market returns?

A. Given the range of annual equity returns that have been observed over the past 94 years (shown in Figure 10 below), a current expected return of 13.04 percent is not unreasonable. In approximately half of all observations, the realized total equity return was at least 13.04 percent or greater.

[57] *In the Matter of the Petition by Great Plains Natural Gas Co., a Division of Montana-Dakota Utilities, Co., for Authority to Increase Natural Gas Rates in Minnesota*, Docket No. G-004/GR-19-511, Surrebuttal Testimony of Craig M. Addonizio at Ex. DER-9, CMA-S-8 ((March 3, 2020).

[58] *See In the Matter of the Application of Otter Tail Power Company for Authority to Increase Rates for Electric Service in Minnesota*, Docket No. E017/GR-15-1033, Findings of Fact, Conclusions and Order at 55-56 (May 1, 2017); *In the Matter of the Application of Minnesota Power for Authority to Increase Rates for Electric Service in Minnesota*, Docket No. E015/GR-16-664, Findings of Fact, Conclusions and Order at 60-61 (March 12, 2018).

Figure 10: Realized U.S. equity market returns (1926-2021)[59]



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

A. Yes, I did. I have also considered the results of an Empirical CAPM ("ECAPM")[60] in estimating the cost of equity for MERC. The ECAPM calculates the product of the adjusted Beta coefficient and the market risk premium and applies a weight of 75.00 percent to that result. The model then applies a 25.00 percent weight to the market risk premium, without any effect from the Beta coefficient. The results of the two calculations are summed, along with the risk-free rate, to produce the ECAPM result, as noted in Equation [5] below:

[59] Depicts total annual returns on large company stocks, as reported in the 2021 Duff & Phelps SBBI Yearbook.

[60] *See, e.g.*, Roger A. Morin, New Regulatory Finance, Public Utilities Reports, Inc., 2006, at 189.

$$k_e = r_f + 0.75\beta(r_m - r_f) + 0.25(r_m - r_f) \qquad [5]$$

Where:

- k_e = the required market ROE;
- β = Adjusted Beta coefficient of an individual security;
- *rf* = the risk-free rate of return; and
- r_m = the required return on the market as a whole.

In essence, the Empirical form of the CAPM addresses the tendency of the "traditional" CAPM to underestimate the cost of equity for companies with low Beta coefficients such as regulated utilities. In that regard, the ECAPM is not redundant to the use of adjusted Betas; rather, it 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 underestimates the "alpha," or the constant return term.[61]

As with the CAPM, my application of the ECAPM uses the forward-looking market risk premium estimates, the three yields on 30-year Treasury securities noted earlier as the risk-free rate, and the Bloomberg, Value Line and long-term average Beta coefficients.

Q. What are the results of your CAPM and ECAPM analyses?

A. As shown in Figure 11 (*see* also Exhibit___ (AEB-D), Schedule 7), my CAPM analysis produces a range of returns from 10.46 percent to 11.50 percent. My ECAPM analysis produces a range of returns from 11.11 percent to 11.89 percent.

[61] *Id*. at 191.

Figure 11: CAPM and ECAPM Results

	Current Risk-Free Rate (3.47%)	Q1 2023–Q1 2024 Projected Risk-Free Rate (3.88%)	2024-2028 Projected Risk-Free Rate (3.80%)
CAPM			
Value Line Beta	11.45%	11.52%	11.50%
Bloomberg Beta	10.94%	11.03%	11.01%
Long-term Avg. Beta	10.47%	10.58%	10.56%
ECAPM			
Value Line Beta	11.85%	11.90%	11.89%
Bloomberg Beta	11.47%	11.53%	11.52%
Long-term Avg. Beta	11.11%	11.19%	11.18%

F. Bond Yield Risk Premium Analysis

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

A. In general terms, this approach is based on the fundamental principle that equity investors bear the residual risk associated with equity ownership and therefore require a premium over the return they would have earned as a bondholder. That is, since returns to equity holders have greater risk than returns to bondholders, equity investors must be compensated to bear that 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. In my analysis, I used actual authorized returns for gas utilities as the historical measure of the cost of equity to determine the risk premium.

Q. Are there other considerations that should be addressed in conducting this analysis?

A. Yes. It is important to recognize both academic literature and market evidence indicating that the equity risk premium (as used in this approach) is inversely related to the level of interest rates. That is, as interest rates increase (decrease), the equity risk premium decreases (increases). Consequently, it is important to develop an

analysis that: (1) reflects the inverse relationship between interest rates and the equity risk premium; and (2) relies on recent and expected market conditions. Such an analysis can be developed based on a regression of the risk premium as a function of U.S. Treasury bond yields. If we let authorized ROEs for gas utilities serve as the measure of required equity returns and define the yield on the long-term U.S. Treasury bond as the relevant measure of interest rates, the risk premium simply would be the difference between those two points.[62]

Q. Is the Bond Yield Plus Risk Premium analysis relevant to investors?

A. Yes. Investors are aware of ROE awards in other jurisdictions, and they consider those awards as a benchmark for a reasonable level of equity returns for utilities of comparable risk operating in other jurisdictions. Since my Bond Yield Plus Risk Premium analysis is based on authorized ROEs for gas utilities relative to corresponding Treasury yields, it provides relevant information to assess the return expectations of investors.

Q. What did your Bond Yield Plus Risk Premium analysis reveal?

A. As shown on Figure 12 below, from 1992 through September 2022, there was a strong negative relationship between risk premia and interest rates. To estimate that relationship, I conducted a regression analysis using the following equation:

$$RP = a + b(T) \quad [5]$$

Where:

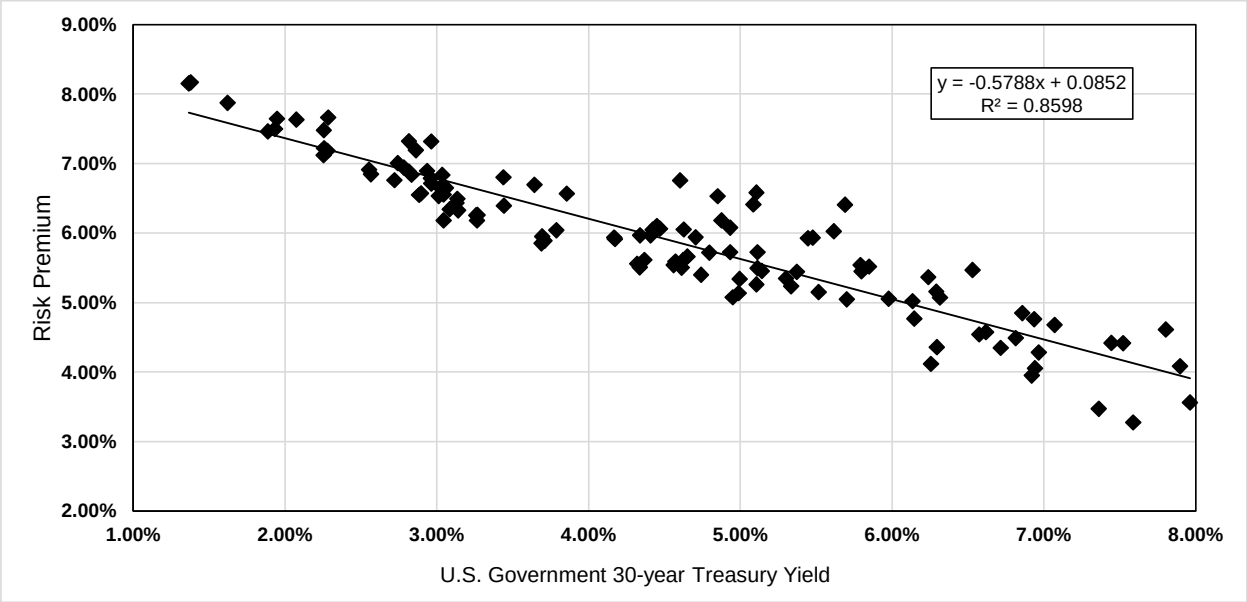
- RP = Risk Premium (difference between authorized ROEs and the yield on 30-year U.S. Treasury bonds)
- a = intercept term
- b = slope term

[62] *See e.g.*, S. Keith Berry, *Interest Rate Risk and Utility Risk Premia during 1982-93*, Managerial and Decision Economics, Vol. 19, No. 2 (March, 1998), in which the author used a methodology similar to the regression described below, including using allowed ROEs as the relevant data source, and came to similar conclusions regarding the inverse relationship between risk premia and interest rates. *See also* Robert S. Harris, *Using Analysts' Growth Forecasts to Estimate Shareholders Required Rates of Return*, Financial Management, Spring 1986, at 66.

- T = 30-year U.S. Treasury bond yield

Data regarding allowed ROEs were derived from 773 rate cases from 1992 through September 2022 as reported by Regulatory Research Associates.[63] This equation's coefficients were statistically significant at the 99.0 percent level.

Figure 12: Risk Premium Results



As shown on Exhibit ___ (AEB-D), Schedule 10, based on the current 30-day average of the 30-year U.S. Treasury bond yield (i.e., 3.47 percent), the risk premium would be 6.52 percent, resulting in an estimated ROE of 9.98 percent. Based on the near-term (2023-2024) projections of the 30-year U.S. Treasury bond yield (i.e., 3.88 percent), the risk premium would be 6.28 percent, resulting in an estimated ROE of 10.16 percent. Based on longer-term (2024-2028) projections of the 30-year U.S. Treasury bond yield (i.e., 3.80 percent), the risk premium would be 6.32 percent, resulting in an estimated ROE of 10.12 percent.

[63] This analysis began with a total of 848 cases and was screened to eliminate limited issue rider cases, transmission-only cases, and cases that were silent with respect to the authorized ROE. After applying those screening criteria, the analysis was based on data for 559 cases.

Q. How did the results of the Bond Yield Risk Premium inform your recommended ROE for the Company?

A. I have considered the results of the Bond Yield Risk Premium analysis in setting my recommended ROE for the Company. The results of both my CAPM and Bond Yield Risk Premium analysis provide support for my view that the DCF model is understating investors' return requirements under current market conditions. Also, as noted above, investors will consider the ROE award of a company when assessing the risk of that company as compared to utilities of comparable risk operating in other jurisdictions. The risk premium analysis takes into account this comparison by estimating the return expectations of investors based on the current and past ROE awards of gas utilities across the U.S. As a result, I have weighted the results of my Bond Yield Risk Premium analysis equally with the results of the DCF and CAPM models.

VIII. Regulatory and Business Risks

Q. Is it reasonable to rely exclusively on the mean DCF, CAPM, and Risk Premium results for the proxy group to provide an appropriate estimate of the cost of equity for MERC?

A. No. These results provide only a range of the appropriate estimate of the Company's cost of equity. There are several additional factors that must be taken into consideration when determining where the Company's cost of equity falls within the range of results. These factors, which are discussed below, should be considered with respect to their overall effect on the Company's risk profile.

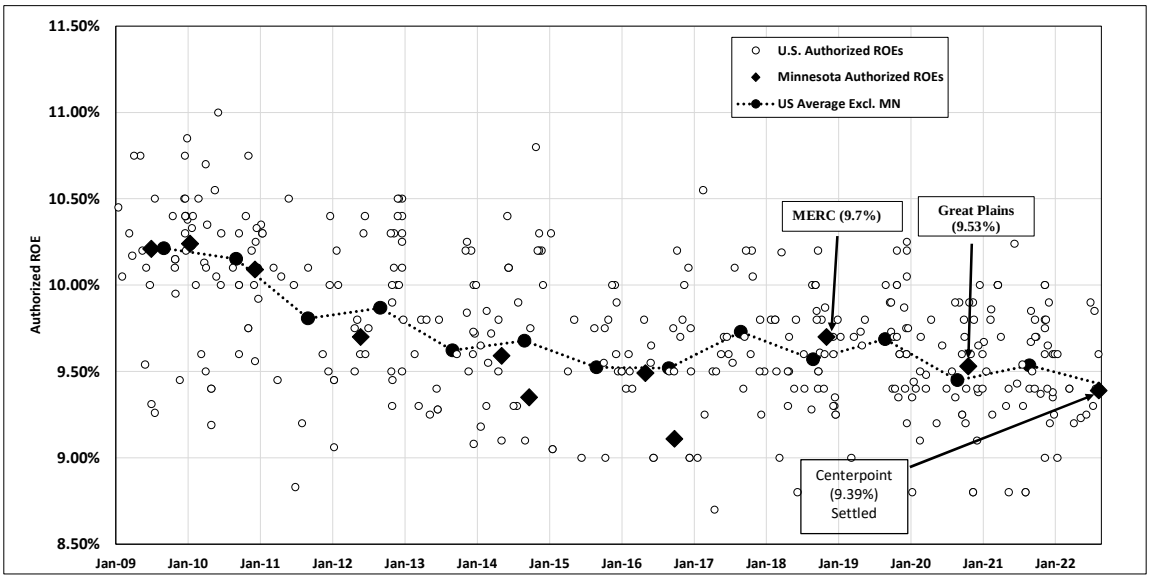
A. Minnesota Allowed ROEs

Q. How do recent returns in Minnesota compare to the authorized returns in other jurisdictions?

A. Over time, the Commission's preference for the DCF model had significantly reduced the overall authorized ROE for natural gas utility operations in Minnesota. However, as shown in Figure 13 below, the Commission-determined ROE for

natural gas cases over the past few years (MERC and Great Plains) have more closely tracked the national average authorized ROEs than the determinations made prior to 2018

Figure 13: Comparison of Minnesota and U.S. Authorized Returns



Q. Is there any reason that the Commission should be concerned about authorizing equity returns that are at the low end of the range established by other state regulatory jurisdictions?

A. Yes, for several reasons. First, as noted previously, Minnesota utility subsidiaries must compete for capital within their own corporate structure, which must in turn compete for capital with other utilities and businesses. Placing MERC at the low end of authorized ROEs over the longer term can negatively impact MERC's access to capital.

Second, as noted in Sections V and VII, the historically low interest rates on Treasury bonds have resulted in high valuations of utility stocks which has reduced dividend yields and therefore the ROE results produced by the DCF model. However, given that interest rates are expected to increase over the period in which MERC's rate will be in effect, the results of the DCF model will underestimate an investor's expected ROE. As a result, it is important that the Commission consider the results

of alternative methods such as the forward looking CAPM and Bond Yield Plus Risk Premium analyses.

B. Small Size Risk

Q. Please explain the risk associated with small size.

A. Both the financial and academic communities have long accepted the proposition that the cost of equity for small firms is subject to a "size effect." While empirical evidence of the size effect often is based on studies of industries other than regulated utilities, utility analysts also have noted the risk associated with small market capitalizations. Specifically, an analyst for Ibbotson Associates noted:

> For small utilities, investors face additional obstacles, such as a smaller customer base, limited financial resources, and a lack of diversification across customers, energy sources, and geography. These obstacles imply a higher investor return.[64]

Q. How does the smaller size of a utility affect its business risk?

A. In general, smaller companies are less able to withstand adverse events that affect their revenues and expenses. The impact of weather variability, the loss of large customers to bypass opportunities, or the destruction of demand as a result of general macroeconomic conditions or fuel price volatility will have a proportionately greater impact on the earnings and cash flow volatility of smaller utilities. Similarly, capital expenditures for non-revenue producing investments, such as system maintenance and replacements, will put proportionately greater pressure on customer costs, potentially leading to customer attrition or demand reduction. Taken together, these risks affect the return required by investors for smaller companies.

[64] Michael Annin, Equity and the Small-Stock Effect, Public Utilities Fortnightly, October 15, 1995.

Q. How does MERC's natural gas distribution operations compare in size to the proxy group companies?

A. MERC's natural gas distribution operations are substantially smaller than the median for the proxy group companies in terms of market capitalization. Exhibit ___ (AEB-D), Schedule 11 provides the actual market capitalization for the proxy group companies and estimates the implied market capitalization for MERC (*i.e.*, the implied market capitalization if MERC's natural gas distribution operations were a stand-alone publicly-traded entity). To estimate the size of the Company's market capitalization relative to the proxy group, I used the Company's capital structure equity component of $229.09 million. I then applied the median market-to-book ratio for the proxy group of 1.74 to MERC's implied common equity balance and arrived at an implied market capitalization of approximately $398.87 million, or 9.47 percent of the median market capitalization for the proxy group.

Q. How did you estimate the size premium for MERC?

A. Given this relative size information, it is possible to estimate the impact of size on the ROE for MERC using Kroll (formerly Duff & Phelps) data that estimates the stock risk premia based on the size of a company's market capitalization. As shown in Exhibit ___ (AEB-D), Schedule 11, the median market capitalization of the proxy group of approximately $4.27 billion corresponds to the fifth decile of the Kroll market capitalization data. Based on Kroll's analysis, that decile corresponds to a size premium of 0.89 percent (*i.e.*, 89 basis points). MERC's implied market capitalization of approximately $297.33 million falls within the ninth decile, which comprises market capitalization levels up to $627.80 million and corresponds to a size premium of 2.10 percent (*i.e.*, 210 basis points). The difference between those size premia is 121 basis points (*i.e.*, 2.10 percent minus 0.89 percent).

Q. Is the size premium applicable to companies in regulated industries such as natural gas utilities?

A. Yes, it is. For example, Thomas Zepp in his article "Utility stocks and the size effect – revisited" provided the results of two studies that showed evidence of the required risk premium for small water utilities. The first study conducted by the California Public Utilities Commission Staff ("CPUC Staff") computed proxies for Beta risk using accounting data from 1981 through 1991 for 58 water utilities and concluded that smaller water utilities had greater risk and required higher returns on equity than larger water utilities.[65] The second study referenced by Zepp examined the differences in required returns over the period of 1987-1997 for two large and two small water utilities in California. As Zepp showed, the required return for the two small water utilities calculated using the DCF model was on average 99 basis points higher than the two larger water utilities.[66]

Additionally, Stéphane Chrétien and Frank Coggins, in the article "Cost of Equity for Energy Utilities: Beyond the CAPM",[67] recently studied the CAPM and its ability to estimate the risk premium for the utility industry in particular subgroups of utilities. One of the subgroups was a group of natural gas distribution companies that contained many of the same natural gas distribution companies included in my proxy group.[68] The article considered the CAPM, the Fama-French three-factor model, and a model similar to the ECAPM that I have also considered above. In the article, the Fama-French three-factor model explicitly included an adjustment to the CAPM for risk associated with size. As Chrétien and Coggins show, the Beta coefficient on the size variable for the U.S. natural gas utility group was positive and statistically significant, indicating that small size risk was relevant for regulated natural gas

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65 Zepp, Thomas M. "Utility Stocks and the Size Effect—Revisited." *The Quarterly Review of Economics and Finance*, vol. 43, no. 3, 2003, pp. 578–582., doi:10.1016/s1062-9769(02)00172-2.

66 *Id.*

67 Chrétien, Stéphane, and Frank Coggins. "Cost Of Equity For Energy Utilities: Beyond The CAPM." Energy Studies Review, vol. 18, no. 2, 2011, doi:10.15173/esr.v18i2.531.

68 The U.S. natural gas utility group included: AGL Resources Inc., Atmos Energy Corp., Laclede Group, New Jersey Resources Corp., Northwest Natural Gas Co., Piedmont Natural Gas Co., South Jersey Industries, Southwest Gas Corp., and WGL Holdings Inc.

utilities.[69] These two studies demonstrate that the size premium is evident in market data and is clearly applicable to natural gas and water utilities.

Q. Has the Commission considered the small size of a company in setting the ROE?

A. Yes. In Docket No. E017/GR-15-1033 for Otter Tail, the Commission selected an ROE above the mean DCF results due to multiple factors, including Otter Tail's small size. The Commission stated:

> The record in this case establishes a compelling basis for selecting an ROE above the mean average within the DCF range, given Otter Tail's unique characteristics and circumstances relative to other utilities in the proxy group. These factors include the company's relatively smaller size, geographically diffuse customer base, and the scope of the Company's planned infrastructure investments.[70]

Q. How have you considered the smaller size of MERC in your recommendation?

A. While I have estimated the effect of MERC's small size on the ROE, I am not proposing a specific adjustment for this risk factor. Rather, I believe it is important to consider the small size of MERC's natural gas distribution operations in the determination of where, within the range of analytical results, the Company's required ROE falls. Therefore, the additional risk associated with small size indicates that the Company's ROE should be established above the mean results for the proxy group companies.

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[69] Chrétien, Stéphane, and Frank Coggins. "Cost of Equity For Energy Utilities: Beyond The CAPM." Energy Studies Review, vol. 18, no. 2, 2011, doi:10.15173/esr.v18i2.531.

[70] *In the Matter of the Application of Otter Tail Power Company for Authority to Increase Rates for Electric Service in Minnesota*, Docket No. E017/GR-15-1033, Findings of Fact, Conclusions and Order at 55 (May 1, 2017).

C. MERC's Capital Expenditure Plan

Q. Please summarize the Company's capital expenditure requirements.

A. The Company's current projections for 2022 through 2026 include $290 million in capital investments over the period.[71] Based on the Company's net utility plant of approximately $438 million as of December 31, 2021,[72] the Company's capital expenditures are approximately 66 percent of MERC's net utility plant as of December 31, 2021**.**

Q. How is the Company's risk profile affected by its substantial capital expenditure requirements?

A. As with any utility faced with substantial capital expenditure requirements, the Company's risk profile may be adversely affected in two significant and related ways: (1) the heightened level of investment increases the risk of under-recovery or delayed recovery of the invested capital; and (2) an inadequate return would put downward pressure on key credit metrics.

Q. Do credit rating agencies recognize the risks associated with elevated levels of capital expenditures?

A. Yes, they do. 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. To that point, S&P explains the importance of regulatory support for large capital projects:

> When applicable, a jurisdiction's willingness to support large capital projects with cash during construction is an important aspect of our analysis. This is especially true when the project represents a major addition to rate base and entails long lead times and technological risks that make it susceptible to construction delays. Broad support for all capital spending is the most credit-sustaining. Support for only specific types of capital spending, such as specific environmental projects or system integrity plans, is less so, but still favorable for creditors.

[71] WEC Energy Group September 2022 Investor Presentation at 38.
[72] Company-provided data.

> Allowance of a cash return on construction work-in-progress or similar ratemaking methods historically were extraordinary measures for use in unusual circumstances, but when construction costs are rising, cash flow support could be crucial to maintain credit quality through the spending program. Even more favorable are those jurisdictions that present an opportunity for a higher return on capital projects as an incentive to investors.[73]

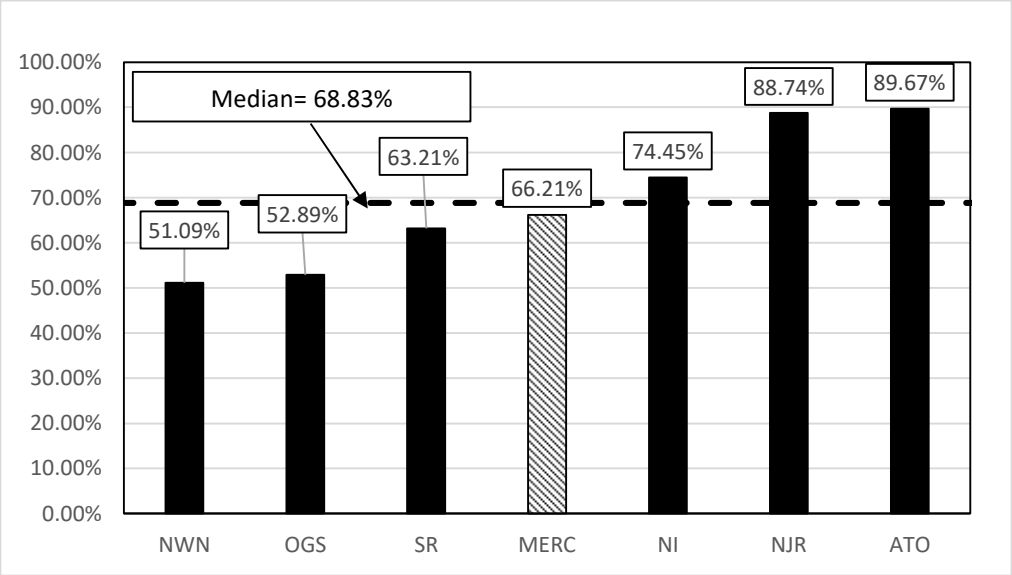
Therefore, to the extent that MERC's rates do not permit the opportunity to recover its full cost of doing business, the Company will face increased recovery risk and thus increased pressure on its credit metrics.

Q. How do MERC's capital expenditure requirements compare to those of the proxy group companies?

A. As shown in Exhibit ___ (AEB-D), Schedule 12, I calculated the ratio of expected capital expenditures to net utility plant for MERC and each of the companies in the proxy group by dividing each company's projected capital expenditures for the period from 2023-2027 by its total net utility plant as of December 31, 2021. As shown in Exhibit ___ (AEB-D), Schedule 12 (*see also* Figure 14 below), MERC's ratio of capital expenditures as a percentage of net utility plant of 66.21 percent is similar to the median for the proxy group companies of 68.83 percent.

[73] S&P Global Ratings, "Assessing U.S. Investor-Owned Utility Regulatory Environments," August 10, 2016, at 7.

Figure 14: Comparison of Capital Expenditures – Proxy Group Companies



Q. Are capital tracking mechanisms available to the electric and natural gas utilities in Minnesota?

A. Yes. In Minnesota, capital tracking mechanisms are available that allow electric and natural gas utilities to recover investment in certain capital investment projects between rate cases. Currently, there is the Gas Utility Infrastructure Cost ("GUIC") Rider, which allows a utility to recover its investment in certain gas infrastructure investments that improve safety and reliability, and the Natural Gas Expansion Project Rider ("NGEP"), which grant the utility the ability to recover certain investment in natural gas expansion projects. It is my understanding that the GUIC mechanism will expire in 2023 absent legislation or a Commission determination to continue the mechanism.

Q. To what extent does MERC have a capital tracking mechanism to recover the costs associated with its capital expenditures plan between rate cases?

A. MERC received authorization for both a GUIC rider and an NGEP rider in 2019. MERC's NGEP rider was related to its Rochester Natural Gas Expansion Project, but authorized recovery of only 33 percent of the annual revenue deficiency related

to that significant capital investment. Further, the NGEP rider will not be in use as of January 1, 2023, when Rochester Project costs are rolled into base rates. As noted above, the GUIC rider, which is authorized by Minn. Stat. § 216B.1635 contains a sunset of June 30, 2023. Assuming no legislation is implemented to extend or remove the sunset provision, the termination of the GUIC statute effective June 30, 2023 would eliminate the Company's ability to recover future capital or O&M project costs through the GUIC rider. Additionally, as shown in Exhibit ___ (AEB-D), Schedule 13, 68 percent of the proxy group utilities recover costs through capital tracking mechanisms. As such, MERC has equal or greater risk relative to the proxy group in this area.

Q. What are your conclusions regarding the effect of the Company's capital spending requirements on its risk profile and cost of capital?

A. The Company's capital expenditure requirements as a percentage of net utility plant is significant and will continue over the next few years. Additionally, unlike most of the operating subsidiaries of the proxy group, MERC does not have a comprehensive capital tracking mechanism to recover the Company's projected capital expenditures. Therefore, MERC's significant capital expenditures plan and limited ability to recover the capital investment costs in a timely manner results in a risk profile that is greater than that of the proxy group and supports an ROE toward the higher end of the range of COE model results.

D. Customer Concentration

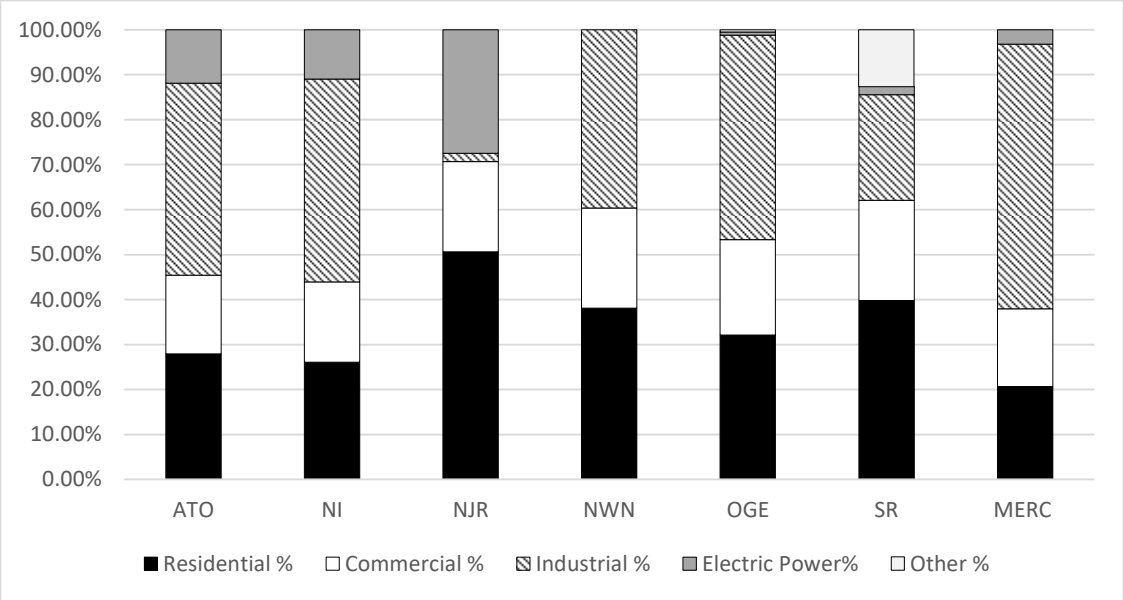
Q. Please summarize MERC's customer concentration risk.

A. Approximately 59 percent of MERC's total company utility gas sales in 2020 were derived from industrial customers. As shown in Figure 15, MERC's commercial and industrial sales volume as a percentage of total utility gas sales was 76 percent; higher than each of the proxy group companies.[74] Furthermore, MERC has only

[74] Does not include "other" or residential customers.

approximately 3 percent of its total volume that is associated with either electric power or vehicle fuel (*i.e.*, Other Volume) which is lower than all but two of the proxy group companies. As a result, MERC is only marginally benefiting from two rapidly growing segments of natural gas consumption.

Figure 15: Customer Concentration[75]



Q. How does customer concentration affect business risk?

A. A relatively high concentration of commercial and industrial customers results in higher business risk. Since the customers are large, they can represent a significant portion of a company's sales which could be lost if a customer goes out of business or switches suppliers. As noted by Dhaliwal, Judd, Serfling and Shaikh in their article, *Customer Concentration Risk and the Cost of Equity Capital*:

> Depending on a major customer for a large portion of sales can be risky for a supplier for two primary reasons. First, a supplier faces the risk of losing substantial future sales if a major customer becomes financially distressed or declares bankruptcy, switches to a different supplier, or decides to develop products internally. Consistent with this notion, Hertzel et al. (2008) and Kolay et al. (2015) document negative supplier abnormal stock returns to the announcement that a major customer

[75] EIA FORM 176 - Other sales includes Electric Power and Vehicle Fuel Volume.

> declares bankruptcy. Further, a customer's weak financial condition or actions could signal inherent problems about the supplier's viability to its remaining customers and lead to compounding losses in sales. Second, a supplier faces the risk of losing anticipated cash flows from being unable to collect outstanding receivables if the customer goes bankrupt. This assertion is consistent with the finding that suppliers offering customers more trade credit experience larger negative abnormal stock returns around the announcement of a customer filing for Chapter 11 bankruptcy (Jorion and Zhang, 2009; Kolay et al., 2015).[76]

Therefore, a company that has a high degree of customer concentration will be inherently riskier than a company that derived income from a larger customer base. Furthermore, as Dhaliwal, Judd, Serfling and Shaik detail in the article, the increased risk associated with a more concentrated customer base will have the effect of increasing a company's cost of equity.[77]

Q. Please describe how changes in economic conditions and MERC's high degree of customer concentration can affect its business risk?

A. While MERC doesn't depend on any one major customer, MERC has a high concentration of commercial and industrial customers. MERC's major industrial customers are engaged in industries such as taconite mining and processing and paper manufacturing. Taconite processing is highly dependent on economic conditions and the business cycle, as taconite is an input into steel used in durable consumer goods. Paper manufacturing companies (*i.e.*, paper mills) are also facing decreased demand as companies are moving away from printed materials and instead providing information electronically.

Q. How has mining and logging employment faired in recent economic conditions?

A. As shown in Figure 16, total mining and logging employment in Minnesota has been volatile, and has not fully recovered to 2014 from its decline in 2015.

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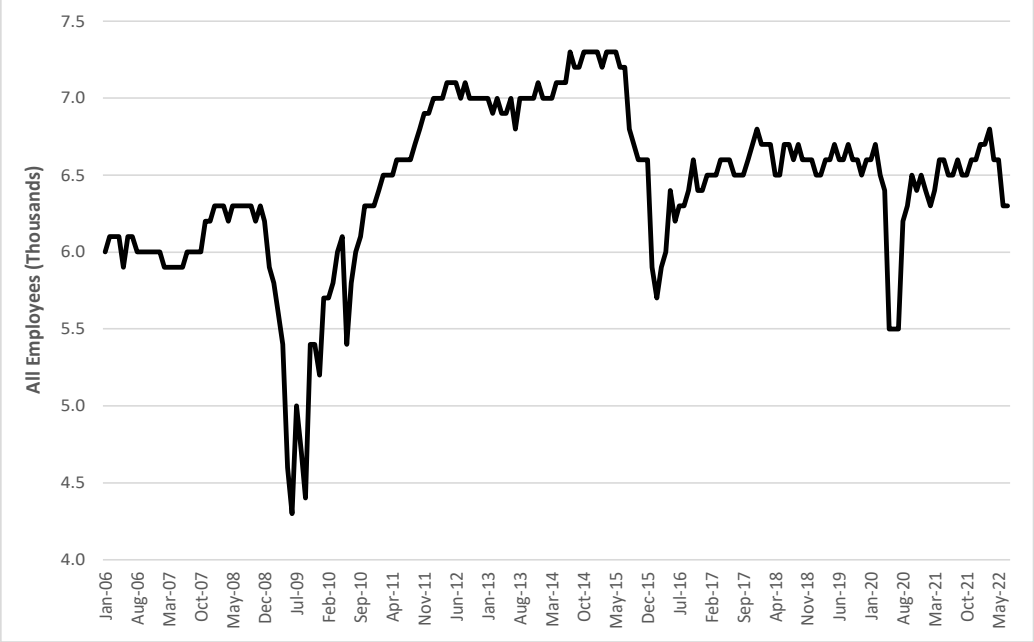
[76] Dhaliwal, Dan S., J. Scott Judd, Matthew A. Serfling, and Sarah Shaikh. "Customer Concentration Risk and the Cost of Equity Capital." SSRN Electronic Journal (2016): 1-2. Web.

[77] *Id.* at 4.

Q. Is MERC's natural gas delivery volume dependent on the taconite processing and paper manufacturing industries?

A. Yes. MERC has a small number of large customers in taconite processing and paper manufacturing, representing a significant amount of the Company's distribution load. Fluctuations in the business cycle could have a large impact on MERC's natural gas sales. Furthermore, if taconite processing firms and paper mills reduce output due to weak economic conditions, the effect could be compounded if local employment declined, reducing the sales volume for MERC.

Figure 16: Minnesota Mining and Logging Employment (Thous.)



Q. Are you aware of other risk factors that could affect MERC's business operations?

A. Yes. MERC is also in direct competition with other sources of energy such as electricity, diesel, solar, and wind, among others. Furthermore, in Minnesota, natural gas utilities do not have exclusive service territories; therefore, MERC competes with other natural gas utilities who serve the surrounding areas such as

Northern States Power Company or CenterPoint Energy Minnesota Gas.[78] This creates an additional risk that customers in the commercial and industrial classes could be served by a competing natural gas utility. Thus, MERC's reliance on a large percentage of commercial and industrial load results in an increased risk of volatility with respect to sales, earnings, and cash flow.

Q. What is your conclusion regarding the Company's customer concentration and its effect on the cost of equity for MERC?

A. MERC is heavily reliant on sales to commercial and industrial customers. As noted above, 76 percent of MERC's total utility gas sales were to commercial and industrial customers. This concentration is higher than all of the proxy group companies. A high degree of customer concentration increases MERC's risk related to customer migration, economic conditions, or competition. Increased customer diversity decreases the effect that any one customer can have on a company's sales. Thus, MERC's heavy customer concentration in a small number of customers within the commercial and industrial rate classes implies that MERC has an above average risk profile when compared to the companies in the proxy group.

E. MERC's Revenue-Decoupling Program

Q. What is your understanding of the Company's current Revenue Decoupling Program?

A. As discussed in its Order in MERC's previous rate case, the Commission approved the continuation of MERC's revenue-decoupling program for the Company's residential rate classes with the expectation that in the current rate case, the Company would evaluate the impacts of extending revenue decoupling to include commercial and industrial customer classes with 50 or more customers.[79] The

[78] *In the Matter of Minnesota Energy Resources Corporation's Complaint Against Northern States Power Company, et al*, Docket No. G-011,002/C-17-305, Order Dismissing Complaint, Requiring Filings, and Opening Investigation at 5 (July 12, 2017).

[79] *In the Matter of the Application of Minnesota Energy Resources Corporation for Authority to Increase Rates for Natural Gas Service in Minnesota*, Docket No. G011/GR-17-563, Findings of Fact, Conclusions and Order at 44-45 (December 26, 2018).

revenue requirement for the residential rate class was set by the Commission in the Company's last rate case. MERC then calculates, at the end of each year during the pilot program, the revenue excluding gas costs that is collected from each of the rate classes included in the pilot program and compares the revenue collected with the approved rate class revenue requirements. If the revenue collected does not equal the revenue requirement, MERC adjusts distribution rates to recover or refund any differences to those rates classes where there was an over or under collection of revenue. In order to mitigate any potential large bill increases associated with the distribution rate adjustment, the Company has implemented a 10 percent symmetrical cap on the size of the revenue-decoupling adjustment. The goal of the Company's decoupling mechanism is to separate the recovery of fixed costs from gas volumes sold, mitigating the risks associated with weather, energy efficiency, and changes in economic conditions for MERC in Minnesota.

Q. Have you evaluated the effect of the Revenue-Decoupling Program on the Company's authorized ROE?

A. Yes, I have. Since the ROE recommendation is established for a company based on its risk relative to the proxy group, it is necessary to consider how the revenue-decoupling pilot program affects the Company's risk profile relative to the proxy companies. As shown on Exhibit ___ (AEB-D), Schedule 13, approximately 86.4 percent of the jurisdictions where the proxy companies operate have approved some form of mechanism (*i.e.*, formula rate plan, revenue decoupling mechanism, straight fixed-variable rate design) that provides for the recovery of prudently incurred costs between rate cases. In addition, as discussed above, nearly all of the proxy companies have implemented some form of capital tracking mechanism to address ongoing capital replacement programs.

Q. What is your conclusion regarding the effect of the Company's Revenue-Decoupling Program on the cost of equity for MERC?

A. Based on the analysis discussed above, the implementation of the revenue-decoupling pilot program makes MERC's risk profile more comparable to the proxy group companies with respect to the availability of cost recovery mechanisms, since many of the proxy companies have approved some form of an alternative rate mechanism, such as non-volumetric rate design. However, the implementation of the revenue-decoupling pilot program does not sufficiently offset the additional business risk factors that affect the Company such as customer concentration and the relatively small size of the Company.

Q. Has the Commission considered the business risk of a company when determining the appropriate ROE among a range of COE results?

A. Yes. The Commission has consistently acknowledged that it is necessary to consider the risk profile of the subject company. In the Company's last case, the Commission authorized an ROE of 9.70 percent based on its evaluation of the data in the record, including the Company's unique risk profile, capital structure, and costs of obtaining equity investment.[80]

Further, in Docket No. E017/GR-15-1033, the Commission noted that:

> The record in this case establishes a compelling basis for selecting an ROE above the mean average within the DCF range, given Otter Tail's unique characteristics and circumstances relative to other utilities in the proxy group. These factors include the company's relatively smaller size, geographically diffuse customer base, and the scope of the Company's planned infrastructure investments. The Commission has also considered Otter Tail's recognized the Company's performance in completing major infrastructure projects substantially under budget, its history of providing reliable service with stable rates,

[80] *In the Matter of the Application of Minnesota Energy Resources Corporation for Authority to Increase Rates for Natural Gas Service in Minnesota*, Docket No. G011/GR-17-563, Findings of Fact, Conclusions and Order at 28 (December 26, 2018).

and its record of effectively serving the needs of its customers, as measured by multiple customer-satisfaction metrics.[81]

Q. How have you accounted for the additional business risk of MERC relative to the proxy group?

A. As discussed above, in the areas that I have evaluated, MERC has greater risk than the proxy group due primarily to its small size, capital expenditure program, and high degree of customer concentration. Furthermore, as discussed in Section VII, the Company has incurred flotation costs associated with the sale of new issues of common stock which must also be accounted for in the determination of the Company's ROE. As a result, I consider MERC's additional business risk and flotation costs when developing my recommended ROE among the range of results.

IX. Capital Structure

Q. Is the capital structure of the Company an important consideration in the determination of the appropriate ROE?

A. Yes, it is. Assuming other factors equal, a higher debt ratio increases the risk to investors. For debt holders, higher debt ratios result in a greater portion of the available cash flow being required to meet debt service, thereby increasing the risk associated with the payments on debt. The result of increased risk is a higher interest rate. The incremental risk of a higher debt ratio is more significant for common equity shareholders. Common shareholders are the residual claimants on the cash flow of the Company. Therefore, the greater the debt service requirement, the less cash flow available for common equity holders.

[81] *In the Matter of the Application of Otter Tail Power Company for Authority to Increase Rates for Electric Service in Minnesota*, Docket No. E017/GR-15-1033, Findings of Fact, Conclusions and Order at 55 (May 1, 2017).

Q. What is MERC's proposed capital structure?

A. The Company's proposal is to establish a capital structure composed of 53.00 percent common equity, 42.64 percent long term debt and 4.36 percent short-term debt.

Q. Did you conduct any analysis to determine if this requested equity ratio was reasonable?

A. Yes, I did. I reviewed the capital structures for each of the proxy group companies at the operating company level. Since the ROE is set based on the return that is derived from the risk-comparable proxy group, it is reasonable to look to the proxy group average capital structure to benchmark the equity ratio for the Company.

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

A. As shown in Exhibit ___ (AEB-D), Schedule 14, I calculated the most recent annual actual equity ratio for each of the proxy group companies at the operating subsidiary level which produced equity ratios for the proxy group ranging from 44.08 percent to 61.09 percent, with a median of 53.46 percent.[82]

Q. Why is the median equity ratio an important data point?

A. It is important to consider the relative financial risk of the subject company and the proxy group company. To the extent that MERC's proposed equity ratio is consistent with the median of the proxy group, the leverage of the Company is generally comparable to the proxy group and therefore the financial risk is similar. In this case, MERC's proposed equity ratio falls slightly below the median of the proxy group, which suggests that MERC has slightly greater leverage (and financial risk related to debt costs) than the regulated utility operating companies owned by the proxy group.

[82] Source: SNL Financial and FERC Form 2 annual reports.

Q. Do you have any additional comments regarding the relationship between the authorized equity ratio and the authorized ROE?

A. Yes. There is a relationship between the authorized equity ratio and the authorized ROE. As discussed previously, the equity ratio is an indicator of financial risk for a regulated utility such as MERC. To the extent the authorized equity ratio is reduced, a corresponding increase in the authorized ROE is necessary to compensate investors for the greater financial risk associated with a lower equity ratio.

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

A. MERC's proposed common equity ratio of 53.00 percent is generally consistent with the median equity ratio of the utility operating subsidiaries of the proxy companies, and is reasonable.

X. Conclusions and Recommendation

Q. What is your conclusion regarding a fair ROE and equity ratio for MERC?

A. Based on the quantitative and qualitative analyses presented in my Direct Testimony, and in light of the business and financial risks of MERC compared to the proxy group, it is my view that an ROE of 10.30 percent on an equity ratio of 53.00 percent would fairly balance the interests of customers and shareholders. This return and capitalization would enable the Company to maintain its financial integrity and therefore its ability to attract capital at reasonable rates under a variety of economic and financial market conditions, while continuing to provide safe, reliable, and affordable gas utility service to customers in Minnesota.

Figure 17: Summary of Analytical Results[83]

	Mean Low	Mean	Mean High
Constant Growth DCF			
30-Day Average Price	9.14%	9.96%	11.28%
90-Day Average Price	9.06%	9.88%	11.20%
180-Day Average Price	9.11%	9.92%	11.24%
Two-Stage Growth DCF			
30-Day Average Price	9.03%	9.88%	11.25%
90-Day Average Price	8.95%	9.80%	11.17%
180-Day Average Price	9.00%	9.84%	11.21%
Capital Asset Pricing Model			
Value Line Beta	11.45%	11.52%	11.50%
Bloomberg Beta	10.94%	11.03%	11.01%
Long-Term Avg. Beta	10.47%	10.58%	10.56%
ECAPM			
Value Line Beta	11.85%	11.90%	11.89%
Bloomberg Beta	11.47%	11.53%	11.52%
Long-Term Avg. Beta	11.11%	11.19%	11.18%
Bond Yield Plus Risk Premium			
Bond Yield Plus Risk Premium	9.98%	10.16%	10.12%
Additional Considerations			
Small Size Premium		1.21%	

Q. Does this conclude your Direct Testimony?

A. Yes, it does.

[83] The analytical results included in Figure 17 reflect the results of the Constant Growth, Two-Stage Growth and Projected DCF analysis including flotation costs of 0.13%

Ann E. Bulkley

PRINCIPAL

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With more than 25 years of experience in the energy industry, Ms. Bulkley specializes in regulatory economics for the electric and natural gas sectors, including rate of return, cost of equity, and capital structure issues.

Ms. Bulkley has extensive state and federal regulatory experience, and she has provided expert testimony on the cost of capital in nearly 100 regulatory proceedings before 32 state regulatory commissions and the Federal Energy Regulatory Commission (FERC).

In addition to her regulatory experience, Ms. Bulkley has provided valuation and appraisal services for a variety of purposes, including the sale or acquisition of utility assets, regulated ratemaking, ad valorem tax disputes, and other litigation purposes. In addition, she has experience in the areas of contract and business unit valuation, strategic alliances, market restructuring, and regulatory and litigation support.

Ms. Bulkley is a Certified General Appraiser licensed in the Commonwealth of Massachusetts and the State of New Hampshire.

Prior to joining Brattle, Ms. Bulkley was a Senior Vice President at an economic consultancy and held senior positions at several other consulting firms.

AREAS OF EXPERTISE

- Regulatory Economics, Finance & Rates
- Regulatory Investigations & Enforcement
- Tax Controversy & Transfer Pricing
- Electricity Litigation & Regulatory Disputes
- M&A Litigation

EDUCATION

- **Boston University**
  MA in Economics
- **Simmons College**
  BA in Economics and Finance

PROFESSIONAL EXPERIENCE

- **The Brattle Group (2022–Present)**
  Principal
- **Concentric Energy Advisors, Inc. (2002–2021)**
  Senior Vice President
  Vice President
  Assistant Vice President
  Project Manager
- **Navigant Consulting, Inc. (1997–2002)**
  Project Manager
- **Reed Consulting Group (1995-1997)**
  Consultant- Project Manager
- **Cahners Publishing Company (1995)**
  Economist

SELECTED CONSULTING EXPERIENCE & EXPERT TESTIMONY

REGULATORY ANALYSIS AND RATEMAKING

Have provided a range of advisory services relating to regulatory policy analysis and many aspects of utility ratemaking, with specific services including:

- Cost of capital and return on equity testimony, cost of service and rate design analysis and testimony, development of ratemaking strategies
- Development of merchant function exit strategies

- Analysis and program development to address residual energy supply and/or provider of last resort obligations
- Stranded costs assessment and recovery
  Performance-based ratemaking analysis and design
- Many aspects of traditional utility ratemaking (e.g., rate design, rate base valuation)

COST OF CAPITAL

Have provided expert testimony on the cost of capital and capital structure in nearly 100 regulatory proceedings before state and federal regulatory commissions in the United States.

RATEMAKING

Have assisted several clients with analysis to support investor-owned and municipal utility clients in the preparation of rate cases. Sample engagements include:

- Assisted several investor-owned and municipal clients on cost allocation and rate design issues including the development of expert testimony supporting recommended rate alternatives.
- Worked with Canadian regulatory staff to establish filing requirements for a rate review of a newly regulated electric utility. Along with analyzing and evaluating rate application, attended hearings and conducted investigation of rate application for regulatory staff. And prepared, supported, and defended recommendations for revenue requirements and rates for the company. Additionally, developed rates for gas utility for transportation program and ancillary services.

VALUATION

Have provided valuation services to utility clients, unregulated generators, and private equity clients for a variety of purposes, including ratemaking, fair value, ad valorem tax, litigation and damages, and acquisition. Appraisal practices are consistent with the national standards established by the Uniform Standards of Professional Appraisal Practice.

Representative projects/clients have included:

- Prepared appraisals of electric utility transmission and distribution assets for ad valorem tax purposes.
- Prepared appraisals of several hydroelectric generating facilities for ad valorem tax purposes.
- Conducted appraisals of fossil fuel generating facilities for ad valorem tax purposes.
- Conducted appraisals of generating assets for the purposes of unwinding sale-leaseback agreements.
- For a confidential utility client, prepared valuation of fossil and nuclear generation assets for financing purposes for regulated utility client.

- Prepared a valuation of a portfolio of generation assets for a large energy utility to be used for strategic planning purposes. Valuation approach included an income approach, a real options analysis, and a risk analysis.
- Assisted clients in the restructuring of NUG contracts through the valuation of the underlying assets. Performed analysis to determine the option value of a plant in a competitively priced electricity market following the settlement of the NUG contract.
- Prepared market valuations of several purchase power contracts for large electric utilities in the sale of purchase power contracts. Assignment included an assessment of the regional power market, analysis of the underlying purchase power contracts, and a traditional discounted cash flow valuation approach, as well as a risk analysis. Analyzed bids from potential acquirers using income and risk analysis approached. Prepared an assessment of the credit issues and value at risk for the selling utility.
- Prepared appraisal of a portfolio of generating facilities for a large electric utility to be used for financing purposes.
- Prepared fair value rate base analyses for Northern Indiana Public Service Company for several electric rate proceedings. Valuation approaches used in this project included income, cost, and comparable sales approaches.
- Prepared an appraisal of a fleet of fossil generating assets for a large electric utility to establish the value of assets transferred from utility property.
- Conducted due diligence on an electric transmission and distribution system as part of a buy-side due diligence team.
- Provided analytical support for and prepared appraisal reports of generation assets to be used in ad valorem tax disputes.
- Provided analytical support and prepared testimony regarding the valuation of electric distribution system assets in five communities in a condemnation proceeding.
- Prepared feasibility reports analyzing the expected net benefits resulting from municipal ownership of investor-owned utility operations.
- Prepared independent analyses of proposal for the proposed government condemnation of the investor-owned utilities in Maine and the formation of a public power district.
- Valued purchase power agreements in the transfer of assets to a deregulated electric market.

STRATEGIC AND FINANCIAL ADVISORY SERVICES

Have assisted several clients across North America with analytically-based strategic planning, due diligence, and financial advisory services.

Representative projects include:

- Preparation of feasibility studies for bond issuances for municipal and district steam clients.
- Assisted in the development of a generation strategy for an electric utility. Analyzed various NERC regions to identify potential market entry points. Evaluated potential competitors and alliance partners. Assisted in the development of gas and electric price forecasts. Developed a framework for the implementation of a risk management program.
- Assisted clients in identifying potential joint venture opportunities and alliance partners. Contacted interviewed and evaluated potential alliance candidates based on company-established criteria for several LDCs and marketing companies. Worked with several LDCs and unregulated marketing companies to establish alliances to enter into the retail energy market. Prepared testimony in support of several merger cases and participated in the regulatory process to obtain approval for these mergers.
- Assisted clients in several buy-side due diligence efforts, providing regulatory insight and developing valuation recommendations for acquisitions of both electric and gas properties.

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Arizona Corporation Commission				
Tucson Electric Power Company	6/22	Tucson Electric Power Company	Docket No. G-01933A-22-0107	Return on Equity
Southwest Gas Corporation	12/21	Southwest Gas Corporation	Docket No. G-01551A-21-0368	Return on Equity
Arizona Public Service Company	10/19	Arizona Public Service Company	Docket No. E-01345A-19-0236	Return on Equity
Tucson Electric Power Company	04/19	Tucson Electric Power Company	Docket No. E-01933A-19-0028	Return on Equity
Tucson Electric Power Company	11/15	Tucson Electric Power Company	Docket No. E-01933A-15-0322	Return on Equity
UNS Electric	05/15	UNS Electric	Docket No. E-04204A-15-0142	Return on Equity
UNS Electric	12/12	UNS Electric	Docket No. E-04204A-12-0504	Return on Equity
Arkansas Public Service Commission				

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Oklahoma Gas and Electric Co	10/21	Oklahoma Gas and Electric Co	Docket No. D-18-046-FR	Return on Equity
Arkansas Oklahoma Gas Corporation	10/13	Arkansas Oklahoma Gas Corporation	Docket No. 13-078-U	Return on Equity
California Public Utilities Commission				
Pacificorp, d/b/a Pacific Power	5/22	Pacificorp, d/b/a Pacific Power		Return on Equity
San Jose Water Company	05/21	San Jose Water Company	A2105004	Return on Equity
Colorado Public Utilities Commission				
Public Service Company of Colorado	07/21	Public Service Company of Colorado	21AL-0317E	Return on Equity
Public Service Company of Colorado	02/20	Public Service Company of Colorado	20AL-0049G	Return on Equity
Public Service Company of Colorado	05/19	Public Service Company of Colorado	19AL-0268E	Return on Equity
Public Service Company of Colorado	01/19	Public Service Company of Colorado	19AL-0063ST	Return on Equity
Atmos Energy Corporation	05/15	Atmos Energy Corporation	Docket No. 15AL-0299G	Return on Equity
Atmos Energy Corporation	04/14	Atmos Energy Corporation	Docket No. 14AL-0300G	Return on Equity
Atmos Energy Corporation	05/13	Atmos Energy Corporation	Docket No. 13AL-0496G	Return on Equity
Connecticut Public Utilities Regulatory Authority				
United Illuminating	05/21	United Illuminating	Docket No. 17-12-03RE11	Return on Equity
Connecticut Water Company	01/21	Connecticut Water Company	Docket No. 20-12-30	Return on Equity

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Connecticut Natural Gas Corporation	06/18	Connecticut Natural Gas Corporation	Docket No. 18-05-16	Return on Equity
Yankee Gas Services Co. d/b/a Eversource Energy	06/18	Yankee Gas Services Co. d/b/a Eversource Energy	Docket No. 18-05-10	Return on Equity
The Southern Connecticut Gas Company	06/17	The Southern Connecticut Gas Company	Docket No. 17-05-42	Return on Equity
The United Illuminating Company	07/16	The United Illuminating Company	Docket No. 16-06-04	Return on Equity
Federal Energy Regulatory Commission				
Northern Natural Gas Company	07/22	Northern Natural Gas Company	Docket No. RP22-___	Return on Equity
Transwestern Pipeline Company, LLC	07/22	Transwestern Pipeline Company, LLC	Docket No. RP22-___	Return on Equity
Florida Gas Transmission	02/21	Florida Gas Transmission	Docket No. RP21-441	Return on Equity
TransCanyon	01/21	TransCanyon	Docket No. ER21-1065	Return on Equity
Duke Energy	12/20	Duke Energy	Docket No. EL21-9-000	Return on Equity
Wisconsin Electric Power Company	08/20	Wisconsin Electric Power Company	Docket No. EL20-57-000	Return on Equity
Panhandle Eastern Pipe Line Company, LP	10/19	Panhandle Eastern Pipe Line Company, LP	Docket Nos. RP19-78-000 RP19-78-001	Return on Equity
Panhandle Eastern Pipe Line Company, LP	08/19	Panhandle Eastern Pipe Line Company, LP	Docket Nos. RP19-1523	Return on Equity
Sea Robin Pipeline Company LLC	11/18	Sea Robin Pipeline Company LLC	Docket# RP19-352-000	Return on Equity

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Tallgrass Interstate Gas Transmission	10/15	Tallgrass Interstate Gas Transmission	RP16-137	Return on Equity
Idaho Public Utilities Commission				
PacifiCorp d/b/a Rocky Mountain Power	05/21	PacifiCorp d/b/a Rocky Mountain Power	Case No. PAC-E-21-07	Return on Equity
Illinois Commerce Commission				
Illinois American Water	02/22	Illinois American Water	Docket No. 22-0210	Return on Equity
North Shore Gas Company	02/21	North Shore Gas Company	No. 20-0810	Return on Equity
Indiana Utility Regulatory Commission				
Indiana Michigan Power Co.	07/21	Indiana Michigan Power Co.	IURC Cause No. 45576	Return on Equity
Indiana Gas Company Inc.	12/20	Indiana Gas Company Inc.	IURC Cause No. 45468	Return on Equity
Southern Indiana Gas and Electric Company	10/20	Southern Indiana Gas and Electric Company	IURC Cause No. 45447	Return on Equity
Indiana and Michigan American Water Company	09/18	Indiana and Michigan American Water Company	IURC Cause No. 45142	Return on Equity
Indianapolis Power and Light Company	12/17	Indianapolis Power and Light Company	Cause No. 45029	Fair Value
Northern Indiana Public Service Company	09/17	Northern Indiana Public Service Company	Cause No. 44988	Fair Value
Indianapolis Power and Light Company	12/16	Indianapolis Power and Light Company	Cause No.44893	Fair Value
Northern Indiana Public Service Company	10/15	Northern Indiana Public Service Company	Cause No. 44688	Fair Value

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Indianapolis Power and Light Company	09/15	Indianapolis Power and Light Company	Cause No. 44576 Cause No. 44602	Fair Value
Kokomo Gas and Fuel Company	09/10	Kokomo Gas and Fuel Company	Cause No. 43942	Fair Value
Northern Indiana Fuel and Light Company, Inc.	09/10	Northern Indiana Fuel and Light Company, Inc.	Cause No. 43943	Fair Value
Iowa Department of Commerce Utilities Board				
MidAmerican Energy Company	01/22	MidAmerican Energy Company	Docket No. RPU-2022-0001	Return on Equity
Iowa-American Water Company	08/20	Iowa-American Water Company	Docket No. RPU-2020-0001	Return on Equity
Kansas Corporation Commission				
Atmos Energy Corporation	08/15	Atmos Energy Corporation	Docket No. 16-ATMG-079-RTS	Return on Equity
Kentucky Public Service Commission				
Kentucky American Water Company	11/18	Kentucky American Water Company	Docket No. 2018-00358	Return on Equity
Maine Public Utilities Commission				
Central Maine Power	08/22	Central Maine Power	Docket No. 2022-00152	Return on Equity
Central Maine Power	10/18	Central Maine Power	Docket No. 2018-194	Return on Equity
Maryland Public Service Commission				
Maryland American Water Company	06/18	Maryland American Water Company	Case No. 9487	Return on Equity
Massachusetts Appellate Tax Board				
Hopkinton LNG Corporation	03/20	Hopkinton LNG Corporation	Docket No.	Valuation of LNG Facility

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
FirstLight Hydro Generating Company	06/17	FirstLight Hydro Generating Company	Docket No. F-325471 Docket No. F-325472 Docket No. F-325473 Docket No. F-325474	Valuation of Electric Generation Assets
Massachusetts Department of Public Utilities				
National Grid USA	11/20	Boston Gas Company	DPU 20-120	Return on Equity
Berkshire Gas Company	05/18	Berkshire Gas Company	DPU 18-40	Return on Equity
Unitil Corporation	01/04	Fitchburg Gas and Electric	DTE 03-52	Integrated Resource Plan; Gas Demand Forecast
Michigan Public Service Commission				
Michigan Gas Utilities Corporation	03/21	Michigan Gas Utilities Corporation	Case No. U-20718	Return on Equity
Wisconsin Electric Power Company	12/11	Wisconsin Electric Power Company	Case No. U-16830	Return on Equity
Michigan Tax Tribunal				
New Covert Generating Co., LLC.	03/18	The Township of New Covert Michigan	MTT Docket No. 000248TT and 16-001888-TT	Valuation of Electric Generation Assets
Covert Township	07/14	New Covert Generating Co., LLC.	Docket No. 399578	Valuation of Electric Generation Assets
Minnesota Public Utilities Commission				
CenterPoint Energy Resources	11/21	CenterPoint Energy Resources	D-G-008/GR-21-435	Return on Equity
Allete, Inc. d/b/a Minnesota Power	11/21	Allete, Inc. d/b/a Minnesota Power	D-E-015/GR-21-630	Return on Equity

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Otter Tail Power Company	11/20	Otter Tail Power Company	E017/GR-20-719	Return on Equity
Allete, Inc. d/b/a Minnesota Power	11/19	Allete, Inc. d/b/a Minnesota Power	E015/GR-19-442	Return on Equity
CenterPoint Energy Resources Corporation d/b/a CenterPoint Energy Minnesota Gas	10/19	CenterPoint Energy Resources Corporation d/b/a CenterPoint Energy Minnesota Gas	G-008/GR-19-524	Return on Equity
Great Plains Natural Gas Co.	09/19	Great Plains Natural Gas Co.	Docket No. G004/GR-19-511	Return on Equity
Minnesota Energy Resources Corporation	10/17	Minnesota Energy Resources Corporation	Docket No. G011/GR-17-563	Return on Equity
Missouri Public Service Commission				
Missouri American Water Company	07/22	Missouri American Water Company	Case No. WR-2022-0303 Case No. SR-2022-0304	Return on Equity
Evergy Missouri West	1/22	Evergy Missouri West	File No. ER-2022-0130	Return on Equity
Evergy Missouri Metro	1/22	Evergy Missouri Metro	File No. ER-2022-0129	Return on Equity
Ameren Missouri	03/21	Ameren Missouri	Docket No. ER-2021-0240 Docket No. GR-2021-0241	Return on Equity
Missouri American Water Company	06/20	Missouri American Water Company	Case No. WR-2020-0344 Case No. SR-2020-0345	Return on Equity

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Missouri American Water Company	06/17	Missouri American Water Company	Case No. WR-17-0285 Case No. SR-17-0286	Return on Equity
Montana Public Service Commission				
Montana-Dakota Utilities Co.	06/20	Montana-Dakota Utilities Co.	D2020.06.076	Return on Equity
Montana-Dakota Utilities Co.	09/18	Montana-Dakota Utilities Co.	D2018.9.60	Return on Equity
New Hampshire - Board of Tax and Land Appeals				
Public Service Company of New Hampshire d/b/a Eversource Energy	11/19 12/19	Public Service Company of New Hampshire d/b/a Eversource Energy	Master Docket No. 28873-14-15-16-17PT	Valuation of Utility Property and Generating Assets
New Hampshire Public Utilities Commission				
Public Service Company of New Hampshire	05/19	Public Service Company of New Hampshire	DE-19-057	Return on Equity
New Hampshire-Merrimack County Superior Court				
Northern New England Telephone Operations, LLC d/b/a FairPoint Communications, NNE	04/18	Northern New England Telephone Operations, LLC d/b/a FairPoint Communications, NNE	220-2012-CV-1100	Valuation of Utility Property
New Hampshire-Rockingham Superior Court				
Eversource Energy	05/18	Public Service Commission of New Hampshire	218-2016-CV-00899 218-2017-CV-00917	Valuation of Utility Property
New Jersey Board of Public Utilities				
New Jersey American Water Company, Inc.	01/22	New Jersey American Water Company, Inc.	WR22010019	Return on Equity
Public Service Electric and Gas Company	10/20	Public Service Electric and Gas Company	EO18101115	Return on Equity

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
New Jersey American Water Company, Inc.	12/19	New Jersey American Water Company, Inc.	WR19121516	Return on Equity
Public Service Electric and Gas Company	04/19	Public Service Electric and Gas Company	EO18060629 GO18060630	Return on Equity
Public Service Electric and Gas Company	02/18	Public Service Electric and Gas Company	GR17070776	Return on Equity
Public Service Electric and Gas Company	01/18	Public Service Electric and Gas Company	ER18010029 GR18010030	Return on Equity
New Mexico Public Regulation Commission				
Southwestern Public Service Company	07/19	Southwestern Public Service Company	19-00170-UT	Return on Equity
Southwestern Public Service Company	10/17	Southwestern Public Service Company	Case No. 17-00255-UT	Return on Equity
Southwestern Public Service Company	12/16	Southwestern Public Service Company	Case No. 16-00269-UT	Return on Equity
Southwestern Public Service Company	10/15	Southwestern Public Service Company	Case No. 15-00296-UT	Return on Equity
Southwestern Public Service Company	06/15	Southwestern Public Service Company	Case No. 15-00139-UT	Return on Equity
New York State Department of Public Service				
New York State Electric and Gas Company Rochester Gas and Electric	05/22	New York State Electric and Gas Company Rochester Gas and Electric	22-E-0317 22-G-0318 22-E-0319 22-G-0320	Return on Equity
Corning Natural Gas Corporation	07/21	Corning Natural Gas Corporation	Case No. 21-G-0394	Return on Equity
Central Hudson Gas and Electric Corporation	08/20	Central Hudson Gas and Electric Corporation	Electric 20-E-0428 Gas 20-G-0429	Return on Equity

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Niagara Mohawk Power Corporation	07/20	National Grid USA	Case No. 20-E-0380 20-G-0381	Return on Equity
Corning Natural Gas Corporation	02/20	Corning Natural Gas Corporation	Case No. 20-G-0101	Return on Equity
New York State Electric and Gas Company Rochester Gas and Electric	05/19	New York State Electric and Gas Company Rochester Gas and Electric	19-E-0378 19-G-0379 19-E-0380 19-G-0381	Return on Equity
Brooklyn Union Gas Company d/b/a National Grid NY KeySpan Gas East Corporation d/b/a National Grid	04/19	Brooklyn Union Gas Company d/b/a National Grid NY KeySpan Gas East Corporation d/b/a National Grid	19-G-0309 19-G-0310	Return on Equity
Central Hudson Gas and Electric Corporation	07/17	Central Hudson Gas and Electric Corporation	Electric 17-E-0459 Gas 17-G-0460	Return on Equity
Niagara Mohawk Power Corporation	04/17	National Grid USA	Case No. 17-E-0238 17-G-0239	Return on Equity
Corning Natural Gas Corporation	06/16	Corning Natural Gas Corporation	Case No. 16-G-0369	Return on Equity
National Fuel Gas Company	04/16	National Fuel Gas Company	Case No. 16-G-0257	Return on Equity
KeySpan Energy Delivery	01/16	KeySpan Energy Delivery	Case No. 15-G-0058 Case No. 15-G-0059	Return on Equity
New York State Electric and Gas Company Rochester Gas and Electric	05/15	New York State Electric and Gas Company Rochester Gas and Electric	Case No. 15-E-0283 Case No. 15-G-0284 Case No. 15-E-0285 Case No. 15-G-0286	Return on Equity
North Dakota Public Service Commission				

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Montana-Dakota Utilities Co.	05/22	Montana-Dakota Utilities Co.	C-PU-22-194	Return on Equity
Montana-Dakota Utilities Co.	08/20	Montana-Dakota Utilities Co.	C-PU-20-379	Return on Equity
Northern States Power Company	12/12	Northern States Power Company	C-PU-12-813	Return on Equity
Northern States Power Company	12/10	Northern States Power Company	C-PU-10-657	Return on Equity
Oklahoma Corporation Commission				
Oklahoma Gas & Electric	12/21	Oklahoma Gas & Electric	Cause No. PUD 202100164	Return on Equity
Arkansas Oklahoma Gas Corporation	01/13	Arkansas Oklahoma Gas Corporation	Cause No. PUD 201200236	Return on Equity
Oregon Public Service Commission				
PacifiCorp d/b/a Pacific Power & Light	03/22	PacifiCorp d/b/a Pacific Power & Light	Docket No. UE-399	Return on Equity
PacifiCorp d/b/a Pacific Power & Light	02/20	PacifiCorp d/b/a Pacific Power & Light	Docket No. UE-374	Return on Equity
Pennsylvania Public Utility Commission				
American Water Works Company Inc.	04/22	Pennsylvania-American Water Company	Docket No. R-2020-3031672 (water) Docket No. R-2020-3031673 (wastewater)	Return on Equity
American Water Works Company Inc.	04/20	Pennsylvania-American Water Company	Docket No. R-2020-3019369 (water) Docket No. R-2020-3019371 (wastewater)	Return on Equity

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
American Water Works Company Inc.	04/17	Pennsylvania-American Water Company	Docket No. R-2017-2595853	Return on Equity
South Dakota Public Utilities Commission				
MidAmerican Energy Company	05/22	MidAmerican Energy Company	D-NG22-005	Return on Equity
Northern States Power Company	06/14	Northern States Power Company	Docket No. EL14-058	Return on Equity
Texas Public Utility Commission				
Entergy Texas, Inc.	07/22	Entergy Texas, Inc.	D-53719	Return on Equity
Southwestern Public Service Commission	08/19	Southwestern Public Service Commission	Docket No. D-49831	Return on Equity
Southwestern Public Service Company	01/14	Southwestern Public Service Company	Docket No. 42004	Return on Equity
Utah Public Service Commission				
PacifiCorp d/b/a Rocky Mountain Power	05/20	PacifiCorp d/b/a Rocky Mountain Power	Docket No. 20-035-04	Return on Equity
Virginia State Corporation Commission				
Virginia American Water Company, Inc.	11/21	Virginia American Water Company, Inc.	Docket No. PUR-2021-00255	Return on Equity
Virginia American Water Company, Inc.	11/18	Virginia American Water Company, Inc.	Docket No. PUR-2018-00175	Return on Equity
Washington Utilities Transportation Commission				
Cascade Natural Gas Corporation	06/20	Cascade Natural Gas Corporation	Docket No. UG-200568	Return on Equity
PacifiCorp d/b/a Pacific Power & Light	12/19	PacifiCorp d/b/a Pacific Power & Light	Docket No. UE-191024	Return on Equity
Cascade Natural Gas Corporation	04/19	Cascade Natural Gas Corporation	Docket No. UG-190210	Return on Equity
West Virginia Public Service Commission				

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
West Virginia American Water Company	04/21	West Virginia American Water Company	Case No. 21-02369-W-42T	Return on Equity
West Virginia American Water Company	04/18	West Virginia American Water Company	Case No. 18-0573-W-42T Case No. 18-0576-S-42T	Return on Equity
Wisconsin Public Service Commission				
Wisconsin Electric Power Company and Wisconsin Gas LLC	04/22	Wisconsin Electric Power Company and Wisconsin Gas LLC	Docket No. 05-UR-110	Return on Equity
Wisconsin Public Service Corp.	04/22	Wisconsin Public Service Corp.	6690-UR-127	Return on Equity
Alliant Energy		Alliant Energy		Return on Equity
Wisconsin Electric Power Company and Wisconsin Gas LLC	03/19	Wisconsin Electric Power Company and Wisconsin Gas LLC	Docket No. 05-UR-109	Return on Equity
Wisconsin Public Service Corp.	03/19	Wisconsin Public Service Corp.	6690-UR-126	Return on Equity
Wyoming Public Service Commission				
PacifiCorp d/b/a Rocky Mountain Power	03/20	PacifiCorp d/b/a Rocky Mountain Power	Docket No. 20000-578-ER-20	Return on Equity
Montana-Dakota Utilities Co.	05/19	Montana-Dakota Utilities Co.	30013-351-GR-19	Return on Equity

CERTIFICATIONS/ACCREDITATIONS

Certified General Appraiser, licensed in the Commonwealth of Massachusetts and the State of New Hampshire

SUMMARY OF ROE ANALYSES RESULTS

Constant Growth DCF- Incl. Flotation Costs			
	Mean Low	Mean	Mean High
30-Day Average	9.14%	9.96%	11.28%
90-Day Average	9.06%	9.88%	11.20%
180-Day Average	9.11%	9.92%	11.24%
Constant Growth Average	9.10%	9.92%	11.24%
Two-Growth DCF- Incl. Flotation Costs			
	Mean Low	Mean	Mean High
30-Day Average	9.03%	9.88%	11.25%
90-Day Average	8.95%	9.80%	11.17%
180-Day Average	9.00%	9.84%	11.21%
Two-Stage Average	8.99%	9.84%	11.21%
CAPM			
	Current 30-day Average Treasury Bond Yield	Near-Term Blue Chip Forecast Yield	Long-Term Blue Chip Forecast Yield
Value Line Beta	11.45%	11.52%	11.50%
Bloomberg Beta	10.94%	11.03%	11.01%
Long-Term Avg. Beta	10.47%	10.58%	10.56%
ECAPM			
	Current 30-day Average Treasury Bond Yield	Near-Term Blue Chip Forecast Yield	Long-Term Blue Chip Forecast Yield
Value Line Beta	11.85%	11.90%	11.89%
Bloomberg Beta	11.47%	11.53%	11.52%
Long-Term Avg. Beta	11.11%	11.19%	11.18%
Risk Premium			
	Current 30-day Average Treasury Bond Yield	Near-Term Blue Chip Forecast Yield	Long-Term Blue Chip Forecast Yield
Risk Premium Results	9.98%	10.16%	10.12%

Company	Ticker	Total Number of Screens Passed	Pays Dividends (Yes/No)	S&P Credit Rating	Covered by More than One Analyst	Positive Growth Rates from at least two sources (Value Line, Yahoo! First Call, and Zacks)	Regulated Operating Income / Total Operating Income	Regulated Gas Operating Income / Total Reg. Operating Income	M&A Activity
Atmos Energy Corporation	ATO	6	1	1	1	1	1		1
Chesapeake Utilities Corporation	CPK	5	1		1	1	1		1
New Jersey Resources Corporation	NJR	6	1	1	1	1	1		1
NiSource Inc.	NI	6	1	1	1	1	1		1
Northwest Natural Gas Company	NWN	6	1	1	1	1	1		1
ONE Gas, Inc.	OGS	6	1	1	1	1	1		1
South Jersey Industries, Inc.	SJI	5	1	1	1	1	1		
Southwest Gas Corporation	SWX	5	1	1	1	1	1		
Spire, Inc.	SR	6	1	1	1	1	1		1
UGI Corporation	UGI	5	1	1	1	1			1

FLOTATION COST ADJUSTMENT

Company	Date [i]	[1] Shares Issued (000)	[2] Offering Price	[3] Under-writing Discount [ii]	[4] Offering Expense ($000)	[5] Net Proceeds Per Share	[6] Total Flotation Costs ($000)	[7] Gross Equity Issue Before Costs ($000)	[8] Net Proceeds ($000)	[9] Flotation Cost Percentage
Integrys Holding, Inc.	11/12/2003	4,025	$ 43.00	1.51	$ 217	$ 41.44	$ 6,295	$ 173,075	$ 166,780	3.637%
Integrys Holding, Inc.	11/9/2005	1,900	$ 53.70	1.75	$ 415	$ 51.73	$ 3,740	$ 102,030	$ 98,290	3.666%
Total							$ 10,034.75	$ 275,105.00	$ 265,070.25	
							WEIGHTED AVERAGE FLOTATION COSTS			3.648% [10]

Notes:
[i] Offering Completion Date
[ii] Underwriting discount was calculated as the market price minus the offering price when not explicitly given in the prospectus.

The flotation cost adjustment is derived by dividing the dividend yield by 1 − F (where F = flotation costs expressed in percentage terms), or by 0.9635, and adding that result to the constant growth rate to determine the cost of equity. Using the formulas shown previously in my testimony, the Constant Growth DCF calculation is modified as follows to accommodate an adjustment for flotation costs:

$$k = \frac{D \times (1 + 0.5g)}{P \times (1 - F)} + g$$

Company	Ticker	[11] Annualized Dividend	[12] Stock Price	[13] Dividend Yield	[14] Expected Dividend Yield	[15] Expected Dividend Yield Adjusted for Flotation Costs	[16] Value Line Earnings Growth	[17] Yahoo! Finance Earnings Growth	[18] Zacks Earnings Growth	[19] Average Earnings Growth	[20] ROE	[21] ROE Adjusted for Flotation Costs
Atmos Energy Corporation	ATO	$2.72	$114.06	2.38%	2.48%	2.57%	7.50%	8.39%	7.50%	7.80%	10.27%	10.37%
New Jersey Resources Corporation	NJR	$1.56	$43.97	3.55%	3.65%	3.79%	5.00%	6.00%	6.00%	5.67%	9.31%	9.45%
NiSource Inc.	NI	$0.94	$29.29	3.21%	3.34%	3.46%	9.50%	7.30%	7.20%	8.00%	11.34%	11.46%
Northwest Natural Gas Company	NWN	$1.93	$48.20	4.00%	4.11%	4.26%	6.50%	4.30%	4.30%	5.03%	9.14%	9.29%
ONE Gas Inc.	OGS	$2.48	$79.19	3.13%	3.22%	3.34%	6.50%	5.00%	5.00%	5.50%	8.72%	8.84%
Spire, Inc.	SR	$2.74	$69.51	3.94%	4.06%	4.22%	9.00%	4.30%	5.00%	6.10%	10.16%	10.32%
Mean											9.82%	9.96%
Flotation Cost Adjustment											[22]	0.13%

Notes:
[1] Source: Company-provided information
[2] Source: Company-provided information
[3]-[4] Source: Company-provided information
[5] Equals [8]/[1]
[6] Equals [4] + ([1] x [3])
[7] Equals [1] x [2]
[8] Equals [7] - [6]
[9] Equals [6] / [7]
[10] Equals average [6] / average [7]
[11] Source: Bloomberg Professional
[12] Source: Bloomberg Professional, equals 30-day average as of September 30, 2022
[13] Equals [11] / [12]
[14] Equals [13] x (1 + 0.5 x [19])
[15] Equals [14] / (1 − Flotation Cost)
[16] Source: Value Line
[17] Source: Yahoo! Finance
[18] Source: Zacks
[19] Equals Average ([16], [17], [18])
[20] Equals [14] + [19]
[21] Equals [15] + [19]
[22] Equals Average ([21]) − Average ([20])

30-DAY CONSTANT GROWTH DCF -- MINNESOTA ENERGY RESOURCES CORPORATION PROXY GROUP

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	All Proxy Group [9]	[10]	[11]
Company	Ticker	Annualized Dividend	Stock Price	Dividend Yield	Expected Dividend Yield	Value Line Earnings Growth	Yahoo! Finance Earnings Growth	Zacks Earnings Growth	Average Growth Rate	Low ROE	Mean ROE	High ROE
Atmos Energy Corporation	ATO	$2.72	$114.06	2.38%	2.48%	7.50%	8.39%	7.50%	7.80%	9.97%	10.27%	10.87%
New Jersey Resources Corporation	NJR	$1.56	$43.97	3.55%	3.65%	5.00%	6.00%	6.00%	5.67%	8.64%	9.31%	9.65%
NiSource Inc.	NI	$0.94	$29.29	3.21%	3.34%	9.50%	7.30%	7.20%	8.00%	10.52%	11.34%	12.86%
Northwest Natural Gas Company	NWN	$1.93	$48.20	4.00%	4.11%	6.50%	4.30%	4.30%	5.03%	8.39%	9.14%	10.63%
ONE Gas Inc.	OGS	$2.48	$79.19	3.13%	3.22%	6.50%	5.00%	5.00%	5.50%	8.21%	8.72%	9.73%
Spire, Inc.	SR	$2.74	$69.51	3.94%	4.06%	9.00%	4.30%	5.00%	6.10%	8.33%	10.16%	13.12%
Mean				3.37%	3.47%	7.33%	5.88%	5.83%	6.35%	9.01%	9.82%	11.15%
Median				3.38%	3.49%	7.00%	5.50%	5.50%	5.88%	8.51%	9.74%	10.75%
Flotation Cost										0.13%	0.13%	0.13%
Flotation Cost-Adjusted Mean										**9.14%**	**9.96%**	**11.28%**
Flotation Cost-Adjusted Median										**8.65%**	**9.87%**	**10.89%**

Notes:
[1] Source: Bloomberg Professional
[2] Source: Bloomberg Professional, equals 30-day average as of September 30, 2022
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [8])
[5] Source: Value Line
[6] Source: Yahoo! Finance
[7] Source: Zacks
[8] Equals Average ([5], [6], [7])
[9] Equals [3] x (1 + 0.50 x Minimum ([5], [6], [7]) + Minimum ([5], [6], [7])
[10] Equals [4] + [8]
[11] Equals [3] x (1 + 0.50 x Maximum ([5], [6], [7]) + Maximum ([5], [6], [7])

90-DAY CONSTANT GROWTH DCF -- MINNESOTA ENERGY RESOURCES CORPORATION PROXY GROUP

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	All Proxy Group [9]	[10]	[11]
Company	Ticker	Annualized Dividend	Stock Price	Dividend Yield	Expected Dividend Yield	Value Line Earnings Growth	Yahoo! Finance Earnings Growth	Zacks Earnings Growth	Average Growth Rate	Low ROE	Mean ROE	High ROE
Atmos Energy Corporation	ATO	$2.72	$113.31	2.40%	2.49%	7.50%	8.39%	7.50%	7.80%	9.99%	10.29%	10.89%
New Jersey Resources Corporation	NJR	$1.56	$44.21	3.53%	3.63%	5.00%	6.00%	6.00%	5.67%	8.62%	9.30%	9.63%
NiSource Inc.	NI	$0.94	$29.41	3.20%	3.32%	9.50%	7.30%	7.20%	8.00%	10.51%	11.32%	12.85%
Northwest Natural Gas Company	NWN	$1.93	$51.24	3.77%	3.86%	6.50%	4.30%	4.30%	5.03%	8.15%	8.89%	10.39%
ONE Gas Inc.	OGS	$2.48	$80.95	3.06%	3.15%	6.50%	5.00%	5.00%	5.50%	8.14%	8.65%	9.66%
Spire, Inc.	SR	$2.74	$71.95	3.81%	3.92%	9.00%	4.30%	5.00%	6.10%	8.19%	10.02%	12.98%
Mean				3.29%	3.40%	7.33%	5.88%	5.83%	6.35%	8.93%	9.75%	11.07%
Median				3.36%	3.48%	7.00%	5.50%	5.50%	5.88%	8.40%	9.66%	10.64%
Flotation Cost										0.13%	0.13%	0.13%
Flotation Cost-Adjusted Mean										**9.06%**	**9.88%**	**11.20%**
Flotation Cost-Adjusted Median										**8.54%**	**9.79%**	**10.77%**

Notes:
[1] Source: Bloomberg Professional
[2] Source: Bloomberg Professional, equals 90-day average as of September 30, 2022
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [8])
[5] Source: Value Line
[6] Source: Yahoo! Finance
[7] Source: Zacks
[8] Equals Average ([5], [6], [7])
[9] Equals [3] x (1 + 0.50 x Minimum ([5], [6], [7]) + Minimum ([5], [6], [7])
[10] Equals [4] + [8]
[11] Equals [3] x (1 + 0.50 x Maximum ([5], [6], [7]) + Maximum ([5], [6], [7])

180-DAY CONSTANT GROWTH DCF -- MINNESOTA ENERGY RESOURCES CORPORATION PROXY GROUP

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	All Proxy Group [9]	[10]	[11]
Company	Ticker	Annualized Dividend	Stock Price	Dividend Yield	Expected Dividend Yield	Value Line Earnings Growth	Yahoo! Finance Earnings Growth	Zacks Earnings Growth	Average Growth Rate	Low ROE	Mean ROE	High ROE
Atmos Energy Corporation	ATO	$2.72	$112.17	2.42%	2.52%	7.50%	8.39%	7.50%	7.80%	10.02%	10.32%	10.92%
New Jersey Resources Corporation	NJR	$1.56	$43.24	3.61%	3.71%	5.00%	6.00%	6.00%	5.67%	8.70%	9.38%	9.72%
NiSource Inc.	NI	$0.94	$29.38	3.20%	3.33%	9.50%	7.30%	7.20%	8.00%	10.51%	11.33%	12.85%
Northwest Natural Gas Company	NWN	$1.93	$50.33	3.84%	3.93%	6.50%	4.30%	4.30%	5.03%	8.22%	8.96%	10.46%
ONE Gas Inc.	OGS	$2.48	$81.51	3.04%	3.13%	6.50%	5.00%	5.00%	5.50%	8.12%	8.63%	9.64%
Spire, Inc.	SR	$2.74	$70.11	3.91%	4.03%	9.00%	4.30%	5.00%	6.10%	8.29%	10.13%	13.08%
Mean				3.34%	3.44%	7.33%	5.88%	5.83%	6.35%	8.98%	9.79%	11.11%
Median				3.40%	3.52%	7.00%	5.50%	5.50%	5.88%	8.49%	9.75%	10.69%
Flotation Cost										0.13%	0.13%	0.13%
Flotation Cost-Adjusted Mean										**9.11%**	**9.92%**	**11.24%**
Flotation Cost-Adjusted Median										**8.63%**	**9.88%**	**10.82%**

Notes:
[1] Source: Bloomberg Professional
[2] Source: Bloomberg Professional, equals 180-day average as of September 30, 2022
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [8])
[5] Source: Value Line
[6] Source: Yahoo! Finance
[7] Source: Zacks
[8] Equals Average ([5], [6], [7])
[9] Equals [3] x (1 + 0.50 x Minimum ([5], [6], [7]) + Minimum ([5], [6], [7])
[10] Equals [4] + [8]
[11] Equals [3] x (1 + 0.50 x Maximum ([5], [6], [7]) + Maximum ([5], [6], [7])

30-DAY TWO-GROWTH DCF -- MEAN GROWTH RATE

Company	Ticker	[1] Annualized Dividend	[2] Stock Price	[3] Dividend Yield	[4] Expected Dividend Yield	[5] Average Growth Rate	[9] Second Growth Rate	[10] Mean ROE	Check
Atmos Energy Corporation	ATO	$2.72	$114.06	2.38%	2.48%	7.80%	7.60%	10.09%	0.00
New Jersey Resources Corporation	NJR	$1.56	$43.97	3.55%	3.65%	5.67%	5.67%	9.31%	0.00
NiSource Inc.	NI	$0.94	$29.29	3.21%	3.34%	8.00%	7.60%	10.98%	0.00
Northwest Natural Gas Company	NWN	$1.93	$48.20	4.00%	4.11%	5.03%	5.10%	9.20%	0.00
ONE Gas Inc.	OGS	$2.48	$79.19	3.13%	3.22%	5.50%	5.50%	8.72%	0.00
Spire, Inc.	SR	$2.74	$69.51	3.94%	4.06%	6.10%	6.10%	10.16%	0.00
Mean				3.37%	3.47%	6.35%	6.26%	9.74%	
Flotation Cost								0.13%	
Flotation Cost-Adjusted Result								9.88%	

Standard Deviation [6]	1.25%
Avg. less Standard Dev [7]	5.10%
Avg. plus Standard Dev [8]	7.60%

Notes:
[1] Source: AEB-5
[2] Source: AEB-5
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [5])
[5] Source: AEB-5
[6] Standard Deviation of Column [5]
[7] Mean of Column [5], minus [6]
[8] Mean of Column [5], plus [6]
[9] If [5] > [8], then [8]; If [5] < [7], then [7], Else [5]
[10] ROE that sets [2] equal to [29] using Excel's goal seek function
[11] = [2] x [4]
[12] = (1 + [10]) ^ 1
[13] = [11] / [12]
[14] = [11] * (1 + [5])
[15] = (1 + [10]) ^ 2
[16] = [14] / [15]
[17] = [14] * (1 + [5])
[18] = (1 + [10]) ^ 3
[19] = [17] / [18]
[20] = [17] * (1 + [5])
[21] = (1 + [10]) ^ 4
[22] = [20] / [21]
[23] = [20] * (1 + [5])
[24] = (1 + [10]) ^ 5
[25] = [23] / [24]
[26] = [23] * (1 + [9])
[27] = [26] / ([10] - [9])
[28] = [27] / [24]
[29] = [13] + [16] + [19] + [22] + [25] + [28]

30-DAY TWO-GROWTH DCF -- MEAN GROWTH RATE

Company	Ticker	[11] Year 1 Div.	[12] (1+k)^1	[13] PV of Year 1 Div.	[14] Year 2 Div.	[15] (1+k)^2	[16] PV of Year 2 Div.	[17] Year 3 Div.	[18] (1+k)^3	[19] PV of Year 3 Div.	[20] Year 4 Div.	[21] (1+k)^4	[22] PV of Year 4 Div.	[23] Year 5 Div.	[24] (1+k)^5	[25] PV of Year 5 Div.	[26] Year 6 Div.	[27] Year 5 Stock Price	[28] PV of Year 5 Stock Price	[29] Current Stock Price
Atmos Energy Corporation	ATO	$2.83	1.10	2.57	$3.05	1.21	2.51	$3.28	1.33	2.46	$3.54	1.47	2.41	$3.82	1.62	2.36	$4.11	$164.56	$101.75	$114.06
New Jersey Resources Corporation	NJR	$1.60	1.09	1.47	$1.70	1.19	1.42	$1.79	1.31	1.37	$1.89	1.43	1.33	$2.00	1.56	1.28	$2.11	$57.92	$37.11	$43.97
NiSource Inc.	NI	$0.98	1.11	0.88	$1.06	1.23	0.86	$1.14	1.37	0.83	$1.23	1.52	0.81	$1.33	1.68	0.79	$1.43	$42.29	$25.12	$29.29
Northwest Natural Gas Company	NWN	$1.98	1.09	1.81	$2.08	1.19	1.74	$2.18	1.30	1.68	$2.29	1.42	1.61	$2.41	1.55	1.55	$2.53	$61.79	$39.80	$48.20
ONE Gas Inc.	OGS	$2.55	1.09	2.34	$2.69	1.18	2.27	$2.84	1.29	2.21	$2.99	1.40	2.14	$3.16	1.52	2.08	$3.33	$103.49	$68.14	$79.19
Spire, Inc.	SR	$2.82	1.10	2.56	$3.00	1.21	2.47	$3.18	1.34	2.38	$3.37	1.47	2.29	$3.58	1.62	2.21	$3.80	$93.47	$57.61	$69.51
Mean																				
Flotation Cost																				
Flotation Cost-Adjusted Result																				

Notes:
[1] Source: AEB-5
[2] Source: AEB-5
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [5])
[5] Source: AEB-5
[6] Standard Deviation of Column [5]
[7] Mean of Column [5], minus [6]
[8] Mean of Column [5], plus [6]
[9] If [5] > [8], then [8]; If [5] < [7], then [7], Else [5]
[10] ROE that sets [2] equal to [29] using Excel's goal s
[11] = [2] x [4]
[12] = (1 + [10]) ^ 1
[13] = [11] / [12]
[14] = [11] * (1 + [5])
[15] = (1 + [10]) ^ 2
[16] = [14] / [15]
[17] = [14] * (1 + [5])
[18] = (1 + [10]) ^ 3
[19] = [17] / [18]
[20] = [17] * (1 + [5])
[21] = (1 + [10]) ^ 4
[22] = [20] / [21]
[23] = [20] * (1 + [5])
[24] = (1 + [10]) ^ 5
[25] = [23] / [24]
[26] = [23] * (1 + [9])
[27] = [26] / ([10] - [9])
[28] = [27] / [24]
[29] = [13] + [16] + [19] + [22] + [25] + [28]

90-DAY TWO-GROWTH DCF -- MEAN GROWTH RATE

Company	Ticker	[1] Annualized Dividend	[2] Stock Price	[3] Dividend Yield	[4] Expected Dividend Yield	[5] Average Growth Rate	[9] Second Growth Rate	[10] Mean ROE	Check
Atmos Energy Corporation	ATO	$2.72	$113.31	2.40%	2.49%	7.80%	7.60%	10.11%	0.00
New Jersey Resources Corporation	NJR	$1.56	$44.21	3.53%	3.63%	5.67%	5.67%	9.30%	0.00
NiSource Inc.	NI	$0.94	$29.41	3.20%	3.32%	8.00%	7.60%	10.97%	0.00
Northwest Natural Gas Company	NWN	$1.93	$51.24	3.77%	3.86%	5.03%	5.10%	8.95%	0.00
ONE Gas Inc.	OGS	$2.48	$80.95	3.06%	3.15%	5.50%	5.50%	8.65%	0.00
Spire, Inc.	SR	$2.74	$71.95	3.81%	3.92%	6.10%	6.10%	10.02%	0.00
Mean				3.29%	3.40%	6.35%	6.26%	9.67%	
Flotation Cost								0.13%	
Flotation Cost-Adjusted Result								9.80%	

Standard Deviation [6]	1.25%
Avg. less Standard Dev [7]	5.10%
Avg. plus Standard Dev [8]	7.60%

Notes:
[1] Source: AEB-5
[2] Source: AEB-5
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [5])
[5] Source: AEB-5
[6] Standard Deviation of Column [5]
[7] Mean of Column [5], minus [6]
[8] Mean of Column [5], plus [6]
[9] If [5] > [8], then [8]; If [5] < [7], then [7], Else [5]
[10] ROE that sets [2] equal to [29] using Excel's goal seek function
[11] = [2] x [4]
[12] = (1 + [10]) ^ 1
[13] = [11] / [12]
[14] = [11] * (1 + [5])
[15] = (1 + [10]) ^ 2
[16] = [14] / [15]
[17] = [14] * (1 + [5])
[18] = (1 + [10]) ^ 3
[19] = [17] / [18]
[20] = [17] * (1 + [5])
[21] = (1 + [10]) ^ 4
[22] = [20] / [21]
[23] = [20] * (1 + [5])
[24] = (1 + [10]) ^ 5
[25] = [23] / [24]
[26] = [23] * (1 + [9])
[27] = [26] / ([10] - [9])
[28] = [27] / [24]
[29] = [13] + [16] + [19] + [22] + [25] + [28]

90-DAY TWO-GROWTH DCF -- MEAN GROWTH RATE

Company	Ticker	[11] Year 1 Div.	[12] (1+k)^1	[13] PV of Year 1 Div.	[14] Year 2 Div.	[15] (1+k)^2	[16] PV of Year 2 Div.	[17] Year 3 Div.	[18] (1+k)^3	[19] PV of Year 3 Div.	[20] Year 4 Div.	[21] (1+k)^4	[22] PV of Year 4 Div.	[23] Year 5 Div.	[24] (1+k)^5	[25] PV of Year 5 Div.	[26] Year 6 Div.	[27] Year 5 Stock Price	[28] PV of Year 5 Stock Price	[29] Current Stock Price
Atmos Energy Corporation	ATO	$2.83	1.10	2.57	$3.05	1.21	2.51	$3.28	1.33	2.46	$3.54	1.47	2.41	$3.82	1.62	2.36	$4.11	$163.48	$101.00	$113.31
New Jersey Resources Corporation	NJR	$1.60	1.09	1.47	$1.70	1.19	1.42	$1.79	1.31	1.37	$1.89	1.43	1.33	$2.00	1.56	1.28	$2.11	$58.24	$37.34	$44.21
NiSource Inc.	NI	$0.98	1.11	0.88	$1.06	1.23	0.86	$1.14	1.37	0.83	$1.23	1.52	0.81	$1.33	1.68	0.79	$1.43	$42.47	$25.24	$29.41
Northwest Natural Gas Company	NWN	$1.98	1.09	1.82	$2.08	1.19	1.75	$2.18	1.29	1.69	$2.29	1.41	1.63	$2.41	1.54	1.57	$2.53	$65.69	$42.79	$51.24
ONE Gas Inc.	OGS	$2.55	1.09	2.35	$2.69	1.18	2.28	$2.84	1.28	2.21	$2.99	1.39	2.15	$3.16	1.51	2.09	$3.33	$105.80	$69.88	$80.95
Spire, Inc.	SR	$2.82	1.10	2.57	$3.00	1.21	2.47	$3.18	1.33	2.39	$3.37	1.47	2.30	$3.58	1.61	2.22	$3.80	$96.74	$60.00	$71.95
Mean																				
Flotation Cost																				
Flotation Cost-Adjusted Result																				

Notes:
[1] Source: AEB-5
[2] Source: AEB-5
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [5])
[5] Source: AEB-5
[6] Standard Deviation of Column [5]
[7] Mean of Column [5], minus [6]
[8] Mean of Column [5], plus [6]
[9] If [5] > [8], then [8]; If [5] < [7], then [7], Else [5]
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[11] = [2] x [4]
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[15] = (1 + [10]) ^ 2
[16] = [14] / [15]
[17] = [14] * (1 + [5])
[18] = (1 + [10]) ^ 3
[19] = [17] / [18]
[20] = [17] * (1 + [5])
[21] = (1 + [10]) ^ 4
[22] = [20] / [21]
[23] = [20] * (1 + [5])
[24] = (1 + [10]) ^ 5
[25] = [23] / [24]
[26] = [23] * (1 + [9])
[27] = [26] / ([10] - [9])
[28] = [27] / [24]
[29] = [13] + [16] + [19] + [22] + [25] + [28]

180-DAY TWO-GROWTH DCF -- MEAN GROWTH RATE

Company	Ticker	[1] Annualized Dividend	[2] Stock Price	[3] Dividend Yield	[4] Expected Dividend Yield	[5] Average Growth Rate	[9] Second Growth Rate	[10] Mean ROE	Check
Atmos Energy Corporation	ATO	$2.72	$112.17	2.42%	2.52%	7.80%	7.60%	10.14%	0.00
New Jersey Resources Corporation	NJR	$1.56	$43.24	3.61%	3.71%	5.67%	5.67%	9.38%	0.00
NiSource Inc.	NI	$0.94	$29.38	3.20%	3.33%	8.00%	7.60%	10.97%	0.00
Northwest Natural Gas Company	NWN	$1.93	$50.33	3.84%	3.93%	5.03%	5.10%	9.02%	0.00
ONE Gas Inc.	OGS	$2.48	$81.51	3.04%	3.13%	5.50%	5.50%	8.63%	0.00
Spire, Inc.	SR	$2.74	$70.11	3.91%	4.03%	6.10%	6.10%	10.13%	0.00
Mean				3.34%	3.44%	6.35%	6.26%	9.71%	
Flotation Cost								0.13%	
Flotation Cost-Adjusted Result								9.84%	

Standard Deviation [6]	1.25%
Avg. less Standard Dev [7]	5.10%
Avg. plus Standard Dev [8]	7.60%

Notes:
[1] Source: AEB-5
[2] Source: AEB-5
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [5])
[5] Source: AEB-5
[6] Standard Deviation of Column [5]
[7] Mean of Column [5], minus [6]
[8] Mean of Column [5], plus [6]
[9] If [5] > [8], then [8]; If [5] < [7], then [7], Else [5]
[10] ROE that sets [2] equal to [29] using Excel's goal seek function
[11] = [2] x [4]
[12] = (1 + [10]) ^ 1
[13] = [11] / [12]
[14] = [11] * (1 + [5])
[15] = (1 + [10]) ^ 2
[16] = [14] / [15]
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[19] = [17] / [18]
[20] = [17] * (1 + [5])
[21] = (1 + [10]) ^ 4
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[23] = [20] * (1 + [5])
[24] = (1 + [10]) ^ 5
[25] = [23] / [24]
[26] = [23] * (1 + [9])
[27] = [26] / ([10] - [9])
[28] = [27] / [24]
[29] = [13] + [16] + [19] + [22] + [25] + [28]

180-DAY TWO-GROWTH DCF -- MEAN GROWTH RATE

Company	Ticker	[11] Year 1 Div.	[12] (1+k)^1	[13] PV of Year 1 Div.	[14] Year 2 Div.	[15] (1+k)^2	[16] PV of Year 2 Div.	[17] Year 3 Div.	[18] (1+k)^3	[19] PV of Year 3 Div.	[20] Year 4 Div.	[21] (1+k)^4	[22] PV of Year 4 Div.	[23] Year 5 Div.	[24] (1+k)^5	[25] PV of Year 5 Div.	[26] Year 6 Div.	[27] Year 5 Stock Price	[28] PV of Year 5 Stock Price	[29] Current Stock Price
Atmos Energy Corporation	ATO	$2.83	1.10	2.57	$3.05	1.21	2.51	$3.28	1.34	2.46	$3.54	1.47	2.41	$3.82	1.62	2.35	$4.11	$161.84	$99.87	$112.17
New Jersey Resources Corporation	NJR	$1.60	1.09	1.47	$1.70	1.20	1.42	$1.79	1.31	1.37	$1.89	1.43	1.32	$2.00	1.57	1.28	$2.11	$56.97	$36.39	$43.24
NiSource Inc.	NI	$0.98	1.11	0.88	$1.06	1.23	0.86	$1.14	1.37	0.83	$1.23	1.52	0.81	$1.33	1.68	0.79	$1.43	$42.42	$25.20	$29.38
Northwest Natural Gas Company	NWN	$1.98	1.09	1.81	$2.08	1.19	1.75	$2.18	1.30	1.68	$2.29	1.41	1.62	$2.41	1.54	1.56	$2.53	$64.52	$41.89	$50.32
ONE Gas Inc.	OGS	$2.55	1.09	2.35	$2.69	1.18	2.28	$2.84	1.28	2.21	$2.99	1.39	2.15	$3.16	1.51	2.09	$3.33	$106.53	$70.44	$81.51
Spire, Inc.	SR	$2.82	1.10	2.56	$3.00	1.21	2.47	$3.18	1.34	2.38	$3.37	1.47	2.29	$3.58	1.62	2.21	$3.80	$94.27	$58.20	$70.11
Mean																				
Flotation Cost																				
Flotation Cost-Adjusted Result																				

Notes:
[1] Source: AEB-5
[2] Source: AEB-5
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [5])
[5] Source: AEB-5
[6] Standard Deviation of Column [5]
[7] Mean of Column [5], minus [6]
[8] Mean of Column [5], plus [6]
[9] If [5] > [8], then [8]; If [5] < [7], then [7], Else [5]
[10] ROE that sets [2] equal to [29] using Excel's goal s
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[17] = [14] * (1 + [5])
[18] = (1 + [10]) ^ 3
[19] = [17] / [18]
[20] = [17] * (1 + [5])
[21] = (1 + [10]) ^ 4
[22] = [20] / [21]
[23] = [20] * (1 + [5])
[24] = (1 + [10]) ^ 5
[25] = [23] / [24]
[26] = [23] * (1 + [9])
[27] = [26] / ([10] - [9])
[28] = [27] / [24]
[29] = [13] + [16] + [19] + [22] + [25] + [28]

30-DAY TWO-GROWTH DCF -- MEAN LOW GROWTH RATE

Company	Ticker	[1] Annualized Dividend	[2] Stock Price	[3] Dividend Yield	[4] Expected Dividend Yield	[5] Low Growth Rate	[9] Second Growth Rate	[10] Mean ROE	Check
Atmos Energy Corporation	ATO	$2.72	$114.06	2.38%	2.47%	7.50%	6.98%	9.50%	0.00
New Jersey Resources Corporation	NJR	$1.56	$43.97	3.55%	3.64%	5.00%	5.00%	8.64%	0.00
NiSource Inc.	NI	$0.94	$29.29	3.21%	3.32%	7.20%	6.98%	10.33%	0.00
Northwest Natural Gas Company	NWN	$1.93	$48.20	4.00%	4.09%	4.30%	4.30%	8.39%	0.00
ONE Gas Inc.	OGS	$2.48	$79.19	3.13%	3.21%	5.00%	5.00%	8.21%	0.00
Spire, Inc.	SR	$2.74	$69.51	3.94%	4.03%	4.30%	4.30%	8.33%	0.00
Mean				3.37%	3.46%	5.55%	5.43%	8.90%	
Flotation Cost								0.13%	
Flotation Cost-Adjusted Result								9.03%	

Standard Deviation [6]	1.43%
Avg. less Standard Dev [7]	4.12%
Avg. plus Standard Dev [8]	6.98%

Notes:
[1] Source: AEB-5
[2] Source: AEB-5
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [5])
[5] Source: AEB-5
[6] Standard Deviation of Column [5]
[7] Mean of Column [5], minus [6]
[8] Mean of Column [5], plus [6]
[9] If [5] > [8], then [8]; If [5] < [7], then [7], Else [5]
[10] ROE that sets [2] equal to [29] using Excel's goal seek function
[11] = [2] x [4]
[12] = (1 + [10]) ^ 1
[13] = [11] / [12]
[14] = [11] * (1 + [5])
[15] = (1 + [10]) ^ 2
[16] = [14] / [15]
[17] = [14] * (1 + [5])
[18] = (1 + [10]) ^ 3
[19] = [17] / [18]
[20] = [17] * (1 + [5])
[21] = (1 + [10]) ^ 4
[22] = [20] / [21]
[23] = [20] * (1 + [5])
[24] = (1 + [10]) ^ 5
[25] = [23] / [24]
[26] = [23] * (1 + [9])
[27] = [26] / ([10] - [9])
[28] = [27] / [24]
[29] = [13] + [16] + [19] + [22] + [25] + [28]

30-DAY TWO-GROWTH DCF -- MEAN LOW GROWTH RATE

Company	Ticker	[11] Year 1 Div.	[12] (1+k)^1	[13] PV of Year 1 Div.	[14] Year 2 Div.	[15] (1+k)^2	[16] PV of Year 2 Div.	[17] Year 3 Div.	[18] (1+k)^3	[19] PV of Year 3 Div.	[20] Year 4 Div.	[21] (1+k)^4	[22] PV of Year 4 Div.	[23] Year 5 Div.	[24] (1+k)^5	[25] PV of Year 5 Div.	[26] Year 6 Div.	[27] Year 5 Stock Price	[28] PV of Year 5 Stock Price	[29] Current Stock Price
Atmos Energy Corporation	ATO	$2.82	1.10	2.58	$3.03	1.20	2.53	$3.26	1.31	2.48	$3.51	1.44	2.44	$3.77	1.57	2.39	$4.03	$160.01	$101.63	$114.06
New Jersey Resources Corporation	NJR	$1.60	1.09	1.47	$1.68	1.18	1.42	$1.76	1.28	1.37	$1.85	1.39	1.33	$1.94	1.51	1.28	$2.04	$56.12	$37.09	$43.97
NiSource Inc.	NI	$0.97	1.10	0.88	$1.04	1.22	0.86	$1.12	1.34	0.83	$1.20	1.48	0.81	$1.29	1.63	0.79	$1.38	$41.07	$25.12	$29.29
Northwest Natural Gas Company	NWN	$1.97	1.08	1.82	$2.06	1.17	1.75	$2.14	1.27	1.68	$2.24	1.38	1.62	$2.33	1.50	1.56	$2.43	$59.49	$39.76	$48.20
ONE Gas Inc.	OGS	$2.54	1.08	2.35	$2.67	1.17	2.28	$2.80	1.27	2.21	$2.94	1.37	2.15	$3.09	1.48	2.08	$3.24	$101.06	$68.12	$79.19
Spire, Inc.	SR	$2.80	1.08	2.58	$2.92	1.17	2.49	$3.04	1.27	2.40	$3.18	1.38	2.31	$3.31	1.49	2.22	$3.45	$85.80	$57.52	$69.51
Mean																				
Flotation Cost																				
Flotation Cost-Adjusted Result																				

Notes:

[1] Source: AEB-5
[2] Source: AEB-5
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [5])
[5] Source: AEB-5
[6] Standard Deviation of Column [5]
[7] Mean of Column [5], minus [6]
[8] Mean of Column [5], plus [6]
[9] If [5] > [8], then [8]; If [5] < [7], then [7], Else [5]
[10] ROE that sets [2] equal to [29] using Excel's goal s
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[14] = [11] * (1 + [5])
[15] = (1 + [10]) ^ 2
[16] = [14] / [15]
[17] = [14] * (1 + [5])
[18] = (1 + [10]) ^ 3
[19] = [17] / [18]
[20] = [17] * (1 + [5])
[21] = (1 + [10]) ^ 4
[22] = [20] / [21]
[23] = [20] * (1 + [5])
[24] = (1 + [10]) ^ 5
[25] = [23] / [24]
[26] = [23] * (1 + [9])
[27] = [26] / ([10] - [9])
[28] = [27] / [24]
[29] = [13] + [16] + [19] + [22] + [25] + [28]

90-DAY TWO-GROWTH DCF -- MEAN LOW GROWTH RATE

Company	Ticker	[1] Annualized Dividend	[2] Stock Price	[3] Dividend Yield	[4] Expected Dividend Yield	[5] Average Growth Rate	[9] Second Growth Rate	[10] Mean ROE	Check
Atmos Energy Corporation	ATO	$2.72	$113.31	2.40%	2.49%	7.50%	6.98%	9.52%	0.00
New Jersey Resources Corporation	NJR	$1.56	$44.21	3.53%	3.62%	5.00%	5.00%	8.62%	0.00
NiSource Inc.	NI	$0.94	$29.41	3.20%	3.31%	7.20%	6.98%	10.32%	0.00
Northwest Natural Gas Company	NWN	$1.93	$51.24	3.77%	3.85%	4.30%	4.30%	8.15%	0.00
ONE Gas Inc.	OGS	$2.48	$80.95	3.06%	3.14%	5.00%	5.00%	8.14%	0.00
Spire, Inc.	SR	$2.74	$71.95	3.81%	3.89%	4.30%	4.30%	8.19%	0.00
Mean				3.29%	3.38%	5.55%	5.43%	8.82%	
Flotation Cost								0.13%	
Flotation Cost-Adjusted Result								8.95%	

Standard Deviation [6]	1.43%
Avg. less Standard Dev [7]	4.12%
Avg. plus Standard Dev [8]	6.98%

Notes:
[1] Source: AEB-5
[2] Source: AEB-5
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [5])
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[6] Standard Deviation of Column [5]
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[16] = [14] / [15]
[17] = [14] * (1 + [5])
[18] = (1 + [10]) ^ 3
[19] = [17] / [18]
[20] = [17] * (1 + [5])
[21] = (1 + [10]) ^ 4
[22] = [20] / [21]
[23] = [20] * (1 + [5])
[24] = (1 + [10]) ^ 5
[25] = [23] / [24]
[26] = [23] * (1 + [9])
[27] = [26] / ([10] - [9])
[28] = [27] / [24]
[29] = [13] + [16] + [19] + [22] + [25] + [28]

90-DAY TWO-GROWTH DCF -- MEAN LOW GROWTH RATE

Company	Ticker	[11] Year 1 Div.	[12] (1+k)^1	[13] PV of Year 1 Div.	[14] Year 2 Div.	[15] (1+k)^2	[16] PV of Year 2 Div.	[17] Year 3 Div.	[18] (1+k)^3	[19] PV of Year 3 Div.	[20] Year 4 Div.	[21] (1+k)^4	[22] PV of Year 4 Div.	[23] Year 5 Div.	[24] (1+k)^5	[25] PV of Year 5 Div.	[26] Year 6 Div.	[27] Year 5 Stock Price	[28] PV of Year 5 Stock Price	[29] Current Stock Price
Atmos Energy Corporation	ATO	$2.82	1.10	2.58	$3.03	1.20	2.53	$3.26	1.31	2.48	$3.51	1.44	2.44	$3.77	1.58	2.39	$4.03	$158.96	$100.89	$113.31
New Jersey Resources Corporation	NJR	$1.60	1.09	1.47	$1.68	1.18	1.42	$1.76	1.28	1.38	$1.85	1.39	1.33	$1.94	1.51	1.29	$2.04	$56.42	$37.32	$44.21
NiSource Inc.	NI	$0.97	1.10	0.88	$1.04	1.22	0.86	$1.12	1.34	0.83	$1.20	1.48	0.81	$1.29	1.63	0.79	$1.38	$41.24	$25.24	$29.41
Northwest Natural Gas Company	NWN	$1.97	1.08	1.82	$2.06	1.17	1.76	$2.14	1.26	1.70	$2.24	1.37	1.64	$2.33	1.48	1.58	$2.43	$63.24	$42.75	$51.24
ONE Gas Inc.	OGS	$2.54	1.08	2.35	$2.67	1.17	2.28	$2.80	1.26	2.22	$2.94	1.37	2.15	$3.09	1.48	2.09	$3.24	$103.31	$69.86	$80.95
Spire, Inc.	SR	$2.80	1.08	2.59	$2.92	1.17	2.49	$3.04	1.27	2.40	$3.18	1.37	2.32	$3.31	1.48	2.23	$3.45	$88.81	$59.91	$71.95
Mean																				
Flotation Cost																				
Flotation Cost-Adjusted Result																				

Notes:

[1] Source: AEB-5
[2] Source: AEB-5
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [5])
[5] Source: AEB-5
[6] Standard Deviation of Column [5]
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[16] = [14] / [15]
[17] = [14] * (1 + [5])
[18] = (1 + [10]) ^ 3
[19] = [17] / [18]
[20] = [17] * (1 + [5])
[21] = (1 + [10]) ^ 4
[22] = [20] / [21]
[23] = [20] * (1 + [5])
[24] = (1 + [10]) ^ 5
[25] = [23] / [24]
[26] = [23] * (1 + [9])
[27] = [26] / ([10] - [9])
[28] = [27] / [24]
[29] = [13] + [16] + [19] + [22] + [25] + [28]

180-DAY TWO-GROWTH DCF -- MEAN LOW GROWTH RATE

		[1]	[2]	[3]	[4]	[5]	[9]	[10]	
Company	Ticker	Annualized Dividend	Stock Price	Dividend Yield	Expected Dividend Yield	Average Growth Rate	Second Growth Rate	Mean ROE	Check
Atmos Energy Corporation	ATO	$2.72	$112.17	2.42%	2.52%	7.50%	6.98%	9.54%	0.00
New Jersey Resources Corporation	NJR	$1.56	$43.24	3.61%	3.70%	5.00%	5.00%	8.70%	0.00
NiSource Inc.	NI	$0.94	$29.38	3.20%	3.31%	7.20%	6.98%	10.32%	0.00
Northwest Natural Gas Company	NWN	$1.93	$50.33	3.84%	3.92%	4.30%	4.30%	8.22%	0.00
ONE Gas Inc.	OGS	$2.48	$81.51	3.04%	3.12%	5.00%	5.00%	8.12%	0.00
Spire, Inc.	SR	$2.74	$70.11	3.91%	3.99%	4.30%	4.30%	8.29%	0.00
Mean				3.34%	3.43%	5.55%	5.43%	8.87%	
Flotation Cost								0.13%	
Flotation Cost-Adjusted Result								9.00%	

Standard Deviation [6]	1.43%
Avg. less Standard Dev [7]	4.12%
Avg. plus Standard Dev [8]	6.98%

Notes:
[1] Source: AEB-5
[2] Source: AEB-5
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [5])
[5] Source: AEB-5
[6] Standard Deviation of Column [5]
[7] Mean of Column [5], minus [6]
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[9] If [5] > [8], then [8]; If [5] < [7], then [7], Else [5]
[10] ROE that sets [2] equal to [29] using Excel's goal seek function
[11] = [2] x [4]
[12] = (1 + [10]) ^ 1
[13] = [11] / [12]
[14] = [11] * (1 + [5])
[15] = (1 + [10]) ^ 2
[16] = [14] / [15]
[17] = [14] * (1 + [5])
[18] = (1 + [10]) ^ 3
[19] = [17] / [18]
[20] = [17] * (1 + [5])
[21] = (1 + [10]) ^ 4
[22] = [20] / [21]
[23] = [20] * (1 + [5])
[24] = (1 + [10]) ^ 5
[25] = [23] / [24]
[26] = [23] * (1 + [9])
[27] = [26] / ([10] - [9])
[28] = [27] / [24]
[29] = [13] + [16] + [19] + [22] + [25] + [28]

180-DAY TWO-GROWTH DCF -- MEAN LOW GROWTH RATE

Company	Ticker	[11] Year 1 Div.	[12] (1+k)^1	[13] PV of Year 1 Div.	[14] Year 2 Div.	[15] (1+k)^2	[16] PV of Year 2 Div.	[17] Year 3 Div.	[18] (1+k)^3	[19] PV of Year 3 Div.	[20] Year 4 Div.	[21] (1+k)^4	[22] PV of Year 4 Div.	[23] Year 5 Div.	[24] (1+k)^5	[25] PV of Year 5 Div.	[26] Year 6 Div.	[27] Year 5 Stock Price	[28] PV of Year 5 Stock Price	[29] Current Stock Price
Atmos Energy Corporation	ATO	$2.82	1.10	2.58	$3.03	1.20	2.53	$3.26	1.31	2.48	$3.51	1.44	2.43	$3.77	1.58	2.39	$4.03	$157.36	$99.76	$112.17
New Jersey Resources Corporation	NJR	$1.60	1.09	1.47	$1.68	1.18	1.42	$1.76	1.28	1.37	$1.85	1.40	1.33	$1.94	1.52	1.28	$2.04	$55.19	$36.37	$43.24
NiSource Inc.	NI	$0.97	1.10	0.88	$1.04	1.22	0.86	$1.12	1.34	0.83	$1.20	1.48	0.81	$1.29	1.63	0.79	$1.38	$41.20	$25.21	$29.38
Northwest Natural Gas Company	NWN	$1.97	1.08	1.82	$2.06	1.17	1.76	$2.14	1.27	1.69	$2.24	1.37	1.63	$2.33	1.48	1.57	$2.43	$62.12	$41.85	$50.33
ONE Gas Inc.	OGS	$2.54	1.08	2.35	$2.67	1.17	2.28	$2.80	1.26	2.22	$2.94	1.37	2.15	$3.09	1.48	2.09	$3.24	$104.03	$70.42	$81.51
Spire, Inc.	SR	$2.80	1.08	2.58	$2.92	1.17	2.49	$3.04	1.27	2.40	$3.18	1.38	2.31	$3.31	1.49	2.22	$3.45	$86.54	$58.11	$70.11
Mean																				
Flotation Cost																				
Flotation Cost-Adjusted Result																				

Notes:

[1] Source: AEB-5
[2] Source: AEB-5
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [5])
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[16] = [14] / [15]
[17] = [14] * (1 + [5])
[18] = (1 + [10]) ^ 3
[19] = [17] / [18]
[20] = [17] * (1 + [5])
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[22] = [20] / [21]
[23] = [20] * (1 + [5])
[24] = (1 + [10]) ^ 5
[25] = [23] / [24]
[26] = [23] * (1 + [9])
[27] = [26] / ([10] - [9])
[28] = [27] / [24]
[29] = [13] + [16] + [19] + [22] + [25] + [28]

30-DAY TWO-GROWTH DCF -- MEAN HIGH GROWTH RATE

Company	Ticker	[1] Annualized Dividend	[2] Stock Price	[3] Dividend Yield	[4] Expected Dividend Yield	[5] High Growth Rate	[9] Second Growth Rate	[10] Mean ROE	Check
Atmos Energy Corporation	ATO	$2.72	$114.06	2.38%	2.48%	8.39%	8.39%	10.87%	0.00
New Jersey Resources Corporation	NJR	$1.56	$43.97	3.55%	3.65%	6.00%	6.15%	9.79%	0.00
NiSource Inc.	NI	$0.94	$29.29	3.21%	3.36%	9.50%	9.14%	12.55%	0.00
Northwest Natural Gas Company	NWN	$1.93	$48.20	4.00%	4.13%	6.50%	6.50%	10.63%	0.00
ONE Gas Inc.	OGS	$2.48	$79.19	3.13%	3.23%	6.50%	6.50%	9.73%	0.00
Spire, Inc.	SR	$2.74	$69.51	3.94%	4.12%	9.00%	9.00%	13.12%	0.00
Mean				3.37%	3.50%	7.65%	7.61%	11.12%	
Flotation Cost								0.13%	
Flotation Cost-Adjusted Result								11.25%	

Standard Deviation [6]	1.49%
Avg. less Standard Dev [7]	6.15%
Avg. plus Standard Dev [8]	9.14%

Notes:
[1] Source: AEB-5
[2] Source: AEB-5
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [5])
[5] Source: AEB-5
[6] Standard Deviation of Column [5]
[7] Mean of Column [5], minus [6]
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[24] = (1 + [10]) ^ 5
[25] = [23] / [24]
[26] = [23] * (1 + [9])
[27] = [26] / ([10] - [9])
[28] = [27] / [24]
[29] = [13] + [16] + [19] + [22] + [25] + [28]

30-DAY TWO-GROWTH DCF -- MEAN HIGH GROWTH RATE

Company	Ticker	[11] Year 1 Div.	[12] (1+k)^1	[13] PV of Year 1 Div.	[14] Year 2 Div.	[15] (1+k)^2	[16] PV of Year 2 Div.	[17] Year 3 Div.	[18] (1+k)^3	[19] PV of Year 3 Div.	[20] Year 4 Div.	[21] (1+k)^4	[22] PV of Year 4 Div.	[23] Year 5 Div.	[24] (1+k)^5	[25] PV of Year 5 Div.	[26] Year 6 Div.	[27] Year 5 Stock Price	[28] PV of Year 5 Stock Price	[29] Current Stock Price
Atmos Energy Corporation	ATO	$2.83	1.11	2.56	$3.07	1.23	2.50	$3.33	1.36	2.44	$3.61	1.51	2.39	$3.91	1.68	2.33	$4.24	$170.63	$101.84	$114.06
New Jersey Resources Corporation	NJR	$1.61	1.10	1.46	$1.70	1.21	1.41	$1.81	1.32	1.36	$1.91	1.45	1.32	$2.03	1.60	1.27	$2.15	$59.25	$37.14	$43.97
NiSource Inc.	NI	$0.98	1.13	0.87	$1.08	1.27	0.85	$1.18	1.43	0.83	$1.29	1.60	0.81	$1.42	1.81	0.78	$1.55	$45.40	$25.15	$29.29
Northwest Natural Gas Company	NWN	$1.99	1.11	1.80	$2.12	1.22	1.73	$2.26	1.35	1.67	$2.41	1.50	1.61	$2.56	1.66	1.55	$2.73	$66.03	$39.84	$48.20
ONE Gas Inc.	OGS	$2.56	1.10	2.33	$2.73	1.20	2.26	$2.90	1.32	2.20	$3.09	1.45	2.13	$3.29	1.59	2.07	$3.51	$108.49	$68.19	$79.19
Spire, Inc.	SR	$2.86	1.13	2.53	$3.12	1.28	2.44	$3.40	1.45	2.35	$3.71	1.64	2.26	$4.04	1.85	2.18	$4.41	$106.96	$57.75	$69.51
Mean																				
Flotation Cost																				
Flotation Cost-Adjusted Result																				

Notes:
[1] Source: AEB-5
[2] Source: AEB-5
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [5])
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[6] Standard Deviation of Column [5]
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[22] = [20] / [21]
[23] = [20] * (1 + [5])
[24] = (1 + [10]) ^ 5
[25] = [23] / [24]
[26] = [23] * (1 + [9])
[27] = [26] / ([10] - [9])
[28] = [27] / [24]
[29] = [13] + [16] + [19] + [22] + [25] + [28]

90-DAY TWO-GROWTH DCF -- MEAN HIGH GROWTH RATE

Company	Ticker	[1] Annualized Dividend	[2] Stock Price	[3] Dividend Yield	[4] Expected Dividend Yield	[5] Average Growth Rate	[9] Second Growth Rate	[10] Mean ROE	Check
Atmos Energy Corporation	ATO	$2.72	$113.31	2.40%	2.50%	8.39%	8.39%	10.89%	0.00
New Jersey Resources Corporation	NJR	$1.56	$44.21	3.53%	3.63%	6.00%	6.15%	9.77%	0.00
NiSource Inc.	NI	$0.94	$29.41	3.20%	3.35%	9.50%	9.14%	12.53%	0.00
Northwest Natural Gas Company	NWN	$1.93	$51.24	3.77%	3.89%	6.50%	6.50%	10.39%	0.00
ONE Gas Inc.	OGS	$2.48	$80.95	3.06%	3.16%	6.50%	6.50%	9.66%	0.00
Spire, Inc.	SR	$2.74	$71.95	3.81%	3.98%	9.00%	9.00%	12.98%	0.00
Mean				3.29%	3.42%	7.65%	7.61%	11.04%	
Flotation Cost								0.13%	
Flotation Cost-Adjusted Result								11.17%	

Standard Deviation [6]	1.49%
Avg. less Standard Dev [7]	6.15%
Avg. plus Standard Dev [8]	9.14%

Notes:
[1] Source: AEB-5
[2] Source: AEB-5
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [5])
[5] Source: AEB-5
[6] Standard Deviation of Column [5]
[7] Mean of Column [5], minus [6]
[8] Mean of Column [5], plus [6]
[9] If [5] > [8], then [8]; If [5] < [7], then [7], Else [5]
[10] ROE that sets [2] equal to [29] using Excel's goal seek function
[11] = [2] x [4]
[12] = (1 + [10]) ^ 1
[13] = [11] / [12]
[14] = [11] * (1 + [5])
[15] = (1 + [10]) ^ 2
[16] = [14] / [15]
[17] = [14] * (1 + [5])
[18] = (1 + [10]) ^ 3
[19] = [17] / [18]
[20] = [17] * (1 + [5])
[21] = (1 + [10]) ^ 4
[22] = [20] / [21]
[23] = [20] * (1 + [5])
[24] = (1 + [10]) ^ 5
[25] = [23] / [24]
[26] = [23] * (1 + [9])
[27] = [26] / ([10] - [9])
[28] = [27] / [24]
[29] = [13] + [16] + [19] + [22] + [25] + [28]

90-DAY TWO-GROWTH DCF -- MEAN HIGH GROWTH RATE

Company	Ticker	[11] Year 1 Div.	[12] (1+k)^1	[13] PV of Year 1 Div.	[14] Year 2 Div.	[15] (1+k)^2	[16] PV of Year 2 Div.	[17] Year 3 Div.	[18] (1+k)^3	[19] PV of Year 3 Div.	[20] Year 4 Div.	[21] (1+k)^4	[22] PV of Year 4 Div.	[23] Year 5 Div.	[24] (1+k)^5	[25] PV of Year 5 Div.	[26] Year 6 Div.	[27] Year 5 Stock Price	[28] PV of Year 5 Stock Price	[29] Current Stock Price
Atmos Energy Corporation	ATO	$2.83	1.11	2.56	$3.07	1.23	2.50	$3.33	1.36	2.44	$3.61	1.51	2.39	$3.91	1.68	2.33	$4.24	$169.51	$101.09	$113.31
New Jersey Resources Corporation	NJR	$1.61	1.10	1.46	$1.70	1.20	1.41	$1.81	1.32	1.36	$1.91	1.45	1.32	$2.03	1.59	1.27	$2.15	$59.56	$37.37	$44.21
NiSource Inc.	NI	$0.98	1.13	0.88	$1.08	1.27	0.85	$1.18	1.42	0.83	$1.29	1.60	0.81	$1.42	1.80	0.78	$1.55	$45.60	$25.27	$29.41
Northwest Natural Gas Company	NWN	$1.99	1.10	1.81	$2.12	1.22	1.74	$2.26	1.35	1.68	$2.41	1.48	1.62	$2.56	1.64	1.56	$2.73	$70.20	$42.83	$51.24
ONE Gas Inc.	OGS	$2.56	1.10	2.33	$2.73	1.20	2.27	$2.90	1.32	2.20	$3.09	1.45	2.14	$3.29	1.59	2.08	$3.51	$110.91	$69.93	$80.95
Spire, Inc.	SR	$2.86	1.13	2.53	$3.12	1.28	2.45	$3.40	1.44	2.36	$3.71	1.63	2.28	$4.04	1.84	2.20	$4.41	$110.71	$60.14	$71.95
Mean																				
Flotation Cost																				
Flotation Cost-Adjusted Result																				

Notes:
[1] Source: AEB-5
[2] Source: AEB-5
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [5])
[5] Source: AEB-5
[6] Standard Deviation of Column [5]
[7] Mean of Column [5], minus [6]
[8] Mean of Column [5], plus [6]
[9] If [5] > [8], then [8]; If [5] < [7], then [7], Else [5]
[10] ROE that sets [2] equal to [29] using Excel's goal s
[11] = [2] x [4]
[12] = (1 + [10]) ^ 1
[13] = [11] / [12]
[14] = [11] * (1 + [5])
[15] = (1 + [10]) ^ 2
[16] = [14] / [15]
[17] = [14] * (1 + [5])
[18] = (1 + [10]) ^ 3
[19] = [17] / [18]
[20] = [17] * (1 + [5])
[21] = (1 + [10]) ^ 4
[22] = [20] / [21]
[23] = [20] * (1 + [5])
[24] = (1 + [10]) ^ 5
[25] = [23] / [24]
[26] = [23] * (1 + [9])
[27] = [26] / ([10] - [9])
[28] = [27] / [24]
[29] = [13] + [16] + [19] + [22] + [25] + [28]

180-DAY TWO-GROWTH DCF -- MEAN HIGH GROWTH RATE

Company	Ticker	[1] Annualized Dividend	[2] Stock Price	[3] Dividend Yield	[4] Expected Dividend Yield	[5] Average Growth Rate	[9] Second Growth Rate	[10] Mean ROE	Check
Atmos Energy Corporation	ATO	$2.72	$112.17	2.42%	2.53%	8.39%	8.39%	10.92%	0.00
New Jersey Resources Corporation	NJR	$1.56	$43.24	3.61%	3.72%	6.00%	6.15%	9.85%	0.00
NiSource Inc.	NI	$0.94	$29.38	3.20%	3.35%	9.50%	9.14%	12.53%	0.00
Northwest Natural Gas Company	NWN	$1.93	$50.33	3.84%	3.96%	6.50%	6.50%	10.46%	0.00
ONE Gas Inc.	OGS	$2.48	$81.51	3.04%	3.14%	6.50%	6.50%	9.64%	0.00
Spire, Inc.	SR	$2.74	$70.11	3.91%	4.08%	9.00%	9.00%	13.08%	0.00
Mean				3.34%	3.46%	7.65%	7.61%	11.08%	
Flotation Cost								0.13%	
Flotation Cost-Adjusted Result								11.21%	

Standard Deviation [6]	1.49%
Avg. less Standard Dev [7]	6.15%
Avg. plus Standard Dev [8]	9.14%

Notes:
[1] Source: AEB-5
[2] Source: AEB-5
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [5])
[5] Source: AEB-5
[6] Standard Deviation of Column [5]
[7] Mean of Column [5], minus [6]
[8] Mean of Column [5], plus [6]
[9] If [5] > [8], then [8]; If [5] < [7], then [7], Else [5]
[10] ROE that sets [2] equal to [29] using Excel's goal seek function
[11] = [2] x [4]
[12] = (1 + [10]) ^ 1
[13] = [11] / [12]
[14] = [11] * (1 + [5])
[15] = (1 + [10]) ^ 2
[16] = [14] / [15]
[17] = [14] * (1 + [5])
[18] = (1 + [10]) ^ 3
[19] = [17] / [18]
[20] = [17] * (1 + [5])
[21] = (1 + [10]) ^ 4
[22] = [20] / [21]
[23] = [20] * (1 + [5])
[24] = (1 + [10]) ^ 5
[25] = [23] / [24]
[26] = [23] * (1 + [9])
[27] = [26] / ([10] - [9])
[28] = [27] / [24]
[29] = [13] + [16] + [19] + [22] + [25] + [28]

180-DAY TWO-GROWTH DCF -- MEAN HIGH GROWTH RATE

Company	Ticker	[11] Year 1 Div.	[12] (1+k)^1	[13] PV of Year 1 Div.	[14] Year 2 Div.	[15] (1+k)^2	[16] PV of Year 2 Div.	[17] Year 3 Div.	[18] (1+k)^3	[19] PV of Year 3 Div.	[20] Year 4 Div.	[21] (1+k)^4	[22] PV of Year 4 Div.	[23] Year 5 Div.	[24] (1+k)^5	[25] PV of Year 5 Div.	[26] Year 6 Div.	[27] Year 5 Stock Price	[28] PV of Year 5 Stock Price	[29] Current Stock Price
Atmos Energy Corporation	ATO	$2.83	1.11	2.56	$3.07	1.23	2.50	$3.33	1.36	2.44	$3.61	1.51	2.38	$3.91	1.68	2.33	$4.24	$167.81	$99.96	$112.17
New Jersey Resources Corporation	NJR	$1.61	1.10	1.46	$1.70	1.21	1.41	$1.81	1.33	1.36	$1.91	1.46	1.31	$2.03	1.60	1.27	$2.15	$58.27	$36.43	$43.24
NiSource Inc.	NI	$0.98	1.13	0.87	$1.08	1.27	0.85	$1.18	1.43	0.83	$1.29	1.60	0.81	$1.42	1.80	0.78	$1.55	$45.54	$25.24	$29.38
Northwest Natural Gas Company	NWN	$1.99	1.10	1.80	$2.12	1.22	1.74	$2.26	1.35	1.68	$2.41	1.49	1.62	$2.56	1.64	1.56	$2.73	$68.95	$41.93	$50.32
ONE Gas Inc.	OGS	$2.56	1.10	2.34	$2.73	1.20	2.27	$2.90	1.32	2.20	$3.09	1.45	2.14	$3.29	1.58	2.08	$3.51	$111.68	$70.49	$81.51
Spire, Inc.	SR	$2.86	1.13	2.53	$3.12	1.28	2.44	$3.40	1.45	2.35	$3.71	1.64	2.27	$4.04	1.85	2.19	$4.41	$107.87	$58.33	$70.11
Mean																				
Flotation Cost																				
Flotation Cost-Adjusted Result																				

Notes:
[1] Source: AEB-5
[2] Source: AEB-5
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [5])
[5] Source: AEB-5
[6] Standard Deviation of Column [5]
[7] Mean of Column [5], minus [6]
[8] Mean of Column [5], plus [6]
[9] If [5] > [8], then [8]; If [5] < [7], then [7], Else [5]
[10] ROE that sets [2] equal to [29] using Excel's goal s
[11] = [2] x [4]
[12] = (1 + [10]) ^ 1
[13] = [11] / [12]
[14] = [11] * (1 + [5])
[15] = (1 + [10]) ^ 2
[16] = [14] / [15]
[17] = [14] * (1 + [5])
[18] = (1 + [10]) ^ 3
[19] = [17] / [18]
[20] = [17] * (1 + [5])
[21] = (1 + [10]) ^ 4
[22] = [20] / [21]
[23] = [20] * (1 + [5])
[24] = (1 + [10]) ^ 5
[25] = [23] / [24]
[26] = [23] * (1 + [9])
[27] = [26] / ([10] - [9])
[28] = [27] / [24]
[29] = [13] + [16] + [19] + [22] + [25] + [28]

CAPITAL ASSET PRICING MODEL -- CURRENT RISK-FREE RATE & VL BETA

$K = Rf + \beta \times (Rm - Rf)$
$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Current 30-day average of 30-year U.S. Treasury bond yield	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE (K)	ECAPM ROE (K)
Atmos Energy Corporation	ATO	3.47%	0.80	13.04%	9.58%	11.13%	11.61%
New Jersey Resources Corporation	NJR	3.47%	0.95	13.04%	9.58%	12.56%	12.68%
NiSource Inc.	NI	3.47%	0.85	13.04%	9.58%	11.61%	11.97%
Northwest Natural Gas Company	NWN	3.47%	0.80	13.04%	9.58%	11.13%	11.61%
ONE Gas Inc.	OGS	3.47%	0.80	13.04%	9.58%	11.13%	11.61%
Spire, Inc.	SR	3.47%	0.80	13.04%	9.58%	11.13%	11.61%
Mean			0.83			11.45%	11.85%

Notes:
[1] Source: Bloomberg Professional, as of September 30, 2022
[2] Source: Value Line
[3] Source: AEB-9
[4] Equals [3] - [1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL -- NEAR-TERM PROJECTED RISK-FREE RATE & VL BETA

$K = Rf + \beta \times (Rm - Rf)$
$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Near-term projected 30-year U.S. Treasury bond yield (Q1 2023 - Q1 2024)	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE (K)	ECAPM ROE (K)
Atmos Energy Corporation	ATO	3.88%	0.80	13.04%	9.16%	11.21%	11.67%
New Jersey Resources Corporation	NJR	3.88%	0.95	13.04%	9.16%	12.58%	12.70%
NiSource Inc.	NI	3.88%	0.85	13.04%	9.16%	11.67%	12.01%
Northwest Natural Gas Company	NWN	3.88%	0.80	13.04%	9.16%	11.21%	11.67%
ONE Gas Inc.	OGS	3.88%	0.80	13.04%	9.16%	11.21%	11.67%
Spire, Inc.	SR	3.88%	0.80	13.04%	9.16%	11.21%	11.67%
Mean			0.83			11.52%	11.90%

Notes:
[1] Source: Blue Chip Financial Forecasts, Vol. 41, No. 10, October 1, 2022, at 2
[2] Source: Value Line
[3] Source: AEB-9
[4] Equals [3] - [1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL -- LONG-TERM PROJECTED RISK-FREE RATE & VL BETA

$K = Rf + \beta \times (Rm - Rf)$
$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Projected 30-year U.S. Treasury bond yield (2024 - 2028)	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE (K)	ECAPM ROE (K)
Atmos Energy Corporation	ATO	3.80%	0.80	13.04%	9.24%	11.19%	11.66%
New Jersey Resources Corporation	NJR	3.80%	0.95	13.04%	9.24%	12.58%	12.70%
NiSource Inc.	NI	3.80%	0.85	13.04%	9.24%	11.66%	12.00%
Northwest Natural Gas Company	NWN	3.80%	0.80	13.04%	9.24%	11.19%	11.66%
ONE Gas Inc.	OGS	3.80%	0.80	13.04%	9.24%	11.19%	11.66%
Spire, Inc.	SR	3.80%	0.80	13.04%	9.24%	11.19%	11.66%
Mean			0.83			11.50%	11.89%

Notes:
[1] Source: Blue Chip Financial Forecasts, Vol. 41, No. 6, June 1, 2022, at 14
[2] Source: Value Line
[3] Source: AEB-9
[4] Equals [3] - [1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL -- CURRENT RISK-FREE RATE & BLOOMBERG BETA

$K = Rf + \beta \times (Rm - Rf)$
$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$

Company	Ticker	[1] Current 30-day average of 30-year U.S. Treasury bond yield	[2] Beta (β)	[3] Market Return (Rm)	[4] Market Risk Premium (Rm − Rf)	[5] CAPM ROE (K)	[6] ECAPM ROE (K)
Atmos Energy Corporation	ATO	3.47%	0.77	13.04%	9.58%	10.81%	11.37%
New Jersey Resources Corporation	NJR	3.47%	0.81	13.04%	9.58%	11.23%	11.68%
NiSource Inc.	NI	3.47%	0.83	13.04%	9.58%	11.46%	11.85%
Northwest Natural Gas Company	NWN	3.47%	0.71	13.04%	9.58%	10.24%	10.94%
ONE Gas Inc.	OGS	3.47%	0.80	13.04%	9.58%	11.11%	11.60%
Spire, Inc.	SR	3.47%	0.76	13.04%	9.58%	10.78%	11.35%
Mean			0.78			10.94%	11.47%

Notes:
[1] Source: Bloomberg Professional, as of September 30, 2022
[2] Source: Bloomberg Professional, as of September 30, 2022
[3] Source: AEB-9
[4] Equals [3] - [1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL -- NEAR-TERM PROJECTED RISK-FREE RATE & BLOOMBERG BETA

$K = Rf + \beta \times (Rm - Rf)$
$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$

Company	Ticker	[1] Near-term projected 30-year U.S. Treasury bond yield (Q1 2023 - Q1 2024)	[2] Beta (β)	[3] Market Return (Rm)	[4] Market Risk Premium (Rm − Rf)	[5] CAPM ROE (K)	[6] ECAPM ROE (K)
Atmos Energy Corporation	ATO	3.88%	0.77	13.04%	9.16%	10.91%	11.44%
New Jersey Resources Corporation	NJR	3.88%	0.81	13.04%	9.16%	11.31%	11.74%
NiSource Inc.	NI	3.88%	0.83	13.04%	9.16%	11.53%	11.91%
Northwest Natural Gas Company	NWN	3.88%	0.71	13.04%	9.16%	10.36%	11.03%
ONE Gas Inc.	OGS	3.88%	0.80	13.04%	9.16%	11.20%	11.66%
Spire, Inc.	SR	3.88%	0.76	13.04%	9.16%	10.88%	11.42%
Mean			0.78			11.03%	11.53%

Notes:
[1] Source: Blue Chip Financial Forecasts, Vol. 41, No. 10, October 1, 2022, at 2
[2] Source: Bloomberg Professional, as of September 30, 2022
[3] Source: AEB-9
[4] Equals [3] - [1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL -- LONG-TERM PROJECTED RISK-FREE RATE & BLOOMBERG BETA

$K = Rf + \beta \times (Rm - Rf)$
$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$

Company	Ticker	[1] Projected 30-year U.S. Treasury bond yield (2024 - 2028)	[2] Beta (β)	[3] Market Return (Rm)	[4] Market Risk Premium (Rm − Rf)	[5] CAPM ROE (K)	[6] ECAPM ROE (K)
Atmos Energy Corporation	ATO	3.80%	0.77	13.04%	9.24%	10.89%	11.43%
New Jersey Resources Corporation	NJR	3.80%	0.81	13.04%	9.24%	11.29%	11.73%
NiSource Inc.	NI	3.80%	0.83	13.04%	9.24%	11.51%	11.90%
Northwest Natural Gas Company	NWN	3.80%	0.71	13.04%	9.24%	10.34%	11.01%
ONE Gas Inc.	OGS	3.80%	0.80	13.04%	9.24%	11.18%	11.65%
Spire, Inc.	SR	3.80%	0.76	13.04%	9.24%	10.86%	11.41%
Mean			0.78			11.01%	11.52%

Notes:
[1] Source: Blue Chip Financial Forecasts, Vol. 41, No. 6, June 1, 2022, at 14
[2] Source: Bloomberg Professional, as of September 30, 2022
[3] Source: AEB-9
[4] Equals [3] - [1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL -- CURRENT RISK-FREE RATE & LONG-TERM BETA

$K = Rf + \beta \times (Rm - Rf)$
$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Current 30-day average of 30-year U.S. Treasury bond yield	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE (K)	ECAPM ROE (K)
Atmos Energy Corporation	ATO	3.47%	0.73	13.04%	9.58%	10.49%	11.13%
New Jersey Resources Corporation	NJR	3.47%	0.81	13.04%	9.58%	11.18%	11.65%
NiSource Inc.	NI	3.47%	0.72	13.04%	9.58%	10.37%	11.04%
Northwest Natural Gas Company	NWN	3.47%	0.69	13.04%	9.58%	10.06%	10.81%
ONE Gas Inc.	OGS	3.47%	0.72	13.04%	9.58%	10.36%	11.03%
Spire, Inc.	SR	3.47%	0.72	13.04%	9.58%	10.33%	11.01%
Mean			0.73			10.47%	11.11%

Notes:
[1] Source: Bloomberg Professional, as of September 30, 2022
[2] Source: Bloomberg Professional, as of September 30, 2022
[3] Source: AEB-9
[4] Equals [3] - [1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL -- NEAR-TERM PROJECTED RISK-FREE RATE & LONG-TERM BETA

$K = Rf + \beta \times (Rm - Rf)$
$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Near-term projected 30-year U.S. Treasury bond yield (Q1 2023 - Q1 2024)	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE (K)	ECAPM ROE (K)
Atmos Energy Corporation	ATO	3.88%	0.73	13.04%	9.16%	10.60%	11.21%
New Jersey Resources Corporation	NJR	3.88%	0.81	13.04%	9.16%	11.26%	11.71%
NiSource Inc.	NI	3.88%	0.72	13.04%	9.16%	10.49%	11.13%
Northwest Natural Gas Company	NWN	3.88%	0.69	13.04%	9.16%	10.19%	10.90%
ONE Gas Inc.	OGS	3.88%	0.72	13.04%	9.16%	10.48%	11.12%
Spire, Inc.	SR	3.88%	0.72	13.04%	9.16%	10.45%	11.10%
Mean			0.73			10.58%	11.19%

Notes:
[1] Source: Blue Chip Financial Forecasts, Vol. 41, No. 10, October 1, 2022, at 2
[2] Source: Bloomberg Professional, as of September 30, 2022
[3] Source: AEB-9
[4] Equals [3] - [1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL -- LONG-TERM PROJECTED RISK-FREE RATE & LONG-TERM BETA

$K = Rf + \beta \times (Rm - Rf)$
$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Projected 30-year U.S. Treasury bond yield (2024 - 2028)	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE (K)	ECAPM ROE (K)
Atmos Energy Corporation	ATO	3.80%	0.73	13.04%	9.24%	10.58%	11.19%
New Jersey Resources Corporation	NJR	3.80%	0.81	13.04%	9.24%	11.25%	11.69%
NiSource Inc.	NI	3.80%	0.72	13.04%	9.24%	10.47%	11.11%
Northwest Natural Gas Company	NWN	3.80%	0.69	13.04%	9.24%	10.17%	10.89%
ONE Gas Inc.	OGS	3.80%	0.72	13.04%	9.24%	10.45%	11.10%
Spire, Inc.	SR	3.80%	0.72	13.04%	9.24%	10.42%	11.08%
Mean			0.73			10.56%	11.18%

Notes:
[1] Source: Blue Chip Financial Forecasts, Vol. 41, No. 6, June 1, 2022, at 14
[2] Source: Bloomberg Professional, as of September 30, 2022
[3] Source: AEB-9
[4] Equals [3] - [1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

HISTORICAL BETA - 2013 - 2021

Company	Ticker	[1] 12/31/2013	[2] 12/31/2014	[3] 12/31/2015	[4] 12/31/2016	[5] 12/31/2017	[6] 12/31/2018	[7] 12/31/2019	[8] 12/31/2020	[9] 12/31/2021	[10] Average
Atmos Energy Corporation	ATO	0.80	0.80	0.80	0.70	0.70	0.60	0.60	0.80	0.80	0.73
New Jersey Resources Corporation	NJR	0.70	0.80	0.80	0.80	0.80	0.70	0.70	0.95	1.00	0.81
NiSource Inc.	NI	0.85	0.85	NMF	NMF	0.60	0.50	0.55	0.85	0.85	0.72
Northwest Natural Gas Company	NWN	0.65	0.70	0.65	0.65	0.70	0.60	0.60	0.80	0.85	0.69
ONE Gas Inc.	OGS				N/A	0.70	0.65	0.65	0.80	0.80	0.72
Spire, Inc.	SR	0.65	0.70	0.70	0.70	0.70	0.65	0.65	0.85	0.85	0.72
Mean		0.73	0.77	0.74	0.71	0.70	0.62	0.63	0.84	0.86	0.73

Notes:
[1] Value Line, dated December 26, 2013.
[2] Value Line, dated December 31, 2014.
[3] Value Line, dated December 30, 2015.
[4] Value Line, dated December 29, 2016.
[5] Value Line, dated December 28, 2017.
[6] Value Line, dated December 27, 2018.
[7] Value Line, dated December 26, 2019.
[8] Value Line, dated December 30, 2020.
[9] Value Line, dated December 29, 2021.
[10] Average ([1] - [9])

MARKET RISK PREMIUM DERIVED FROM S&P 500 INDEX

[1] Estimate of the S&P 500 Dividend Yield	1.98%
[2] Estimate of the S&P 500 Growth Rate	10.95%
[3] S&P 500 Estimated Required Market Return	13.04%

Notes:
[1] Sum of [6]
[2] Sum of [8]
[3] Equals ([1] x (1 + 0.5 x [2])) + [2]

STANDARD & POOR'S 500 INDEX

		[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]
Name	Ticker	Shares Outst'g	Price	Market Capitalization	Weight in Index	Estimated Dividend Yield	Cap-Weighted Dividend Yield	Value Line Long-Term Growth Est.	Cap-Weighted Long-Term Growth Est.
LyondellBasell Industries NV	LYB	326.21	75.28	24,556.79	0.10%	6.32%	0.01%	3.50%	0.00%
Signature Bank/New York NY	SBNY	62.93	151.00	9,502.28		1.48%		21.50%	
American Express Co	AXP	749.75	134.91	101,148.50	0.40%	1.54%	0.01%	10.00%	0.04%
Verizon Communications Inc	VZ	4,199.72	37.97	159,463.18	0.64%	6.87%	0.04%	2.50%	0.02%
Broadcom Inc	AVGO	405.00	444.01	179,824.49		3.69%		29.50%	
Boeing Co/The	BA	593.81	121.08	71,898.64					
Caterpillar Inc	CAT	527.91	164.08	86,619.31	0.35%	2.93%	0.01%	8.00%	0.03%
JPMorgan Chase & Co	JPM	2,932.57	104.50	306,453.77	1.22%	3.83%	0.05%	5.00%	0.06%
Chevron Corp	CVX	1,957.44	143.67	281,224.69		3.95%		44.00%	
Coca-Cola Co/The	KO	4,324.63	56.02	242,265.72	0.97%	3.14%	0.03%	7.50%	0.07%
AbbVie Inc	ABBV	1,768.10	134.21	237,296.16	0.95%	4.20%	0.04%	4.50%	0.04%
Walt Disney Co/The	DIS	1,823.06	94.33	171,969.06				30.50%	
FleetCor Technologies Inc	FLT	75.01	176.17	13,215.04	0.05%			10.50%	0.01%
Extra Space Storage Inc	EXR	133.91	172.71	23,127.94	0.09%	3.47%	0.00%	4.00%	0.00%
Exxon Mobil Corp	XOM	4,167.64	87.31	363,876.30		4.03%			
Phillips 66	PSX	481.05	80.72	38,830.44		4.81%		85.00%	
General Electric Co	GE	1,096.55	61.91	67,887.60		0.52%		22.00%	
HP Inc	HPQ	1,005.94	24.92	25,068.00	0.10%	4.01%	0.00%	12.50%	0.01%
Home Depot Inc/The	HD	1,023.73	275.94	282,486.95	1.13%	2.75%	0.03%	9.00%	0.10%
Monolithic Power Systems Inc	MPWR	46.79	363.40	17,003.12		0.83%		23.50%	
International Business Machines Corp	IBM	903.18	118.81	107,306.82	0.43%	5.56%	0.02%	3.00%	0.01%
Johnson & Johnson	JNJ	2,629.18	163.36	429,502.84	1.71%	2.77%	0.05%	8.00%	0.14%
McDonald's Corp	MCD	735.72	230.74	169,759.34	0.68%	2.39%	0.02%	10.50%	0.07%
Merck & Co Inc	MRK	2,533.28	86.12	218,166.07	0.87%	3.20%	0.03%	8.00%	0.07%
3M Co	MMM	553.61	110.50	61,174.35	0.24%	5.39%	0.01%	6.50%	0.02%
American Water Works Co Inc	AWK	181.79	130.16	23,661.27	0.09%	2.01%	0.00%	3.00%	0.00%
Bank of America Corp	BAC	8,035.24	30.20	242,664.22	0.97%	2.91%	0.03%	8.50%	0.08%
Pfizer Inc	PFE	5,612.35	43.76	245,596.52	0.98%	3.66%	0.04%	6.50%	0.06%

STANDARD & POOR'S 500 INDEX

Name	Ticker	[4] Shares Outst'g	[5] Price	[6] Market Capitalization	[7] Weight in Index	[8] Estimated Dividend Yield	[9] Cap-Weighted Dividend Yield	[10] Value Line Long-Term Growth Est.	[11] Cap-Weighted Long-Term Growth Est.
Procter & Gamble Co/The	PG	2,389.55	126.25	301,681.19	1.20%	2.89%	0.03%	6.50%	0.08%
AT&T Inc	T	7,126.00	15.34	109,312.84	0.44%	7.24%	0.03%	0.50%	0.00%
Travelers Cos Inc/The	TRV	237.31	153.20	36,356.35	0.15%	2.43%	0.00%	6.50%	0.01%
Raytheon Technologies Corp	RTX	1,476.51	81.86	120,867.44	0.48%	2.69%	0.01%	7.00%	0.03%
Analog Devices Inc	ADI	514.34	139.34	71,668.41	0.29%	2.18%	0.01%	14.00%	0.04%
Walmart Inc	WMT	2,714.24	129.70	352,036.67	1.40%	1.73%	0.02%	7.50%	0.11%
Cisco Systems Inc	CSCO	4,108.84	40.00	164,353.76	0.66%	3.80%	0.02%	8.00%	0.05%
Intel Corp	INTC	4,106.00	25.77	105,811.62	0.42%	5.67%	0.02%	2.50%	0.01%
General Motors Co	GM	1,458.05	32.09	46,788.79	0.19%	1.12%	0.00%	10.00%	0.02%
Microsoft Corp	MSFT	7,457.89	232.90	1,736,943.05	6.93%	1.17%	0.08%	16.50%	1.14%
Dollar General Corp	DG	225.57	239.31	53,981.64	0.22%	0.92%	0.00%	10.00%	0.02%
Cigna Corp	CI	305.12	277.47	84,660.54	0.34%	1.61%	0.01%	10.00%	0.03%
Kinder Morgan Inc	KMI	2,253.00	16.64	37,489.94	0.15%	6.67%	0.01%	19.00%	0.03%
Citigroup Inc	C	1,936.71	41.67	80,702.71	0.32%	4.90%	0.02%	5.50%	0.02%
American International Group Inc	AIG	760.42	47.48	36,104.55		2.70%		#N/A	
Altria Group Inc	MO	1,800.82	40.38	72,717.23	0.29%	9.31%	0.03%	5.50%	0.02%
HCA Healthcare Inc	HCA	287.03	183.79	52,752.32	0.21%	1.22%	0.00%	12.50%	0.03%
International Paper Co	IP	362.02	31.70	11,475.94	0.05%	5.84%	0.00%	12.50%	0.01%
Hewlett Packard Enterprise Co	HPE	1,286.70	11.98	15,414.68	0.06%	4.01%	0.00%	7.50%	0.00%
Abbott Laboratories	ABT	1,751.22	96.76	169,448.05	0.68%	1.94%	0.01%	8.00%	0.05%
Aflac Inc	AFL	631.92	56.20	35,513.68	0.14%	2.85%	0.00%	9.00%	0.01%
Air Products and Chemicals Inc	APD	221.80	232.73	51,619.28	0.21%	2.78%	0.01%	12.00%	0.02%
Royal Caribbean Cruises Ltd	RCL	255.06	37.90	9,666.74					
Hess Corp	HES	309.62	108.99	33,744.94		1.38%			
Archer-Daniels-Midland Co	ADM	560.56	80.45	45,097.21	0.18%	1.99%	0.00%	13.00%	0.02%
Automatic Data Processing Inc	ADP	415.29	226.19	93,934.90	0.37%	1.84%	0.01%	10.00%	0.04%
Verisk Analytics Inc	VRSK	156.96	170.53	26,766.39	0.11%	0.73%	0.00%	10.50%	0.01%
AutoZone Inc	AZO	19.49	2,141.93	41,741.93	0.17%			14.00%	0.02%
Avery Dennison Corp	AVY	81.26	162.70	13,220.35	0.05%	1.84%	0.00%	12.00%	0.01%
Enphase Energy Inc	ENPH	135.46	277.47	37,585.25				26.50%	
MSCI Inc	MSCI	80.50	421.79	33,955.36	0.14%	1.19%	0.00%	15.50%	0.02%
Ball Corp	BALL	314.31	48.32	15,187.31		1.66%		21.50%	
Ceridian HCM Holding Inc	CDAY	153.06	55.88	8,552.83					
Carrier Global Corp	CARR	841.58	35.56	29,926.69		1.69%			
Bank of New York Mellon Corp/The	BK	808.10	38.52	31,128.13	0.12%	3.84%	0.00%	6.00%	0.01%
Otis Worldwide Corp	OTIS	420.23	63.80	26,810.80		1.82%			
Baxter International Inc	BAX	503.61	53.86	27,124.49	0.11%	2.15%	0.00%	10.00%	0.01%
Becton Dickinson and Co	BDX	285.20	222.83	63,550.00	0.25%	1.56%	0.00%	4.50%	0.01%
Berkshire Hathaway Inc	BRK/B	1,301.13	267.02	347,426.66	1.39%			6.00%	0.08%
Best Buy Co Inc	BBY	225.13	63.34	14,259.80	0.06%	5.56%	0.00%	9.50%	0.01%
Boston Scientific Corp	BSX	1,431.61	38.73	55,446.41	0.22%			16.00%	0.04%
Bristol-Myers Squibb Co	BMY	2,135.26	71.09	151,795.28		3.04%			
Fortune Brands Home & Security Inc	FBHS	129.32	53.69	6,943.03	0.03%	2.09%	0.00%	10.00%	0.00%

STANDARD & POOR'S 500 INDEX

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Brown-Forman Corp	BF/B	309.92	66.57	20,631.64	0.08%	1.13%	0.00%	14.00%	0.01%
Coterra Energy Inc	CTRA	795.60	26.12	20,780.94		9.95%			
Campbell Soup Co	CPB	299.36	47.12	14,106.03	0.06%	3.14%	0.00%	5.00%	0.00%
Hilton Worldwide Holdings Inc	HLT	274.29	120.62	33,084.50		0.50%			
Carnival Corp	CCL	1,096.76	7.03	7,710.19					
Qorvo Inc	QRVO	103.20	79.41	8,195.43	0.03%			14.50%	0.00%
Lumen Technologies Inc	LUMN	1,035.34	7.28	7,537.27	0.03%	13.74%	0.00%	3.50%	0.00%
UDR Inc	UDR	324.92	41.71	13,552.54	0.05%	3.64%	0.00%	10.50%	0.01%
Clorox Co/The	CLX	123.16	128.39	15,812.90	0.06%	3.68%	0.00%	7.50%	0.00%
Paycom Software Inc	PAYC	60.03	329.99	19,807.98				21.00%	
CMS Energy Corp	CMS	290.20	58.24	16,901.02	0.07%	3.16%	0.00%	6.50%	0.00%
Newell Brands Inc	NWL	413.60	13.89	5,744.90		6.62%			
Colgate-Palmolive Co	CL	834.12	70.25	58,596.93	0.23%	2.68%	0.01%	6.50%	0.02%
EPAM Systems Inc	EPAM	57.37	362.19	20,777.75				20.50%	
Comerica Inc	CMA	130.82	71.10	9,301.30	0.04%	3.83%	0.00%	9.00%	0.00%
Conagra Brands Inc	CAG	480.63	32.63	15,682.89	0.06%	4.05%	0.00%	4.00%	0.00%
Consolidated Edison Inc	ED	354.58	85.76	30,408.95	0.12%	3.68%	0.00%	4.00%	0.00%
Corning Inc	GLW	845.32	29.02	24,531.13	0.10%	3.72%	0.00%	17.50%	0.02%
Cummins Inc	CMI	140.99	203.51	28,693.28	0.11%	3.09%	0.00%	8.50%	0.01%
Caesars Entertainment Inc	CZR	214.42	32.26	6,917.09					
Danaher Corp	DHR	727.45	258.29	187,891.77	0.75%	0.39%	0.00%	17.00%	0.13%
Target Corp	TGT	460.26	148.39	68,298.43	0.27%	2.91%	0.01%	13.00%	0.04%
Deere & Co	DE	301.82	333.89	100,774.68	0.40%	1.35%	0.01%	15.00%	0.06%
Dominion Energy Inc	D	832.50	69.11	57,534.28	0.23%	3.86%	0.01%	5.00%	0.01%
Dover Corp	DOV	143.55	116.58	16,734.94	0.07%	1.73%	0.00%	9.00%	0.01%
Alliant Energy Corp	LNT	250.93	52.99	13,296.57	0.05%	3.23%	0.00%	6.00%	0.00%
Duke Energy Corp	DUK	770.00	93.02	71,625.40	0.29%	4.32%	0.01%	5.00%	0.01%
Regency Centers Corp	REG	171.12	53.85	9,214.60	0.04%	4.64%	0.00%	12.50%	0.00%
Eaton Corp PLC	ETN	398.30	133.36	53,117.29	0.21%	2.43%	0.01%	12.00%	0.03%
Ecolab Inc	ECL	284.99	144.42	41,158.11	0.16%	1.41%	0.00%	10.50%	0.02%
PerkinElmer Inc	PKI	126.22	120.33	15,188.53	0.06%	0.23%	0.00%	4.00%	0.00%
Emerson Electric Co	EMR	591.30	73.22	43,294.99	0.17%	2.81%	0.00%	10.50%	0.02%
EOG Resources Inc	EOG	586.05	111.73	65,478.81	0.26%	2.69%	0.01%	18.00%	0.05%
Aon PLC	AON	210.93	267.87	56,500.75	0.23%	0.84%	0.00%	6.50%	0.01%
Entergy Corp	ETR	203.42	100.63	20,469.95	0.08%	4.01%	0.00%	4.00%	0.00%
Equifax Inc	EFX	122.40	171.43	20,983.03	0.08%	0.91%	0.00%	10.00%	0.01%
EQT Corp	EQT	369.44	40.75	15,054.68		1.47%			
IQVIA Holdings Inc	IQV	186.51	181.14	33,784.06	0.13%			14.50%	0.02%
Gartner Inc	IT	79.09	276.69	21,884.52	0.09%			15.50%	0.01%
FedEx Corp	FDX	260.22	148.47	38,634.86	0.15%	3.10%	0.00%	13.00%	0.02%
FMC Corp	FMC	125.96	105.70	13,313.87	0.05%	2.01%	0.00%	11.00%	0.01%
Brown & Brown Inc	BRO	282.45	60.48	17,082.82	0.07%	0.68%	0.00%	8.00%	0.01%
Ford Motor Co	F	3,949.39	11.20	44,233.11		5.36%		33.50%	

STANDARD & POOR'S 500 INDEX

Name	Ticker	[4] Shares Outst'g	[5] Price	[6] Market Capitalization	[7] Weight in Index	[8] Estimated Dividend Yield	[9] Cap-Weighted Dividend Yield	[10] Value Line Long-Term Growth Est.	[11] Cap-Weighted Long-Term Growth Est.
NextEra Energy Inc	NEE	1,964.78	78.41	154,058.32	0.61%	2.17%	0.01%	10.00%	0.06%
Franklin Resources Inc	BEN	498.36	21.52	10,724.64	0.04%	5.39%	0.00%	9.00%	0.00%
Garmin Ltd	GRMN	192.86	80.31	15,488.19	0.06%	3.64%	0.00%	6.00%	0.00%
Freeport-McMoRan Inc	FCX	1,429.27	27.33	39,061.95		2.20%		27.00%	
Dexcom Inc	DXCM	392.58	80.54	31,618.55					
General Dynamics Corp	GD	274.25	212.17	58,186.77	0.23%	2.38%	0.01%	8.50%	0.02%
General Mills Inc	GIS	593.54	76.61	45,470.79	0.18%	2.82%	0.01%	3.50%	0.01%
Genuine Parts Co	GPC	141.43	149.32	21,118.48	0.08%	2.40%	0.00%	9.00%	0.01%
Atmos Energy Corp	ATO	139.89	101.85	14,248.00	0.06%	2.67%	0.00%	7.50%	0.00%
WW Grainger Inc	GWW	50.87	489.19	24,885.58	0.10%	1.41%	0.00%	9.50%	0.01%
Halliburton Co	HAL	906.94	24.62	22,328.96		1.95%		31.00%	
L3Harris Technologies Inc	LHX	191.35	207.83	39,768.89	0.16%	2.16%	0.00%	18.00%	0.03%
Healthpeak Properties Inc	PEAK	539.58	22.92	12,367.20	0.05%	5.24%	0.00%	17.00%	0.01%
Catalent Inc	CTLT	179.90	72.36	13,017.27				21.00%	
Fortive Corp	FTV	355.70	58.30	20,737.14	0.08%	0.48%	0.00%	12.00%	0.01%
Hershey Co/The	HSY	146.87	220.47	32,380.43	0.13%	1.88%	0.00%	6.50%	0.01%
Synchrony Financial	SYF	481.76	28.19	13,580.79	0.05%	3.26%	0.00%	9.50%	0.01%
Hormel Foods Corp	HRL	546.20	45.44	24,819.24	0.10%	2.29%	0.00%	6.00%	0.01%
Arthur J Gallagher & Co	AJG	210.34	171.22	36,013.73	0.14%	1.19%	0.00%	17.50%	0.03%
Mondelez International Inc	MDLZ	1,370.57	54.83	75,148.13	0.30%	2.81%	0.01%	9.50%	0.03%
CenterPoint Energy Inc	CNP	629.43	28.18	17,737.39	0.07%	2.56%	0.00%	6.50%	0.00%
Humana Inc	HUM	126.55	485.19	61,402.74	0.25%	0.65%	0.00%	11.00%	0.03%
Willis Towers Watson PLC	WTW	109.97	200.94	22,096.57	0.09%	1.63%	0.00%	8.50%	0.01%
Illinois Tool Works Inc	ITW	309.62	180.65	55,933.21	0.22%	2.90%	0.01%	11.00%	0.02%
CDW Corp/DE	CDW	135.24	156.08	21,108.73	0.08%	1.28%	0.00%	8.50%	0.01%
Trane Technologies PLC	TT	231.72	144.81	33,554.94		1.85%			
Interpublic Group of Cos Inc/The	IPG	391.03	25.60	10,010.32	0.04%	4.53%	0.00%	10.00%	0.00%
International Flavors & Fragrances Inc	IFF	254.95	90.83	23,156.84	0.09%	3.57%	0.00%	7.50%	0.01%
Generac Holdings Inc	GNRC	63.83	178.14	11,370.85				23.50%	
NXP Semiconductors NV	NXPI	262.60	147.51	38,735.83	0.15%	2.29%	0.00%	12.00%	0.02%
Kellogg Co	K	340.11	69.66	23,692.27	0.09%	3.39%	0.00%	3.50%	0.00%
Broadridge Financial Solutions Inc	BR	154.46	144.32	22,291.81	0.09%	2.01%	0.00%	9.00%	0.01%
Kimberly-Clark Corp	KMB	337.62	112.54	37,995.98	0.15%	4.12%	0.01%	5.50%	0.01%
Kimco Realty Corp	KIM	618.48	18.41	11,386.25	0.05%	4.78%	0.00%	8.50%	0.00%
Oracle Corp	ORCL	2,696.17	61.07	164,654.86	0.66%	2.10%	0.01%	9.00%	0.06%
Kroger Co/The	KR	715.81	43.75	31,316.51	0.12%	2.38%	0.00%	5.50%	0.01%
Lennar Corp	LEN	254.99	74.55	19,009.28	0.08%	2.01%	0.00%	9.00%	0.01%
Eli Lilly & Co	LLY	950.18	323.35	307,239.09	1.23%	1.21%	0.01%	11.50%	0.14%
Bath & Body Works Inc	BBWI	228.37	32.60	7,444.99		2.45%		26.50%	
Charter Communications Inc	CHTR	160.66	303.35	48,734.69				22.50%	
Lincoln National Corp	LNC	170.23	43.91	7,474.62	0.03%	4.10%	0.00%	11.50%	0.00%
Loews Corp	L	240.95	49.84	12,008.80	0.05%	0.50%	0.00%	18.50%	0.01%
Lowe's Cos Inc	LOW	620.70	187.81	116,573.85	0.47%	2.24%	0.01%	12.50%	0.06%

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IDEX Corp	IEX	75.48	199.85	15,083.88	0.06%	1.20%	0.00%	11.00%	0.01%
Marsh & McLennan Cos Inc	MMC	499.02	149.29	74,498.40	0.30%	1.58%	0.00%	12.00%	0.04%
Masco Corp	MAS	225.52	46.69	10,529.53	0.04%	2.40%	0.00%	8.50%	0.00%
S&P Global Inc	SPGI	333.50	305.35	101,834.23	0.41%	1.11%	0.00%	9.50%	0.04%
Medtronic PLC	MDT	1,329.15	80.75	107,329.10	0.43%	3.37%	0.01%	9.00%	0.04%
Viatris Inc	VTRS	1,212.58	8.52	10,331.19		5.63%			
CVS Health Corp	CVS	1,312.83	95.37	125,204.50	0.50%	2.31%	0.01%	6.00%	0.03%
DuPont de Nemours Inc	DD	500.90	50.40	25,245.46	0.10%	2.62%	0.00%	10.00%	0.01%
Micron Technology Inc	MU	1,103.15	50.10	55,267.56	0.22%	0.92%	0.00%	16.00%	0.04%
Motorola Solutions Inc	MSI	166.89	223.97	37,377.23	0.15%	1.41%	0.00%	8.00%	0.01%
Cboe Global Markets Inc	CBOE	106.06	117.37	12,448.50	0.05%	1.70%	0.00%	10.00%	0.00%
Laboratory Corp of America Holdings	LH	90.40	204.81	18,514.82	0.07%	1.41%	0.00%	1.50%	0.00%
Newmont Corp	NEM	793.68	42.03	33,358.37	0.13%	5.23%	0.01%	9.50%	0.01%
NIKE Inc	NKE	1,263.65	83.12	105,034.84		1.47%		24.00%	
NiSource Inc	NI	405.95	25.19	10,225.96	0.04%	3.73%	0.00%	9.50%	0.00%
Norfolk Southern Corp	NSC	234.87	209.65	49,241.33	0.20%	2.37%	0.00%	10.00%	0.02%
Principal Financial Group Inc	PFG	249.24	72.15	17,982.45	0.07%	3.55%	0.00%	6.00%	0.00%
Eversource Energy	ES	346.44	77.96	27,008.70	0.11%	3.27%	0.00%	6.50%	0.01%
Northrop Grumman Corp	NOC	154.71	470.32	72,763.68	0.29%	1.47%	0.00%	6.50%	0.02%
Wells Fargo & Co	WFC	3,793.05	40.22	152,556.47	0.61%	2.98%	0.02%	11.50%	0.07%
Nucor Corp	NUE	261.79	106.99	28,008.38		1.87%		-0.50%	
Occidental Petroleum Corp	OXY	931.49	61.45	57,240.18		0.85%			
Omnicom Group Inc	OMC	204.84	63.09	12,923.54	0.05%	4.44%	0.00%	6.50%	0.00%
ONEOK Inc	OKE	446.86	51.24	22,897.21	0.09%	7.30%	0.01%	11.50%	0.01%
Raymond James Financial Inc	RJF	215.83	98.82	21,327.83	0.09%	1.38%	0.00%	10.50%	0.01%
PG&E Corp	PCG	1,987.67	12.50	24,845.85	0.10%			7.50%	0.01%
Parker-Hannifin Corp	PH	128.46	242.31	31,127.38	0.12%	2.20%	0.00%	14.00%	0.02%
Rollins Inc	ROL	492.42	34.68	17,077.02	0.07%	1.15%	0.00%	10.50%	0.01%
PPL Corp	PPL	736.19	25.35	18,662.29	0.07%	3.55%	0.00%	3.00%	0.00%
ConocoPhillips	COP	1,273.03	102.34	130,282.20	0.52%	1.80%	0.01%	20.00%	0.10%
PulteGroup Inc	PHM	231.50	37.50	8,681.18	0.03%	1.60%	0.00%	11.00%	0.00%
Pinnacle West Capital Corp	PNW	113.04	64.51	7,292.47	0.03%	5.27%	0.00%	0.50%	0.00%
PNC Financial Services Group Inc/The	PNC	410.12	149.42	61,280.73	0.24%	4.02%	0.01%	12.00%	0.03%
PPG Industries Inc	PPG	235.00	110.69	26,011.82	0.10%	2.24%	0.00%	4.00%	0.00%
Progressive Corp/The	PGR	585.10	116.21	67,994.47	0.27%	0.34%	0.00%	6.50%	0.02%
Public Service Enterprise Group Inc	PEG	498.86	56.23	28,050.90	0.11%	3.84%	0.00%	4.00%	0.00%
Robert Half International Inc	RHI	109.57	76.50	8,381.95	0.03%	2.25%	0.00%	7.50%	0.00%
Edison International	EIX	381.43	56.58	21,581.42		4.95%			
Schlumberger NV	SLB	1,414.39	35.90	50,776.53		1.95%		23.00%	
Charles Schwab Corp/The	SCHW	1,817.79	71.87	130,644.85	0.52%	1.22%	0.01%	9.00%	0.05%
Sherwin-Williams Co/The	SHW	259.18	204.75	53,067.72	0.21%	1.17%	0.00%	11.50%	0.02%
West Pharmaceutical Services Inc	WST	74.05	246.08	18,221.73	0.07%	0.29%	0.00%	17.00%	0.01%
J M Smucker Co/The	SJM	106.56	137.41	14,642.00	0.06%	2.97%	0.00%	4.00%	0.00%

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Snap-on Inc	SNA	53.27	201.35	10,725.51	0.04%	2.82%	0.00%	4.50%	0.00%
AMETEK Inc	AME	229.58	113.41	26,036.44	0.10%	0.78%	0.00%	10.00%	0.01%
Southern Co/The	SO	1,062.53	68.00	72,251.70	0.29%	4.00%	0.01%	6.50%	0.02%
Truist Financial Corp	TFC	1,326.39	43.54	57,751.15	0.23%	4.78%	0.01%	6.50%	0.01%
Southwest Airlines Co	LUV	593.35	30.84	18,298.91					
W R Berkley Corp	WRB	265.27	64.58	17,131.33	0.07%	0.62%	0.00%	15.50%	0.01%
Stanley Black & Decker Inc	SWK	147.82	75.21	11,117.24	0.04%	4.25%	0.00%	6.00%	0.00%
Public Storage	PSA	175.54	292.81	51,400.45	0.21%	2.73%	0.01%	8.00%	0.02%
Arista Networks Inc	ANET	304.28	112.89	34,350.17	0.14%			10.00%	0.01%
Sysco Corp	SYY	506.11	70.71	35,787.04	0.14%	2.77%	0.00%	16.50%	0.02%
Corteva Inc	CTVA	725.32	57.15	41,452.04	0.17%	1.05%	0.00%	16.50%	0.03%
Texas Instruments Inc	TXN	913.71	154.78	141,423.57	0.56%	3.20%	0.02%	9.00%	0.05%
Textron Inc	TXT	211.53	58.26	12,323.85	0.05%	0.14%	0.00%	10.50%	0.01%
Thermo Fisher Scientific Inc	TMO	391.79	507.19	198,711.46	0.79%	0.24%	0.00%	10.00%	0.08%
TJX Cos Inc/The	TJX	1,161.05	62.12	72,124.61	0.29%	1.90%	0.01%	20.00%	0.06%
Globe Life Inc	GL	97.44	99.70	9,714.57	0.04%	0.83%	0.00%	8.00%	0.00%
Johnson Controls International plc	JCI	688.81	49.22	33,903.23	0.14%	2.84%	0.00%	13.00%	0.02%
Ulta Beauty Inc	ULTA	51.22	401.19	20,549.35	0.08%			15.00%	0.01%
Union Pacific Corp	UNP	624.48	194.82	121,661.00	0.49%	2.67%	0.01%	9.50%	0.05%
Keysight Technologies Inc	KEYS	178.80	157.36	28,135.34	0.11%			13.00%	0.01%
UnitedHealth Group Inc	UNH	935.38	505.04	472,405.83	1.89%	1.31%	0.02%	12.00%	0.23%
Marathon Oil Corp	MRO	677.58	22.58	15,299.85		1.42%			
Bio-Rad Laboratories Inc	BIO	24.63	417.14	10,275.83	0.04%			11.50%	0.00%
Ventas Inc	VTR	399.71	40.17	16,056.47	0.06%	4.48%	0.00%	10.50%	0.01%
VF Corp	VFC	388.50	29.91	11,619.89	0.05%	6.69%	0.00%	9.50%	0.00%
Vornado Realty Trust	VNO	191.78	23.16	4,441.51		9.15%		-20.50%	
Vulcan Materials Co	VMC	132.90	157.71	20,959.82	0.08%	1.01%	0.00%	8.50%	0.01%
Weyerhaeuser Co	WY	740.32	28.56	21,143.40	0.08%	2.52%	0.00%	7.00%	0.01%
Whirlpool Corp	WHR	54.51	134.81	7,348.22	0.03%	5.19%	0.00%	6.00%	0.00%
Williams Cos Inc/The	WMB	1,218.53	28.63	34,886.51	0.14%	5.94%	0.01%	8.50%	0.01%
Constellation Energy Corp	CEG	326.66	83.19	27,175.18		0.68%			
WEC Energy Group Inc	WEC	315.44	89.43	28,209.35	0.11%	3.25%	0.00%	6.00%	0.01%
Adobe Inc	ADBE	464.90	275.20	127,940.48	0.51%			14.50%	0.07%
AES Corp/The	AES	667.93	22.60	15,095.31	0.06%	2.80%	0.00%	14.00%	0.01%
Amgen Inc	AMGN	534.93	225.40	120,573.45	0.48%	3.44%	0.02%	5.50%	0.03%
Apple Inc	AAPL	16,070.75	138.20	2,220,977.93	8.86%	0.67%	0.06%	14.00%	1.24%
Autodesk Inc	ADSK	215.86	186.80	40,322.46	0.16%			14.00%	0.02%
Cintas Corp	CTAS	101.53	388.19	39,414.10	0.16%	1.18%	0.00%	13.50%	0.02%
Comcast Corp	CMCSA	4,403.79	29.33	129,163.28	0.52%	3.68%	0.02%	9.50%	0.05%
Molson Coors Beverage Co	TAP	200.37	47.99	9,615.56		3.17%		49.50%	
KLA Corp	KLAC	141.81	302.63	42,915.36		1.72%		23.00%	
Marriott International Inc/MD	MAR	324.55	140.14	45,482.58	0.18%	0.86%	0.00%	17.50%	0.03%
McCormick & Co Inc/MD	MKC	250.47	71.27	17,851.14	0.07%	2.08%	0.00%	5.50%	0.00%

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PACCAR Inc	PCAR	347.72	83.69	29,100.60	0.12%	1.77%	0.00%	5.00%	0.01%
Costco Wholesale Corp	COST	442.66	472.27	209,056.93	0.83%	0.76%	0.01%	10.50%	0.09%
First Republic Bank/CA	FRC	182.72	130.55	23,853.44	0.10%	0.83%	0.00%	11.50%	0.01%
Stryker Corp	SYK	378.32	202.54	76,625.14	0.31%	1.37%	0.00%	8.50%	0.03%
Tyson Foods Inc	TSN	289.62	65.93	19,094.45	0.08%	2.79%	0.00%	6.00%	0.00%
Lamb Weston Holdings Inc	LW	143.72	77.38	11,121.21	0.04%	1.27%	0.00%	5.00%	0.00%
Applied Materials Inc	AMAT	860.31	81.93	70,485.12	0.28%	1.27%	0.00%	17.00%	0.05%
American Airlines Group Inc	AAL	649.85	12.04	7,824.15					
Cardinal Health Inc	CAH	262.01	66.68	17,471.03	0.07%	2.97%	0.00%	5.00%	0.00%
Cincinnati Financial Corp	CINF	159.20	89.57	14,259.45	0.06%	3.08%	0.00%	8.50%	0.00%
Paramount Global	PARA	608.42	19.04	11,584.34	0.05%	5.04%	0.00%	4.50%	0.00%
DR Horton Inc	DHI	347.48	67.35	23,402.85	0.09%	1.34%	0.00%	13.00%	0.01%
Electronic Arts Inc	EA	278.05	115.71	32,172.59	0.13%	0.66%	0.00%	11.50%	0.01%
Expeditors International of Washington Inc	EXPD	163.60	88.31	14,447.07	0.06%	1.52%	0.00%	10.00%	0.01%
Fastenal Co	FAST	574.68	46.04	26,458.22	0.11%	2.69%	0.00%	8.50%	0.01%
M&T Bank Corp	MTB	175.61	176.32	30,964.26	0.12%	2.72%	0.00%	8.00%	0.01%
Xcel Energy Inc	XEL	546.99	64.00	35,007.42	0.14%	3.05%	0.00%	6.00%	0.01%
Fiserv Inc	FISV	639.58	93.57	59,845.87	0.24%			11.00%	0.03%
Fifth Third Bancorp	FITB	686.19	31.96	21,930.63	0.09%	4.13%	0.00%	9.00%	0.01%
Gilead Sciences Inc	GILD	1,253.37	61.69	77,320.21	0.31%	4.73%	0.01%	12.00%	0.04%
Hasbro Inc	HAS	138.09	67.42	9,310.10	0.04%	4.15%	0.00%	11.50%	0.00%
Huntington Bancshares Inc/OH	HBAN	1,442.19	13.18	19,008.12	0.08%	4.70%	0.00%	12.50%	0.01%
Welltower Inc	WELL	463.37	64.32	29,803.96	0.12%	3.79%	0.00%	3.50%	0.00%
Biogen Inc	BIIB	145.11	267.00	38,745.17				-10.50%	
Northern Trust Corp	NTRS	208.39	85.56	17,829.59	0.07%	3.51%	0.00%	8.00%	0.01%
Packaging Corp of America	PKG	93.74	112.29	10,526.06	0.04%	4.45%	0.00%	11.00%	0.00%
Paychex Inc	PAYX	360.40	112.21	40,440.60	0.16%	2.82%	0.00%	10.00%	0.02%
QUALCOMM Inc	QCOM	1,123.00	112.98	126,876.54	0.51%	2.66%	0.01%	19.00%	0.10%
Roper Technologies Inc	ROP	106.01	359.64	38,125.44	0.15%	0.69%	0.00%	3.50%	0.01%
Ross Stores Inc	ROST	347.06	84.27	29,247.00	0.12%	1.47%	0.00%	14.00%	0.02%
IDEXX Laboratories Inc	IDXX	83.25	325.80	27,124.15	0.11%			12.00%	0.01%
Starbucks Corp	SBUX	1,147.40	84.26	96,679.92	0.39%	2.52%	0.01%	16.50%	0.06%
KeyCorp	KEY	932.66	16.02	14,941.20	0.06%	4.87%	0.00%	9.00%	0.01%
Fox Corp	FOXA	305.37	30.68	9,368.66	0.04%	1.63%	0.00%	11.00%	0.00%
Fox Corp	FOX	241.57	28.50	6,884.83		1.75%			
State Street Corp	STT	367.62	60.81	22,354.91	0.09%	4.14%	0.00%	9.50%	0.01%
Norwegian Cruise Line Holdings Ltd	NCLH	421.39	11.36	4,786.98					
US Bancorp	USB	1,485.78	40.32	59,906.81	0.24%	4.76%	0.01%	6.00%	0.01%
A O Smith Corp	AOS	128.48	48.58	6,241.41	0.02%	2.31%	0.00%	11.50%	0.00%
NortonLifeLock Inc	NLOK	666.03	20.14	13,413.74	0.05%	2.48%	0.00%	9.50%	0.01%
T Rowe Price Group Inc	TROW	225.69	105.01	23,699.92	0.09%	4.57%	0.00%	9.50%	0.01%
Waste Management Inc	WM	413.34	160.21	66,220.56	0.26%	1.62%	0.00%	6.50%	0.02%
Constellation Brands Inc	STZ	161.22	229.68	37,029.93	0.15%	1.39%	0.00%	5.00%	0.01%

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DENTSPLY SIRONA Inc	XRAY	215.45	28.35	6,108.06	0.02%	1.76%	0.00%	12.00%	0.00%
Zions Bancorp NA	ZION	150.47	50.86	7,652.96	0.03%	3.22%	0.00%	6.50%	0.00%
Alaska Air Group Inc	ALK	126.77	39.15	4,962.85					
Invesco Ltd	IVZ	454.94	13.70	6,232.68	0.02%	5.47%	0.00%	14.00%	0.00%
Linde PLC	LIN	496.34	269.59	133,807.49	0.53%	1.74%	0.01%	12.00%	0.06%
Intuit Inc	INTU	281.87	387.32	109,173.89	0.44%	0.81%	0.00%	17.50%	0.08%
Morgan Stanley	MS	1,716.83	79.01	135,646.42	0.54%	3.92%	0.02%	10.50%	0.06%
Microchip Technology Inc	MCHP	552.48	61.03	33,718.10	0.13%	1.97%	0.00%	10.00%	0.01%
Chubb Ltd	CB	417.64	181.88	75,960.55	0.30%	1.83%	0.01%	14.50%	0.04%
Hologic Inc	HOLX	249.65	64.52	16,107.61				25.00%	
Citizens Financial Group Inc	CFG	495.64	34.36	17,030.29	0.07%	4.89%	0.00%	9.00%	0.01%
O'Reilly Automotive Inc	ORLY	63.32	703.35	44,534.72	0.18%			13.00%	0.02%
Allstate Corp/The	ALL	270.30	124.53	33,659.96	0.13%	2.73%	0.00%	2.50%	0.00%
Equity Residential	EQR	376.12	67.22	25,282.65		3.72%		-6.00%	
BorgWarner Inc	BWA	236.83	31.40	7,436.49	0.03%	2.17%	0.00%	9.50%	0.00%
Keurig Dr Pepper Inc	KDP	1,416.11	35.82	50,725.13	0.20%	2.23%	0.00%	11.50%	0.02%
Organon & Co	OGN	254.33	23.40	5,951.32		4.79%			
Host Hotels & Resorts Inc	HST	714.89	15.88	11,352.50		3.02%		59.50%	
Incyte Corp	INCY	222.43	66.64	14,822.80				25.50%	
Simon Property Group Inc	SPG	327.35	89.75	29,379.84	0.12%	7.80%	0.01%	3.00%	0.00%
Eastman Chemical Co	EMN	122.81	71.05	8,725.58	0.03%	4.28%	0.00%	9.50%	0.00%
Twitter Inc	TWTR	765.25	43.84	33,548.38					
AvalonBay Communities Inc	AVB	139.83	184.19	25,755.47	0.10%	3.45%	0.00%	8.00%	0.01%
Prudential Financial Inc	PRU	372.60	85.78	31,961.63	0.13%	5.60%	0.01%	5.50%	0.01%
United Parcel Service Inc	UPS	731.85	161.54	118,223.70	0.47%	3.76%	0.02%	11.50%	0.05%
Walgreens Boots Alliance Inc	WBA	864.26	31.40	27,137.67	0.11%	6.11%	0.01%	7.50%	0.01%
STERIS PLC	STE	100.02	166.28	16,630.49	0.07%	1.13%	0.00%	11.50%	0.01%
McKesson Corp	MCK	143.73	339.87	48,849.52	0.19%	0.64%	0.00%	10.00%	0.02%
Lockheed Martin Corp	LMT	265.15	386.29	102,425.57	0.41%	3.11%	0.01%	7.00%	0.03%
AmerisourceBergen Corp	ABC	207.26	135.33	28,048.23	0.11%	1.36%	0.00%	8.50%	0.01%
Capital One Financial Corp	COF	383.82	92.17	35,376.51		2.60%			
Waters Corp	WAT	59.88	269.53	16,138.38	0.06%			6.00%	0.00%
Nordson Corp	NDSN	57.21	212.27	12,144.18	0.05%	1.22%	0.00%	12.00%	0.01%
Dollar Tree Inc	DLTR	223.94	136.10	30,477.83	0.12%			12.00%	0.01%
Darden Restaurants Inc	DRI	122.58	126.32	15,484.31		3.83%		21.00%	
Match Group Inc	MTCH	282.99	47.75	13,512.58				21.00%	
Domino's Pizza Inc	DPZ	35.89	310.20	11,131.53	0.04%	1.42%	0.00%	14.50%	0.01%
NVR Inc	NVR	3.28	3,987.08	13,089.58	0.05%			5.50%	0.00%
NetApp Inc	NTAP	217.37	61.85	13,444.09	0.05%	3.23%	0.00%	8.00%	0.00%
DXC Technology Co	DXC	229.88	24.48	5,627.39	0.02%			12.00%	0.00%
Old Dominion Freight Line Inc	ODFL	111.77	248.77	27,806.02	0.11%	0.48%	0.00%	11.50%	0.01%
DaVita Inc	DVA	91.30	82.77	7,556.90	0.03%			11.00%	0.00%
Hartford Financial Services Group Inc/The	HIG	323.14	61.94	20,015.42	0.08%	2.49%	0.00%	6.50%	0.01%

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Iron Mountain Inc	IRM	290.69	43.97	12,781.42	0.05%	5.63%	0.00%	11.00%	0.01%
Estee Lauder Cos Inc/The	EL	231.55	215.90	49,990.78	0.20%	1.11%	0.00%	14.00%	0.03%
Cadence Design Systems Inc	CDNS	273.87	163.43	44,758.57	0.18%			12.00%	0.02%
Tyler Technologies Inc	TYL	41.58	347.50	14,449.40	0.06%			12.00%	0.01%
Universal Health Services Inc	UHS	65.72	88.18	5,794.93	0.02%	0.91%	0.00%	7.00%	0.00%
Skyworks Solutions Inc	SWKS	160.45	85.27	13,681.23	0.05%	2.91%	0.00%	13.00%	0.01%
Quest Diagnostics Inc	DGX	116.61	122.03	14,229.44	0.06%	2.16%	0.00%	3.50%	0.00%
Activision Blizzard Inc	ATVI	782.31	74.34	58,156.70	0.23%	0.63%	0.00%	14.00%	0.03%
Rockwell Automation Inc	ROK	115.44	215.11	24,831.22	0.10%	2.08%	0.00%	9.50%	0.01%
Kraft Heinz Co/The	KHC	1,225.44	33.35	40,868.42	0.16%	4.80%	0.01%	5.50%	0.01%
American Tower Corp	AMT	465.59	214.70	99,961.53	0.40%	2.74%	0.01%	9.00%	0.04%
Regeneron Pharmaceuticals Inc	REGN	107.19	688.87	73,839.98	0.29%			3.00%	0.01%
Amazon.com Inc	AMZN	10,187.56	113.00	1,151,193.72				26.50%	
Jack Henry & Associates Inc	JKHY	72.90	182.27	13,288.03	0.05%	1.08%	0.00%	9.00%	0.00%
Ralph Lauren Corp	RL	42.90	84.93	3,643.33	0.01%	3.53%	0.00%	12.50%	0.00%
Boston Properties Inc	BXP	156.74	74.97	11,750.42		5.23%		-1.00%	
Amphenol Corp	APH	594.83	66.96	39,829.68	0.16%	1.19%	0.00%	13.00%	0.02%
Howmet Aerospace Inc	HWM	415.40	30.93	12,848.41	0.05%	0.52%	0.00%	12.00%	0.01%
Pioneer Natural Resources Co	PXD	238.67	216.53	51,678.57		15.83%		21.00%	
Valero Energy Corp	VLO	393.97	106.85	42,095.69	0.17%	3.67%	0.01%	11.00%	0.02%
Synopsys Inc	SNPS	152.91	305.51	46,715.84	0.19%			12.50%	0.02%
Etsy Inc	ETSY	126.61	100.13	12,677.36				24.50%	
CH Robinson Worldwide Inc	CHRW	123.88	96.31	11,931.17	0.05%	2.28%	0.00%	8.50%	0.00%
Accenture PLC	ACN	664.19	257.30	170,895.57	0.68%	1.74%	0.01%	12.50%	0.09%
TransDigm Group Inc	TDG	54.24	524.82	28,463.61	0.11%			19.50%	0.02%
Yum! Brands Inc	YUM	284.54	106.34	30,258.20	0.12%	2.14%	0.00%	10.50%	0.01%
Prologis Inc	PLD	740.34	101.60	75,218.95	0.30%	3.11%	0.01%	6.00%	0.02%
FirstEnergy Corp	FE	571.40	37.00	21,141.62	0.08%	4.22%	0.00%	3.00%	0.00%
VeriSign Inc	VRSN	107.28	173.70	18,635.06	0.07%			11.00%	0.01%
Quanta Services Inc	PWR	143.02	127.39	18,219.70	0.07%	0.22%	0.00%	12.50%	0.01%
Henry Schein Inc	HSIC	136.12	65.77	8,952.28	0.04%			7.00%	0.00%
Ameren Corp	AEE	258.09	80.55	20,789.31	0.08%	2.93%	0.00%	6.50%	0.01%
ANSYS Inc	ANSS	87.07	221.70	19,303.20	0.08%			8.50%	0.01%
FactSet Research Systems Inc	FDS	37.98	400.11	15,196.18	0.06%	0.89%	0.00%	10.50%	0.01%
NVIDIA Corp	NVDA	2,490.00	121.39	302,261.10		0.13%		23.00%	
Sealed Air Corp	SEE	145.23	44.51	6,464.05	0.03%	1.80%	0.00%	10.00%	0.00%
Cognizant Technology Solutions Corp	CTSH	517.79	57.44	29,741.57	0.12%	1.88%	0.00%	7.50%	0.01%
SVB Financial Group	SIVB	59.08	335.78	19,838.55	0.08%			6.50%	0.01%
Intuitive Surgical Inc	ISRG	357.11	187.44	66,936.89	0.27%			12.50%	0.03%
Take-Two Interactive Software Inc	TTWO	166.49	109.00	18,147.30	0.07%			10.50%	0.01%
Republic Services Inc	RSG	315.93	136.04	42,979.53	0.17%	1.46%	0.00%	12.50%	0.02%
eBay Inc	EBAY	549.37	36.81	20,222.24	0.08%	2.39%	0.00%	15.50%	0.01%
Goldman Sachs Group Inc/The	GS	341.36	293.05	100,034.38	0.40%	3.41%	0.01%	5.00%	0.02%

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SBA Communications Corp	SBAC	107.88	284.65	30,707.47		1.00%		35.50%	
Sempra Energy	SRE	314.31	149.94	47,127.64	0.19%	3.05%	0.01%	7.50%	0.01%
Moody's Corp	MCO	183.50	243.11	44,610.69	0.18%	1.15%	0.00%	8.00%	0.01%
ON Semiconductor Corp	ON	433.24	62.33	27,003.60				22.50%	
Booking Holdings Inc	BKNG	39.71	1,643.21	65,245.30				22.00%	
F5 Inc	FFIV	59.56	144.73	8,620.41	0.03%			10.00%	0.00%
Akamai Technologies Inc	AKAM	158.96	80.32	12,767.43	0.05%			5.50%	0.00%
Charles River Laboratories International Inc	CRL	50.86	196.80	10,009.84	0.04%			12.00%	0.00%
MarketAxess Holdings Inc	MKTX	37.64	222.49	8,374.52	0.03%	1.26%	0.00%	11.00%	0.00%
Devon Energy Corp	DVN	654.80	60.13	39,373.12		10.31%		30.00%	
Bio-Techne Corp	TECH	39.22	284.00	11,139.33	0.04%	0.45%	0.00%	17.50%	0.01%
Alphabet Inc	GOOGL	5,996.00	95.65	573,517.40					
Teleflex Inc	TFX	46.91	201.46	9,449.48	0.04%	0.68%	0.00%	10.00%	0.00%
Netflix Inc	NFLX	444.71	235.44	104,701.58	0.42%			14.50%	0.06%
Allegion plc	ALLE	87.84	89.68	7,877.31	0.03%	1.83%	0.00%	10.50%	0.00%
Agilent Technologies Inc	A	296.04	121.34	35,921.61	0.14%	0.69%	0.00%	12.00%	0.02%
Warner Bros Discovery Inc	WBD	2,427.59	11.50	27,917.32					
Elevance Health Inc	ELV	240.00	454.24	109,018.05	0.44%	1.13%	0.00%	12.50%	0.05%
Trimble Inc	TRMB	247.66	54.27	13,440.35	0.05%			10.00%	0.01%
CME Group Inc	CME	359.43	177.13	63,666.37	0.25%	2.26%	0.01%	8.50%	0.02%
Juniper Networks Inc	JNPR	322.61	26.12	8,426.55	0.03%	3.22%	0.00%	9.00%	0.00%
BlackRock Inc	BLK	150.77	550.28	82,965.17	0.33%	3.55%	0.01%	10.00%	0.03%
DTE Energy Co	DTE	193.74	115.05	22,290.02	0.09%	3.08%	0.00%	4.50%	0.00%
Nasdaq Inc	NDAQ	491.23	56.68	27,842.69	0.11%	1.41%	0.00%	6.00%	0.01%
Celanese Corp	CE	108.35	90.34	9,788.25	0.04%	3.01%	0.00%	7.50%	0.00%
Philip Morris International Inc	PM	1,550.16	83.01	128,679.03	0.51%	6.12%	0.03%	7.00%	0.04%
Salesforce Inc	CRM	1,000.00	143.84	143,840.00	0.57%			19.50%	0.11%
Ingersoll Rand Inc	IR	403.18	43.26	17,441.61		0.18%			
Huntington Ingalls Industries Inc	HII	39.95	221.50	8,848.48	0.04%	2.13%	0.00%	10.00%	0.00%
MetLife Inc	MET	797.61	60.78	48,478.98	0.19%	3.29%	0.01%	7.50%	0.01%
Tapestry Inc	TPR	242.05	28.43	6,881.48	0.03%	4.22%	0.00%	10.00%	0.00%
CSX Corp	CSX	2,141.24	26.64	57,042.66	0.23%	1.50%	0.00%	10.50%	0.02%
Edwards Lifesciences Corp	EW	619.94	82.63	51,225.89	0.20%			12.00%	0.02%
Ameriprise Financial Inc	AMP	108.17	251.95	27,252.42	0.11%	1.98%	0.00%	12.50%	0.01%
Zebra Technologies Corp	ZBRA	51.79	262.01	13,569.50	0.05%			11.50%	0.01%
Zimmer Biomet Holdings Inc	ZBH	209.82	104.55	21,936.68	0.09%	0.92%	0.00%	7.00%	0.01%
CBRE Group Inc	CBRE	321.17	67.51	21,682.25	0.09%			8.50%	0.01%
Camden Property Trust	CPT	106.53	119.45	12,724.77	0.05%	3.15%	0.00%	4.50%	0.00%
Mastercard Inc	MA	958.68	284.34	272,589.93	1.09%	0.69%	0.01%	18.50%	0.20%
CarMax Inc	KMX	158.02	66.02	10,432.15	0.04%			13.00%	0.01%
Intercontinental Exchange Inc	ICE	558.46	90.35	50,456.68	0.20%	1.68%	0.00%	6.50%	0.01%
Fidelity National Information Services Inc	FIS	607.98	75.57	45,944.97		2.49%		52.00%	
Chipotle Mexican Grill Inc	CMG	27.77	1,502.76	41,724.13				22.50%	

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Wynn Resorts Ltd	WYNN	113.73	63.03	7,168.40				27.00%	
Live Nation Entertainment Inc	LYV	229.97	76.04	17,487.07					
Assurant Inc	AIZ	53.21	145.27	7,729.67	0.03%	1.87%	0.00%	15.50%	0.00%
NRG Energy Inc	NRG	235.15	38.27	8,999.08		3.66%		-10.50%	
Regions Financial Corp	RF	934.40	20.07	18,753.33	0.07%	3.99%	0.00%	11.50%	0.01%
Monster Beverage Corp	MNST	526.89	86.96	45,817.92	0.18%			11.50%	0.02%
Mosaic Co/The	MOS	345.27	48.33	16,686.75		1.24%		38.00%	
Baker Hughes Co	BKR	1,011.75	20.96	21,206.36		3.44%			
Expedia Group Inc	EXPE	152.04	93.69	14,244.16					
Evergy Inc	EVRG	229.48	59.40	13,630.99	0.05%	3.86%	0.00%	7.50%	0.00%
CF Industries Holdings Inc	CF	199.26	96.25	19,178.87		1.66%		32.00%	
Leidos Holdings Inc	LDOS	136.54	87.47	11,943.24	0.05%	1.65%	0.00%	8.50%	0.00%
APA Corp	APA	326.53	34.19	11,164.06		2.92%			
Alphabet Inc	GOOG	6,163.00	96.15	592,572.45	2.36%			18.50%	0.44%
TE Connectivity Ltd	TEL	319.84	110.36	35,297.43	0.14%	2.03%	0.00%	10.50%	0.01%
Cooper Cos Inc/The	COO	49.35	263.90	13,022.41	0.05%	0.02%	0.00%	14.00%	0.01%
Discover Financial Services	DFS	273.17	90.92	24,836.71	0.10%	2.64%	0.00%	16.00%	0.02%
Visa Inc	V	1,635.02	177.65	290,460.41	1.16%	0.84%	0.01%	13.50%	0.16%
Mid-America Apartment Communities Inc	MAA	115.44	155.07	17,901.13	0.07%	3.22%	0.00%	4.50%	0.00%
Xylem Inc/NY	XYL	180.18	87.36	15,740.70	0.06%	1.37%	0.00%	9.00%	0.01%
Marathon Petroleum Corp	MPC	498.62	99.33	49,528.32		2.34%			
Tractor Supply Co	TSCO	111.00	185.88	20,632.68	0.08%	1.98%	0.00%	12.50%	0.01%
Advanced Micro Devices Inc	AMD	1,614.32	63.36	102,283.38				25.50%	
ResMed Inc	RMD	146.43	218.30	31,964.58	0.13%	0.81%	0.00%	8.50%	0.01%
Mettler-Toledo International Inc	MTD	22.51	1,084.12	24,400.29	0.10%			12.50%	0.01%
VICI Properties Inc	VICI	963.09	29.85	28,748.33	0.11%	5.23%	0.01%	8.50%	0.01%
Copart Inc	CPRT	238.06	106.40	25,329.26	0.10%			12.00%	0.01%
Jacobs Solutions Inc	J	127.61	108.49	13,843.97	0.06%	0.85%	0.00%	12.00%	0.01%
Albemarle Corp	ALB	117.13	264.44	30,973.59	0.12%	0.60%	0.00%	15.00%	0.02%
Fortinet Inc	FTNT	788.52	49.13	38,740.04				21.50%	
Moderna Inc	MRNA	391.20	118.25	46,259.40				-2.50%	
Essex Property Trust Inc	ESS	65.12	242.23	15,774.99		3.63%		-4.00%	
CoStar Group Inc	CSGP	406.55	69.65	28,316.35	0.11%			13.00%	0.01%
Realty Income Corp	O	617.58	58.20	35,942.98	0.14%	5.11%	0.01%	6.00%	0.01%
Westrock Co	WRK	254.30	30.89	7,855.27	0.03%	3.24%	0.00%	20.00%	0.01%
Westinghouse Air Brake Technologies Corp	WAB	181.88	81.35	14,795.53	0.06%	0.74%	0.00%	9.50%	0.01%
Pool Corp	POOL	39.59	318.21	12,598.25	0.05%	1.26%	0.00%	14.00%	0.01%
Western Digital Corp	WDC	314.49	32.55	10,236.75	0.04%			20.00%	0.01%
PepsiCo Inc	PEP	1,380.09	163.26	225,312.68	0.90%	2.82%	0.03%	6.00%	0.05%
Diamondback Energy Inc	FANG	177.79	120.46	21,415.98		10.13%			
ServiceNow Inc	NOW	202.00	377.61	76,277.22				45.50%	
Church & Dwight Co Inc	CHD	242.91	71.44	17,353.42	0.07%	1.47%	0.00%	6.00%	0.00%
Federal Realty Investment Trust	FRT	80.91	90.12	7,291.43	0.03%	4.79%	0.00%	2.50%	0.00%

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MGM Resorts International	MGM	393.10	29.72	11,682.99		0.03%		25.00%	
American Electric Power Co Inc	AEP	513.73	86.45	44,412.30	0.18%	3.61%	0.01%	6.50%	0.01%
SolarEdge Technologies Inc	SEDG	55.64	231.46	12,877.28				22.00%	
Invitation Homes Inc	INVH	610.36	33.77	20,611.86		2.61%			
PTC Inc	PTC	117.47	104.60	12,286.94				29.00%	
JB Hunt Transport Services Inc	JBHT	103.81	156.42	16,238.43	0.06%	1.02%	0.00%	11.50%	0.01%
Lam Research Corp	LRCX	136.84	366.00	50,081.61	0.20%	1.89%	0.00%	20.00%	0.04%
Mohawk Industries Inc	MHK	63.53	91.19	5,793.67	0.02%			10.00%	0.00%
Pentair PLC	PNR	164.46	40.63	6,682.01	0.03%	2.07%	0.00%	13.00%	0.00%
Vertex Pharmaceuticals Inc	VRTX	256.46	289.54	74,255.14	0.30%			12.50%	0.04%
Amcor PLC	AMCR	1,489.02	10.73	15,977.18	0.06%	4.47%	0.00%	14.50%	0.01%
Meta Platforms Inc	META	2,280.67	135.68	309,441.58	1.23%			16.00%	0.20%
T-Mobile US Inc	TMUS	1,254.04	134.17	168,254.68	0.67%			10.00%	0.07%
United Rentals Inc	URI	69.99	270.12	18,904.35	0.08%			18.00%	0.01%
ABIOMED Inc	ABMD	45.46	245.66	11,167.95	0.04%			7.50%	0.00%
Honeywell International Inc	HON	673.69	166.97	112,486.35	0.45%	2.47%	0.01%	11.00%	0.05%
Alexandria Real Estate Equities Inc	ARE	163.17	140.19	22,874.52	0.09%	3.37%	0.00%	10.00%	0.01%
Delta Air Lines Inc	DAL	641.20	28.06	17,992.02					
Seagate Technology Holdings PLC	STX	208.03	53.23	11,073.44	0.04%	5.26%	0.00%	15.00%	0.01%
United Airlines Holdings Inc	UAL	326.73	32.53	10,628.49					
News Corp	NWS	195.82	15.42	3,019.61		1.30%			
Centene Corp	CNC	571.58	77.81	44,474.72	0.18%			10.00%	0.02%
Martin Marietta Materials Inc	MLM	62.37	322.09	20,090.04	0.08%	0.82%	0.00%	5.50%	0.00%
Teradyne Inc	TER	156.78	75.15	11,782.17	0.05%	0.59%	0.00%	8.50%	0.00%
PayPal Holdings Inc	PYPL	1,156.48	86.07	99,537.89	0.40%			12.00%	0.05%
Tesla Inc	TSLA	3,133.47	265.25	831,152.92				52.00%	
DISH Network Corp	DISH	291.87	13.83	4,036.56	0.02%			2.50%	0.00%
Dow Inc	DOW	718.17	43.93	31,549.08	0.13%	6.37%	0.01%	15.00%	0.02%
Everest Re Group Ltd	RE	39.41	262.44	10,342.76	0.04%	2.51%	0.00%	17.50%	0.01%
Teledyne Technologies Inc	TDY	46.87	337.47	15,815.53	0.06%			11.50%	0.01%
News Corp	NWSA	385.60	15.11	5,826.39		1.32%			
Exelon Corp	EXC	991.76	37.46	37,151.22		3.60%			
Global Payments Inc	GPN	277.16	108.05	29,947.46	0.12%	0.93%	0.00%	17.00%	0.02%
Crown Castle Inc	CCI	433.04	144.55	62,595.79	0.25%	4.07%	0.01%	12.00%	0.03%
Aptiv PLC	APTV	270.93	78.21	21,189.67				26.00%	
Advance Auto Parts Inc	AAP	60.12	156.34	9,398.85	0.04%	3.84%	0.00%	16.00%	0.01%
Align Technology Inc	ALGN	78.11	207.11	16,176.95	0.06%			17.00%	0.01%
Illumina Inc	ILMN	157.30	190.79	30,011.27	0.12%			6.50%	0.01%
LKQ Corp	LKQ	274.39	47.15	12,937.49	0.05%	2.12%	0.00%	13.00%	0.01%
Nielsen Holdings PLC	NLSN	359.83	27.72	9,974.60		0.87%			
Zoetis Inc	ZTS	468.14	148.29	69,420.33	0.28%	0.88%	0.00%	11.00%	0.03%
Equinix Inc	EQIX	91.08	568.84	51,807.10	0.21%	2.18%	0.00%	15.00%	0.03%
Digital Realty Trust Inc	DLR	287.41	99.18	28,505.13		4.92%		-3.50%	

STANDARD & POOR'S 500 INDEX

Name	Ticker	[4] Shares Outst'g	[5] Price	[6] Market Capitalization	[7] Weight in Index	[8] Estimated Dividend Yield	[9] Cap-Weighted Dividend Yield	[10] Value Line Long-Term Growth Est.	[11] Cap-Weighted Long-Term Growth Est.
Las Vegas Sands Corp	LVS	764.16	37.52	28,671.13	0.11%			13.50%	0.02%
Molina Healthcare Inc	MOH	58.10	329.84	19,163.70	0.08%			11.00%	0.01%

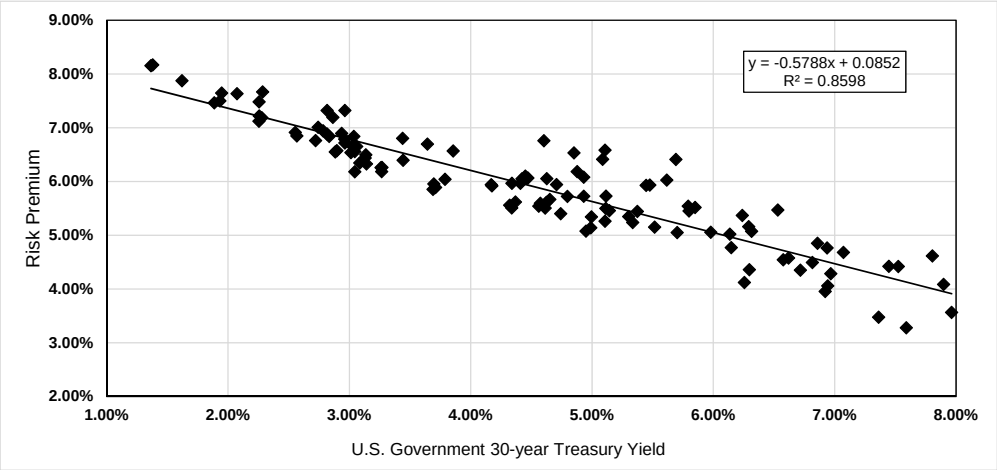
Notes:
[1] Equals sum of Col. [9]
[2] Equals sum of Col. [11]
[3] Equals ([1] x (1 + (0.5 x [2]))) + [2]
[4] Source: Bloomberg Professional as of January 31, 2022
[5] Source: Bloomberg Professional as of January 31, 2022
[6] Equals [4] x [5]
[7] Equals weight in S&P 500 based on market capitalization [6] if Growth Rate >0% and ≤20%
[5] Source: Bloomberg Professional as of January 31, 2022
[9] Equals [7] x [8]
[10] Source: Value Line, as of January 31, 2021
[11] Equals [7] x [10]

BOND YIELD PLUS RISK PREMIUM

Quarter	[1] Average Authorized Natual Gas	[2] U.S. Govt. 30-year Treasury	[3] Risk Premium
1992.1	12.42%	7.81%	4.61%
1992.2	11.98%	7.90%	4.09%
1992.3	11.87%	7.45%	4.42%
1992.4	11.94%	7.52%	4.42%
1993.1	11.75%	7.07%	4.68%
1993.2	11.71%	6.86%	4.85%
1993.3	11.39%	6.32%	5.07%
1993.4	11.16%	6.14%	5.02%
1994.1	11.12%	6.58%	4.54%
1994.2	10.84%	7.36%	3.47%
1994.3	10.87%	7.59%	3.28%
1994.4	11.53%	7.96%	3.56%
1995.2	11.00%	6.94%	4.06%
1995.3	11.07%	6.72%	4.35%
1995.4	11.61%	6.24%	5.37%
1996.1	11.45%	6.29%	5.16%
1996.2	10.88%	6.92%	3.95%
1996.3	11.25%	6.97%	4.28%
1996.4	11.19%	6.62%	4.57%
1997.1	11.31%	6.82%	4.49%
1997.2	11.70%	6.94%	4.76%
1997.3	12.00%	6.53%	5.47%
1997.4	10.92%	6.15%	4.77%
1998.2	11.37%	5.85%	5.52%
1998.3	11.41%	5.48%	5.93%
1998.4	11.69%	5.11%	6.58%
1999.1	10.82%	5.37%	5.44%
1999.2	11.25%	5.80%	5.45%
1999.4	10.38%	6.26%	4.12%
2000.1	10.66%	6.30%	4.36%
2000.2	11.03%	5.98%	5.05%
2000.3	11.33%	5.79%	5.54%
2000.4	12.10%	5.69%	6.41%
2001.1	11.38%	5.45%	5.93%
2001.2	10.75%	5.70%	5.05%
2001.4	10.65%	5.30%	5.35%
2002.1	10.67%	5.52%	5.15%
2002.2	11.64%	5.62%	6.03%
2002.3	11.50%	5.09%	6.41%
2002.4	11.01%	4.93%	6.08%
2003.1	11.38%	4.85%	6.53%
2003.2	11.36%	4.60%	6.76%
2003.3	10.61%	5.11%	5.50%
2003.4	10.84%	5.11%	5.73%
2004.1	11.06%	4.88%	6.18%
2004.2	10.57%	5.34%	5.24%
2004.3	10.37%	5.11%	5.26%
2004.4	10.66%	4.93%	5.73%
2005.1	10.65%	4.71%	5.94%
2005.2	10.54%	4.47%	6.07%
2005.3	10.47%	4.42%	6.05%
2005.4	10.32%	4.65%	5.66%
2006.1	10.68%	4.63%	6.05%
2006.2	10.60%	5.14%	5.46%
2006.3	10.34%	5.00%	5.34%
2006.4	10.14%	4.74%	5.40%
2007.1	10.52%	4.80%	5.72%
2007.2	10.13%	4.99%	5.14%
2007.3	10.03%	4.95%	5.08%
2007.4	10.12%	4.61%	5.50%
2008.1	10.38%	4.41%	5.97%
2008.2	10.17%	4.57%	5.59%
2008.3	10.55%	4.45%	6.10%
2008.4	10.34%	3.64%	6.69%
2009.1	10.24%	3.44%	6.80%
2009.2	10.11%	4.17%	5.94%

BOND YIELD PLUS RISK PREMIUM

	[1]	[2]	[3]
Quarter	Average Authorized Natual Gas	U.S. Govt. 30-year Treasury	Risk Premium
2009.3	9.88%	4.32%	5.56%
2009.4	10.31%	4.34%	5.97%
2010.1	10.24%	4.62%	5.61%
2010.2	9.99%	4.37%	5.62%
2010.3	10.43%	3.86%	6.57%
2010.4	10.09%	4.17%	5.92%
2011.1	10.10%	4.56%	5.54%
2011.2	9.85%	4.34%	5.51%
2011.3	9.65%	3.70%	5.95%
2011.4	9.88%	3.04%	6.84%
2012.1	9.63%	3.14%	6.50%
2012.2	9.83%	2.94%	6.89%
2012.3	9.75%	2.74%	7.01%
2012.4	10.06%	2.86%	7.19%
2013.1	9.57%	3.13%	6.44%
2013.2	9.47%	3.14%	6.33%
2013.3	9.60%	3.71%	5.89%
2013.4	9.83%	3.79%	6.04%
2014.1	9.54%	3.69%	5.85%
2014.2	9.84%	3.44%	6.39%
2014.3	9.45%	3.27%	6.18%
2014.4	10.28%	2.96%	7.32%
2015.1	9.47%	2.55%	6.91%
2015.2	9.43%	2.88%	6.55%
2015.3	9.75%	2.96%	6.79%
2015.4	9.68%	2.96%	6.71%
2016.1	9.48%	2.72%	6.76%
2016.2	9.42%	2.57%	6.85%
2016.3	9.47%	2.28%	7.19%
2016.4	9.67%	2.83%	6.84%
2017.1	9.60%	3.05%	6.55%
2017.2	9.47%	2.90%	6.57%
2017.3	10.14%	2.82%	7.32%
2017.4	9.70%	2.82%	6.88%
2018.1	9.68%	3.02%	6.66%
2018.2	9.43%	3.09%	6.34%
2018.3	9.71%	3.06%	6.65%
2018.4	9.53%	3.27%	6.26%
2019.1	9.55%	3.01%	6.54%
2019.2	9.73%	2.78%	6.94%
2019.3	9.95%	2.29%	7.67%
2019.4	9.74%	2.26%	7.48%
2020.1	9.35%	1.89%	7.46%
2020.2	9.55%	1.38%	8.17%
2020.3	9.52%	1.37%	8.15%
2020.4	9.50%	1.62%	7.87%
2021.1	9.71%	2.07%	7.63%
2021.2	9.48%	2.26%	7.22%
2021.3	9.43%	1.93%	7.50%
2021.4	9.59%	1.95%	7.65%
2022.1	9.38%	2.25%	7.12%
2022.2	9.23%	3.05%	6.18%
2022.3	9.52%	3.26%	6.26%
AVERAGE	10.42%	4.50%	5.91%
MEDIAN	10.32%	4.57%	5.95%



SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.927263
R Square	0.859817
Adjusted R Square	0.858619
Standard Error	0.003883
Observations	119.000000

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1.000000	0.010822	0.010822	717.621589	0.000000
Residual	117.000000	0.001764	0.000015		
Total	118.000000	0.012587			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.0852	0.0010	82.2486	0.0000	0.0832	0.0873	0.0832	0.0873
U.S. Govt. 30-year Treasury	(0.5788)	0.0216	(26.7885)	0.0000	(0.6216)	(0.5360)	(0.6216)	(0.5360)

	[7] U.S. Govt. 30-year Treasury	[8] Risk Premium	[9] ROE
Current 30-day average of 30-year U.S. Treasury bond yield [4]	3.47%	6.52%	9.98%
Blue Chip Near-Term Projected Forecast (Q1 2023 - Q1 2024) [5]	3.88%	6.28%	10.16%
Blue Chip Long-Term Projected Forecast (2024-2028) [6]	3.80%	6.32%	10.12%
AVERAGE			10.09%

Notes:
[1] Source: Regulatory Research Associates, rate cases through September 30, 2022
[2] Source: S&P Capital IQ Pro, quarterly bond yields are the average of each trading day in the quarter
[3] Equals Column [1] − Column [2]
[4] Source: S&P Capital IQ Pro, 30-day average as of September 30, 2022
[5] Source: Blue Chip Financial Forecasts, Vol. 41, No. 10, October 1, 2022, at 2
[6] Source: Blue Chip Financial Forecasts, Vol. 41, No. 6, June 1, 2021, at 14
[7] See notes [4], [5] & [6]
[8] Equals 0.085214 + (-0.578770 x Column [7])
[9] Equals Column [7] + Column [8]

SIZE PREMIUM CALCULATION

Proxy Group Market Capitalization and Market-to-Book Ratio

Company	Ticker	[1] Market Capitalization ($ billions)	[2] Market-to-Book Ratio
Atmos Energy Corporation	ATO	15.96	1.72
New Jersey Resources Corporation	NJR	4.26	2.41
NiSource Inc.	NI	11.89	2.18
Northwest Natural Gas Company	NWN	1.68	1.47
ONE Gas Inc.	OGS	4.29	1.75
Spire, Inc.	SR	3.67	1.41
Average		6.96	1.82
Median		4.27	1.73

MERC		
Common Equity ($ millions) [3]	$	229.09
Implied Market Capitalization [4]		397.33
As a percent of Proxy Group Median Market Capitalization		9.30%

Kroll Cost of Capital Navigator -- Size Premium

	[5]	[6]
Breakdown of Deciles 1-10	Market Capitalization of Largest Company ($ millions)	Size Premium
1-Largest	2,324,390.22	-0.22%
2	36,099.22	0.43%
3	16,738.36	0.55%
4	8,212.64	0.54%
5	5,003.75	0.89%
6	3,276.55	1.18%
7	2,164.52	1.34%
8	1,306.04	1.21%
9	627.80	2.10%
10-Smallest	289.01	4.80%
MERC - Implied Market Capitalization	397.33	2.10%
Proxy Group Median Market Capitalization	4,274.49	0.89%
Size Premium [7]		1.21%

Notes:

[1] Source: S&P Capital IQ Pro, equals 30-day average as of September 30, 2022
[2] Source: S&P Capital IQ Pro; equals 30-day average as of September 30, 2022
[3] Year 2021 Total common equity provided by MERC.
[4] Equals [3] x proxy group median market-to-book ratio
[5] Kroll Cost of Capital Navigator - Size Premium: Annual Data as of 12/31/2021
[6] Kroll Cost of Capital Navigator - Size Premium: Annual Data as of 12/31/2021
[7] Equals 2.10% − 0.89%

2023-2027 CAPITAL EXPENDITURES AS A PERCENTAGE OF2021 NET PLANT

($ Millions)

		[1]	[2]	[3]	[4]	[5]	[6]	[7]
		2021	2023	2024	2025	2026	2027	2023-2027 Cap. Ex. / Year 0 Net Plant
Atmos Energy Corporation	ATO							
Capital Spending per Share			$ 17.10	$ 17.55	$ 18.00	$ 18.00	$ 18.00	
Common Shares Outstanding			$ 146.00	$ 150.50	$ 155.00	$ 155.00	$ 155.00	
Capital Expenditures			$ 2,496.60	$ 2,641.28	$ 2,790.00	$ 2,790.00	$ 2,790.00	89.67%
Net Plant		$ 15,064						
New Jersey Resources Corporation	NJR							
Capital Spending per Share			$ 5.15	$ 6.83	$ 8.50	$ 8.50	$ 8.50	
Common Shares Outstanding			$ 99.00	$ 99.50	$ 100.00	$ 100.00	$ 100.00	
Capital Expenditures			$ 509.85	$ 679.09	$ 850.00	$ 850.00	$ 850.00	88.74%
Net Plant		$ 4,214						
NiSource Inc.	NI							
Capital Spending per Share			$ 8.10	$ 6.93	$ 5.75	$ 5.75	$ 5.75	
Common Shares Outstanding			$ 408.00	$ 411.50	$ 415.00	$ 415.00	$ 415.00	
Capital Expenditures			$ 3,304.80	$ 2,849.64	$ 2,386.25	$ 2,386.25	$ 2,386.25	74.45%
Net Plant		$ 17,882						
Northwest Natural Gas Company	NWN							
Capital Spending per Share			$ 7.75	$ 8.58	$ 9.40	$ 9.40	$ 9.40	
Common Shares Outstanding			$ 35.50	$ 33.75	$ 32.00	$ 32.00	$ 32.00	
Capital Expenditures			$ 275.13	$ 289.41	$ 300.80	$ 300.80	$ 300.80	51.09%
Net Plant		$ 2,871						
ONE Gas, Inc.	OGS							
Capital Spending per Share			$ 9.55	$ 9.70	$ 9.85	$ 9.85	$ 9.85	
Common Shares Outstanding			$ 54.50	$ 55.75	$ 57.00	$ 57.00	$ 57.00	
Capital Expenditures			$ 520.48	$ 540.78	$ 561.45	$ 561.45	$ 561.45	52.89%
Net Plant		$ 5,191						
Spire, Inc.	SR							
Capital Spending per Share			$ 11.25	$ 11.63	$ 12.00	$ 12.00	$ 12.00	
Common Shares Outstanding			$ 52.50	$ 53.75	$ 55.00	$ 55.00	$ 55.00	
Capital Expenditures			$ 590.63	$ 624.84	$ 660.00	$ 660.00	$ 660.00	63.21%
Net Plant		$ 5,056						
MERC	MERC							
Capital Expenditures [8]							$ 290.00	66.21%
Net Plant [9]		$ 438						

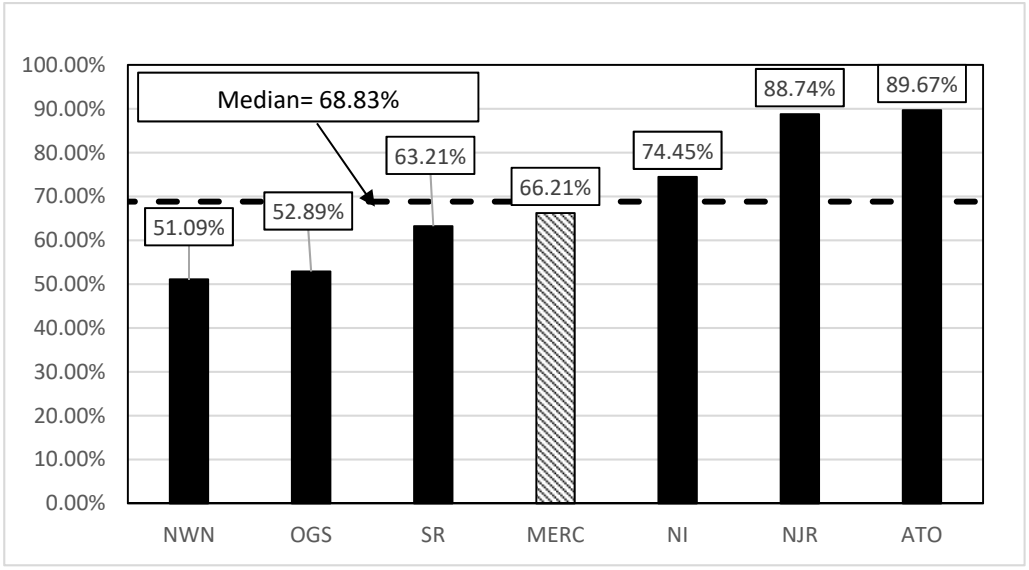
Notes:

[1] - [6] Source: Value Line, dated August 26, 2022

[7] Equals (Column [2] + [3] + [4] + [5] + [6]) / Column [1]

[8] Forecast is 2022-2026 Source: WEC Energy Group Investor Presentation September 2022, p. 38.

[9] Source: Company-Provided Data for December 31, 2021



Projected CAPEX/2020 Net Plant

Company	Ticker	2020/2026
Northwest Natural Gas Company	NWN	51.09%
ONE Gas, Inc.	OGS	52.89%
Spire, Inc.	SR	63.21%
MERC	MERC	66.21%
NiSource Inc.	NI	74.45%
New Jersey Resources Corporation	NJR	88.74%
Atmos Energy Corporation	ATO	89.67%
Proxy Group Median		68.83%
MERC		66.21%

PUBLIC DOCUMENT
TRADE SECRET DATA
HAS BEEN EXCISED

REGULATORY RISK ASSESSMENT
Comparison of MERC and Proxy Group Companies

[TRADE SECRET DATA BEGINS...

Parent Company	Operating Subsidiary	State	Type	[1] Full/Partial Forecasted Test Year	[2] Partial/Full Revenue Decoupling	[3] Capital Cost Recovery Mechanism
Atmos Energy Corporation	Atmos Energy Corporation	Kansas	Gas			
	Atmos Energy Corporation	Kentucky	Gas			
	Atmos Energy Corporation	Louisiana	Gas			
	Atmos Energy Corporation	Mississippi	Gas			
	Atmos Energy Corporation	Tennessee	Gas			
	Atmos Energy Corporation	Texas	Gas			
New Jersey Resources Corporation	New Jersey Natural Gas Co.	New Jersey	Gas			
NiSource Inc.	Northern Indiana Public Service Co.	Indiana	Electric			
	Northern Indiana Public Service Co.	Indiana	Gas			
	Columbia Gas of Kentucky Inc	Kentucky	Gas			
	Columbia Gas of Maryland Inc.	Maryland	Gas			
	Columbia Gas of Ohio Inc.	Ohio	Gas			
	Columbia Gas of Pennsylvania Inc.	Pennsylvania	Gas			
	Columbia Gas of Virginia Inc.	Virginia	Gas			
Northwest Natural Gas Company	Northwest Natural Gas Co.	Oregon	Gas			
	Northwest Natural Gas Co.	Washington	Gas			
ONE Gas, Inc.	Kansas Gas Service Co.	Kansas	Gas			
	Oklahoma Natural Gas Co.	Oklahoma	Gas			
	Texas Gas Service Co. Inc.	Texas	Gas			
Spire, Inc.	Spire Alabama Inc.	Alabama	Gas			
	Spire Gulf Inc.	Alabama	Gas			
	Spire Missouri Inc.	Missouri	Gas			
Proxy Group Totals			**Yes**			
			No			
			% Full/Partial			
MERC	**MERC**	**Minnesota**				

...TRADE SECRET DATA ENDS]

Notes
[1] S&P Capital IQ Pro, Rate Case History (Past Rate Cases), ATO LA Tariff, ATO MS Tariff, SR AL Tariff, and SR Gulf Tariff.
[2]-[3] "Adjustment Clauses: A State-by-state Overview," Regulatory Research Associates, July 18, 2022. Operating subsidiaries not covered in this report were excluded from this exhibit.

CAPITAL STRUCTURE ANALYSIS

COMMON EQUITY RATIO [1]

Proxy Group Company	Ticker	2021	2020	2019	3-yr Avg.
Atmos Energy Corporation	ATO	59.88%	58.31%	57.85%	58.68%
NiSource Inc.	NI	54.85%	54.43%	54.33%	54.54%
New Jersey Resources Corporation	NJR	51.75%	55.13%	57.55%	54.81%
Northwest Natural Gas Company	NWN	44.08%	41.92%	45.77%	43.92%
One Gas Inc.	OGS	61.09%	60.04%	63.28%	61.47%
Spire Inc.	SR	49.12%	52.78%	53.20%	51.70%
Proxy Group					
MEAN		53.46%	53.77%	55.33%	54.19%
MEDIAN		53.30%	54.78%	55.94%	54.67%
LOW		44.08%	41.92%	45.77%	43.92%
HIGH		61.09%	60.04%	63.28%	61.47%
		0.586252			

COMMON EQUITY RATIO - UTILITY OPERATING COMPANIES

Company Name	Ticker	2021	2020	2019	3-yr Avg.
Atmos Energy Corporation	ATO	59.88%	58.31%	57.85%	58.68%
Northern Indiana Public Service Company LLC	NI	58.59%	58.01%	56.43%	57.68%
Columbia Gas of Kentucky, Inc.	NI	53.87%	54.68%	54.23%	54.26%
Columbia Gas of Maryland, Inc.	NI	55.26%	54.95%	52.38%	54.20%
Columbia Gas of Ohio, Inc.	NI	50.79%	50.45%	53.00%	51.41%
Columbia Gas of Pennsylvania, Inc.	NI	56.05%	55.68%	55.59%	55.77%
Columbia Gas of Virginia, Inc.	NI	44.52%	43.69%	42.53%	43.58%
New Jersey Natural Gas Company	NJR	51.75%	55.13%	57.55%	54.81%
Northwest Natural Gas Company	NWN	44.08%	41.92%	45.77%	43.92%
Kansas Gas Service Company, Inc.	OGS	61.37%	60.33%	63.55%	61.75%
Oklahoma Natural Gas Company	OGS	60.99%	59.85%	63.10%	61.31%
Texas Gas Service Company, Inc.	OGS	60.98%	59.99%	63.23%	61.40%
Spire Alabama Inc.	SR	56.81%	58.95%	60.54%	58.77%
Spire Gulf Inc.	SR	41.14%	39.49%	37.18%	39.27%
Spire Mississippi Inc.	SR	39.18%	38.74%	45.95%	41.29%
Spire Missouri Inc.	SR	46.20%	50.65%	50.45%	49.10%

Notes:

[1] Ratios are weighted by actual common capital, preferred equity, long-term debt and short-term debt of Operating Subsidiaries.

[2] Natural Gas operating subsidiaries where data was unable to be obtained for 2021, 2020 and 2019 were removed from the analysis.

CAPITAL STRUCTURE ANALYSIS

LONG-TERM DEBT RATIO [1]

Proxy Group Company	Ticker	2021	2020	2019	3-yr Avg.
Atmos Energy Corporation	ATO	40.12%	41.69%	41.16%	40.99%
NiSource Inc.	NI	45.15%	45.57%	45.67%	45.46%
New Jersey Resources Corporation	NJR	42.01%	44.29%	40.21%	42.17%
Northwest Natural Gas Company	NWN	44.85%	46.45%	47.27%	46.19%
One Gas Inc.	OGS	38.91%	39.96%	36.72%	38.53%
Spire Inc.	SR	39.38%	37.20%	34.23%	36.94%
Proxy Group					
MEAN		41.73%	42.53%	40.88%	41.71%
MEDIAN		41.06%	42.99%	40.69%	41.58%
LOW		38.91%	37.20%	34.23%	36.94%
HIGH		45.15%	46.45%	47.27%	46.19%

LONG-TERM DEBT RATIO - UTILITY OPERATING COMPANIES

Company Name	Ticker	2021	2020	2019	3-yr Avg.
Atmos Energy Corporation	ATO	40.12%	41.69%	41.16%	40.99%
Northern Indiana Public Service Company LLC	NI	41.41%	41.99%	43.57%	42.32%
Columbia Gas of Kentucky, Inc.	NI	46.13%	45.32%	45.77%	45.74%
Columbia Gas of Maryland, Inc.	NI	44.74%	45.05%	47.62%	45.80%
Columbia Gas of Ohio, Inc.	NI	49.21%	49.55%	47.00%	48.59%
Columbia Gas of Pennsylvania, Inc.	NI	43.95%	44.32%	44.41%	44.23%
Columbia Gas of Virginia, Inc.	NI	55.48%	56.31%	57.47%	56.42%
New Jersey Natural Gas Company	NJR	42.01%	44.29%	40.21%	42.17%
Northwest Natural Gas Company	NWN	44.85%	46.45%	47.27%	46.19%
Kansas Gas Service Company, Inc.	OGS	38.63%	39.67%	36.45%	38.25%
Oklahoma Natural Gas Company	OGS	39.01%	40.15%	36.90%	38.69%
Texas Gas Service Company, Inc.	OGS	39.02%	40.01%	36.77%	38.60%
Spire Alabama Inc.	SR	40.03%	32.66%	30.07%	34.25%
Spire Gulf Inc.	SR	42.00%	57.90%	62.82%	54.24%
Spire Mississippi Inc.	SR	0.00%	0.00%	0.00%	0.00%
Spire Missouri Inc.	SR	39.42%	38.72%	34.99%	37.71%

Notes:

[1] Ratios are weighted by actual common capital, preferred equity, long-term debt and short-term debt of Operating Subsidiaries.

[2] Natural Gas operating subsidiaries where data was unable to be obtained for 2021, 2020 and 2019 were removed from the analysis.

CAPITAL STRUCTURE ANALYSIS

SHORT-TERM DEBT RATIO [1]

Proxy Group Company	Ticker	2021	2020	2019	3-yr Avg.
Atmos Energy Corporation	ATO	0.00%	0.00%	0.99%	0.33%
NiSource Inc.	NI	0.00%	0.00%	0.00%	0.00%
New Jersey Resources Corporation	NJR	6.25%	0.58%	2.23%	3.02%
Northwest Natural Gas Company	NWN	11.07%	11.63%	6.96%	9.89%
One Gas Inc.	OGS	0.00%	0.00%	0.00%	0.00%
Spire Inc.	SR	11.50%	10.02%	12.57%	11.36%
Proxy Group					
MEAN		4.80%	3.70%	3.79%	4.10%
MEDIAN		3.12%	0.29%	1.61%	1.68%
LOW		0.00%	0.00%	0.00%	0.00%
HIGH		11.50%	11.63%	12.57%	11.36%

SHORT-TERM DEBT RATIO - UTILITY OPERATING COMPANIES

Company Name	Ticker	2021	2020	2019	3-yr Avg.
Atmos Energy Corporation	ATO	0.00%	0.00%	0.99%	0.33%
Northern Indiana Public Service Company LLC	NI	0.00%	0.00%	0.00%	0.00%
Columbia Gas of Kentucky, Inc.	NI	0.00%	0.00%	0.00%	0.00%
Columbia Gas of Maryland, Inc.	NI	0.00%	0.00%	0.00%	0.00%
Columbia Gas of Ohio, Inc.	NI	0.00%	0.00%	0.00%	0.00%
Columbia Gas of Pennsylvania, Inc.	NI	0.00%	0.00%	0.00%	0.00%
Columbia Gas of Virginia, Inc.	NI	0.00%	0.00%	0.00%	0.00%
New Jersey Natural Gas Company	NJR	6.25%	0.58%	2.23%	3.02%
Northwest Natural Gas Company	NWN	11.07%	11.63%	6.96%	9.89%
Kansas Gas Service Company, Inc.	OGS	0.00%	0.00%	0.00%	0.00%
Oklahoma Natural Gas Company	OGS	0.00%	0.00%	0.00%	0.00%
Texas Gas Service Company, Inc.	OGS	0.00%	0.00%	0.00%	0.00%
Spire Alabama Inc.	SR	3.16%	8.40%	9.39%	6.98%
Spire Gulf Inc.	SR	16.86%	2.61%	0.00%	6.49%
Spire Mississippi Inc.	SR	60.82%	61.26%	54.05%	58.71%
Spire Missouri Inc.	SR	14.38%	10.63%	14.56%	13.19%

Notes:

[1] Ratios are weighted by actual common capital, preferred equity, long-term debt and short-term debt of Operating Subsidiaries.

[2] Natural Gas operating subsidiaries where data was unable to be obtained for 2021, 2020 and 2019 were removed from the analysis.