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DIRECT TESTIMONY, APPENDICES, AND EXHIBITS OF

DR. J. RANDALL WOOLRIDGE

ON BEHALF OF

THE SOUTH CAROLINA OFFICE OF REGULATORY STAFF

DOCKET NO. 2020-125-E

IN RE: APPLICATION OF DOMINION ENERGY SOUTH CAROLINA, INCORPORATED FOR ADJUSTMENT OF RATES AND CHARGES

THE OFFICE OF REGULATORY STAFF
1401 Main Street, Suite 900
Columbia, SC 29201

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Q. PLEASE STATE YOUR FULL NAME, ADDRESS, AND OCCUPATION.

A. My name is J. Randall Woolridge, and my business address is 120 Haymaker Circle, State College, PA 16801. I am a Professor of Finance and the Goldman, Sachs & Co. and Frank P. Smeal Endowed University Fellow in Business Administration at the University Park Campus of Pennsylvania State University. I am also the Director of the Smeal College Trading Room and President of the Nittany Lion Fund, LLC.

Q. PLEASE STATE YOUR EDUCATIONAL BACKGROUND AND EXPERIENCE.

A. I received my Bachelor of Arts degree in Economics from the University of North Carolina, a Master of Business Administration degree from the Pennsylvania State University, and a Doctor of Philosophy degree in Business Administration (with a major focus in finance and minor focus in statistics) from the University of Iowa. In the course of my research, which focuses heavily on empirical issues in corporate finance and financial markets, I have published more than 35 articles in academic and professional journals and have co-authored two books and one textbook. As a consultant with more than 35 years of experience, I have participated in regulatory rate cases in 33 states and the District of Columbia and have testified before the Federal Energy Regulatory Commission ("FERC"). A summary of my education background, research, and related business experience is provided in Appendix A.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE PUBLIC SERVICE COMMISSION OF SOUTH CAROLINA ("COMMISSION")?

A. No.

I. INTRODUCTION AND SUMMARY OF TESTIMONY

Q. WHAT IS THE SCOPE OF YOUR TESTIMONY IN THIS PROCEEDING?

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A. I have been asked by the Office of Regulatory Staff ("ORS") to provide an opinion as to the fair rate of return or cost of capital for Dominion Energy South Carolina, Inc. ("DESC" or the "Company"), including the market cost of equity capital.

Q. HOW IS YOUR TESTIMONY ORGANIZED?

A. First, I summarize my cost of capital recommendation for the Company and review the primary areas of contention on the Company's position. Second, I provide an overview of capital market conditions and utility authorized returns on equity ("ROEs"). Third, I discuss the proxy group that I have used to estimate an equity cost rate for DESC. Fourth, I provide my recommendations on the Company's appropriate capital structure and senior capital cost rates. Fifth, I estimate the equity cost rate for the Company. Finally, I critique DESC's rate of return analysis and testimony. In Appendix A, I provide a summary of my educational and professional background. Appendix B provides an overview on the cost of common equity capital and the long-term relationship between earnings per share and GDP growth is discussed in Appendix C.

A. Utility Rate of Return

Q. WHAT COMPRISES A UTILITY'S "RATE OF RETURN?"

A. A company's overall rate of return consists of three main categories: (1) capital structure (*i.e.*, ratios of short-term debt, long-term debt, preferred stock, and common equity); (2) cost rates for short-term debt, long-term debt, and preferred stock; and (3) common equity cost, otherwise known as ROE.

Q. WHAT IS A UTILITY'S ROE INTENDED TO REFLECT?

A. A ROE is most simply described as the allowed rate of profit for a regulated company. In a competitive market, a company's profit level is determined by a variety of

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factors, including the state of the economy, the degree of competition a company faces, the ease of entry into its markets, the existence of substitute or complementary products/services, the company's cost structure, the impact of technological changes, and the supply and demand for its services and/or products. For a regulated monopoly, the regulator determines the level of profit available to the utility. The United States Supreme Court established the guiding principles for establishing an appropriate level of profitability for regulated public utilities in two cases: (1) *Bluefield*[1] and (2) *Hope*.[2] In those cases, the Court recognized that the fair rate of return on equity should be: (1) comparable to returns investors expect to earn on investments with similar risk; (2) sufficient to assure confidence in the company's financial integrity; and (3) adequate to maintain the company's credit and to attract capital.

Thus, the appropriate ROE for a regulated utility requires determining the market-based cost of capital. The market-based cost of capital for a regulated firm represents the return investors could expect from other investments, while assuming no more and no less risk. The purpose of all of the economic models and formulas in cost of capital testimony (including those presented later in my testimony) is to estimate, using market data of similar-risk firms, the rate of return equity investors require for that risk-class of firms in order to set an appropriate ROE for a regulated firm.

B. Summary of Positions

Q. PLEASE REVIEW THE COMPANY'S PROPOSED RATE OF RETURN OR COST OF CAPITAL.

[1] *Bluefield Water Works and Improvement Co. v. Public Service Commission of West Virginia*, 262 U.S. 679 (1923) ("*Bluefield*").

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

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A. DESC has proposed a capital structure consisting of 46.65% long-term debt, 0.00% preferred stock, and 53.35% common equity, and a long-term debt cost rate of 6.46%. Company witness Dr. James H. Vander Weide has recommended a common equity cost rate, or ROE, of 10.40% for DESC, but the Company has chosen to request a ROE of 10.25%. The Company's overall proposed rate of return is 8.48%.

Q. PLEASE REVIEW YOUR RECOMMENDATIONS REGARDING THE APPROPRIATE MARKET-BASED RATE OF RETURN FOR DESC.

A. I have reviewed the Company's proposed capital structure and overall cost of capital. DESC's proposed capitalization has more equity and less financial risk than the capitalizations of other electric utility companies as well as those approved by state regulatory commissions for gas companies. As such, I am using a capital structure with a common equity ratio of 50.0%, which is more reflective of the capital structures of electric utilities. In addition, as highlighted in the testimony of ORS witness Lane Kollen, the Company has significantly inflated its long-term debt cost rate of 6.46%. I am using witness Kollen's restated long-term debt cost rate of 5.56%,

To estimate an equity cost rate for the Company, I have applied the Discounted Cash Flow Model ("DCF") and the Capital Asset Pricing Model ("CAPM") to my proxy group of electric utility companies ("Electric Proxy Group"). My DCF and CAPM analyses indicate an equity cost rate range of 7.60% to 8.90%. Given that I rely primarily on the DCF approach and the Company's credit rating relative to the proxy groups, I recommend a ROE of 8.90% for DESC. This is at the top end of my equity cost rate range. Using this figure, my capital structure ratios, and the adjusted debt cost rate, my overall

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rate of return or cost of capital recommendation is 7.23% for DESC. This is summarized in Table 1 and Exhibit JRW-1

Table 1
ORS' Rate of Return Recommendation

Capital Source	Capitalization Ratios	Cost Rate	Weighted Cost Rate
Long-Term Debt	50.00%	5.56%	2.78%
Preferred Stock	0.00%	0.00%	0.00%
Common Equity	50.00%	8.90%	4.45%
Total Capital	**100.00%**		**7.23%**

C. Primary Rate of Return Issues in this Case

Q. PLEASE PROVIDE AN OVERVIEW OF THE PRIMARY ISSUES REGARDING RATE OF RETURN IN THIS PROCEEDING.

A. The primary issues related to the Company's rate of return include the following:

- Capital Structure – The Company has proposed a capitalization with a common equity ratio of 53.65% which has more equity and less financial risk than the capitalizations of other electric utilities as well as those approved by state regulatory commissions for electric utilities. As such, I am using a capital structure with a common equity ratio of 50.0%, which is more reflective of the capitalizations of electric utilities. In conjunction with Dominion Energy's acquisition of DESC, the parent company agreed to maintain a capital structure for DESC with a common equity ratio in the range of 50.0% to 55.0%. This is summarized below:[3]
- Capital Market Conditions – Witness Vander Weide's analyses, ROE results, and recommendations are based on assumptions of higher interest rates and capital costs.

[3] South Carolina Public Service Commission, Order No. 2018-804, Docket Nos. 2017-207E, 2017-305E, and 2017-370-E, Order Exhibit 1, p. 8 of 10, December 21, 2018.

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However, interest rates and capital costs have remained at low levels in recent years. In 2019, interest rates fell due to slow economic growth and low inflation and, as discussed below, interest rates have fallen even further to record low levels in 2020 due to the impact of the novel coronavirus on the world's population and economy.

- Leverage and Flotation Cost Adjustments –Witness Vander Weide estimates an equity cost rate for DESC of 9.80% using the DCF, Risk Premium ("RP"), and CAPM approaches, and then has added a leverage adjustment of 60 basis points to account for the leverage difference between the market and book values of the capital structures of DESC and the companies in his proxy group. The DCF, risk premium, and CAPM equity cost rates also include a flotation cost adjustment of 20 basis points. Neither of these adjustments are warranted. With respect to the leverage adjustment, utility commissions have been using book value capital structures in the regulatory ratemaking process for decades and this is a well-known fact to utility commissions, investors, analysts, and customers. In short, there is absolutely no economic justification to suddenly adopt witness Vander Weide's novel approach. In fact, witness Vander Weide has proposed this adjustment in hundreds of rate cases over the years, and he cannot point to any regulatory commission orders in which it has been adopted.[4] With respect to the 20-basis point flotation cost adjustment, witness Vander Weide cannot point to any flotation costs paid by the Company because he cannot identify any such costs. Therefore, this is no justification to provide the Company with additional revenues in the form of a higher ROE for expenses the Company does not incur.

[4] See DESC response to ORS 05-22.

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- DCF Approach – Witness Vander Weide has overstated his reported DCF results in three ways:
  (1) he has made an inappropriate adjustment to reflect the quarterly payment of dividends;
  (2) most significantly, he has relied exclusively on the forecasted earnings per share ("EPS") growth rates of Wall Street analysts. I provide empirical evidence from studies that demonstrate the long-term earnings growth rates of Wall Street analysts are overly optimistic and upwardly-biased. Consequently, in developing a DCF growth rate, I have reviewed both historic and projected growth rate measures and have evaluated growth in dividends, book value, and earnings per share; and
  (3) he has made an unwarranted 20 basis point flotation cost adjustment.
- Risk Premium Model – Witness Vander Weide also estimates an equity cost rate using a risk premium model. There are three issues with this approach:
  (1) With respect to the base rate, he has used an overstated A-rated utility bond yield of 4.43%, which is based on project interest rates;
  (2) Witness Vander Weide has employed historical (*ex post*) and an expected (*ex ante*) risk premium models and reports equity cost rates of 10.1% using the expected return approach and 9.0% using the historical RP approach. These figures include the 20 basis point flotation cost adjustment. In his expected risk premium approach, witness Vander Weide computes an expected stock return by applying the DCF model to the S&P utilities and the S&P 500 indexes and uses the EPS growth rate forecasts of Wall Street analysts as his growth rate. He then subtracts the yield on 'A' rated utility bonds. In his historic risk premium model, witness Vander Weide computes a

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historical risk premium as the difference in the arithmetic mean stock and bond returns. The stock returns are computed for different time periods for different indexes, including S&P and Moody's electric utility indexes as well as the S&P 500. As discussed below, there are numerous, well-known empirical issues with using historic stock and bond returns to estimate a risk premium. In addition, the expected return approach results in an overstated risk premium due to the well-known, overly-optimistic, and upwardly-biased earnings per share growth rate forecasts of Wall Street analysts. This issue is addressed in depth in my rebuttal to the Company and in Appendix C; and

(3) he has made an unwarranted 20 basis point flotation cost adjustment.

- CAPM Approach – The CAPM approach requires an estimate of the risk-free interest rate, beta, and the market or risk premium. There are three primary issues with witness Vander Weide's CAPM analysis:

(1) Witness Vander Weide uses a risk-free rate of interest of 2.84% in his CAPM, which is based on the average projected rate on 20-year Treasury bonds by *Value Line* and EIA. However, the current rate on 20-year Treasury bonds is about 1.5%. As such, witness Vander Weide's risk-free interest rate is overstated.

(2) he has employed a historical market risk premium of 7.20% and a projected market risk premium of 8.70%. These market risk premiums are larger than the market risk premiums: (1) indicated by historic stock and bond return data; and (2) found in the published studies and surveys of the market risk premium. In his historic risk premium model, witness Vander Weide computes a historical risk premium as the difference in the arithmetic mean stock and bond returns. As discussed below, there

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are numerous, well-known empirical issues with using historic stock and bond returns to estimate a risk premium. In addition, I demonstrate that the projected market risk premium of 8.70% is based on totally unrealistic assumptions of future economic and earnings growth and stock returns. To compute his projected market risk premium, witness Vander Weide has applied the DCF to the S&P 500 and employed analysts' three-to-five-year earnings per share ("EPS") growth-rate projections as a growth rate to compute an expected market return and market risk premium. As I demonstrate later in my testimony, the EPS growth-rate projection used for the S&P 500 and the resulting expected market return and market risk premium include totally unrealistic assumptions regarding future economic and earnings growth and stock returns. As I highlight in my testimony, there are three commonly-used procedures for estimating a market risk premium – historic returns, surveys, and expected return models. I have used a market risk premium of 6.00%, which: (1) factors in all three approaches – historic returns, surveys, and expected return models – to estimate a market premium; and (2) employs the results of many studies of the market risk premium. As I note, the 6.00% figure reflects the market risk premiums: (1) determined in recent academic studies by leading finance scholars; (2) employed by leading investment banks and management consulting firms; and (3) found in surveys of companies, financial forecasters, financial analysts, and corporate CFOs; and

(3) he has made the unwarranted 20 basis point flotation cost adjustment.

- <u>Comparable Earnings Approach</u> – Witness Vander Weide also uses the Comparable Earnings approach to estimate an equity cost rate for the Company. Witness Vander

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Weide computes the expected ROE as forecasted by *Value Line* for his proxy group of electric utilities for 2020 and 2023-2025. As I discuss in my critique of witness Vander Weide's presentation, the "Comparable Earnings" approach does not measure the market cost of equity capital, is independent of most cost of capital indicators, ignores the research on the upward bias in *Value Line*'s earnings projections, and has several other empirical issues. Therefore, the Commission should ignore witness Vander Weide's "Comparable Earnings" approach in determining the appropriate ROE for DESC.

II. CAPITAL MARKET CONDITIONS AND UTILITY AUTHORIZED ROEs

A. Capital Market Conditions

Q. PLEASE REVIEW THE FINANCIAL MARKETS IN 2020.

A. The financial markets began the year in good form – stock prices rose about 5% in the first six weeks of the year and interest rates declined. Then came weeks of chaos. In the middle of February, the spread of the coronavirus went global and the virus became a major risk factor for the world's population and global economy. The coronavirus disease 2019 (COVID-19) has spread to over 200 countries around the world and was officially identified by the World Health Organization as a global pandemic in mid-March.

Investors around the world began to focus on the potential economic consequences of the coronavirus in the middle of January.[5] However, the markets largely ignored the impact of the virus until the third week of February. In the following month, the S&P 500 market declined 35% and investors fled to low risk financial assets, most notably long-term Treasury bonds. The yield on the benchmark 30-year Treasury bond declined from 2.0%

[5] Akane Otane, "Coronavirus Tests Market's Faith in Global Economy" *Wall Street Journal*, January 28, 2020.

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and traded as low as 0.9%, an all-time low. Furthermore, the day-to-day volatility of prices in financial markets was at extremes. The VIX, which is the CBOE volatility index and is known as Wall Street's Fear Index, increased from 15 and traded over 50, a level which has not been seen since the financial crisis in 2008.[6]

The stock market began its recovery in the third week of March. Despite the ongoing spread of COVID-19 and an economic crisis created by the virus that includes record unemployment, the S&P 500 has come back strong and is within 5% of its previous all-time high in February. The 30-year Treasury yield, which was about 2.0% in mid-February, dropped to record low levels below 1.0% and now has come back to about 1.5%. The VIX, which topped out over 50, is now about 25. And utility stocks, which declined with the market by about 35% from Mid-February to mid-March, have come back, but less so than the overall market.

Q. DOES WITNESS VANDER WEIDE HIGHLIGHT THE ACTIONS OF THE FEDERAL RESERVE IN RESPONSE TO THE CORONAVIRUS PANDEMIC?

A. Yes. Witness Vander Weide notes that the Federal Reserve has been active in monetary policy to support the economy in the wake of the coronavirus pandemic. In addition, since he prepared his testimony, Federal Reserve Chair Jerome Powell stated that the Fed would keep interest rates low for a number of years in a September 4th NPR interview: "We think that the economy's going to need low interest rates, which support economic activity, for an extended period of time … It will be measured in years."[7]

[6] The Chicago Board Options Exchange (CBOE)), the CBOE Volatility Index, or VIX, is a market index that represents the market's expectation of 30-day forward-looking volatility. The VIX is derived from the price inputs of the S&P 500 index options. Investors use the VIX to measure market risk and fear in the markets.

[7] Jeff Cox, "Powell says duration of low interest rates 'will be measured in years'," CNBC, September 4,2020.

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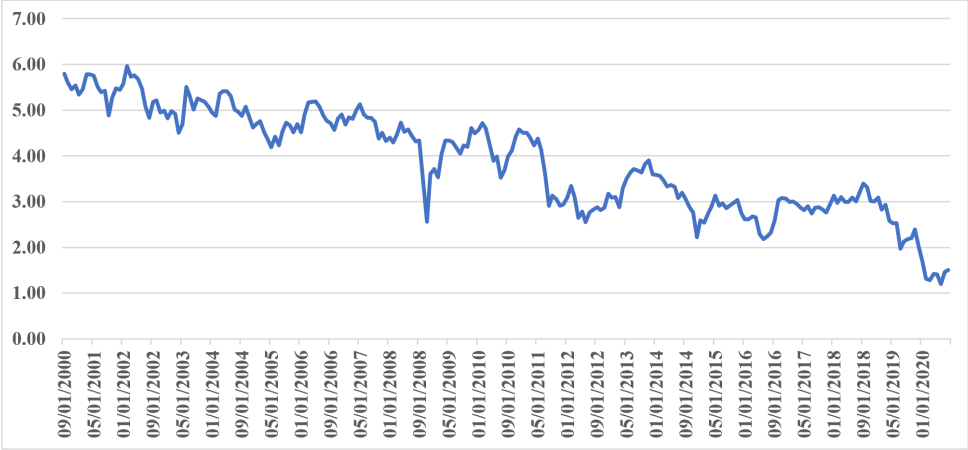
Subsequently, on September 15, 2020, Federal Reserve officials made more specific Mr. Powell's September 4th comments, projecting that they would keep interest rates near zero through 2023 to help the economy fully recover from the pandemic.[8]

Q. WITNESS VANDER WEIDE DOES NOT DISCUSS HOW THE FED'S ACTIONS HAVE IMPACTED UTILITY BOND YIELDS. HAVE UTILITY BOND YIELDS DECLINED WITH TREASURY BOND YIELDS?

A. Yes. Figure 1 shows 30-year Treasury yields (Panel A), long-term 'A' rated utility yields (Panel B), and the yield differentials between these two yields (Panel C) over the 2000-2020 time period. The yield differentials in Panel C shows that the spread between utility and Treasury yields has increased dramatically during the 2008 financial crisis and during March of this year as a result of the coronavirus. The yield differential has declined significantly in recent months and is now back to the 1.0% to 1.5% range, which it has been historically.

[8] https://www.politico.com/news/2020/09/16/federal-reserve-zero-interest-rate416202#:~:text=Federal%20Reserve%20officials%20on%20Wednesday,probably%20have%20to%20do%20more.

Figure 1
Panel A
30-Year Treasury Yields



Data Source: https://fred.stlouisfed.org/series/DGS30

Panel B
Long-Term A-Rated Utility Bond Yields

Data Source: Mergent Bond Record

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Panel C
Long-Term A-Rated Utility Bonds Minus
30-Year Treasury Yields

Q. HAVE UTILITIES TAKEN ADVANTAGE OF THE LOWER BOND YIELDS TO RAISE CAPITAL?

A. Yes. Figure 2 shows the amount of capital raised in debt (Panel A) and equity capital markets from 2016-2020. Utilities have especially taken advantage of the low interest rates; as of October 2, 2020, they have already raised a record amount of capital in the debt markets. The amount of equity raised by utilities is shown in Panel B. For 2020 year-to-date, the amount of equity is down a little relative to 2019, but this figure is only for the first nine months of 2020.

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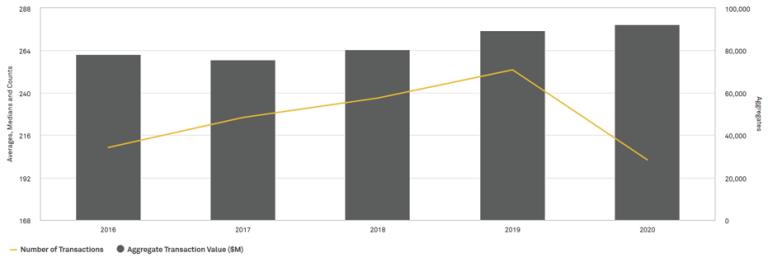
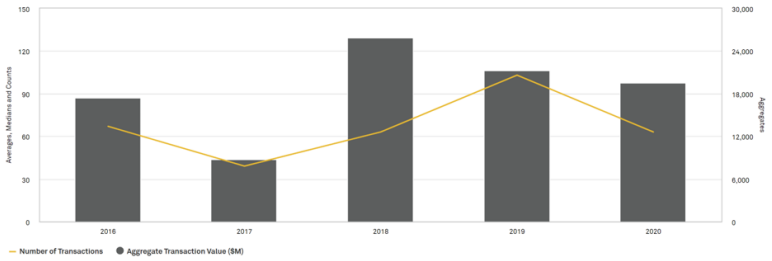
Figure 2

Panel A
Utility Debt Offerings
2016-2020



Source: S&P Global Market Intelligence.

Panel B
Utility Equity Offerings
2016-2020



Source: S&P Global Market Intelligence.

B. Authorized ROEs

Q. PLEASE DISCUSS THE TREND IN AUTHORIZED ROES FOR ELECTRIC AND ELECTRIC UTILITIES.

A. Over the years, as interest rates have come down, authorized ROEs for electric utility companies have slowly declined to reflect a low capital cost environment. Figure 3, which shows the quarterly authorized ROEs for electric and gas companies from 2000 to 2020, clearly shows a downward trend in the data. The authorized ROEs for electric utilities have declined from an average of 10.01% in 2012 to 9.8% in 2013, 9.76% in 2014, 9.58% in 2015, 9.60% in 2016, 9.68% in 2017, 9.56% in 2018, 9.64% in of 2019, and 9.44% in the first three quarters of 2020, according to Regulatory Research Associates.

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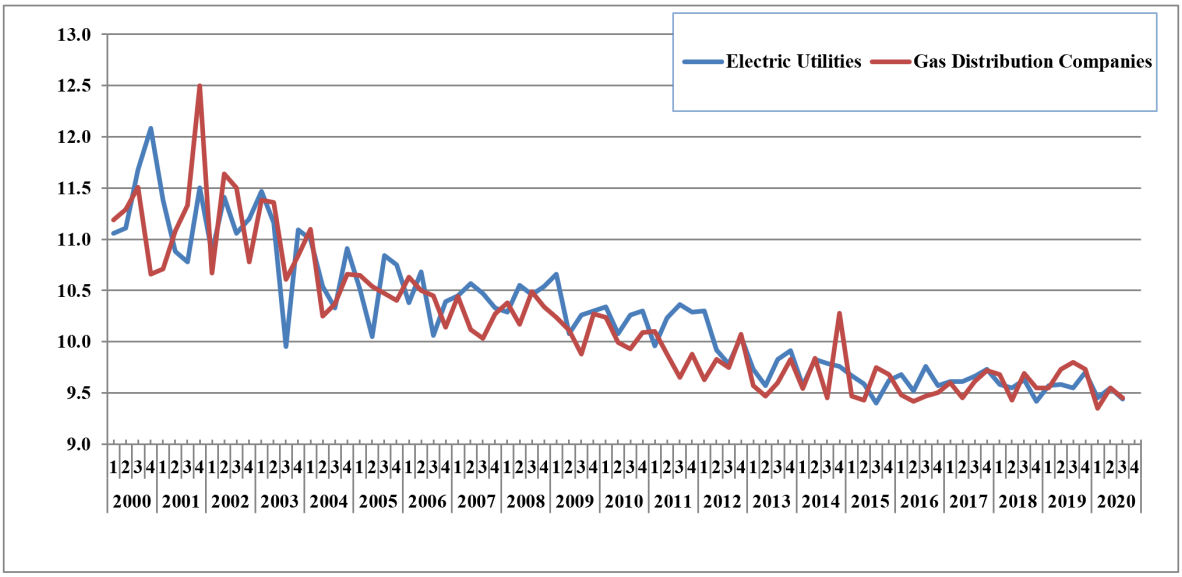
Figure 3
Authorized ROEs for Electric Utility and Gas Distribution Companies
2000-2020



Q. HOW DO AUTHORIZED ROES IN SOUTH CAROLINA COMPARE TO INTEREST RATES?

A. Figure 4 shows the authorized ROEs by the Public Service Commission of South Carolina and 30-year Treasury yields over the 2012-2020 time period. Over the 2012-2018 time period, the yields on 30-year Treasury bonds were in the 3.0% range, while the South Carolina authorized ROEs were in the 10.10%-10.25% range. Since 2019, with Treasury yields declining from 3.0% to 1.50%, there have been two ROE authorizations at 9.50%.

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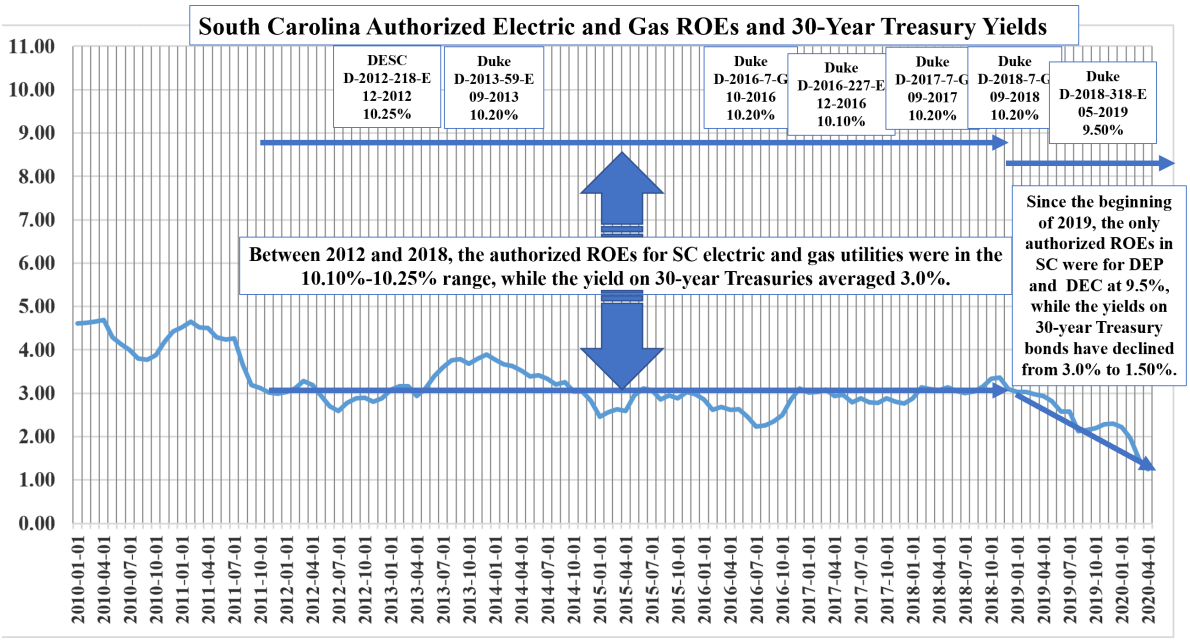
Figure 4
South Carolina Authorized ROEs and 30-Year Treasury Yields
2012-2020



Q. DO YOU BELIEVE THAT YOUR ROE RECOMMENDATION MEETS *HOPE* AND *BLUEFIELD* STANDARDS?

A. Yes, I do. As previously noted, according to the *Hope* and *Bluefield* decisions, returns on capital should be: (1) comparable to returns investors expect to earn on other investments of similar risk; (2) sufficient to assure confidence in the company's financial integrity; and (3) adequate to maintain and support the company's credit and to attract capital. As shown on page 3 of Exhibit JRW-5, electric utility companies have been earning ROEs in the range of 9.0% to 10.0% in recent years. With such a ROE, electric utilities such as those in the proxy groups have strong investment grade credit ratings, their stocks have been selling at almost 2.0 times book value, and they have been raising abundant amounts of capital. While my recommendation is below the average authorized ROEs for electric utility companies, it reflects the record low levels of interest rates and

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capital costs. Therefore, I do believe that my ROE recommendation meets the criteria established in the *Hope* and *Bluefield* decisions.

III. PROXY GROUP SELECTION

Q. PLEASE DESCRIBE YOUR APPROACH TO DEVELOPING A FAIR RATE OF RETURN RECOMMENDATION FOR DESC.

A. To develop a fair rate of return recommendation for the Company (market cost of equity), I evaluated the return requirements of investors on the common stock of a proxy group of electric utility companies ("the Electric Proxy Group").

Q. PLEASE DESCRIBE YOUR PROXY GROUP OF ELECTRIC COMPANIES.

A. The selection criteria for my Electric Proxy Group include the following:

1. At least 50% of revenues from regulated electric operations as indicated in the most recent SEC 10-K Report;
2. Listed as an U.S.-based Electric Utility by *Value Line Investment Survey*;
3. An investment grade issuer credit rating by Moody's and/or S&P;
4. Has paid a cash dividend in the past six months, with no cuts or omissions;
5. Not involved in an acquisition of another utility, the target of an acquisition, or in the sale or spin-off of significant utility assets, in the past six months; and
6. Analysts' long-term EPS growth rate forecasts available from Yahoo and/or Zacks.

My Electric Proxy Group includes 29 companies. Summary financial statistics for the proxy group are listed in Panel A of page 1 of Exhibit JRW-2.[9] The median operating revenues and net plant among members of the Electric Proxy Group are $7,523.1 million

[9] In my testimony, I present financial results using both mean and medians as measures of central tendency. However, due to outliers among means, I have used the median as a measure of central tendency.

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and $24,412.0 million, respectively. On average, the group receives 81% of its revenues from regulated electric operations, has an average of BBB+ and Baa1 issuer credit ratings from S&P and Moody's, respectively, a current average common equity ratio of 43.5%, and an earned return on common equity of 10.5%.

Q. PLEASE DESCRIBE WITNESS VANDER WEIDE'S PROXY GROUP OF ELECTRIC UTILITY COMPANIES.

A. The Vander Weide Proxy Group consists of 33 electric utility companies.[10] Summary financial statistics for the proxy group are listed on Panel B of page 1 of Exhibit JRW-2. The median operating revenues and net plant among members of the Vander Weide Proxy Group are $7,523.1 million and $24,412.0 million, respectively. On average, the group receives 76% of revenues from regulated electric operations, has an average BBB+ issuer credit rating from S&P and an average Baa1 long-term rating from Moody's, a current common equity ratio of 43.4%, and an earned return on common equity of 10.4%.

Q. HOW DOES THE INVESTMENT RISK OF THE COMPANY COMPARE TO THAT OF THE TWO PROXY GROUPS?

A. I believe that bond ratings provide a good assessment of the investment risk of a company. Page 1 of Exhibit JRW-2 also shows S&P and Moody's issuer credit ratings for the companies in the two groups. DESC's issuer credit rating is BBB+ according to S&P and Baa2 according to Moody's. DESC's S&P rating (BBB+) is equal to the average S&P rating for the Electric and Vander Weide Proxy Groups (BBB+). DESC's Moody's rating of Baa2 is one notch below the average Moody's rating for the Electric and Vander Weide

[10] I have excluded CenterPoint from the Vander Weide Proxy Group since the company recently cut its dividend, and Avangrid and PNM Resources due to their announced merger.

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Proxy Groups (Baa1). As such, I believe that DESC is at the higher end of the risk profile of the Electric and Vander Weide Proxy Groups.

Q. HOW DOES THE INVESTMENT RISK OF THE TWO PROXY GROUPS COMPARE BASED ON THE VARIOUS RISK METRICS PUBLISHED BY *VALUE LINE*?

A. On page 2 of Exhibit JRW-2, I have assessed the riskiness of the two proxy groups using five different risk measures from *Value Line*. These measures include Beta, Financial Strength, Safety, Earnings Predictability, and Stock Price Stability.[11] These risk measures suggest that the two proxy groups are similar in risk. The comparisons of the risk measures include Beta (0.87 vs. 0.87), Financial Strength (A vs. A), Safety (1.9 vs. 1.8), Earnings Predictability (79 vs. 79), and Stock Price Stability (89 vs. 89). These measures suggest that the two proxy groups are relatively low risk as well as similar in risk.

IV. CAPITAL STRUCTURE RATIOS AND DEBT COST RATES

Q. PLEASE DESCRIBE DESC'S PROPOSED CAPITAL STRUCTURE.

A. DESC has proposed a capital structure consisting of 46.65% long-term debt, 0.00% preferred stock, and 53.35% common equity, and a long-term debt cost rate of 6.46%. This is shown in Panel A of page 1 of Exhibit JRW-3.

Q. HOW DO THE COMPANY'S PROPOSED CAPITAL STRUCTURE RATIOS COMPARE TO THE AVERAGE CAPITALIZATION RATIOS FOR COMPANIES IN YOUR PROXY GROUPS?

A. As shown in page 1 of Exhibit JRW-2, the average common equity ratios of the Electric and Vander Weide Proxy Groups are 43.5% and 43.4%, respectively. As such,

[11] These metrics are defined on page 3 of Exhibit JRW-2.

DESC's proposed capitalization from investor-provided capital has much more equity and much less financial risk than the average current capitalizations of the electric utility companies in the proxy groups.

Q. IS IT APPROPRIATE TO USE THE COMMON EQUITY RATIOS OF THE PARENT HOLDING COMPANIES OR SUBSIDIARY OPERATING UTILITIES FOR COMPARISON PURPOSES WITH DESC'S PROPOSED CAPITALIZATION?

A. It is appropriate to use the common equity ratios of the utility holding companies because the holding companies are publicly-traded and their stocks are used in the cost of equity capital studies. However, the equities of the subsidiary operating utilities are not publicly-traded and hence their stocks cannot be used to compute the cost of equity capital for DESC.

Q. IS IT APPROPRIATE TO INCLUDE SHORT-TERM DEBT IN THE CAPITALIZATION IN COMPARING THE COMMON EQUITY RATIOS OF THE HOLDING COMPANIES WITH THE COMPANY'S PROPOSED CAPITALIZATION?

A. Yes. In comparing the common equity ratios of the holding companies with DESC's recommendation, it is appropriate to include short-term debt when computing the holding company common equity ratios. That is because short-term debt, like long-term debt, has a higher claim on the assets and earnings of the company and requires timely payment of interest and repayment of principal. In addition, the financial risk of a company is based on total debt, which includes both short-term and long-term debt. This is why credit rating agencies use total debt in assessing the leverage and financial risk of companies.

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Q. HOW DO DESC'S PROPOSED CAPITAL STRUCTURE RATIOS COMPARE TO ITS RECENT CAPITALIZATION RATIOS AS WELL AS TO THOSE OF ITS PARENT, DOMINION ENERGY, INC. ("D")?

A. Panels B and C of page 1 of Exhibit JRW-3 provide DESC's and D's average quarterly capitalization ratios over the 2018-2020 time period including (Panel B) and excluding (Panel C) short-term debt. The quarterly data are provided on page 2 of Exhibit JRW-3. The Company's and D's average common equity ratios were 47.27% and 38.38% including short-term debt, respectively, and 49.83% and 41.79% excluding short-term debt. The much lower common equity ratio of D reflects the overall much greater amount of debt and greater financial risk of the parent company. As such, DESC is proposing a capital structure with a higher common equity ratio and less financial risk than its recent history, and a much higher common equity ratio than its parent, D.

Q. PLEASE DISCUSS THE ISSUE OF PUBLIC UTILITY HOLDING COMPANIES SUCH AS DEI USING DEBT TO FINANCE THE EQUITY IN SUBSIDIARIES SUCH AS THE COMPANY.

A. Moody's published an article on the use of low-cost debt financing by public utility holding companies to increase their ROEs. The summary observations included the following:

> U.S. utilities use leverage at the holding-company level to invest in other businesses, make acquisitions and earn higher returns on equity. In some cases, an increase in leverage at the parent can hurt the credit profiles of its regulated subsidiaries.[12]

[12] Moody's Investors' Service, "High Leverage at the Parent Often Hurts the Whole Family," May 11, 2015, p.1.

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This financial strategy has traditionally been known as double leverage. Moody's defined double leverage in the following way:

> Double leverage is a financial strategy whereby the parent raises debt but downstreams the proceeds to its operating subsidiary, likely in the form of an equity investment. Therefore, the subsidiary's operations are financed by debt raised at the subsidiary level and by debt financed at the holding-company level. In this way, the subsidiary's equity is leveraged twice, once with the subsidiary debt and once with the holding-company debt. In a simple operating-company/holding-company structure, this practice results in a consolidated debt-to-capitalization ratio that is higher at the parent than at the subsidiary because of the additional debt at the parent.[13]

Moody's goes on to discuss the potential risk to utilities of the strategy, and specifically notes that regulators could take it into consideration in setting authorized ROEs (emphasis added):

> **"Double leverage" drives returns for some utilities but could pose risks down the road.** The use of double leverage, a long-standing practice whereby a holding company takes on debt and downstreams the proceeds to an operating subsidiary as equity, could pose risks down the road if regulators were to ascribe the debt at the parent level to the subsidiaries or adjust the authorized return on capital.[14]

Q. PLEASE DISCUSS THE SIGNIFICANCE OF THE AMOUNT OF EQUITY THAT IS INCLUDED IN A UTILITY'S CAPITAL STRUCTURE.

A. A utility's decision as to the amount of equity capital it will incorporate into its capital structure involves fundamental trade-offs relating to the amount of financial risk the firm carries, the overall revenue requirements its customers are required to bear through the rates they pay, and the return on equity that investors will require.

Q. PLEASE DISCUSS A UTILITY'S DECISION TO USE DEBT VERSUS EQUITY TO MEET ITS CAPITAL NEEDS.

[13] *Ibid.* p. 5.
[14] *Ibid.* p. 1.

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A. Utilities satisfy their capital needs through a mix of equity and debt. Because equity capital is more expensive than debt, the issuance of debt enables a utility to raise more capital for a given commitment of dollars than it could raise with just equity. Debt is, therefore, a means of "leveraging" capital dollars. However, as the amount of debt in the capital structure increases, financial risk increases and the risk of the utility, as perceived by equity investors, also increases. Significantly for this case, the converse is also true. As the amount of debt in the capital structure decreases, the financial risk decreases. The required return on equity capital is a function of the amount of overall risk that investors perceive, including financial risk in the form of debt.

Q. WHY IS THIS RELATIONSHIP IMPORTANT TO THE UTILITY'S CUSTOMERS?

A. Just as there is a direct correlation between the utility's authorized return on equity and the utility's revenue requirements (the higher the return, the greater the revenue requirement), there is a direct correlation between the amount of equity in the capital structure and the revenue requirements that customers are called on to bear. Again, equity capital is more expensive than debt. Not only does equity command a higher cost rate, it also adds more to the income tax burden that ratepayers are required to pay through rates. As the equity ratio increases, the utility's revenue requirements increase and the rates paid by customers increase. If the proportion of equity is too high, rates will be higher than they need to be. For this reason, the utility's management should pursue a capital acquisition strategy that results in the proper balance in the capital structure.

Q. HOW HAVE UTILITIES TYPICALLY STRUCK THIS BALANCE?

A. Due to regulation and the essential nature of its output, a regulated utility is exposed

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to less business risk than other companies that are not regulated. This means that a utility can reasonably carry relatively more debt in its capital structure than can most unregulated companies. Thus, a utility should take appropriate advantage of its lower business risk to employ cheaper debt capital at a level that will benefit its customers through lower revenue requirements.

Q. GIVEN THAT DESC HAS PROPOSED AN EQUITY RATIO THAT IS HIGHER THAN (1) THE AVERAGE COMMON EQUITY RATIO OF OTHER ELECTRIC UTILITY COMPANIES AND (2) ITS OWN COMMON EQUITY RATIO, AS WELL AS THE COMMON EQUITY RATIO OF ITS PARENT COMPANY, DEI, WHAT SHOULD THE COMMISSION DO IN THIS RATEMAKING PROCEEDING?

A. When a regulated utility's actual capital structure contains a high equity ratio, the options are: (1) to impute a more reasonable capital structure that is comparable to the average of the proxy group used to determine the cost of equity and to reflect the imputed capital structure in revenue requirements; and/or (2) to recognize the downward impact that an unusually high equity ratio will have on the financial risk of a utility and authorize a common equity cost rate lower than that of the proxy group.

Q. PLEASE ELABORATE ON THIS "DOWNWARD IMPACT."

A. As I stated earlier, there is a direct correlation between the amount of debt in a utility's capital structure and the financial risk that an equity investor will associate with that utility. A relatively lower proportion of debt translates into a lower required return on equity, all other things being equal. Stated differently, a utility cannot expect to "have it both ways." Specifically, a utility cannot propose to maintain an unusually high equity

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ratio and not expect to have the resulting lower risk reflected in its authorized return on equity. The fundamental relationship between lower risk and the appropriate authorized return should not be ignored.

Q. GIVEN THIS DISCUSSION, PLEASE DISCUSS YOUR CAPITAL STRUCTURE RECOMMENDATION FOR DESC.

A. My capital structure recommendation is presented in Panel D of Exhibit JRW-3. As previously noted, DESC's proposed capital structure consists of more common equity and less financial risk than any of the other proxy electric companies. As such, in my rate of return recommendation, I am recommending a capital structure that includes a common equity ratio of 50.0%. This capital structure includes a common equity ratio that is about halfway between DESC's proposed capital structure of 53.65% and the average common equity ratios of DESC and DEI, as well as the two proxy groups. As shown in Panel D of Exhibit JRW-5, I have grossed up the percentage amount of long-term debt to total 50.0% and reduced the amount of common equity from 53.65% to 50.0%.

Q. IS YOUR PROPOSED CAPITAL STRUCTURE, WITH A COMMON EQUITY RATIO OF 50.0%, CONSISTENT WITH THE COMMON EQUITY RATIO PRESCRIBED BY DOMINION ENERGY AS PART OF ITS FINANCIAL COMMITMENTS TO DESC?

A. Yes. In conjunction with Dominion Energy's acquisition of DESC, the parent company agreed to maintain a capital structure for DESC with a common equity ratio in the range of 50.0% to 55.0%. This is summarized below:[15]

[15] South Carolina Public Service Commission, Order No. 2018-804, Docket Nos. 2017-207E, 2017-305E, and 2017-370-E, Order Exhibit 1, p. 8 of 10, December 21, 2018.

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> **I. Financial:**
> 1. Dominion Energy, through SCANA, will provide equity, as needed, to SCE&G with the intent of maintaining SCE&G's capital structure targeted within a range of 50%-55% equity that is consistent with existing regulatory guidelines and improving credit ratings.

Q. ARE YOU USING THE COMPANY'S PROPOSED LONG-TERM DEBT COST RATE?

A. No. Witness Kollen has reviewed the Company's long-term debt cost rate and discovered a number of errors in how DESC has adjusted the long-term debt cost rate to reflect Dominion's recapitalization of the Company. As such, I am using witness Kollen's corrected long-term debt cost rate of 5.56%.

V. THE COST OF COMMON EQUITY CAPITAL[16]

A. DCF Approach

Q. PLEASE DESCRIBE THE THEORY BEHIND THE TRADITIONAL DCF MODEL.

A. According to the DCF model, the current stock price is equal to the discounted value of all future dividends that investors expect to receive from investment in the firm. As such, stockholders' returns ultimately result from current as well as future dividends. As owners of a corporation, common stockholders are entitled to a *pro rata* share of the firm's earnings. The DCF model presumes that earnings that are not paid out in the form of dividends are reinvested in the firm so as to provide for future growth in earnings and dividends. The rate at which investors discount future dividends, which reflects the timing and riskiness of the expected cash flows, is interpreted as the market's expected or required

[16] Appendix B provides a detailed overview of the concept of the cost of equity capital.

return on the common stock. Therefore, this discount rate represents the cost of common equity. Algebraically, the DCF model can be expressed as:

$$P = \frac{D_1}{(1+k)^1} + \frac{D_2}{(1+k)^2} + \cdots + \frac{D_n}{(1+k)^n}$$

where P is the current stock price, D_n is the dividend in year n, and k is the cost of common equity.

Q. IS THE DCF MODEL CONSISTENT WITH VALUATION TECHNIQUES EMPLOYED BY INVESTMENT FIRMS?

A. Yes. Virtually all investment firms use some form of the DCF model as a valuation technique. One common application for investment firms is called the three-stage DCF or dividend discount model ("DDM"). The stages in a three-stage DCF model are presented in page 1 of Exhibit JRW-6. This model presumes that a company's dividend payout progresses initially through a growth stage, then proceeds through a transition stage, and finally assumes a maturity (or steady-state) stage. The dividend-payment stage of a firm depends on the profitability of its internal investments which, in turn, is largely a function of the life cycle of the product or service.

1. Growth stage: Characterized by rapidly expanding sales, high profit margins, and an abnormally high growth in earnings per share. Because of highly profitable expected investment opportunities, the payout ratio is low. Competitors are attracted by the unusually high earnings, leading to a decline in the growth rate.
2. Transition stage: In later years, increased competition reduces profit margins and earnings growth slows. With fewer new investment opportunities, the company begins to pay out a larger percentage of earnings.

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3. Maturity (steady-state) stage: Eventually, the company reaches a position where its new investment opportunities offer, on average, only slightly attractive ROEs. At that time, its earnings growth rate, payout ratio, and ROE stabilize for the remainder of its life. The constant-growth DCF model is appropriate when a firm is in the maturity stage of the life cycle.

In using this model to estimate a firm's cost of equity capital, dividends are projected into the future using the different growth rates in the alternative stages, and then the equity cost rate is the discount rate that equates the present value of the future dividends to the current stock price.

Q. HOW DO YOU ESTIMATE STOCKHOLDERS' EXPECTED OR REQUIRED RATE OF RETURN USING THE DCF MODEL?

A. Under certain assumptions, including a constant and infinite expected growth rate, and constant dividend/earnings and price/earnings ratios, the DCF model can be simplified to the following:

$$P = \frac{D_1}{k - g}$$

where D_1 represents the expected dividend over the coming year and g is the expected growth rate of dividends. This is known as the constant-growth version of the DCF model. To use the constant-growth DCF model to estimate a firm's cost of equity, one solves for k in the above expression to obtain the following:

$$k = \frac{D_1}{P} + g$$

Q. IN YOUR OPINION, IS THE CONSTANT-GROWTH VERSION OF THE DCF MODEL APPROPRIATE FOR PUBLIC UTILITIES?

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A. Yes. The economics of the public utility business indicate that the industry is in the maturity or constant-growth stage of a three-stage DCF. The economics include the relative stability of the utility business, the maturity of the demand for public utility services, and the regulated status of public utilities (especially the fact that their returns on investment are effectively set through the ratemaking process). The appropriate DCF valuation procedure for companies in this stage is the constant-growth DCF. In the constant-growth version of the DCF model, the current dividend payment and stock price are directly observable. However, the primary problem and controversy in applying the DCF model to estimate equity cost rates entails estimating investors' expected dividend growth rate.

Q. WHAT FACTORS SHOULD ONE CONSIDER WHEN APPLYING THE DCF METHODOLOGY?

A. One should be sensitive to several factors when using the DCF model to estimate a firm's cost of equity capital. In general, one must recognize the assumptions under which the DCF model was developed in estimating its components (the dividend yield and the expected growth rate). The dividend yield can be measured precisely at any point in time; however, it tends to vary somewhat over time. Estimation of expected growth is considerably more difficult. One must consider recent firm performance, in conjunction with current economic developments and other information available to investors, to accurately estimate investors' expectations.

Q. WHAT DIVIDEND YIELDS HAVE YOU REVIEWED?

A. I have calculated the dividend yields for the companies in the proxy group using the current annual dividend and 30-day, 90-day, and 180-day average stock prices. These

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dividend yields are provided in page 2 of Exhibit JRW-7. For the Electric Proxy Group in Panel A, the median dividend yields using the 30-day, 90-day, and 180-day average stock prices range from 3.7% to 3.9%. As a result, I am using 3.8% as the dividend yield for the Electric Proxy Group. The median dividend yields using the 30-day, 90-day, and 180-day average stock prices for the Vander Weide Proxy Group, shown in Panel B, range from 3.7% to 3.8%. As a result, I am using 3.75% as the dividend yield for the Vander Weide Proxy Group.

Q. PLEASE DISCUSS THE APPROPRIATE ADJUSTMENT TO THE SPOT DIVIDEND YIELD.

A. According to the traditional DCF model, the dividend yield term relates to the dividend yield over the coming period. As indicated by Professor Myron Gordon, who is commonly associated with the development of the DCF model for popular use, this is obtained by: (1) multiplying the expected quarterly dividend over the coming quarter by four, and (2) dividing the resulting annual dividend by the current stock price to determine the appropriate dividend yield for a firm that pays dividends on a quarterly basis.[17]

In applying the DCF model, some analysts adjust the current dividend for growth over the coming year as opposed to the coming quarter. This can be complicated because firms tend to announce changes in dividends at different times during the year. As such, the dividend yield that is computed based upon presumed growth over the coming quarter as opposed to the coming year can be quite different. Consequently, it is common for analysts to adjust the dividend yield by some fraction of the long-term expected growth rate.

[17] Federal Communications Commission, Docket No. 79-05, *Petition for Modification of Prescribed Rate of Return*, Direct Testimony of Myron J. Gordon and Lawrence I. Gould, p. 62 (Apr. 1980).

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Q. GIVEN THIS DISCUSSION, WHAT ADJUSTMENT FACTOR DO YOU USE FOR YOUR DIVIDEND YIELD?

A. I adjust the dividend yield by one-half (1/2) of the expected growth so as to reflect growth over the coming year. The DCF equity cost rate ("*K*") is computed as:

$$K = \left[\left(\frac{D}{P}\right) \times (1 + 0.5g)\right] + g$$

Q. PLEASE DISCUSS THE GROWTH RATE COMPONENT OF THE DCF MODEL.

A. There is debate as to the proper methodology to employ in estimating the growth component of the DCF model. By definition, this component is investors' expectation of the long-term dividend growth rate. Presumably, investors use some combination of historical and/or projected growth rates for earnings and dividends per share and for internal or book-value growth to assess long-term potential.

Q. WHAT GROWTH DATA HAVE YOU REVIEWED FOR THE PROXY GROUP?

A. I have analyzed a number of measures of growth for the companies in the proxy group. I reviewed *Value Line's* historical and projected growth rate estimates for earnings per share ("EPS"), dividends per share ("DPS"), and book value per share ("BVPS"). In addition, I utilized the average EPS growth rate forecasts of Wall Street analysts as provided by Yahoo and Zacks. These services solicit three-to-five-year earnings growth rate projections from securities analysts and compile and publish the means and medians of these forecasts. Finally, I assessed prospective growth as measured by prospective earnings retention rates and earned returns on common equity.

Q. PLEASE DISCUSS HISTORICAL GROWTH IN EARNINGS AND DIVIDENDS AS WELL AS INTERNAL GROWTH.

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A. Historical growth rates for EPS, DPS, and BVPS are readily available to investors and are presumably an important ingredient in forming expectations concerning future growth. However, one must use historical growth numbers as measures of investors' expectations with caution. In some cases, past growth may not reflect future growth potential. Also, employing a single growth rate number (for example, for five or 10 years) is unlikely to accurately measure investors' expectations, due to the sensitivity of a single growth rate figure to fluctuations in individual firm performance as well as overall economic fluctuations (*i.e.*, business cycles). However, one must appraise the context in which the growth rate is being employed. According to the conventional DCF model, the expected return on a security is equal to the sum of the dividend yield and the expected long-term growth in dividends. Therefore, to best estimate the cost of common equity capital using the conventional DCF model, one must look to long-term growth rate expectations.

Internally generated growth is a function of the percentage of earnings retained within the firm (the earnings retention rate) and the rate of return earned on those earnings (the return on equity). The internal growth rate is computed as the retention rate times the return on equity. Internal growth is significant in determining long-term earnings and, therefore, dividends. Investors recognize the importance of internally generated growth and pay premiums for stocks of companies that retain earnings and earn high returns on internal investments.

Q. WHICH EPS FORECASTS SHOULD BE USED IN DEVELOPING A DCF GROWTH RATE?

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A. The DCF growth rate is the long-term projected growth rate in EPS, DPS, and BVPS. Therefore, in developing an equity cost rate using the DCF model, the projected long-term growth rate is the projection used in the DCF model.

Q. WHY DO YOU NOT RELY EXCLUSIVELY ON THE EPS FORECASTS OF WALL STREET ANALYSTS IN ARRIVING AT A DCF GROWTH RATE FOR THE PROXY GROUP?

A. There are several reasons. First, the appropriate growth rate in the DCF model is the dividend growth rate, not the earnings growth rate. Nonetheless, over the very long-term, dividends and earnings will tend to grow at a similar growth rate. Therefore, consideration must be given to other indicators of growth, including prospective dividend growth and internal growth, as well as projected earnings growth.

Second, a 2011 study by Lacina, Lee, and Xu has shown that analysts' long-term earnings growth rate forecasts are not more accurate at forecasting future earnings than just using last year's earnings figure as the projected future earnings number.[18] Employing data over a 20-year period, these authors demonstrate that using the most recent year's EPS figure to forecast EPS in the next three-to-five years proved to be just as accurate as using the EPS estimates from analysts' long-term earnings growth rate forecasts. In the authors' opinion, these results indicate that analysts' long-term earnings growth rate forecasts should be used with caution as inputs for valuation and cost of capital purposes.

Finally, and most significantly, it is well known that the long-term EPS growth rate forecasts of Wall Street securities analysts are overly optimistic and upwardly biased. This

[18] M. Lacina, B. Lee & Z. Xu (2011),*Advances in Business and Management Forecasting* Vol. 8, Kenneth D. Lawrence, Ronald K. Klimberg (ed.), Emerald Group Publishing Limited, pp.77-101.

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has been demonstrated in a number of academic studies over the years.[19] Hence, using these growth rates as a DCF growth rate will provide an overstated equity cost rate. On this issue, a study by Easton and Sommers (2007) found that optimism in analysts' growth rate forecasts leads to an upward bias in estimates of the cost of equity capital of almost 3.0 percentage points.[20]

Q. ARE THE EPS GROWTH RATE FORECASTS OF *VALUE LINE* ALSO OVERLY OPTIMISTIC AND UPWARDLY BIASED?

A. Yes. A study by Szakmary, Conover, and Lancaster (2008) evaluated the accuracy of *Value Line*'s three-to-five-year EPS growth rate forecasts using companies in the Dow Jones Industrial Average over a 30-year time period and found these forecasted EPS growth rates to be significantly higher than the EPS growth rates that these companies subsequently achieved.[21]

Q. IS IT YOUR OPINION THAT STOCK PRICES REFLECT THE UPWARD BIAS IN THE EPS GROWTH RATE FORECASTS?

A. Yes. I do believe that investors are well aware of the bias in analysts' EPS growth rate forecasts and stock prices, therefore, reflect the upward bias.

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[19] The studies that demonstrate analysts' long-term EPS forecasts are overly-optimistic and upwardly biased include: R.D. Harris, "The Accuracy, Bias, and Efficiency of Analysts' Long Run Earnings Growth Forecasts," *Journal of Business Finance & Accounting*, pp. 725-55 (June/July 1999); P. DeChow, A. Hutton, and R. Sloan, "The Relation Between Analysts' Forecasts of Long-Term Earnings Growth and Stock Price Performance Following Equity Offerings," *Contemporary Accounting Research* (2000); K. Chan, L., Karceski, J., & Lakonishok, J., "The Level and Persistence of Growth Rates," *Journal of Finance* pp. 643−684, (2003); M. Lacina, B. Lee and Z. Xu, (2011), *Advances in Business and Management Forecasting (Vol. 8),* Kenneth D. Lawrence, Ronald K. Klimberg (ed.), Emerald Group Publishing Limited, pp.77-101; and Marc H. Goedhart, Rishi Raj, and Abhishek Saxena, "Equity Analysts, Still Too Bullish," *McKinsey on Finance*, pp. 14-17, (Spring 2010).

[20] Peter D. Easton & Gregory A. Sommers, "Effect of Analysts' Optimism on Estimates of the Expected Rate of Return Implied by Earnings Forecasts," 45 J. ACCT. RES. 983–1015 (2007).

[21] Szakmary, A., Conover, C., & Lancaster, C. (2008). "An Examination of *Value Line*'s Long-Term Projections," *Journal of Banking & Finance*, May 2008, pp. 820-833.

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Q. HOW DOES THAT AFFECT THE USE OF THESE FORECASTS IN A DCF EQUITY COST RATE STUDY?

A. According to the DCF model, the equity cost rate is a function of the dividend yield and expected growth rate. Because stock prices reflect the bias, it would affect the dividend yield. In addition, the DCF growth rate needs to be adjusted downward from the projected EPS growth rate to reflect the upward bias.

Q. PLEASE DISCUSS THE HISTORICAL GROWTH OF THE COMPANIES IN THE PROXY GROUP, AS PROVIDED BY *VALUE LINE.*

A. Page 3 of Exhibit JRW-7 provides the five- and 10-year historical growth rates for EPS, DPS, and BVPS for the companies in the proxy group, as published in the *Value Line Investment Survey.* The median historical growth measures for EPS, DPS, and BVPS for the Electric Proxy Group, as provided in Panel A, range from 4.0% to 5.5%, with an average of the medians of 4.4%. For the Vander Weide Proxy Group, as shown in Panel B of page 3 of Exhibit JRW-7, the historical growth measures in EPS, DPS, and BVPS, as measured by the medians, range from 4.3% to 5.5%, with an average of the medians of 4.7%.

Q. PLEASE SUMMARIZE *VALUE LINE*'S PROJECTED GROWTH RATES FOR THE COMPANIES IN THE PROXY GROUPS.

A. *Value Line*'s projections of EPS, DPS, and BVPS growth for the companies in the proxy groups are shown on page 4 of Exhibit JRW-7. As stated above, due to the presence of outliers, the medians are used in the analysis. For the Electric Proxy Group, as shown in Panel A of page 4 of Exhibit JRW-7, the medians range from 4.0% to 5.5%, with an average of the medians of 4.7%. The range of the medians for the Vander Weide Proxy

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Group, shown in Panel B of page 4 of Exhibit JRW-7, is from 4.5% to 5.5%, with an average of the medians of 4.8%.

Also provided on page 4 of Exhibit JRW-7 are the prospective sustainable growth rates for the companies in the two proxy groups as measured by *Value Line*'s average projected return on shareholders' equity and retention rate. As noted above, sustainable growth is a significant and a primary driver of long-run earnings growth. For the Electric Proxy Group and Vander Weide Proxy Group, the median prospective sustainable growth rates are 3.6% and 3.6%, respectively.

Q. PLEASE ASSESS GROWTH FOR THE PROXY GROUPS AS MEASURED BY ANALYSTS' FORECASTS OF EXPECTED FIVE-YEAR EPS GROWTH.

A. Yahoo and Zacks collect, summarize, and publish Wall Street analysts' long-term EPS growth rate forecasts for the companies in the proxy groups. These forecasts are provided for the companies in the proxy groups on page 5 of Exhibit JRW-7. I have reported both the mean and median growth rates for the groups. Because there is considerable overlap in analyst coverage between the two services, and not all of the companies have forecasts from the different services, I have averaged the expected five-year EPS growth rates from the two services for each company to arrive at an expected EPS growth rate for each company. The mean/median of analysts' projected EPS growth rates for the Electric Proxy Group and Vander Weide Proxy Group are 4.8%/5.0% and 4.8%/5.4%, respectively.[22]

[22] Given the variation in the measures of central tendency of analysts' projected EPS growth rates for the proxy groups, I have considered both the mean and median figures in the growth rate analysis.

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Q. PLEASE SUMMARIZE YOUR ANALYSIS OF THE HISTORICAL AND PROSPECTIVE GROWTH OF THE PROXY GROUPS.

A. Page 6 of Exhibit JRW-7 shows the summary DCF growth rate indicators for the proxy groups.

The historical growth rate indicators for my Electric Proxy Group imply a baseline growth rate of 4.4%. The average of the projected EPS, DPS, and BVPS growth rates from *Value Line* is 4.7%, and *Value Line*'s projected sustainable growth rate is 3.6%. The projected EPS growth rates of Wall Street analysts for the Electric Proxy Group are 4.8% and 5.0% as measured by the mean and median growth rates. The overall range for the projected growth rate indicators (ignoring historical growth) is 3.6% to 5.0%. Despite the upward bias in analysts' EPS growth rate forecasts, which was discussed above, I am giving primary weight to the projected EPS growth rate of Wall Street analysts. I believe that 5.0% is a conservatively high growth rate for the Electric Proxy Group due to the bias. Also, this growth rate figure is at the upper end of the range of historic and projected growth rates for the Electric Proxy Group.

For the Vander Weide Proxy Group, the historical growth rate indicators indicate a growth rate of 4.7%. The average of the projected EPS, DPS, and BVPS growth rates from *Value Line* is 4.8%, and *Value Line*'s projected sustainable growth rate is 3.6%. The projected EPS growth rates of Wall Street analysts are 4.8% and 5.4% as measured by the mean and median growth rates. The overall range for the projected growth rate indicators is 3.6% to 5.4%. Again, despite the upward bias, giving primary weight to the projected EPS growth rate of Wall Street analysts. I believe that 5.0% is a conservatively high growth rate for the Vander Weide Proxy Group due to the bias. Also, this growth rate figure is

clearly in the upper end of the range of historic and projected growth rates for the Vander Weide Proxy Group.

Q. BASED ON THE ABOVE ANALYSIS, WHAT ARE YOUR INDICATED COMMON EQUITY COST RATES FROM THE DCF MODEL FOR THE PROXY GROUPS?

A. My DCF-derived equity cost rates for the groups are summarized on page 1 of Exhibit JRW-7 and in Table 2 below.

Table 2
DCF-derived Equity Cost Rate/ROE

	Dividend Yield	1 + ½ Growth Adjustment	DCF Growth Rate	Equity Cost Rate
Electric Proxy Group	3.80%	1.02500	5.00%	**8.90%**
Vander Weide Proxy Group	3.75%	1.02500	5.00%	**8.85%**

The result for my Electric Proxy Group is the 3.80% dividend yield, times the one and one-half growth adjustment of 1.0250, plus the DCF growth rate of 5.00%, which results in an equity cost rate of 8.90%. The result for the Vander Weide Proxy Group is 8.85%, which includes a dividend yield of 3.75%, an adjustment factor of 1.02500, and a DCF growth rate of 5.00%.

B. Capital Asset Pricing Model

Q. PLEASE DISCUSS THE CAPM.

A. The CAPM is a risk premium approach to gauging a firm's cost of equity capital. According to the risk premium approach, the cost of equity is the sum of the interest rate on a risk-free bond (R_f) and a risk premium (RP), as in the following:

$$k = R_f + RP$$

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The yield on long-term U.S. Treasury securities is normally used as R_f. Risk premiums are measured in different ways. The CAPM is a theory of the risk and expected returns of common stocks. In the CAPM, two types of risk are associated with a stock: firm-specific or unsystematic risk, and market or systematic risk, which is measured by a firm's beta. The only risk that investors receive a return for bearing is systematic risk.

According to the CAPM, the expected return on a company's stock, which is also the equity cost rate (K), is expressed as:

$$K = (R_f) + \beta \times [E(R_m) - (R_f)]$$

Where:

- K represents the estimated rate of return on the stock;
- $E(R_m)$ represents the expected rate of return on the overall stock market. Frequently, the S&P 500 is used as a proxy for the "market";
- (R_f) represents the risk-free rate of interest;
- $[E(R_m) - (R_f)]$ represents the expected equity or market risk premium—the excess rate of return that an investor expects to receive above the risk-free rate for investing in risky stocks; and
- *Beta* (β) is a measure of the systematic risk of an asset.

To estimate the required return or cost of equity using the CAPM requires three inputs: the risk-free rate of interest (R_f), the beta (β), and the expected equity or market risk premium $[E(R_m) - (R_f)]$. R_f is the easiest of the inputs to measure – it is represented by the yield on long-term U.S. Treasury bonds. β, the measure of systematic risk, is a little more difficult to measure because there are different opinions about what adjustments, if any, should be made to historical betas due to their tendency to regress to 1.0 over time. And finally, the most difficult input to measure is the expected equity or market risk premium [$E(R_m) - (R_f)$]. I will discuss each of these inputs below.

Q. PLEASE DISCUSS EXHIBIT JRW-8.

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A. Exhibit JRW-8 provides the summary results for my CAPM study. Page 1 shows the results, and the following pages contain the supporting data.

Q. PLEASE DISCUSS THE RISK-FREE INTEREST RATE.

A. The yield on long-term U.S. Treasury bonds has usually been viewed as the risk-free rate of interest in the CAPM. In turn, this yield has been considered to be the yield on U.S. Treasury bonds with 30-year maturities.

Q. WHAT RISK-FREE INTEREST RATE ARE YOU USING IN YOUR CAPM?

A. As shown on page 2 of Exhibit JRW-8, the yield on 30-year U.S. Treasury bonds has been in the 1.3% to 4.0% range over the 2013–2020 time period. The current 30-year Treasury yield is near the bottom of this range. Given the recent range of yields, I have chosen to use a yield toward the middle of the range as my risk-free interest rate. Therefore, I am using 2.50% as the risk-free rate, or R_f, in my CAPM. This rate is consistent with Duff & Phelps, who are also using 2.50% (see page 7 of Exhibit JRW-8.)[23].

Q. DOES YOUR 2.50% RISK-FREE INTEREST RATE TAKE INTO CONSIDERATION FORECASTS OF HIGHER INTEREST RATES?

A. No, it does not. As I stated before, forecasts of higher interest rates have been notoriously wrong for a decade. My 2.50% risk-free interest rate takes into account the range of interest rates in the past and effectively synchronizes the risk-free rate with the market risk premium. The risk-free rate and the market risk premium are interrelated in that the market risk premium is developed in relation to the risk-free rate. As discussed below, my market risk premium is based on the results of many studies and surveys that

[23] https://www.duffandphelps.com/insights/publications/cost-of-capital.

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have been published over time. Therefore, my risk-free interest rate of 2.50% is effectively a normalized risk-free rate of interest.

Q. WHAT BETAS ARE YOU EMPLOYING IN YOUR CAPM?

A. Beta is a measure of the systematic risk of a stock. The market, usually taken to be the S&P 500, has a beta of 1.0. The beta of a stock with the same price movement as the market also has a beta of 1.0. A stock with price movement greater than that of the market, such as a technology stock, is riskier than the market and has a beta greater than 1.0. A stock with below average price movement, such as that of a regulated public utility, is less risky than the market and has a beta less than 1.0. Estimating a stock's beta involves running a linear regression of a stock's return on the market return.

As shown on page 3 of Exhibit JRW-8, the slope of the regression line is the stock's β. A steeper line indicates that the stock is more sensitive to the return on the overall market. This means that the stock has a higher β and greater-than-average market risk. A less steep line indicates a lower β and less market risk.

Several online investment information services, such as Yahoo and Reuters, provide estimates of stock betas. Usually these services report different betas for the same stock. The differences are usually due to: (1) the time period over which β is measured; and (2) any adjustments that are made to reflect the fact that betas tend to regress to 1.0 over time.

Q. PLEASE DISCUSS THE RECENT CHANGE IN BETAS.

A. I have traditionally used the betas as provided in the *Value Line Investment Survey*. As discussed above, the betas for utilities recently increased significantly as a result of the volatility of utility stocks during the stock market meltdown associated with the novel

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coronavirus in March. Utility betas as measured by *Value Line* have been in the 0.55 to 0.70 range for the past 10 years. But utility stocks were much more volatile relative to the market in March and April of this year, and this resulted in an increase of about 0.25 to the average utility beta.

Value Line defines their computation of beta as:[24]

> Beta - A relative measure of the historical sensitivity of a stock's price to overall fluctuations in the New York Stock Exchange Composite Index. A Beta of 1.50 indicates a stock tends to rise (or fall) 50% more than the New York Stock Exchange Composite Index. The ''Beta coefficient'' is derived from a regression analysis of the relationship between weekly percent-age changes in the price of a stock and weekly percentage changes in the NYSE Index over a period of five years. In the case of shorter price histories, a smaller time period is used, but two years is the minimum. The Betas are adjusted for their long-term tendency to converge toward 1.00. Value Line then adjusts these Betas to account for their long-term tendency to converge toward 1.00.

However, there are several issues with *Value Line* betas:

1. *Value Line* betas are computed using weekly returns, and the volatility of utility stocks during March was impacted by using weekly and not monthly returns. Yahoo Finance uses five years of monthly returns to compute betas, and Yahoo Finance's betas for utilities are lower than *Value Line*'s.
2. *Value Line* betas are computed using the New York Stock Exchange Index as the market. While about 3,000 stocks trade on the NYSE, most technology stocks are traded on the NASDAQ or over-the-counter market and not the NYSE. Technology stocks, which make up about 25% of the S&P 500, tend to be more volatile. If they were traded on the NYSE, they would increase the volatility of the measure of the market and thereby lower utility betas.

[24] www.valueline.com

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3. Major vendors of CAPM betas such as Merrill Lynch, *Value Line*, and Bloomberg publish adjusted betas. The so-called Blume adjustment cited by *Value Line* adjusts betas calculated using historical returns data to reflect the tendency of stock betas to regress toward 1.0 over time, which means that the Betas of typical low beta stocks tend to increase toward 1.0, and the betas of typical high beta stocks tend to decrease toward 1.0.[25]

The Blume adjustment procedure is:

$$Regressed\ Beta = 0.67 \times (Observed\ Beta) + 0.33$$

For example, suppose a company has an observed past beta of 0.50. The regressed (Blume-adjusted) beta would be:

$$Regressed\ Beta = 0.67 \times (0.50) + 0.33 = 0.67$$

Blume offered two reasons for betas to regress toward 1.0. First, he suggested it may be a by-product of management's efforts to keep the level of firm's systematic risk close to that of the market. Blume also speculated that it results from the management's efforts to diversify through investment projects.

However, there is an issue with using regressed betas for utilities. Specifically, a study by Michelfelder and Theodossiou investigated whether regressed Betas are appropriate for utilities.[26] Conceptually, Michelfelder and Theodossiou suggested that utilities are different from unregulated companies in several areas which may result in betas not regressing toward 1.0:[27]

> Being natural monopolies in their own geographic areas, public utilities have more influence on the prices of their product (gas and electricity) than other firms. The rate setting process provides public utilities with the

[25] M. Blume, "On the Assessment of Risk," *Journal of Finance*, March 1971.

[26] Richard A. Michelfelder and Panayiotis Theodossiou, "Public Utility Beta Adjustment and Biased Costs of Capital in Public Utility Rate Proceedings," *The Electricity Journal*, November, 2013.

[27] *Ibid*, p. 61.

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> opportunity to adjust prices of gas and electricity to recover the rising costs of fuel and other materials used in the transmission and distribution of electricity and gas.

To test for a regression toward 1.0, the authors used monthly holding period total returns for 57 publicly traded U.S. public utilities for the period from January 1962 to December 2007 using 60, 84, 96, and 108 monthly returns over five different non-lapping periods. They also used alternative time periods and got similar results. The authors came to the following conclusion from their analysis of the data:[28]

> Major vendors of CAPM Betas such as Merrill Lynch, Value Line, and Bloomberg distribute Blume adjusted betas to investors. We have shown empirically that public utility betas do not have a tendency to converge to 1. Short-term Betas of public utilities follow a cyclical pattern with recent downward trends, then upward structural breaks with long-term betas following a downward trend.

The authors concluded that utility betas converge to 0.59 as opposed to 1.0. The implication is that using regressed betas such as those from *Value Line* will result in an inflated expected return using the CAPM for gas companies.

Q. GIVEN THIS DISCUSSION, WHAT BETAS ARE YOU USING IN YOUR CAPM?

A. As shown on page 3 of Exhibit JRW-8, the median *Value Line* beta for the Electric and Vander Weide Proxy Groups are both 0.85. At this point, until I have studied utility betas in more depth, I will continue to use *Value Line* betas in my CAPM. I believe this is a conservative approach at this time.

Q. PLEASE DISCUSS THE MARKET RISK PREMIUM.

A. The market risk premium is equal to the expected return on the stock market (*e.g.*, the expected return on the S&P 500, $E(R_m)$, minus the risk-free rate of interest (R_f)). The

[28] *Ibid*, p. 67.

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1 market risk premium is the difference in the expected total return between investing in
2 equities and investing in "safe" fixed-income assets, such as long-term government bonds.
3 However, while the market risk premium is easy to define conceptually, it is difficult to
4 measure because it requires an estimate of the expected return on the market - $E(R_m)$. As
5 is discussed below, there are different ways to measure $E(R_m)$, and studies have come up
6 with significantly different magnitudes for $E(R_m)$. As Merton Miller, the 1990 Nobel Prize
7 winner in economics indicated, $E(R_m)$ is very difficult to measure and is one of the great
8 mysteries in finance.[29]

9 **Q. PLEASE DISCUSS THE ALTERNATIVE APPROACHES TO ESTIMATING THE**
10 **MARKET RISK PREMIUM.**

11 **A.** Page 4 of Exhibit JRW-8 highlights the primary approaches to, and issues in,
12 estimating the expected market risk premium. The traditional way to measure the market
13 risk premium was to use the difference between historical average stock and bond returns.
14 In this case, historical stock and bond returns, also called *ex post* returns, were used as the
15 measures of the market's expected return (known as the *ex ante* or forward-looking
16 expected return). This type of historical evaluation of stock and bond returns is often called
17 the "Ibbotson approach" after Professor Roger Ibbotson, who popularized this method of
18 using historical financial market returns as measures of expected returns. However, this
19 historical evaluation of returns can be a problem because: (1) *ex post* returns are not the
20 same as *ex ante* expectations; (2) market risk premiums can change over time, increasing
21 when investors become more risk-averse and decreasing when investors become less risk-

[29] Merton Miller, "The History of Finance: An Eyewitness Account," *Journal of Applied Corporate Finance*, 2000, p. 3.

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1 averse; and (3) market conditions can change such that *ex post* historical returns are poor
2 estimates of *ex ante* expectations.

3 The use of historical returns as market expectations has been criticized in numerous
4 academic studies as discussed later in my testimony. The general theme of these studies is
5 that the large equity risk premium discovered in historical stock and bond returns cannot
6 be justified by the fundamental data. These studies, which fall under the category "*Ex Ante*
7 Models and Market Data," compute *ex ante* expected returns using market data to arrive at
8 an expected equity risk premium. These studies have also been called "Puzzle Research"
9 after the famous study by Mehra and Prescott in which the authors first questioned the
10 magnitude of historical equity risk premiums relative to fundamentals.[30]

11 In addition, there are a number of surveys of financial professionals regarding the
12 market risk premium, as well as several published surveys of academics on the equity risk
13 premium. Duke University has published a CFO Survey on a quarterly basis for over 10
14 years.[31] Questions regarding expected stock and bond returns are also included in the
15 Federal Reserve Bank of Philadelphia's annual survey of financial forecasters, which is
16 published as the *Survey of Professional Forecasters*.[32] This survey of professional
17 economists has been published for almost 50 years. In addition, Pablo Fernandez conducts

[30] Rajnish Mehra & Edward C. Prescott, "The Equity Premium: A Puzzle," *Journal of Monetary Economics,* 145 (1985).

[31] *The CFO Survey* (https://www.richmondfed.org/cfosurvey).

[32] Federal Reserve Bank of Philadelphia, *Survey of Professional Forecasters* (February, 2020), https://www.philadelphiafed.org/-/media/research-and-data/real-time-center/survey-of-professional-forecasters/2020/spfq119.pdf?la=en. The Survey of Professional Forecasters was formerly conducted by the American Statistical Association ("ASA") and the National Bureau of Economic Research ("NBER") and was known as the ASA/NBER survey. The survey, which began in 1968, is conducted each quarter. The Federal Reserve Bank of Philadelphia, in cooperation with the NBER, assumed responsibility for the survey in June 1990.

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1 annual surveys of financial analysts and companies regarding the equity risk premiums
2 used in their investment and financial decision-making.[33]

3 **Q. PLEASE PROVIDE A SUMMARY OF THE MARKET RISK PREMIUM**
4 **STUDIES.**

5 **A.** Derrig and Orr, Fernandez, and Song completed the most comprehensive reviews
6 of the research on the market risk premium.[34] Derrig and Orr's study evaluated the various
7 approaches to estimating market risk premiums, discussed the issues with the alternative
8 approaches, and summarized the findings of the published research on the market risk
9 premium. Fernandez examined four alternative measures of the market risk premium –
10 historical, expected, required, and implied. He also reviewed the major studies of the
11 market risk premium and presented the summary market risk premium results. Song
12 provided an annotated bibliography and highlighted the alternative approaches to
13 estimating the market risk premium.

14 Page 5 of Exhibit JRW-8 provides a summary of the results of the primary risk
15 premium studies reviewed by Derrig and Orr, Fernandez, and Song, as well as other more
16 recent studies of the market risk premium. In developing page 5 of Exhibit JRW-8, I have
17 categorized the types of studies as discussed on page 4 of Exhibit JRW-8. I have also
18 included the results of studies of the "Building Blocks" approach to estimating the equity

[33] Pablo Fernandez, Apellániz, Eduardo & Acín, Javier. (2020). Survey: Market Risk Premium and Risk-Free Rate used for 81 countries in 2020. SSRN Electronic Journal. 10.2139/ssrn.3560869.

[34] *See* Richard Derrig & Elisha Orr, "Equity Risk Premium: Expectations Great and Small," Working Paper (version 3.0), Automobile Insurers Bureau of Massachusetts, (August 28, 2003); Pablo Fernandez, "Equity Premium: Historical, Expected, Required, and Implied," IESE Business School Working Paper, (2007); Zhiyi Song, "The Equity Risk Premium: An Annotated Bibliography," CFA Institute, (2007).

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risk premium. The Building Blocks approach is a hybrid approach employing elements of both historical and *ex ante* models.

Q. PLEASE DISCUSS PAGE 5 OF EXHIBIT JRW-8.

A. Page 5 of Exhibit JRW-8 provides a summary of the results of the market risk premium studies that I have reviewed. These include the results of: (1) the various studies of the historical risk premium, (2) *ex ante* market risk premium studies, (3) market risk premium surveys of CFOs, financial forecasters, analysts, companies and academics, and (4) the Building Blocks approach to the market risk premium. There are results reported for over 30 studies, and the median market risk premium of these studies is 4.83%.

Q. PLEASE HIGHLIGHT THE RESULTS OF MORE RECENT RISK PREMIUM STUDIES AND SURVEYS.

A. The studies cited on page 5 of Exhibit JRW-8 include every market risk premium study and survey I could identify that was published over the past 20 years and that provided a market risk premium estimate. Many of these studies were published prior to the financial crisis that began in 2008. In addition, some of these studies were published in the early 2000s at the market peak. It should be noted that many of these studies (as indicated) used data over long periods of time (as long as 50 years of data) and so were not estimating a market risk premium as of a specific point in time (*e.g.*, the year 2001). To assess the effect of the earlier studies on the market risk premium, I have reconstructed page 5 of Exhibit JRW-8 on page 6 of Exhibit JRW-8; however, I have eliminated all studies dated before January 2, 2010, which approximates the end of the financial crisis. The median market risk premium estimate for this subset of studies is 5.13%.

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Q. PLEASE SUMMARIZE THE MARKET RISK PREMIUM STUDIES AND SURVEYS.

A. As noted above, there are three approaches to estimating the market risk premium – historic stock and bond returns, *ex ante* or expected returns models, and surveys. The studies on page 6 of Exhibit JRW-8 can be summarized in the following manners:

- Historic Stock and Bond Returns - Historic stock and bond returns suggest a market risk premium in the 4.40% to 6.43% range, depending on whether one uses arithmetic or geometric mean returns.
- *Ex Ante* Models - Market risk premium studies that use expected or *ex ante* return models indicate a market risk premium in the range of 5.24% to 6.75%.
- Surveys - Market risk premiums developed from surveys of analysts, companies, financial professionals, and academics are lower, with a range from 3.36% to 5.70%.

Q. PLEASE HIGHLIGHT THE *EX ANTE* MARKET RISK PREMIUM STUDIES AND SURVEYS THAT YOU BELIEVE ARE MOST TIMELY AND RELEVANT.

A. I will highlight several studies and surveys.

Pablo Fernandez conducts annual surveys of financial analysts and companies regarding the equity risk premiums used in their investment and financial decision-making.[35] His survey results are included on pages 5 and 6 of Exhibit JRW-8. The results of his 2020 survey of academics, financial analysts, and companies, which included 4,000 responses, indicated a mean market risk premium employed by U.S. analysts and

[35] Pablo Fernandez, Vitaly Pershin, and Isabel Fernandez Acín, "Market Risk Premium and Risk-Free Rate used for 81 countries in 2020: a survey," *IESE Business School,* (Apr. 2020).

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1 companies of 5.6%.[36] His estimated market risk premium for the U.S. has been in the
2 5.00%-5.60% range in recent years.

3 Professor Aswath Damodaran of New York University, a leading expert on
4 valuation and the market risk premium, provides a monthly updated market risk premium
5 based on projected S&P 500 EPS and stock price level and long-term interest rates. His
6 estimated market risk premium, shown graphically in Figure 5, below, for the past 20 years,
7 has primarily been in the range of 5.0% to 6.0% since 2010. As of November 2020, his
8 estimate of the implied market risk premium was 5.35%.[37]

Figure 5
Damodaran Market Risk Premium

Source: http://pages.stern.nyu.edu/~adamodar/

[36] *Ibid.* p. 3.

[37] http://pages.stern.nyu.edu/~adamodar/.

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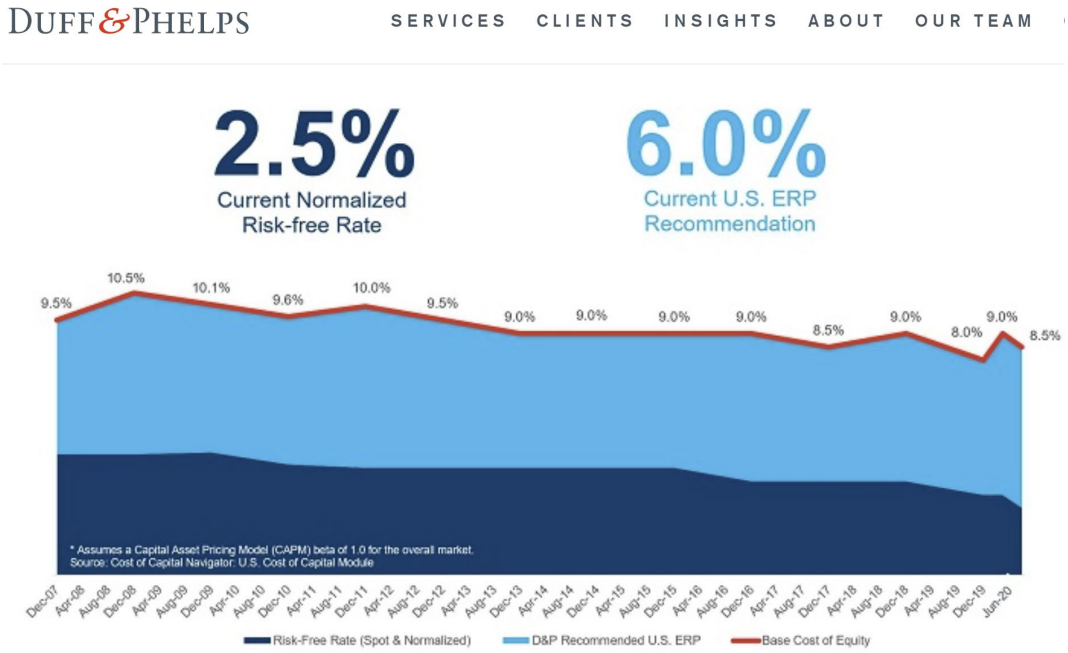
Duff & Phelps, an investment advisory firm, provides recommendations for the normalized risk-free interest rate and market risk premiums to be used in calculating the cost of capital data. Its recommendations over the 2008-2020 time periods are shown on page 7 of Exhibit JRW-8 and are shown graphically in Figure 6. Over the past decade, Duff & Phelps' recommended normalized risk-free interest rates have been in the 2.50% to 4.00% and market risk premiums has been in the 5.0% to 6.0% range. Most recently, in the wake of the novel coronavirus in 2020, Duff & Phelps decreased its recommended normalized risk-free interest rate from 3.0% to 2.50% and increased its market risk premium from 5.00% to 6.00%.[38]

Figure 6
Duff & Phelps
Normalized Risk-Free Rate and Market Risk Premium Recommendations
2007-2020



Source: https://www.duffandphelps.com/insights/publications/cost-of-capital

[38] Duff & Phelps, "U.S. Equity Risk Premium Recommendation," (June 30, 2020, https://www.duffandphelps.com/insights/publications/cost-of-capital.

Q. GIVEN THESE RESULTS, WHAT MARKET RISK PREMIUM ARE YOU USING IN YOUR CAPM?

A. The studies on page 6 of Exhibit JRW-8, and more importantly the more timely and relevant studies just cited, suggest that the appropriate market risk premium in the U.S. is in the 4.0% to 6.0% range. I will use an expected market risk premium of 6.00%, which is in the upper end of the range, as the market risk premium. I gave most weight to the market risk premium estimates of Duff & Phelps, KPMG, the Fernandez survey, and Damodaran. This is a conservatively high estimate of the market risk premium considering the many studies and surveys of the market risk premium.

Q. WHAT EQUITY COST RATE IS INDICATED BY YOUR CAPM ANALYSIS?

A. The results of my CAPM study for the proxy group are summarized on page 1 of Exhibit JRW-8 and in Table 3 below.

Table 3
CAPM-Derived Equity Cost Rate/ROE

$$\boldsymbol{K = (R_f) + \beta \times [E(R_m) - (R_f)]}$$

	Risk-Free Rate	Beta	Equity Risk Premium	Equity Cost Rate
Electric Proxy Group	2.50%	0.85	6.0%	7.6%
Vander Weide Proxy Group	2.50%	0.85	6.0%	7.6%

For the Electric and Vander Weide Proxy Groups, the risk-free rate of 2.50% plus the product of the beta of 0.85 times the equity risk premium of 6.0% results in a 7.6% equity cost rate.

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C. Equity Cost Rate Summary

Q. PLEASE SUMMARIZE THE RESULTS OF YOUR EQUITY COST RATE STUDIES.

A. My DCF analyses for the Electric Proxy Group and Vander Weide Proxy Group indicate equity cost rates of 8.90% and 8.85%, respectively. The CAPM equity cost rates for the Electric Proxy Group and Vander Weide Proxy Group are 7.60% and 7.60%.

Table 4
ROEs Derived from DCF and CAPM Models

	DCF	CAPM
Electric Proxy Group	8.90%	7.60%
Vander Weide Proxy Group	8.85%	7.60%

Q. GIVEN THESE RESULTS, WHAT IS YOUR PRIMARY ESTIMATED EQUITY COST RATE FOR THE GROUP?

A. I conclude that the appropriate equity cost rate for companies in the Electric Proxy Group is in the 7.60% to 8.90% range. However, since I rely primarily on the DCF model, and since DESC issuer credit ratings indicate that the Company's risk is at the high end of the proxy groups, I am using the upper end of the range as the equity cost rate for the group and am recommending a ROE of 8.90% for the Company.

Q. PLEASE INDICATE WHY YOUR EQUITY COST RATE RECOMMENDATIONS ARE APPROPRIATE FOR THE ELECTRIC UTILITY OPERATIONS OF THE COMPANY.

A. There are a number of reasons why an equity cost rate of 8.90% is appropriate and fair for the Company in this case:

1. As shown on page 1 of Exhibit JRW-5, capital costs for utilities, as indicated by long-term utility bond yields, are at historically low levels. In addition, given low

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inflationary expectations and slow global economic growth, interest rates are likely to remain at low levels for some time.

2. As shown on page 4 of Exhibit JRW-5, the electric utility industry is among the lowest risk industries in the U.S. as measured by beta. Overall, the cost of equity capital for this industry is the lowest in the U.S., according to the CAPM.
3. I have recommended an equity cost rate at the high end of the range of my ROE outcomes.
4. The authorized ROEs for electric utilities have declined from an average of 10.01% in 2012 to 9.64% in 2019 and 9.44% in the first three quarters of 2020, according to Regulatory Research Associates.[39] In my opinion, authorized ROEs have lagged behind capital market cost rates, or in other words, authorized ROEs have been slow to reflect low capital market cost rates. However, the trend has been towards lower ROEs and the norm now is below 10%. Hence, I believe that my recommended ROE reflects our present historically low capital cost rates, and these low capital cost rates are finally being recognized as the norm by state utility regulatory commissions.

Q. DO YOU BELIEVE THAT YOUR 8.90% ROE RECOMMENDATION MEETS THE *HOPE* AND *BLUEFIELD* STANDARDS?

A. Yes, I do. As previously noted, according to the *Hope* and *Bluefield* decisions, returns on capital should be: (1) comparable to returns investors expect to earn on other investments of similar risk; (2) sufficient to assure confidence in the company's financial integrity; and (3) adequate to maintain and support the company's credit and to attract capital. As shown on page 3 of Exhibit JRW-5, electric utility companies have been

[39] S&P Global Market Intelligence, RRA *Regulatory Focus*, 2019.

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earning ROEs in the range of 9.0% to 10.0%. With such a ROE, electric utility companies such as those in the proxy group have strong investment grade credit ratings, their stocks have been selling at about 2.0 times book value, and they have been raising abundant amounts of capital. While my recommendation is below the average authorized ROEs for electric utility companies, it reflects the record low levels of interest rates and capital costs. Therefore, I do believe that my ROE recommendation meets the criteria established in the *Hope* and *Bluefield* decisions.

VI. CRITIQUE OF DESC'S RATE OF RETURN TESTIMONY

Q. PLEASE REVIEW THE COMPANY'S PROPOSED RATE OF RETURN.

A. DESC has proposed using its actual capital structure for the Test Year consisting of 46.65% long-term debt and 53.35% common equity, and its long-term debt cost rate of 6.46%. Witness Vander Weide has recommended a common equity cost rate, or ROE, of 10.40%, which DESC reduced to a request of 10.25% in its Application. The Company's overall proposed rate of return is 8.48%. This is summarized on page 1 of Exhibit JRW-9.

Q. WHAT ARE THE PRIMARY AREAS OF DISAGREEMENT IN ESTIMATING THE RATE OF RETURN OR COST OF CAPITAL IN THIS PROCEEDING?

A. The primary issues related to the Company's rate of return include the following:

- Capital Structure – The Company has proposed a capitalization with a common equity ratio of 53.65% which has more equity and less financial risk than the capitalizations of other electric utilities as well as those approved by state regulatory commissions for electric utilities. As such, I am using a capital structure with a common equity ratio of 50.0%, which is more reflective of the capitalizations of electric utilities. In conjunction with Dominion Energy's acquisition of DESC, the parent company agreed

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to maintain a capital structure for DESC with a common equity ratio in the range of 50.0% to 55.0%. This is summarized below:[40]

- Capital Market Conditions – Witness Vander Weide's analyses, ROE results, and recommendations are based on the assumptions of higher interest rates and capital costs. However, interest rates and capital costs have remained at low levels in recent years. In 2019, interest rates fell due to slow economic growth and low inflation and, as discussed below, interest rates have fallen even further to record low levels in 2020 due to the impact of the novel coronavirus on the world's population and economy.
- Leverage and Flotation Cost Adjustments – Witness Vander Weide estimates an equity cost rate for DESC of 9.80% using the DCF, RP, CAPM, and Comparable Earnings approaches, and then has added a leverage adjustment of 60 basis points to account for the leverage difference between the market and book values of the capital structures of DESC and the companies in his proxy group. The DCF, risk premium, and CAPM equity cost rates also include a flotation cost adjustment of 20 basis points. Neither of these adjustments are warranted. With respect to the leverage adjustment, utility commission have been using book value capital structures in the regulatory ratemaking process for decades and this is a well-known fact to utility commissions, investors, analysts, and customers. In short, there is absolutely no economic justification to suddenly adopt witness Vander Weide's novel approach. In fact, witness Vander Weide has proposed this adjustment in hundreds of rate cases over the years, and he cannot point to any regulatory commission orders in which it has been adopted. With respect to the 20 basis point flotation cost adjustment, witness Vander Weide cannot point to any flotation costs

[40] South Carolina Public Service Commission, Order No. 2018-804, Docket Nos. 2017-207E, 2017-305E, and 2017-370-E, Order Exhibit 1, p. 8 of 10, December 21, 2018.

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paid by the Company. Therefore, this is no justification to provide the Company with additional revenues in the form of a higher ROE for expenses the Company does not incur.

- DCF Approach – Witness Vander Weide has overstated his reported DCF results in three ways:
  (1) he has made an inappropriate adjustment to reflect the quarterly payment of dividends;
  (2) most significantly, he has relied exclusively on the forecasted earnings per share ("EPS") growth rates of Wall Street analysts. I provide empirical evidence from studies that demonstrate the long-term earnings growth rates of Wall Street analysts are overly optimistic and upwardly-biased; and
  (3) he has made an unwarranted 20 basis point flotation cost adjustment.
- Risk Premium Model – Witness Vander Weide also estimates an equity cost rate using a risk premium model. There are three issues with this approach:
  (1) With respect to the base rate, he has used an overstated A-rated utility bond yield of 4.43% which is based on project interest rates;
  (2) Witness Vander Weide has employed historical (*ex post*) and an expected (*ex ante*) risk premium models and reports equity cost rates of 10.1% using the expected return approach and 9.0% using the historical RP approach. These figures include the 20 basis point flotation cost adjustment. In his expected risk premium approach, witness Vander Weide computes an expected stock return by applying the DCF model to the S&P utilities and the S&P 500 and uses the EPS growth rate forecasts of Wall Street analysts as his growth rate. He then subtracts the yield on 'A' rated utility bonds. In his historic risk premium model, witness Vander Weide computes a historical risk

premium as the difference in the arithmetic mean stock and bond returns. The stock returns are computed for different time periods for different indexes, including S&P and Moody's electric utility indexes as well as the S&P 500. As discussed below, there are numerous, well-known empirical issues with using historic stock and bond returns to estimate a risk premium. In addition, the expected return approach results in an overstated risk premium due to the well-known overly-optimistic and upwardly biased earnings per share growth rate forecasts of Wall Street analysts; and

(3) He has made an unwarranted 20 basis point flotation cost adjustment.

- CAPM Approach – The CAPM approach requires an estimate of the risk-free interest rate, beta, and the market or risk premium. There are three primary issues with witness Vander Weide's CAPM analysis:

(1) Witness Vander Weide uses a risk-free rate of interest of 2.84% in his CAPM, which is based on the average projected rate on 20-year Treasury bonds by *Value Line* and EIA. However, the current rate on 20-year Treasury bonds is about 1.5%. As such, witness Vander Weide's risk-free interest rate is overstated.

(2) He has employed a historical market risk premium of 7.20% and a projected market risk premium of 8.70%. These market risk premiums are larger than the market risk premiums: (1) indicated by historic stock and bond return data; and (2) found in the published studies and surveys of the market risk premium. In his historic risk premium model, witness Vander Weide computes a historical risk premium as the difference in the arithmetic mean stock and bond returns. As discussed below, there are numerous, well-known empirical issues with using historic stock and bond

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returns to estimate a risk premium. In addition, I demonstrate that the projected market risk premium of 8.70% is based on totally unrealistic assumptions of future economic and earnings growth and stock returns. To compute his projected market risk premium, witness Vander Weide has applied the DCF to the S&P 500 and employed analysts' three-to-five-year earnings per share ("EPS") growth-rate projections as a growth rate to compute an expected market return and market risk premium. As I demonstrate later in my testimony, the EPS growth-rate projection used for the S&P 500 and the resulting expected market return and market risk premium include totally unrealistic assumptions regarding future economic and earnings growth and stock returns; and

(3) He has made the unwarranted 20 basis point flotation cost adjustment.

- Comparable Earnings Approach – Witness Vander Weide also uses the Comparable Earnings approach to estimate an equity cost rate for the Company. Witness Vander Weide computes the expected ROE as forecasted by *Value Line* for his proxy group of electric utilities for 2020 and 2023-2025. As I discuss in my critique of witness Vander Weide's presentation, his "Comparable Earnings" approach does not measure the market cost of equity capital, is independent of most cost of capital indicators, ignores the research on the upward bias in *Value Line*'s earnings projections, and has several other empirical issues. Therefore, the Commission should ignore witness Vander Weide's "Comparable Earnings" approach in determining the appropriate ROE for DESC.

The capital structure and capital market conditions were previously discussed. I will initially address the leverage and flotation cost adjustments, and then the equity cost

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rate approaches.

Q. PLEASE REVIEW WITNESS VANDER WEIDE'S EQUITY COST RATE APPROACHES AND RESULTS.

A. Witness Vander Weide has developed a proxy group of electric utility companies and employs DCF, CAPM, risk premium, and Comparable Earnings equity cost rate approaches. Witness Vander Weide's equity cost rate estimates for DESC are summarized on page 2 Exhibit JRW-9. Based on these figures, he concludes that the appropriate equity cost rate is 9.8% for DESC's electric utility operations. He then makes a so-called leverage adjustment to account for the difference between the market value and book value capital structures of the companies in his electric group. This adjustment increases his ROE recommendation for DESC by 60 basis points to 10.4%. As I discuss below, there are a number of issues with the inputs, applications, and results of his equity cost rate models.

A. Leverage Adjustment

Q. PLEASE REVIEW WITNESS VANDER WEIDE'S LEVERAGE ADJUSTMENT.

A. Witness Vander Weide has added a leverage adjustment of 60 basis points to the estimated equity cost rates that he estimated using the DCF, RP, CAPM, and Comparable Earnings approaches. Witness Vander Weide claims that this is needed since (1) market values are greater than book values for utilities and (2) the overall rate of return is applied to a book value capitalization in the ratemaking process. This adjustment is unwarranted for the following reasons:

(1) The market value of a firm's equity exceeds the book value of equity when the firm is expected to earn more on the book value of investment than investors require. This relationship is described very succinctly in the Harvard Business School case study, which

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I quoted earlier in my testimony.[41] As such, the reason that market values exceed book values is that the company is earning a return on equity in excess of its cost of equity;

(2) Despite witness Vander Weide's contention that this represents a leverage adjustment, there is no change in leverage. There is no need for a leverage adjustment because there is no change in leverage. The Company's financial statements and fixed financial obligations remain the same;

(3) Financial publications and investment firms report capitalizations on a book value and not a market value basis;

(4) Witness Vander Weide has presented his leverage adjustment in many rate cases over many years before various regulatory commissions. In response to ORS' Fifth Continuing Request for Books, Records, and Other Information No. 5-22, witness Vander Weide was asked to list both cases in which he employed this leverage adjustment and cases in which a regulatory commission had adopted the same. In response to this interrogatory, he failed or refused to provide orders in which a regulatory commission has adopted his leverage adjustment.[42] DESC also responded that witness Vander Weide did not maintain copies of commission orders for cases in which he testified and provided a list of cases over the past three years where witness Vander Weide proposed a leverage adjustment; and

(5) As such, there is no evidence that any regulatory commission has ever accepted witness Vander Weide's leverage adjustment. Further, witness Vander Weide has not identified any proceeding in which he has testified over the past 30 plus years where the regulatory

[41] See pages B-2 – B-4 of Appendix B.

[42] ORS requested that DESC provide a list of cases in which a Commission has adopted Dr. Vander Weide's leverage adjustment, but the Company objected and indicated that information was not available.

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commission adopted his leverage adjustment. As a result, ORS is unaware of any proceeding, and the Company has not identified any, in which a regulatory commission adopted Dr. Vander Weide's leverage adjustment.

Q. PLEASE EXPLAIN WHY YOU BELIEVE THAT REGULATORY COMMISSIONS HAVE REJECTED WITNESS VANDER WEIDE'S LEVERAGE ADJUSTMENT?

A. I believe that witness Vander Weide's leverage adjustment has been rejected by regulatory commissions because it increases the ROEs for utilities that have high returns on common equity and decreases the ROEs for utilities that have low returns on common equity.

In the graph presented in Exhibit JRW-6, I have demonstrated that there is a strong positive relationship between expected returns on common equity and market-to-book ratios for public utilities. Hence, in the context of witness Vander Weide's leverage adjustment, this means that: (1) for a utility with a relatively high market-to-book ratio (*e.g.*, 2.5) and ROE (*e.g.*, 12.0%), the leverage adjustment will increase the estimated equity cost rate, while (2) for a utility with a relatively low market-to-book ratio (*e.g.*, 0.5) and ROE (*e.g.*, 5.0%), the leverage adjustment will decrease the estimated equity cost rate. Therefore, the adjustment will result in even higher market-to-book ratios for utilities with relatively high ROEs and even lower market-to-book ratios for utilities with relatively low ROEs.

B. Flotation Cost Adjustment

Q. PLEASE DISCUSS WITNESS VANDER WEIDE'S ADJUSTMENT FOR FLOTATION COSTS.

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A. Witness Vander Weide includes a flotation cost adjustment of 20 basis points to his DCF, risk premium, and CAPM results in developing his ROE recommendation for DESC. This is erroneous for several reasons.

First and foremost, witness Vander Weide has not identified any flotation cost for DESC. Therefore, he is asking for higher revenues in the form of a higher ROE for expenses that he has not identified.

Second, it is commonly argued that a flotation cost adjustment (such as that used by the Company) is necessary to prevent the dilution of the investment of the existing shareholders. This is incorrect for several reasons:

(1) If an equity flotation cost adjustment is similar to a debt flotation cost adjustment, the fact that the market-to-book ratios for electric utility companies are over 1.95X actually suggests that there should be a flotation cost reduction (and not an increase) to the equity cost rate. This is because when (a) a bond is issued at a price in excess of face or book value, and (b) the difference between market price and the book value is greater than the flotation or issuance costs, the cost of that debt is lower than the coupon rate of the debt. The amount by which market values of electric utility companies are in excess of book values is much greater than flotation costs. Hence, if common stock flotation costs were exactly like bond flotation costs, and one was making an explicit flotation cost adjustment to the cost of common equity, the adjustment would be downward;

(2) If a flotation cost adjustment is needed to prevent dilution of existing stockholders' investment, then the reduction of the book value of stockholder investment associated with flotation costs can occur only when a company's stock is selling at a market price

at/or below its book value. As noted above, electric utility companies are selling at market prices well in excess of book value. Hence, when new shares are sold, existing shareholders realize an increase in the book value per share of their investment, not a decrease;

(3) Flotation costs consist primarily of the underwriting spread or fee and not out-of-pocket expenses. On a per-share basis, the underwriting spread is the difference between the price the investment banker receives from investors and the price the investment banker pays to the company. Therefore, these are not expenses that must be recovered through the regulatory process. Furthermore, the underwriting spread is known to the investors who are buying the new issue of stock, and who are well aware of the difference between the price they are paying to buy the stock and the price that the Company is receiving. The offering price they pay is what matters when investors decide to buy a stock based on its expected return and risk prospects. Therefore, the company is not entitled to an adjustment to the allowed return to account for those costs; and

(4) Flotation costs, in the form of the underwriting spread, are a form of a transaction cost in the market. They represent the difference between the price paid by investors and the amount received by the issuing company. Whereas the Company believes that it should be compensated for these transaction costs, it has not accounted for other market transaction costs in determining its cost of equity. Most notably, brokerage fees that investors pay when they buy shares in the open market are another market transaction cost. Brokerage fees increase the effective stock price paid by investors to buy shares. If the Company had included these brokerage fees or transaction costs in its DCF analysis, the higher effective stock prices paid for stocks would lead to lower dividend

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yields and equity cost rates. This would result in a downward adjustment to its DCF equity cost rate.

C. DCF Approach

Q. PLEASE SUMMARIZE WITNESS VANDER WEIDE'S DCF ESTIMATES.

A. On pages 23-31 of his testimony and in Exhibit No. ___(JVW-4), witness Vander Weide develops an equity cost rate by applying a DCF model to his group of electric utility companies. In the traditional DCF approach, the equity cost rate is the sum of the dividend yield and expected growth. Witness Vander Weide adjusts the spot dividend yield to reflect the quarterly payment of dividends. Witness Vander Weide uses one measure of DCF expected growth - the projected EPS growth rate. He uses the EPS growth rate forecasts from Wall Street analysts as provided by the Institutional Brokers' Estimate System ("I/B/E/S"). He also includes a flotation cost adjustment of five percent. Based on his analyses, witness Vander Weide claims that the DCF equity cost rate for groups is 9.3%, respectively.

Q. WHAT ARE THE ERRORS IN WITNESS VANDER WEIDE'S DCF ANALYSES?

A. There are three errors: (1) the quarterly dividend yield adjustment is excessive; (2) the projected DCF growth rate is based entirely on overly optimistic and upwardly-biased EPS growth rate estimates of Wall Street analysts; and (3) the flotation cost adjustment is inappropriate. Flotation costs were addressed above. The other issues are discussed below.

1. <u>DCF Dividend Yield Adjustment</u>

Q. PLEASE DISCUSS THE ADJUSTMENT TO THE DIVIDEND YIELD TO REFLECT THE QUARTERLY PAYMENT OF DIVIDENDS.

A. Witness Vander Weide uses DCF dividend yields of 3.64% for his electric utility group. In Appendix 2 of his testimony, witness Vander Weide discusses the adjustments he

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makes to his spot dividend yields to account for the quarterly payment of dividends. This includes an adjustment to reflect the time value of money. However, the quarterly timing adjustment is in error and results in an overstated equity cost rate. First, as discussed above, the appropriate dividend yield adjustment for growth in the DCF model is the expected dividend for the next quarter multiplied by four. Thus, witness Vander Weide's quarterly adjustment procedure is inconsistent with this approach.

Second, witness Vander Weide's approach presumes that investors require additional compensation during the coming year because their dividends are paid out quarterly instead of being paid all in a lump sum. Therefore, he compounds each dividend to the end of the year using the long-term growth rate as the compounding factor. The error in this logic and approach is that the investor receives the money from each quarterly dividend and has the option to reinvest it as he or she chooses. This reinvestment generates its own compounding; however, it is outside of the dividend payments of the issuing company. Witness Vander Weide's approach serves to duplicate this compounding process, thereby inappropriately inflating the return to the investor.

Finally, the notion that an adjustment is required to reflect the quarterly timing issue is refuted in a study by Richard Bower of Dartmouth College. Bower acknowledges the timing issue and downward bias addressed by witness Vander Weide. However, he demonstrates that this does not result in a biased required rate of return. He provides the following assessment:[43]

> ... authors are correct when they say that the conventional cost of equity calculation is a downward-biased estimate of the market discount rate. They are not correct, however, in concluding that it has a bias as a measure

[43] See Richard Bower, The N-Stage Discount Model and Required Return: A Comment," *Financial Review* (February 1992), pp. 141-9.

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> of required return. As a measure of required return, the conventional cost of equity calculation (K*), ignoring quarterly compounding and even without adjustment for fractional periods, serves very well.

Bower also makes the following observation on the issue:

> Too many rate cases have come and gone, and too many utilities have survived and sustained market prices above book, to make downward bias in the conventional calculation of required return a likely reality.

2. Analysts' EPS Growth Rate Forecasts

Q. PLEASE DISCUSS WITNESS VANDER WEIDE'S EXCLUSIVE RELIANCE ON THE PROJECTED GROWTH RATES OF WALL STREET ANALYSTS AND *VALUE LINE.*

A. It seems highly unlikely that investors today would rely exclusively on the EPS growth rate forecasts of Wall Street analysts and ignore other growth rate measures in arriving at their expected growth rates for equity investments. As I previously indicated, the appropriate growth rate in the DCF model is the dividend growth rate, not the earnings growth rate. Hence, consideration must be given to other indicators of growth, including historical prospective dividend growth, internal growth, as well as projected earnings growth. In addition, a recent study by Lacina, Lee, and Xu (2011) has shown that analysts' long-term earnings growth rate forecasts are not more accurate at forecasting future earnings than naïve random walk forecasts of future earnings.[44] As such, the weight given to analysts' projected EPS growth rates should be limited. And finally, and most significantly, it is well-known that the long-term EPS growth rate forecasts of Wall Street securities analysts are overly optimistic and upwardly biased.[45] Hence, using these growth

[44] If actual earnings growth rates follow a random walk, future growth rates cannot be forecasted. See M. Lacina, B. Lee and Z. Xu, *Advances in Business and Management Forecasting (Vol. 8),* Kenneth D. Lawrence, Ronald K. Klimberg (ed.), Emerald Group Publishing Limited, pp.77-101

[45] See references in footnote No. 19.

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rates as a DCF growth rate produces an overstated equity cost rate. A recent study by Easton and Sommers (2007) found that optimism in analysts' earnings growth rate forecasts leads to an upward bias in estimates of the cost of equity capital of almost 3.0 percentage points.[46] Therefore, exclusive reliance on these forecasts for a DCF growth rate results in failure of one of the basic inputs in the equation. In addition, as noted above, a study by Szakmary, Conover, and Lancaster (2008) discovered the three-to-five-year EPS growth rate forecasts of *Value Line* to be significantly higher than the EPS growth rates that these companies subsequently achieved.[47]

Q. HAVE CHANGES IN REGULATIONS IMPACTING WALL STREET ANALYSTS AND THEIR RESEARCH IMPACTED THE UPWARD BIAS IN THEIR PROJECTED EPS GROWTH RATES?

A. No. A number of the studies I have cited above demonstrate that the upward bias has continued despite changes in regulations and reporting requirements over the past two decades. This observation is highlighted by a 2010 McKinsey study entitled "Equity Analysts: Still Too Bullish," which involved a study of the accuracy of analysts' long-term EPS growth rate forecasts. The authors conclude that after a decade of stricter regulation, analysts' long-term earnings forecasts continue to be excessively optimistic. They made the following observation (emphasis added):[48]

> Alas, a recently completed update of our work only reinforces this view—despite a series of rules and regulations, dating to the last decade, that were intended to improve the quality of the analysts' long-term earnings

[46] Easton, P., & Sommers, G. (2007). Effect of analysts' optimism on estimates of the expected rate of return implied by earnings forecasts. *Journal of Accounting Research*, 45(5), 983–1015.

[47] Szakmary, A., Conover, C., & Lancaster, C. (2008). "An Examination of *Value Line*'s Long-Term Projections," *Journal of Banking & Finance*, May 2008, pp. 820-833.

[48] Marc H. Goedhart, Rishi Raj, and Abhishek Saxena, "Equity Analysts, Still Too Bullish," *McKinsey on Finance*, pp. 14-17, (Spring 2010) (emphasis added).

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> forecasts, restore investor confidence in them, and prevent conflicts of interest. For executives, many of whom go to great lengths to satisfy Wall Street's expectations in their financial reporting and long-term strategic moves, this is a cautionary tale worth remembering. This pattern confirms our earlier findings that analysts typically lag behind events in revising their forecasts to reflect new economic conditions. When economic growth accelerates, the size of the forecast error declines; when economic growth slows, it increases. So as economic growth cycles up and down, the actual earnings S&P 500 companies report occasionally coincide with the analysts' forecasts, as they did, for example, in 1988, from 1994 to 1997, and from 2003 to 2006. *Moreover, analysts have been persistently overoptimistic for the past 25 years, with estimates ranging from 10 to 12 percent a year, compared with actual earnings growth of 6 percent. Over this time frame, actual earnings growth surpassed forecasts in only two instances, both during the earnings recovery following a recession. On average, analysts' forecasts have been almost 100 percent too high.*

This is the same observation made in a *Bloomberg Businessweek* article.[49] The author concluded:

> **The bottom line:** Despite reforms intended to improve Wall Street research, stock analysts seem to be promoting an overly rosy view of profit prospects.

Q. WITNESS VANDER WEIDE HAS DEFENDED THE USE OF ANALYSTS' EPS FORECASTS IN HIS DCF MODEL BY CITING A STUDY HE PUBLISHED WITH DR. WILLARD CARLETON. PLEASE DISCUSS WITNESS VANDER WEIDE'S STUDY.

A. Witness Vander Weide cites the study on pages 27-28 of his testimony. In the study, witness Vander Weide performs a linear regression of a company's stock price to earnings ratio (P/E) on the dividend yield payout ratio (D/E), alternative measures of growth (g), and four measures of risk (beta, covariance, r-squared, and the standard deviation of analysts' growth rate projections). He performed the study for three one-year

[49] Roben Farzad, "For Analysts, Things Are Always Looking Up," *Bloomberg Businessweek* (June 10, 2010), https://www.bloomberg.com/news/articles/2010-06-10/for-analysts-things-are-always-looking-up.

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1 periods – 1981, 1982, and 1983 – and used a sample of approximately 65 companies. His
2 results indicated that regressions measuring growth as analysts' forecasted EPS growth
3 were more statistically significant that those using various historic measures of growth.
4 Consequently, he concluded that analysts' growth rates are superior measures of expected
5 growth.

6 **Q. PLEASE CRITIQUE WITNESS VANDER WEIDE'S STUDY.[50]**

7 **A.** Before highlighting the errors in the study, it is important to note that the study was
8 published more than 30 years ago, used a sample of only 65 companies, and evaluated a
9 three-year time period (1981-1983) that occurred nearly 40 years ago. Since that time,
10 many more exhaustive studies have been performed using significantly larger data bases
11 and, from these studies, much has been learned about Wall Street analysts and their stock
12 recommendations and earnings forecasts. Nonetheless, there are several errors that
13 invalidate the results of witness Vander Weide's study.

14 **Q. PLEASE DESCRIBE THE ERRORS IN WITNESS VANDER WEIDE'S STUDY.**

15 **A.** The primary error in the study is that his regression model is mis-specified. As a
16 result, he cannot conclude whether one growth rate measure is better than the other. The
17 misspecification results from the fact that witness Vander Weide did not actually employ
18 a modified version of the DCF model. Instead, he used a "linear approximation." He used
19 the approximation so that he did not have to measure *k*, the investors' required return,
20 directly; instead, he used some proxy variables for risk. The error in this approach is there
21 can be an interaction between growth (*g*) and investors' required return (*k*), which could

[50] On page 28 of his testimony, witness Vander Weide cites a 2003 updated version of the study. However, this study is not published in a refereed journal and the data and results cannot be verified. Nonetheless, the updated study contains the same methodological errors addressed here as the original study.

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erroneously lead him to conclude that one growth rate measure is superior to others. Furthermore, due to this problem, analysts' EPS forecasts could be upwardly biased and still appear to provide better measures of expected growth.

There are other errors in the study as well that further invalidate the results. Witness Vander Weide does not use both historic and analysts' projections for growth rate measures in the same regression to assess if both historic data and forecasts should be used together to measure expected growth. In addition, he did not perform any tests to determine if the difference between historic and projected growth measures is statistically significant. Without such tests, he cannot make any valid conclusions about the superiority of one measure versus the other.

D. Risk Premium ("RP") Approach

Q. PLEASE REVIEW WITNESS VANDER WEIDE'S RP ANALYSES.

A. On pages 31-32 and Exhibit Nos. __(JVW-6) through ___(JVH-10), witness Vander Weide develops an equity cost rate using expected (*ex ante*) and historical risk premium models. He reports risk premium models equity cost rates of 10.1% using the expected return approach and 9.0% using the historical risk premium models approach.

In his expected risk premium models approach, witness Vander Weide computes an expected stock return by applying the DCF model to the S&P utilities and the S&P 500 and uses the EPS growth rate forecasts of Wall Street analysts as his growth rate. He then subtracts the yield on 'A' rated utility bonds. In his historical risk premium models model, witness Vander Weide computes a historical risk premium as the difference in the arithmetic mean stock and bond returns. The stock returns are computed for different time periods for

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different indexes, including S&P and Moody's electric utility indexes as well as the S&P 500. He then adds a flotation cost adjustment of 20 basis points.

Q. WHAT ARE THE ERRORS IN WITNESS VANDER WEIDE'S RISK PREMIUM ANALYSES?

A. The errors in witness Vander Weide's RP equity cost rate approaches include:

(1) an inflated base interest rate;

(2) excessive risk premiums in both his *ex ante* and historical approaches; and

(3) the inclusion of a flotation cost adjustment of 0.20%.

The errors in the flotation cost issue have already been addressed. The other two issues are discussed below.

1. <u>The Base Interest Rate</u>

Q. PLEASE DISCUSS THE BASE YIELD OF WITNESS VANDER WEIDE'S RISK PREMIUM ANALYSIS.

A. The base yield in witness Vander Weide's RP analysis is the projected yield on 'A' rated utility bonds. There are two issues with his projected 4.43% 'A' rated utility bond yield. First, the yield is well above current market rates. As shown on page 1 of Exhibit JRW-5, the current yield on long-term, 'A' rated public utility bonds is below 3.0%. As such, his base interest rate is vastly overstated and he provides no sound basis for using this overstated rate. Second, witness Vander Weide's base yield is erroneous and inflates the required return on equity in two ways. First, long-term bonds are subject to interest rate risk, a risk which does not affect common stockholders since dividend payments (unlike bond interest payments) are not fixed but tend to increase over time. Second, the base yield in witness Vander Weide's risk premium study is subject to credit risk since it

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is not default risk-free like an obligation of the U.S. Treasury. As a result, its yield-to-maturity includes a premium for default risk and, therefore, is above its expected return. Hence, using such a bond's yield-to-maturity as a base yield results in an overstatement of investors' return expectations.

2. Risk Premium

Q. WITNESS VANDER WEIDE EMPLOYS A DCF-BASED *EX ANTE* RISK PREMIUM APPROACH. PLEASE DISCUSS THE ERRORS IN THIS APPROACH.

A. Witness Vander Weide computes a DCF-based equity risk premium. He estimates an expected return using the DCF model, and subtracts a concurrent measure of interest rates. He computes the expected return in this RP approach by applying the DCF model to a group of electric utility companies on a monthly basis over the 1998-2019 time periods. He employs the EPS growth rate forecasts of Wall Street analysts as the DCF growth rate. To compute the RP, he then subtracts the yield on 'A' rated utility bonds.

The primary error in this approach is that he uses the EPS growth rate forecasts of Wall Street analysts as the one and only measure of growth in the DCF model. The errors in this issue were addressed above. As I have discussed, analysts' EPS growth rate forecasts are highly inaccurate estimates of future earnings (a naïve random walk model performs just as well) and are overly optimistic and upwardly-biased measures of actual future EPS growth for companies in general as well as for utilities. As a result, witness Vander Weide's *ex-ante* risk premium is overstated because his expected return measure is inflated.

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Q. PLEASE REVIEW WITNESS VANDER WEIDE'S *EX POST* OR HISTORIC RP STUDY.

A. Witness Vander Weide performs an *ex post* or historical risk premium study that appears in Exhibit__(JVW-9) and Exhibit__(JVW-10). This study involves an assessment of the historical differences between the S&P Public Utility Index and the S&P 500 stock returns and public utility bond returns over various time periods between the years 1937-2019. From the results of his *ex post* risk premium study, using a projected 'A' bond yield of 4.43%, he reports a ROE of 8.80%. He adds a flotation cost adjustment of 20 basis points to arrive at 9.0%.

Q. FIRST, HAS WITNESS VANDER WEIDE PROVIDED ANY EMPIRICAL EVIDENCE WHATSOEVER THAT THE S&P 500 COMPANIES ARE APPROPRIATE RISK PROXIES FOR ELECTRIC UTILITY COMPANIES?

A. No, he has not. Witness Vander Weide has provided no such evidence, and as I have previously indicated, electric utilities are among the least risky companies in the U.S. As a result, because witness Vander Weide has provided no evidence that the S&P 500 is an appropriate proxy for electric utility companies, the results of this study should be ignored.

Q. PLEASE ADDRESS THE ISSUES INVOLVED IN USING HISTORICAL STOCK AND BOND RETURNS TO COMPUTE A FORWARD-LOOKING OR *EX ANTE* RISK PREMIUM.

A. As previously discussed, one way to measure a market risk premium is to compute the difference between historic stock and bond returns. However, this approach can produce differing results depending on several factors, including the measure of central tendency used, the time period evaluated, and the stock and bond market index employed.

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In addition, there are a myriad of empirical problems in this approach, which result in historical market returns producing inflated estimates of expected risk premiums. Among the errors are the U.S. stock market survivorship bias (the "Peso Problem"), the company survivorship bias (only successful companies survive – poor companies do not survive), the measurement of central tendency (the arithmetic versus geometric mean), the historical time horizon used, the change in risk and required return over time, the downward bias in historical bond returns, and unattainable return bias (the Ibbotson procedure presumes monthly portfolio rebalancing).[51] As noted by well-known financial researcher Jay Ritter, using historical stock and bond returns to estimate a forward-looking risk premium is one of the biggest mistakes taught in finance. The bottom line is that there are a number of empirical problems in using historical stock and bond returns to measure an expected equity risk premium.

E. CAPM Approach

Q. PLEASE DISCUSS WITNESS VANDER WEIDE'S CAPM.

A. In Exhibit No. __(JVW-13) and Exhibit No. __(JVW-14), witness Vander Weide develops an equity cost rate using the CAPM. Witness Vander Weide uses a projected long-term risk-free rate of 2.84% and two different measures of beta: (1) the average beta of 0.87 for his group as provided by *Value Line;* and (2) an historical beta of 0.89, which he computes as the ratio of the risk premium on the utility portfolio to the risk premium on the S&P 500. He employs a both a historical market risk premium (Exhibit No. __(JVW-

[51] These issues are addressed in a number of studies, including: Aswath. Damodaran, "Equity Risk Premiums (ERP): Determinants, Estimation and Implications – The 2015 Edition" NYU Working Paper, 2015, pp. 32-5; See Richard Roll, "On Computing Mean Returns and the Small Firm Premium," *Journal of Financial Economics*, pp. 371-86, (1983); Jay Ritter, "The Biggest Mistakes We Teach," *Journal of Financial Research* (Summer 2002); Bradford Cornell, *The Equity Risk Premium* (New York, John Wiley & Sons),1999, pp. 36-78; and J. P. Morgan, "The Most Important Number in Finance," p. 6.

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13)) and a forward-looking or expected market risk premium (Exhibit No. __(JVW-14)). Witness Vander Weide's also adds a flotation cost adjustment of 20 basis points to his CAPM results. He reports CAPM equity cost rates of 10.10% using the historical CAPM and 10.80% using the expected CAPM.

Witness Vander Weide's historical CAPM uses the Ibbotson return data and the market risk premium of 7.20% is calculated as the difference between the arithmetic mean stock return and the bond income return over the 1926-2019 period. Including the flotation cost adjustment, he reports ROEs of 9.3% using *Value Line* betas and 9.5% using his historical betas. Witness Vander Weide develops his expected market risk premium for his CAPM of 8.70% in Exhibit No.___(JVW-14) by applying the DCF model to the companies in the S&P 500. Witness Vander Weide estimates an expected market return of 11.50% using an adjusted dividend yield of 3.1% and an expected DCF growth rate of 8.4%.

Q. WHAT ARE THE ERRORS IN WITNESS VANDER WEIDE'S CAPM ANALYSIS?

A. There are several flaws with witness Vander Weide's CAPM:

(1) his risk-free rate of 2.84%;

(2) the historic and expected market risk premiums; and

(3) the flotation cost adjustment.

The errors in the flotation cost issue have already been addressed. The other two issues are discussed below.

1. <u>The Risk-Free Interest Rate</u>

Q. PLEASE DISCUSS WITNESS VANDER WEIDE'S RISK-FREE RATE OF INTEREST IN HIS CAPM.

A. Witness Vander Weide uses a risk-free rate of interest of 2.84% in his CAPM. This

figure represents the average projected rate on 20-year Treasury bonds by *Value Line* and EIA. The current rate on 20-year Treasury bonds is about 1.5%. As such, witness Vander Weide's risk-free interest rate is overstated.

2. "Historical Beta"

Q. PLEASE REVIEW WITNESS VANDER WEIDE'S "HISTORICAL BETA."

A. Witness Vander Weide has created a new measure of beta – a "historical beta." As presented on page 3 of Exhibit JRW-8, beta is normally computed based on a regression of a company's stock return on the return of the market (*i.e.*, the S&P 500). *Value Line* then adjusts the beta from the regression for the tendency of betas to move toward the market average beta of 1.0 over time. As noted above, the average *Value Line* beta for the companies in witness Vander Weide's proxy group is 0.87. As previously discussed, betas for utilities increased significantly in March of 2020 due to the increase in market volatility. Prior to this time, the betas for electric utilities were in the 0.6-0.7 range over the past decade. Nonetheless, witness Vander Weide's "historical beta" is a totally new measure of beta that is his own creation. He uses the ratio of the historical risk premium on the utility portfolio to the historical risk premium on the S&P 500.

Q. WHAT IS THE ERROR WITH THIS APPROACH?

A. Witness Vander Weide's "historical beta" has no theoretical or empirical support in the CAPM literature, nor has it been endorsed or accepted by any leading scholars. Beta is a measure of systematic risk or undiversifiable risk. Witness Vander Weide's historical beta is based on total risk and is not calculated based on traditional betas according to the CAPM.

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3. Historical and Expected Market Risk Premiums

Q. PLEASE ADDRESS THE PROBLEMS WITH WITNESS VANDER WEIDE'S HISTORICAL CAPM.

A. Witness Vander Weide's historical CAPM uses a market risk premium of 7.2%, which is based on the difference between the arithmetic mean stock and bond income returns over the 1926-2019 period. The errors associated with computing an expected equity risk premium using historical stock and bond returns were addressed earlier in this testimony. In short, there are a myriad of empirical problems, which result in historical market returns producing inflated estimates of expected risk premiums. These were discussed above and include U.S. stock market survivorship bias, the company survivorship bias, and unattainable return bias. In addition, in this case, witness Vander Weide has compounded the error by using the bond income return rather than the actual bond return and by using arithmetic as opposed to geometric mean returns. By omitting the price change component of the bond return, he has magnified the historical risk premium by not matching the returns on stock with the actual returns on bonds.

Q. PLEASE DISCUSS THE ARITHMETIC VERSUS GEOMETRIC MEAN ISSUE.

A. The measure of investment return has a significant effect on the interpretation of the risk premium results. When analyzing a single security price series over time (*i.e.*, a time series), the best measure of investment performance is the geometric mean return. Using the arithmetic mean overstates the return experienced by investors. In a study entitled "Risk and Return on Equity: The Use and Misuse of Historical Estimates," Carleton and Lakonishok make the following observation: "The geometric mean measures the changes in wealth over more than one period on a buy and hold (with dividends

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invested) strategy."[52] When a historic stock and bond return study covers more than one period (and he assumes that dividends are reinvested), Dr. Vander Weide should employ the geometric mean and not the arithmetic mean.

To demonstrate the upward bias of the arithmetic mean, consider the following example. Assume that you have a stock (that pays no dividend) that is selling for $100 today, increases to $200 in one year, and then falls back to $100 in two years. The table below shows the prices and returns.

Table 5
Geometric versus Arithmetic Mean Return

Time Period	Stock Price	Annual Return
0	$100	
1	$200	100%
2	$100	-50%

The arithmetic mean return is simply (100% + (-50%))/2 = 25% per year. The geometric mean return is $((2 * 0.50)^{(1/2)}) - 1 = 0\%$ per year. Therefore, the arithmetic mean return suggests that your stock has appreciated at an annual rate of 25%, while the geometric mean return indicates an annual return of 0%. Since after two years, your stock is still only worth $100, the geometric mean return is the appropriate return measure.

For this reason, when stock returns and earnings growth rates are reported in the financial press, they are generally reported using the geometric mean. This is because of the upward bias of the arithmetic mean. As further evidence of the appropriate mean return measure, the Securities and Exchange Commission (SEC) requires equity mutual funds to report historic return performance using geometric mean and not arithmetic mean returns.[53]

[52] Willard T. Carleton and Josef Lakonishok, "Risk and Return on Equity: The Use and Misuse of Historical Estimates," *Financial Analysts Journal*, pp. 38-47, (January-February 1985).

[53] SEC, Form N-1A.

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Therefore, the historic arithmetic mean return measures are biased and should be disregarded.

Nonetheless, in measuring historic returns to develop an expected equity risk premium, finance texts will often recommend the use of an arithmetic mean return as a measure of central tendency. A common justification for using the arithmetic mean return is that since annual stock returns are not serially correlated, the best measure of a return for next year is the arithmetic mean of past returns. On the other hand, Damodaran suggests that such an estimate is not appropriate in estimating an equity risk premium:[54]

> The arithmetic average return measures the simple mean of the series of annual returns, whereas the geometric average looks at the compounded return. Many estimation services and academics argue for the arithmetic average as the best estimate of the equity risk premium. In fact, if annual returns are uncorrelated over time, and our objective was to estimate the risk premium for the next year, the arithmetic average is the best and most unbiased estimate of the premium. There are, however, strong arguments that can be made for the use of geometric averages. First, empirical studies seem to indicate that returns on stocks are negatively correlated over long periods of time. Consequently, the arithmetic average return is likely to overstate the premium. Second, while asset pricing models may be single period models, the use of these models to get expected returns over long periods (such as five or ten years) suggests that the estimation period may be much longer than a year. In this context, the argument for geometric average premiums becomes stronger. Indro and Lee (1997) compare arithmetic and geometric premiums, find them both wanting, and argue for a weighted average, with the weight on the geometric premium increasing with the time horizon.

Q. WHAT IS THE SOURCE OF WITNESS VANDER WEIDE'S 7.20% HISTORICAL MARKET RISK PREMIUM?

A. He uses the historical returns annual yearbook, which was once published by Ibbotson but now is published by Duff & Phelps.

[54] Aswath. Damodaran, "Equity Risk Premiums (ERP): Determinants, Estimation and Implications – The 2017 Edition" NYU Working Paper, 2017, p. 34.

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Q. WHAT IS DUFF & PHELPS OPINION REGARDING THE USE OF HISTORICAL STOCK MARKET RETURNS TO ESTIMATE A MARKET RISK PREMIUM?

A. In its Client Update on the market risk premium, dated March 16, 2016, Duff & Phelps made the following statements regarding using historical returns to compute a market risk premium (emphasis added):[55]

> In estimating the conditional ERP, **valuation analysts cannot simply use the long-term historical ERP, without further analysis**. A better alternative would be to examine approaches that are sensitive to the current economic conditions. As previously discussed, Duff & Phelps employs a multi-faceted analysis to estimate the conditional ERP that takes into account a broad range of economic information and multiple ERP estimation methodologies to arrive at its recommendation.

Q. DOES DUFF & PHELPS USE A HISTORIC STOCK MARKET RETURN FIGURE AS ITS RECOMMENDED EQUITY OR MARKET RISK PREMIUM?

A. No.

Q. WHAT DOES DUFF & PHELPS SAY ABOUT THE EXPECTED ERP AND HISTORICAL RETURNS?

A. Duff & Phelps provides details about its perspective on historical returns versus its estimation of the ERP (emphasis added):[56]

> ERP is a forward-looking concept. It is an expectation as of the valuation date for which no market quotes are directly observable. **While an analyst can observe premiums realized over time by referring to historical data (*i.e.*, realized return approach or *ex post* approach), such realized premium data do not represent the ERP expected in prior periods, nor do they represent the current ERP estimate**. Rather, realized premiums represent, at best, only a sample from prior periods of what may have then been the expected ERP. To the extent that realized premiums on the average equate to expected premiums in prior periods, such samples may be representative of current expectations. But to the extent that prior events

[55] Duff & Phelps, Client Alert, March 16, 2016, p. 37 (emphasis added). This document is attached as Exhibit JRW-18. Duff & Phelps uses the term equity risk premium or ERP to refer to the market risk premium.

[56] Duff & Phelps, Client Alert, March 16, 2016, p. 35 (emphasis supplied).

that are not expected to recur caused realized returns to differ from prior expectations, such samples should be adjusted to remove the effects of these nonrecurring events. Such adjustments are needed to improve the predictive power of the sample.

Q. DOES DUFF & PHELPS PUBLISH ITS RECOMMENDED MARKET RISK PREMIUM?

A. Yes. As previously discussed, Duff & Phelps is currently recommending an equity or market risk premium of 6.0%.[57]

Q. PLEASE REVIEW THE ERRORS IN WITNESS VANDER WEIDE'S MARKET RISK PREMIUM IN HIS FORWARD-LOOKING CAPM APPROACH.

A. Witness Vander Weide develops an expected market risk premium for his CAPM of 7.70% in Exhibit__(JVW-14), by applying the DCF model to the S&P 500. Witness Vander Weide estimates an expected market return of 11.5% using a dividend yield of 3.10% and an expected DCF growth rate of 8.40%. The expected DCF growth rate for the S&P 500 is the average of the expected EPS growth rates from I/B/E/S. This is the primary error in this approach. As previously discussed, the expected EPS growth rates of Wall Street analysts are overly optimistic and upwardly biased. In addition, as explained below, witness Vander Weide's projected EPS growth rate of 8.4% is inconsistent with economic and earnings growth in the U.S.

Q. PLEASE ONCE AGAIN ADDRESS THE ISSUES WITH ANALYSTS' EPS GROWTH RATE FORECASTS.

A. The key point is that witness Vander Weide's CAPM market risk premium methodology is based entirely on the concept that analyst projections of companies' three-

[57] http://www.duffandphelps.com/insights/publications/cost-of-capital/index

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to-five EPS growth rates reflect investors' expected *long-term* EPS growth for those companies. However, this seems highly unrealistic given the published research on these projections. As previously noted, numerous studies have shown that the long-term EPS growth rate forecasts of Wall Street securities analysts are overly optimistic and upwardly biased.[58] Moreover, as discussed above, the Lacina, Lee, and Xu study showed that analysts' forecasts of EPS growth over the next three-to-five years earnings are no more accurate than their forecasts of the next single year's EPS growth (and the single year forecasts are notoriously inaccurate). The overly-optimistic inaccuracy of analysts' growth rate forecasts leads to an upward bias in equity cost estimates that has been estimated at about 300 basis points.[59]

Q. IS WITNESS VANDER WEIDE'S MARKET RISK PREMIUM OF 8.70% REFLECTIVE OF THE MARKET RISK PREMIUMS FOUND IN STUDIES AND SURVEYS OF THE MARKET RISK PREMIUM?

A. This figure is in excess of market risk premiums: (1) found in studies of the market risk premiums by leading academic scholars; (2) produced by analyses of historic stock and bond returns; and (3) found in surveys of financial professionals. Page 6 of Exhibit JRW-8 provides the results of over 30 market risk premium studies from the past 15 years. Historic stock and bond returns suggest a market risk premium in the 4.40-6.43% range,

[58] Such studies include: R.D. Harris, "The Accuracy, Bias, and Efficiency of Analysts' Long Run Earnings Growth Forecasts," *Journal of Business Finance & Accounting*, pp. 725-55 (June/July 1999); P. DeChow, A. Hutton, and R. Sloan, "The Relation Between Analysts' Forecasts of Long-Term Earnings Growth and Stock Price Performance Following Equity Offerings," *Contemporary Accounting Research* (2000); K. Chan, L., Karceski, J., & Lakonishok, J., "The Level and Persistence of Growth Rates," *Journal of Finance,* pp. 643−684, (2003); M. Lacina, B. Lee, and Z. Xu, *Advances in Business and Management Forecasting (Vol. 8),* Kenneth D. Lawrence, Ronald K. Klimberg (ed.), Emerald Group Publishing Limited, pp.77-101 (2011).

[59] Peter D. Easton & Gregory A. Sommers, "Effect of Analysts' Optimism on Estimates of the Expected Rate of Return Implied by Earnings Forecasts," 45, *Journal of Accounting Research*, pp. 983–1015 (2007).

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depending on whether one uses arithmetic or geometric mean returns. There have been many studies using expected return (also called *ex ante*) models, and their market risk premiums results vary from as low as 5.24% to as high as 6.0%. Finally, the market risk premiums developed from surveys of analysts, companies, financial professionals, and academics suggest even potentially lower market risk premiums, in a range of from 3.36% to 6.75%. The bottom line is that there is no support in historic return data, surveys, academic studies, or reports for investment firms for a market risk premium as high as the 8.70% used by witness Vander Weide.

Q. IS A PROJECTED EPS GROWTH RATE OF 8.40%, WHICH WITNESS VANDER WEIDE USES TO COMPUTE HIS MARKET RISK PREMIUM OF 8.70%, REASAONABLE GIVEN THE PROJECTED GROWTH IN U.S. GDP?

A. No. This issue is addressed in depth in Appendix C. But the simple answer is that a long-term EPS growth rate of 8.40% is inconsistent with both historic and projected economic and earnings growth in the U.S. for several reasons: (1) long-term EPS and economic growth is about one-half of witness Vander Weide's projected EPS growth rate of 8.40%; (2) long-term EPS and GDP growth are directly linked; and (3) more recent trends in GDP growth, as well as projections of GDP growth, suggest slower economic and earnings growth in the near future, during the period when the rates from this case will be effective.

- <u>Long-Term Historic EPS and GDP Growth have been in the 6%-7% Range</u> - By comparison, witness Vander Weide's long-run growth rate projections of 8.40% is at best overstated. These estimates suggest that companies in the U.S. would be expected to: (1) increase their growth rate of EPS in the future, and (2) maintain that growth

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1 indefinitely in an economy that is currently expected to grow at about one-half of
2 witness Vander Weide's projected growth rates.

3 • There is a Direct Link Between Long-Term EPS and GDP Growth - Brad Cornell of
4 the California Institute of Technology published a study on GDP growth, earnings
5 growth, and equity returns. He finds that long-term EPS growth in the U.S. is directly
6 related to GDP growth, with GDP growth providing an upward limit on EPS growth.
7 In addition, he finds that long-term stock returns are determined by long-term earnings
8 growth.[60]

9 • The Trend and Projections Indicate Slower GDP Growth in the Future - Whereas the
10 long-term compounded GDP growth rate is in the 6.00%-7.00% range, there has been a
11 monotonic and significant decline in nominal GDP growth in recent decades.

12 • Long-Term GDP Projections also Indicate Slower GDP Growth in the Future - A lower
13 range is also consistent with long-term GDP forecasts. There are several forecasts of
14 annual GDP growth that are available from economists and government agencies.
15 These include forecasts from the Energy Information Administration ("EIA"), the
16 Congressional Budget Office ("CBO), and the Social Security Administration ("SSA").
17 Overall, these forecasts suggest long-term GDP growth in the 4.0% - 4.3% range. The
18 trends and projections indicating slower GDP growth make witness Vander Weide's
19 market risk premium of 8.70%, which is computed by using a growth rate of 8.40%
20 from analysts' EPS growth projections, look even more unrealistic. Simply stated,
21 witness Vander Weide's projected EPS growth rate of 8.40% is unrealistic and almost
22 double projected GDP growth.

[60] Bradford Cornell, "Economic Growth and Equity Investing," *Financial Analysts Journal* (January- February 2010).

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- Corporate Profits are Constrained by GDP – Milton Friedman, the noted economist, warned investors and others not to expect corporate profit growth to sustainably exceed GDP growth, stating, "[b]eware of predictions that earnings can grow faster than the economy for long periods. When earnings are exceptionally high, they don't just keep booming."[61] Friedman also noted in the same *Fortune* interview that profits must move back down to their traditional share of GDP. In Appendix C, I show that currently the aggregate net income levels for the S&P 500 companies, using 2019 figures, represent 6.53% of nominal GDP. However, if the S&P 500 companies grow their earnings at witness Vander Weide's projected growth rate of 8.40%, while the U.S. GDP grows at 4.09% (the average of CBO, SSA, and EIA), the S&P 500 profits would grow to 22.97% of GDP by the year 2050!

Q. PLEASE PROVIDE A SUMMARY ANALYSIS ON GDP AND S&P 500 EPS GROWTH RATES.

A. As noted above, the long-term link between corporate profits and GDP is inevitable. The short-term differences in growth between the two has been highlighted by some notable market observers, including Warren Buffet, who indicated that corporate profits as a share of GDP tend to go far higher after periods where they are depressed, and then drop sharply after they have been hovering at historically high levels. In a famous 1999 *Fortune* article, Mr. Buffet made the following observation:[62]

> You know, someone once told me that New York has more lawyers than people. I think that's the same fellow who thinks profits will become larger than GDP. When you begin to expect the growth of a component factor to

[61] Shaun Tully, "Corporate Profits Are Soaring. Here's Why It Can't Last," Fortune, (Dec. 7, 2017), http://fortune.com/2017/12/07/corporate-earnings-profit-boom-end/.

[62] Carol Loomis, "Mr. Buffet on the Stock Market," *Fortune*, (Nov. 22, 1999), https://money.cnn.com/magazines/fortune/fortune_archive/1999/11/22/269071/.

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> forever outpace that of the aggregate, you get into certain mathematical problems. In my opinion, you have to be wildly optimistic to believe that corporate profits as a percent of GDP can, for any sustained period, hold much above 6%. One thing keeping the percentage down will be competition, which is alive and well. In addition, there's a public-policy point: If corporate investors, in aggregate, are going to eat an ever-growing portion of the American economic pie, some other group will have to settle for a smaller portion. That would justifiably raise political problems – and in my view a major reslicing of the pie just isn't going to happen.

In sum, witness Vander Weide's long-term S&P 500 EPS growth rate of 8.40% is overstated and has no basis in economic reality. In the end, the big question remains as to whether corporate profits can grow faster than GDP. Jeremy Siegel, the renowned finance professor at the Wharton School of the University of Pennsylvania, believes that going forward, earnings per share can grow about half a point faster than nominal GDP, or about 5.0%, due to the big gains in the technology sector. But he also believes that sustained EPS growth matching analysts' near-term projections is absurd and stated: "[t]he idea of 8% or 10% or 12% growth is ridiculous. It will not happen."[63]

F. Comparable Earnings Approach

Q. PLEASE DISCUSS WITNESS VANDER WEIDE'S COMPARABLE EARNINGS ANALYSIS.

A. On pages 43-44 of his testimony and in Exhibit No.___(JVW-15), witness Vander Weide develops an equity cost rate using his version of the Comparable Earnings approach. Witness Vander Weide computes the expected ROE as forecasted by *Value Line* for his proxy group of electric utility companies for 2020 and 2023-2025. This produces a Comparable Earnings ROE of 10.1%

[63] Shaun Tully, "Corporate Profits Are Soaring. Here's Why It Can't Last," *Fortune*, (Dec. 7, 2017), http://fortune.com/2017/12/07/corporate-earnings-profit-boom-end/.

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Q. PLEASE ADDRESS THE ISSUES WITH WITNESS VANDER WEIDE'S COMPARABLE EARNINGS APPROACH.

A. There are a number of significant issues with witness Vander Weide's Comparable Earnings approach. These issues include:

- Witness Vander Weide's Comparable Earnings Approach Does Not Measure the Market Cost of Equity Capital – First and foremost, his approach is an accounting-based methodology that does not measure investor return requirements. As indicated by Professor Roger Morin, a long-time rate of return witness for utility companies, "More simply, the Comparable (Expected) Earnings standard ignores capital markets. If interest rates go up 2% for example, investor requirements and the cost of equity should increase commensurably, but if regulation is based on accounting returns, no immediate change in equity cost results."[64] As such, this method does not measure the market cost of equity capital.
- Changes in ROE Ratios do not Track Capital Market Conditions - As also noted by Morin, "[t]he denominator of accounting return, book equity, is a historical cost-based concept, which is insensitive to changes in investor return requirements. Only stock market price is sensitive to a change in investor requirements. Investors can only purchase new shares of common stock at current market prices and not at book value."[65]

[64] Roger Morin, *New Regulatory Finance* (2006), p. 293.

[65] *Id.*

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- The Comparable Earnings Approach is Circular - The ROE ratios for the proxy companies are not determined by competitive market forces, but instead are largely the result of federal and state rate regulation, including the present proceedings.
- The Proxies' ROEs Reflect Earnings on Business Activities that are not Representative of DESC's Rate-Regulated Utility Activities - The numerators of the proxy companies' ROEs include earnings from business activities that are riskier and produce more projected earnings per dollar of book investment than does the regulated electric business. These include earnings from unregulated businesses such as merchant generation, construction services, and other energy services.

Q. FINALLY, PLEASE DISCUSS THE COMPARABLE EARNINGS APPROACH IN LIGHT OF A STUDY OF *VALUE LINE* PROJECTED EARNINGS.

A. Witness Vander Weide's Comparable Earnings approach uses *Value Line*'s adjusted forecast for proxy utility ROEs. Hence, the ROE specified by the Comparable Earnings approach is totally dependent on the forecast of one variable (net income/shareholder's equity) by one analyst firm (*Value Line*), with the same single individual authoring most of the *Value Line* reports for the various proxy companies. Neither the Commission nor other parties have assessed the accuracy of these forecasts. However, there is one study that did evaluate the *Value Line* forecasts. A study by Szakmary, Conover, and Lancaster evaluated the accuracy of *Value Line*'s three-to-five-year EPS growth rate forecasts using companies in the Dow Jones Industrial Average over a 30-year time period and found these forecasted EPS growth rates to be significantly higher than the EPS growth rates that these companies subsequently achieved.[66]

[66] Szakmary, A., Conover, C., & Lancaster, C. (2008). "An Examination of *Value Line*'s Long-Term Projections," *Journal of Banking & Finance*, May 2008, pp. 820-833.

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Szakmary, Conover, and Lancaster ("SCL") studied the predicted versus the projected stock returns, sales, profit margins, and earnings per share made by *Value Line* over the 1969 to 2001 time period. *Value Line* projects variables from a three-year base period (*e.g.*, 2012-2014) to a future three-year projected period (*e.g.*, 2016-2018). SCL reviewed the projections for the 65 stocks included in the Dow Jones Indexes (30 Industrials, 20 Transports, and 15 Utilities) and concluded that *Value Line*'s projected annual stock returns for the Dow Jones stocks were "incredibly overoptimistic" and of no predictive value. The mean annual stock return of 20% for the Dow Jones' stocks *Value Line*'s forecasts was nearly double the realized annual stock return. The authors also found that *Value Line*'s forecasts of earnings per share and profit margins were termed "strikingly overoptimistic." *Value Line*'s forecasts of annual sales were higher than achieved levels, but not statistically significant. SCL concluded that the overly-optimistic projected annual stock returns were attributable to *Value Line*'s upwardly-biased forecasts of earnings per share and profit margins

The SCL results suggest that *Value Line*'s projection of return on equity is upwardly biased. As noted above, the EPS and profit margins as projected by *Value Line* over this 30-year period were termed "strikingly overoptimistic." This is because *Value Line*'s projected earnings is the numerator for their calculation of return on equity (net income/book value). Therefore, the Comparable Earning approach proposed by witness Vander Weide is based on an upwardly-biased measure forecasted by one analyst.

Q. WILL YOU UPDATE YOUR DIRECT TESTIMONY BASED ON INFORMATION THAT BECOMES AVAILABLE?

A. Yes. ORS fully reserves the right to revise its recommendations via supplemental

1 testimony should new information not previously provided by the Company, or other
2 sources, becomes available.

3 **Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?**

4 **A.** Yes, it does.

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Office of Regulatory Staff
Recommended Cost of Capital
Dominion Energy South Carolina, Inc.
Docket No. 2020-125-E

Panel A

Primary Recommended Cost of Capital

Capital Source	Capitalization Ratios	Cost Rate	Weighted Cost Rate
Long-Term Debt	50.00%	5.56%	2.78%
Preferred Stock	0.00%	0.00%	0.00%
Common Equity	50.00%	8.90%	4.45%
Total Capital	100.00%		7.23%

* Capital Structure Ratios are developed in Exhibit JRW-3.

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Office of Regulatory Staff

Summary Financial Statistics for Proxy Groups

Dominion Energy South Carolina, Inc.

Docket No. 2020-125-E

Panel A
Electric Proxy Group

Company	Operating Revenue ($mil)	Percent Reg Elec Revenue	Percent Reg Gas Revenue	Net Plant ($mil)	Market Cap ($mil)	S&P Issuer Credit Rating	Moody's Long Term Rating	Pre-Tax Interest Coverage	Primary Service Area	Common Equity Ratio	Return on Equity	Market to Book Ratio
ALLETE, Inc. (NYSE-ALE)	$1,240.5	84%	0%	$4,405.6	$3,983.2	BBB+	Baa1	2.89x	MN, WI	56.1%	8.5%	1.78
Alliant Energy Corporation (NYSE-LNT)	$3,647.7	84%	12%	$13,527.1	$14,177.5	A-	Baa1	2.63x	WI,IA,IL,MN	43.6%	11.4%	2.72
Ameren Corporation (NYSE-AEE)	$5,646.0	80%	13%	$24,412.0	$21,439.4	BBB+	Baa1	3.56x	IL,MO	44.7%	10.6%	2.66
American Electric Power Co. (NYSE-AEP)	$15,561.4	96%	0%	$61,095.5	$49,306.3	A-	Baa1	2.67x	10 States	38.6%	9.9%	2.51
Avista Corporation (NYSE-AVA)	$1,345.6	64%	22%	$4,944.9	$3,488.8	BBB	Baa2	2.21x	WA,OR,AK,ID	45.7%	10.6%	1.80
CMS Energy Corporation (NYSE-CMS)	$6,845.0	65%	28%	$18,973.0	$19,402.5	BBB+	Baa1	2.54x	MI	27.3%	13.9%	3.87
Consolidated Edison, Inc. (NYSE-ED)	$12,574.0	64%	17%	$44,747.0	$29,375.6	BBB+	A3	2.58x	NY,PA	44.2%	7.7%	1.62
Dominion Energy Inc. (NYSE-D)	$16,572.0	67%	34%	$69,581.0	$74,607.2	BBB+	NA	2.49x	VA,NC,SC,OH,WV,UT	40.5%	5.4%	2.52
Duke Energy Corporation (NYSE-DUK)	$24,658.0	91%	7%	$102,339.0	$74,542.2	A-	Baa1	2.59x	NC,OH,FL,SC,KY	40.5%	8.3%	1.66
Edison International (NYSE-EIX)	$12,347.0	100%	0%	$44,849.0	$25,437.9	BBB	Baa3	2.54x	CA	37.9%	10.8%	1.91
Entergy Corporation (NYSE-ETR)	$10,878.7	88%	0%	$35,515.6	$25,636.9	BBB+	Baa2	2.15x	LA,AR,MS,TX	33.4%	13.0%	2.50
Evergy, Inc. (NYSE-EVRG)	$5,147.8	100%	0%	$19,216.9	$16,564.2	A-	Baa1	3.07x	KS,MO	46.0%	7.2%	1.93
Eversource Energy (NYSE-ES)	$8,526.5	82%	12%	$27,635.4	$32,513.5	A-	Baa1	3.49x	CT,NH,MA	44.4%	7.5%	2.57
Exelon Corporation (NYSE-EXC)	$34,438.0	59%	4%	$78,749.0	$45,617.6	BBB+	Baa2	2.80x	PA,NJ,IL,MD,DCDE	43.6%	9.3%	1.41
FirstEnergy Corporation (NYSE-FE)	$10,844.0	100%	0%	$31,881.0	$26,224.6	BBB	Baa3	1.82x	OH,PA,NY,NJ,WV,MD	24.7%	13.1%	3.76
Hawaiian Electric Industries (NYSE-HE)	$2,874.6	89%	0%	$5,308.8	$5,109.8	BBB-	NA	3.73x	HI	47.7%	9.8%	2.24
IDACORP, Inc. (NYSE-IDA)	$1,346.4	100%	0%	$4,531.5	$5,372.7	BBB	Baa1	2.96x	ID	57.2%	9.6%	2.18
MGE Energy, Inc. (NYSE-MGEE)	$555.0	70%	30%	$1,643.4	$2,631.0	AA-	Aa2	4.95x	WI	60.3%	10.4%	3.07
NextEra Energy, Inc. (NYSE-NEE)	$19,204.0	71%	0%	$82,010.0	$137,996.0	A-	Baa1	2.43x	FL	43.8%	10.6%	3.73
NorthWestern Corporation (NYSE-NWE)	$1,257.9	78%	22%	$4,704.6	$3,932.3	BBB	NA	2.83x	MT,SD,NE	47.5%	10.2%	1.93
OGE Energy Corp. (NYSE-OGE)	$2,231.6	100%	100%	$8,964.8	$8,015.1	BBB+	Baa1	3.36x	OK,AR	55.2%	10.6%	1.94
Otter Tail Corporation (NDQ-OTTR)	$919.5	50%	0%	$1,775.7	$2,065.4	BBB	Baa2	4.16	MN,ND,SD	52.1%	11.5%	2.64
Pinnacle West Capital Corp. (NYSE-PNW)	$3,471.2	95%	0%	$14,254.3	$11,273.2	A-	A3	2.95x	AZ	47.8%	10.1%	2.08
Portland General Electric Company (NYSE-POR)	$2,123.0	100%	0%	$6,820.0	$5,325.9	BBB+	A3	2.62x	OR	48.1%	8.4%	2.06
PPL Corporation (NYSE-PPL)	$7,769.0	91%	8%	$36,578.0	$24,708.2	A-	Baa2	3.18x	PA,KY	35.9%	14.2%	1.90
Sempra Energy (NYSE-SRE)	$10,829.0	56%	44%	$37,043.0	$43,210.1	BBB+	Baa1	2.31x	CA,TX	36.5%	10.4%	2.44
Southern Company (NYSE-SO)	$21,419.0	73%	14%	$84,420.0	$71,408.9	A-	Baa2	3.20x	GA,FL,NJ,IL,VA,TN,MS	34.1%	18.1%	2.60
WEC Energy Group (NYSE-WEC)	$7,523.1	58%	42%	$23,661.5	$32,871.4	A-	Baa1	3.12x	WI,IL,MN,MI	43.9%	11.4%	3.25
Xcel Energy Inc. (NYSE-XEL)	$11,529.0	83%	16%	$40,781.0	$36,307.1	A-	Baa1	2.69x	MN,WI,ND,SD,MI	39.2%	10.8%	2.74
Mean	$9,080.2	81%	15%	$32,219.6	$29,398.1	BBB+	Baa1	2.91		43.5%	10.5%	2.41
Median	$7,523.1	83%	8%	$24,412.0	$24,708.2	BBB+	Baa1	2.80		43.9%	10.4%	2.44

Data Source: Company 2019 SEC 10-K filings, S&P Capital IQ;*Value Line Investment Survey* , 2020.

Panel B
Vander Weide Proxy Group

Company	Operating Revenue ($mil)	Percent Reg Elec Revenue	Percent Reg Gas Revenue	Net Plant ($mil)	Market Cap ($mil)	S&P Issuer Credit Rating	Moody's Long Term Rating	Pre-Tax Interest Coverage	Primary Service Area	Common Equity Ratio	Return on Equity	Market to Book Ratio
ALLETE, Inc. (NYSE-ALE)	$1,240.5	84%	0%	$4,405.6	$3,983.2	BBB+	Baa1	2.89	MN, WI	56.1%	8.5%	1.78
Alliant Energy Corporation (NYSE-LNT)	$3,647.7	84%	12%	$13,527.1	$14,177.5	A-	Baa1	2.63	WI,IA,IL,MN	43.6%	11.4%	2.72
Ameren Corporation (NYSE-AEE)	$5,646.0	80%	13%	$24,412.0	$21,439.4	BBB+	Baa1	3.56	IL,MO	44.7%	10.6%	2.66
American Electric Power Co. (NYSE-AEP)	$15,561.4	96%	0%	$61,095.5	$49,306.3	A-	Baa1	2.67	10 States	38.6%	9.9%	2.51
Avista Corporation (NYSE-AVA)	$1,345.6	64%	22%	$4,944.9	$3,488.8	BBB	Baa2	2.21x	WA,OR,AK,ID	45.7%	10.6%	1.80
Black Hills Corporation (NYSE-BKH)	$1,734.9	41%	58%	$5,508.3	$5,074.5	BBB+	Baa2	2.78	CO,SD,WY,MT	40.3%	8.8%	2.15
CMS Energy Corporation (NYSE-CMS)	$6,845.0	65%	28%	$18,973.0	$19,402.5	BBB+	Baa1	2.54	MI	27.3%	13.9%	3.87
Consolidated Edison, Inc. (NYSE-ED)	$12,574.0	64%	17%	$44,747.0	$29,375.6	BBB+	A3	2.58x	NY,PA	44.2%	7.7%	1.62
Dominion Energy Inc. (NYSE-D)	$16,572.0	67%	34%	$69,581.0	$74,607.2	BBB+	NA	2.49x	VA,NC,SC,OH,WV,UT	40.5%	5.4%	2.52
Duke Energy Corporation (NYSE-DUK)	$24,658.0	91%	7%	$102,339.0	$74,542.2	A-	Baa1	2.59x	NC,OH,FL,SC,KY	40.5%	8.3%	1.66
DTE Energy Company (NYSE-DTE)	$14,212.0	37%	39%	$21,650.0	$20,066.4	BBB+	Baa1	3.15	MI	42.9%	10.8%	1.87
Edison International (NYSE-EIX)	$12,347.0	100%	0%	$44,849.0	$25,437.9	BBB	Baa3	2.54x	CA	37.9%	10.8%	1.91
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Fortis Inc. (NYSE-FTS)	$2,326.0	64%	19%	$53,404.0	$27,083.3	A-	Baa3	2.30	AZ,NY,BC,AL,NEW	41.7%	9.8%	1.43
Hawaiian Electric Industries (NYSE-HE)	$2,874.6	89%	0%	$5,308.8	$5,109.8	BBB-	NA	3.73x	HI	47.7%	9.8%	2.24
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Pinnacle West Capital Corp. (NYSE-PNW)	$3,471.2	95%	0%	$14,254.3	$11,273.2	A-	A3	2.95	AZ	47.8%	10.1%	2.08
Portland General Electric Company (NYSE-POR)	$2,123.0	100%	0%	$6,820.0	$5,325.9	BBB+	A3	2.62	OR	48.1%	8.4%	2.06
PPL Corporation (NYSE-PPL)	$7,769.0	91%	8%	$36,578.0	$24,708.2	A-	Baa2	3.18	PA,KY	35.9%	14.2%	1.90
Public Service Enterprise Group Inc. (NYSE:PEG)	$10,076.0	36%	29%	36,126.0	28,080.0	BBB+	Baa1	4.46	NJ	47.7%	11.5%	1.86
Sempra Energy (NYSE-SRE)	$10,829.0	56%	44%	$37,043.0	$43,210.1	BBB+	Baa1	2.31x	CA,TX	36.5%	10.4%	2.44
Southern Company (NYSE-SO)	$21,419.0	73%	14%	$84,420.0	$71,408.9	A-	Baa2	3.20	GA,FL,NJ,IL,VA,TN,MS	34.1%	18.1%	2.60
WEC Energy Group (NYSE-WEC)	$7,523.1	58%	42%	$23,661.5	$32,871.4	A-	Baa1	3.12x	WI,IL,MN,MI	43.9%	11.4%	3.25
Xcel Energy Inc. (NYSE-XEL)	$11,529.0	83%	16%	$40,781.0	$36,307.1	A-	Baa1	2.69	MN,WI,ND,SD,MI	39.2%	10.8%	2.74
Mean	$8,838.6	76%	17%	$31,850.2	$28,268.1	BBB+	Baa1	2.95		43.4%	10.4%	2.34
Median	$7,523.1	80%	12%	$24,412.0	$24,708.2	BBB+	Baa1	2.80		43.8%	10.4%	2.18

Data Source: Company 2019 SEC 10-K filings, S&P Capital IQ;*Value Line Investment Survey* , 2020.

Office of Regulatory Staff
Value Line Risk Metrics for Proxy Groups
Dominion Energy South Carolina, Inc.
Docket No. 2020-125-E

Panel A
Electric Proxy Group

Company	Beta	Financial Strength	Safety	Earnings Predictability	Stock Price Stability
ALLETE, Inc. (NYSE-ALE)	0.85	A	2	85	95
Alliant Energy Corporation (NYSE-LNT)	0.85	A	2	90	95
Ameren Corporation (NYSE-AEE)	0.80	A	2	90	95
American Electric Power Co. (NYSE-AEP)	0.75	A+	1	90	100
Avista Corporation (NYSE-AVA)	0.90	A	2	60	70
CMS Energy Corporation (NYSE-CMS)	0.80	B++	2	85	95
Consolidated Edison, Inc. (NYSE-ED)	0.75	A+	1	95	85
Dominion Energy Inc. (NYSE-D)	0.80	B++	2	50	90
Duke Energy Corporation (NYSE-DUK)	0.85	A	2	90	90
Edison International (NYSE-EIX)	0.90	B+	3	5	80
Entergy Corporation (NYSE-ETR)	0.95	B++	2	60	90
Evergy, Inc. (NYSE-EVRG)	1.00	B++	2	NMF	60
Eversource Energy (NYSE-ES)	0.90	A	1	100	85
Exelon Corporation (NYSE-EXC)	0.95	B++	3	60	90
FirstEnergy Corporation (NYSE-FE)	0.85	B++	3	40	95
Hawaiian Electric Industries (NYSE-HE)	0.80	A	2	65	85
IDACORP, Inc. (NYSE-IDA)	0.80	A	2	95	100
MGE Energy, Inc. (NYSE-MGEE)	0.70	A+	1	95	95
NextEra Energy, Inc. (NYSE-NEE)	0.85	A+	1	75	95
NorthWestern Corporation (NYSE-NWE)	0.90	B++	2	85	90
OGE Energy Corp. (NYSE-OGE)	1.05	A	2	85	80
Otter Tail Corporation (NDQ-OTTR)	0.85	A	2	85	95
Pinnacle West Capital Corp. (NYSE-PNW)	0.85	A+	1	100	90
Portland General Electric Company (NYSE-POR)	0.85	B++	3	90	95
PPL Corporation (NYSE-PPL)	1.10	B++	2	75	75
Sempra Energy (NYSE-SRE)	0.95	A	2	75	90
Southern Company (NYSE-SO)	0.90	A	2	85	90
WEC Energy Group (NYSE-WEC)	0.80	A+	1	95	85
Xcel Energy Inc. (NYSE-XEL)	0.80	A+	1	100	95
Mean	0.87	A	1.9	79	89

Panel B
Vander Weide Proxy Group

Company	Beta	Financial Strength	Safety	Earnings Predictability	Stock Price Stability
ALLETE, Inc. (NYSE-ALE)	0.85	A	2	85	95
Alliant Energy Corporation (NYSE-LNT)	0.85	A	2	90	95
Ameren Corporation (NYSE-AEE)	0.80	A	2	90	95
American Electric Power Co. (NYSE-AEP)	0.75	A+	1	90	100
Avista Corporation (NYSE-AVA)	0.90	A	2	60	70
Black Hills Corporation (NYSE-BKH)	0.95	A	2	80	80
CMS Energy Corporation (NYSE-CMS)	0.80	B++	2	85	95
Consolidated Edison, Inc. (NYSE-ED)	0.75	A+	1	95	85
Dominion Energy Inc. (NYSE-D)	0.80	B++	2	50	90
DTE Energy Company (NYSE-DTE)	0.90	A	2	85	95
Duke Energy Corporation (NYSE-DUK)	0.85	A	2	90	90
Edison International (NYSE-EIX)	0.90	B+	3	5	80
Entergy Corporation (NYSE-ETR)	0.95	B++	2	60	90
Evergy, Inc. (NYSE-EVRG)	1.00	B++	2	NMF	60
Eversource Energy (NYSE-ES)	0.90	A	1	100	85
Exelon Corporation (NYSE-EXC)	0.95	B++	3	60	90
FirstEnergy Corporation (NYSE-FE)	0.85	B++	3	40	95
Fortis Inc. (NYSE-FTS)	0.80	B++	2	75	100
Hawaiian Electric Industries (NYSE-HE)	0.80	A	2	65	85
IDACORP, Inc. (NYSE-IDA)	0.80	A	2	95	100
MGE Energy, Inc. (NYSE-MGEE)	0.70	A+	1	95	95
NextEra Energy, Inc. (NYSE-NEE)	0.85	A+	1	75	95
NorthWestern Corporation (NYSE-NWE)	0.90	B++	2	85	90
OGE Energy Corp. (NYSE-OGE)	1.05	A	2	85	80
Otter Tail Corporation (NDQ-OTTR)	0.85	A	2	85	95
Pinnacle West Capital Corp. (NYSE-PNW)	0.85	A+	1	100	90
Portland General Electric Company (NYSE-POR)	0.85	B++	3	90	95
PPL Corporation (NYSE-PPL)	1.10	B++	2	75	75
Public Service Enterprise Group Inc. (NYSE:PEG)	0.90	A++	1	70	95
Sempra Energy (NYSE-SRE)	0.95	A	2	75	90
Southern Company (NYSE-SO)	0.90	A	2	85	90
WEC Energy Group (NYSE-WEC)	0.80	A+	1	95	85
Xcel Energy Inc. (NYSE-XEL)	0.80	A+	1	100	95
Mean	0.87	A	1.8	79	89

Data Source: *Value Line Investment Survey* , 2020.

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Office of Regulatory Staff

Value Line Risk Metrics for Proxy Groups

Dominion Energy South Carolina, Inc.

Docket No. 2020-125-E

Beta

A relative measure of the historical sensitivity of a stock's price to overall fluctuations in the New York Stock Exchange Composite Index. A beta of 1.50 indicates a stock tends to rise (or fall) 50% more than the New York Stock Exchange Composite Index. The ''coefficient'' is derived from a regression analysis of the relationship between weekly percentage changes in the price of a stock and weekly percentage changes in the NYSE Index over a period of five years. In the case of shorter price histories, a smaller time period is used, but two years is the minimum. Betas are adjusted for their long-term tendency to converge toward 1.00.

Financial Strength

A relative measure of the companies reviewed by *Value Line* . The relative ratings range from A++ (strongest) down to C (weakest).

Safety Rank

A measurement of potential risk associated with individual common stocks. The Safety Rank is computed by averaging two other *Value Line* indexes the Price Stability Index and the Financial strength Rating. Safety Ranks range from 1 (Highest) to 5 (Lowest). Conservative investors should try to limit their purchases to equities ranked 1 (Highest) and 2 (Above Average) for Safety. .

Earnings Predictability

A measure of the reliability of an earnings forecast. Earnings Predictability is based upon the stability of year-to-year comparisons, with recent years being weighted more heavily than earlier ones. The most reliable forecasts tend to be those with the highest rating (100); the least reliable, the lowest (5). The earnings stability is derived from the standard deviation of percentage changes in quarterly earnings over an eight-year period. Special adjustments are made for comparisons around zero and from plus to minus.

Stock Price Stability

A measure of the stability of a stock's price. It includes sensitivity to the market (see Beta as well as the stock's inherent volatility. *Value Line's* Stability ratings range from 1 (highest) to 5 (lowest).

Source: *Value Line Investment Analyzer* .

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Office of Regulatory Staff

Capital Structure Ratios and Debt Cost Rate

Dominion Energy South Carolina, Inc.

Docket No. 2020-125-E

Panel A - DESC's Proposed Capital Structure and Debt Cost Rates

	Percent of Total	Cost
Long-Term Debt	46.35%	6.46%
Preferred Stock	0.00%	0.00%
Common Equity	53.65%	
Total Capital	100.00%	

Panel B - DESC and D's Quarterly Capital Structure Ratios Including Short-Term Debt

DESC	Average
Short-Term Debt	5.11%
Long-Term Debt	47.62%
Common Equity	47.27%
Total Capital	100.00%

D	Average
Short-Term Debt	8.31%
Long-Term Debt	53.31%
Common Equity	38.38%
Total Capital	100.00%

Panel C - DESC and D's Quarterly Capital Structure Ratios Excluding Short-Term Debt

DESC	Average
Long-Term Debt	50.17%
Common Equity	49.83%
Total Capital	100.00%

D	Average
Long-Term Debt	58.21%
Common Equity	41.79%
Total Capital	100.00%

Source: S&P Global Market Intelligence

Panel D - ORS' Proposed Primary Capital Structure Ratios and Debt Cost Rates

Capital Source	Capitalization Ratios	Adjustment Factor	Adjusted Ratios	Cost Rate
Long-Term Debt	46.35%	1.07875	50.00%	5.56%
Common Equity	53.65%	0.93197	50.00%	
Total Capitalization	100.00%		100.00%	

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Office of Regulatory Staff

Capital Structure Ratios and Debt Cost Rate

Dominion Energy South Carolina, Inc.

Docket No. 2020-125-E

Dominion Energy South Carolina and Dominion Energy Capital Structure Ratios
Quarterly - 2018-2020

Panel A - DESC and D's Quarterly Capital Structure Ratios Including Short-Term Debt

DESC	*2018 FQ1*	*2018 FQ2*	*2018 FQ3*	*2018 FQ4*	*2019 FQ1*	*2019 FQ2*	*2019 FQ3*	*2019 FQ4*	*2020 FQ1*	*2020 FQ2*	Average
Short-Term Debt	10.16%	11.33%	3.63%	3.83%	6.94%	2.87%	2.99%	3.03%	3.21%	3.11%	5.11%
Long-Term Debt	43.23%	42.55%	48.80%	53.25%	48.32%	51.50%	46.77%	47.93%	47.14%	46.75%	47.62%
Common Equity	46.61%	46.12%	47.57%	42.92%	44.74%	45.63%	50.24%	49.04%	49.65%	50.14%	47.27%
Total Capital	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

D	*2018 FQ1*	*2018 FQ2*	*2018 FQ3*	*2018 FQ4*	*2019 FQ1*	*2019 FQ2*	*2019 FQ3*	*2019 FQ4*	*2020 FQ1*	*2020 FQ2*	Average
Short-Term Debt	11.46%	10.19%	10.65%	7.29%	7.96%	7.13%	10.34%	5.87%	7.25%	4.91%	8.31%
Long-Term Debt	56.45%	57.48%	56.77%	56.34%	53.45%	53.14%	48.19%	48.68%	49.13%	53.50%	53.31%
Common Equity	32.09%	32.33%	32.58%	36.37%	38.58%	39.73%	41.47%	45.45%	43.61%	41.58%	38.38%
Total Capital	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Source: S&P Global Market Intelligence

Panel B - DESC and D's Quarterly Capital Structure Ratios Excluding Short-Term Debt

DESC	*2018 FQ1*	*2018 FQ2*	*2018 FQ3*	*2018 FQ4*	*2019 FQ1*	*2019 FQ2*	*2019 FQ3*	*2019 FQ4*	*2020 FQ1*	*2020 FQ2*	Average
Long-Term Debt	48.12%	47.99%	50.64%	55.37%	51.92%	53.03%	48.21%	49.43%	48.70%	48.25%	50.17%
Common Equity	51.88%	52.01%	49.36%	44.63%	48.08%	46.97%	51.79%	50.57%	51.30%	51.75%	49.83%
Total Capital	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

D	*2018 FQ1*	*2018 FQ2*	*2018 FQ3*	*2018 FQ4*	*2019 FQ1*	*2019 FQ2*	*2019 FQ3*	*2019 FQ4*	*2020 FQ1*	*2020 FQ2*	Average
Long-Term Debt	63.76%	64.00%	63.54%	60.77%	58.08%	57.22%	53.75%	51.71%	52.98%	56.27%	58.21%
Common Equity	36.24%	36.00%	36.46%	39.23%	41.92%	42.78%	46.25%	48.29%	47.02%	43.73%	41.79%
Total Capital	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Source: S&P Global Market Intelligence

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EXHIBIT JRW-4

Office of Regulatory Staff

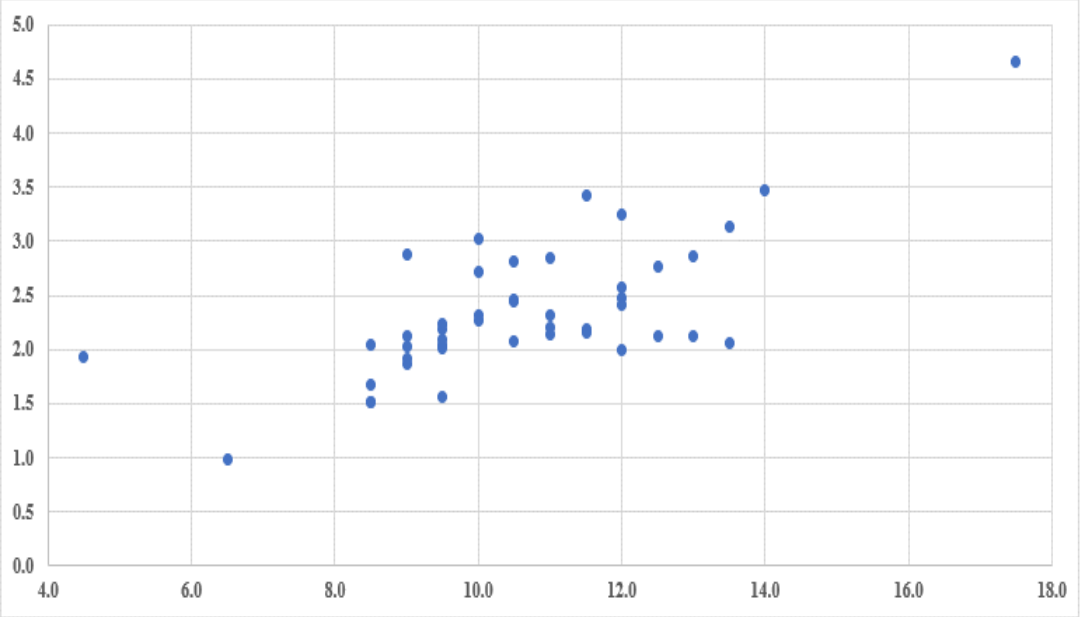
The Relationship Between Expected ROE and Market-to-Book

Dominion Energy South Carolina, Inc.

Docket No. 2020-125-E

Electric Utilities and Gas Distribution Companies

Market-to-Book



Expected Return on Equity
R-Square = .50, N=43

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Office of Regulatory Staff
Public Utility Capital Cost Indicators
Dominion Energy South Carolina, Inc.
Docket No. 2020-125-E

Long-Term 'A' Rated Public Utility Bonds

Data Source: Mergent Bond Record

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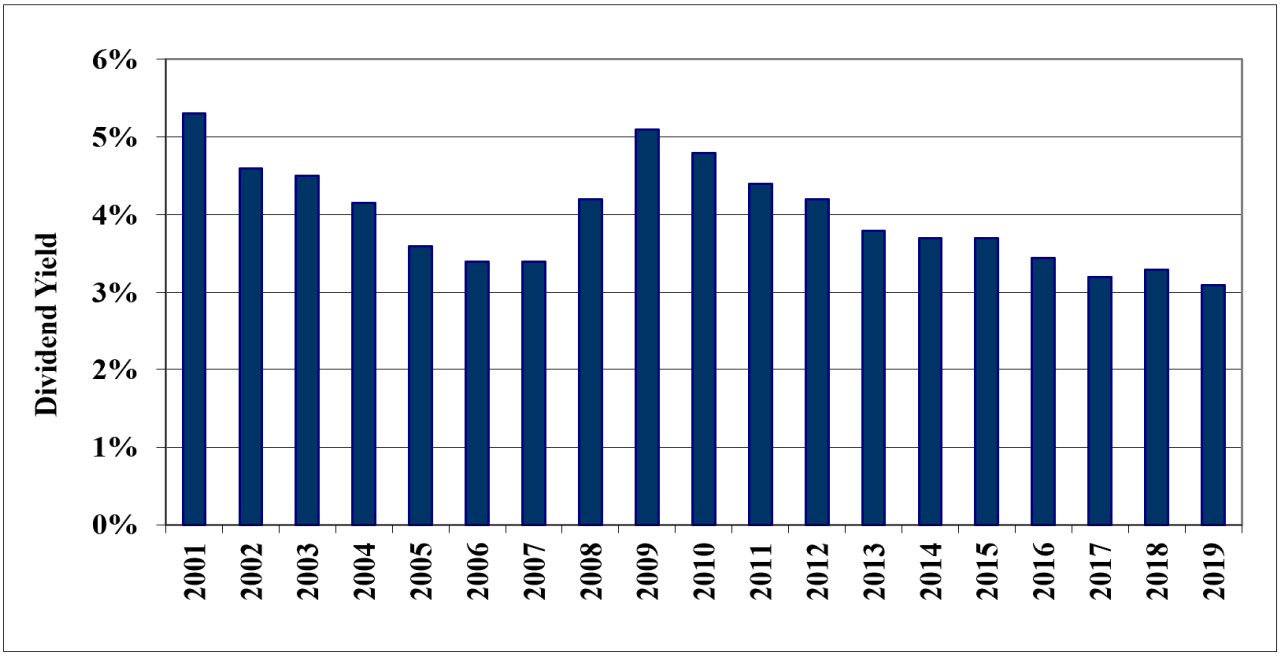
Office of Regulatory Staff
Public Utility Capital Cost Indicators
Dominion Energy South Carolina, Inc.
Docket No. 2020-125-E

Electric Utility Average Dividend Yield



Data Source: ***Value Line Investment Survey.***

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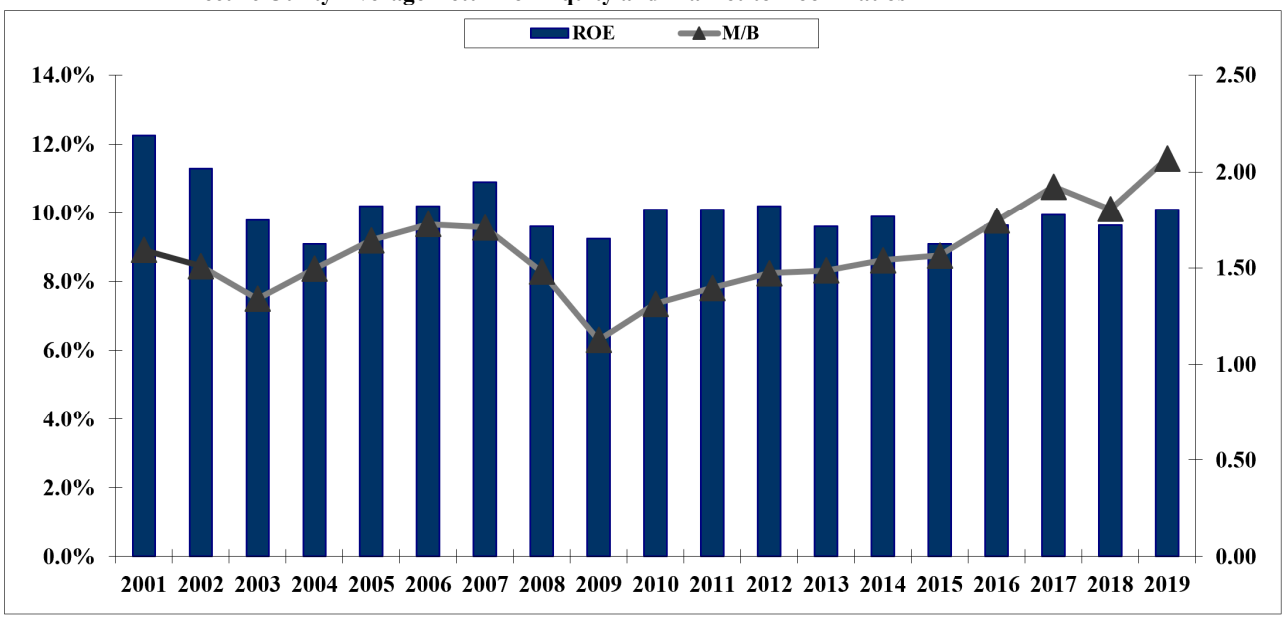
Office of Regulatory Staff
Public Utility Capital Cost Indicators
Dominion Energy South Carolina, Inc.
Docket No. 2020-125-E

Electric Utility Average Return on Equity and Market-to-Book Ratios



Data Source: *Value Line Investment Survey.*

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Office of Regulatory Staff

Industry Average Betas

Dominon Energy South Carolina, Inc.

Docket No. 2020-125-E

Industry Average Betas*

Value Line Investment Survey* Betas*

6-Jul-20

Rank	Industry	Beta	Rank	Industry	Beta	Rank	Industry	Beta
1	Homebuilding	1.49	34	Recreation	1.17	67	Publishing	1.03
2	Oilfield Svcs/Equip.	1.43	35	Diversified Co.	1.16	68	Insurance (Prop/Cas.)	1.02
3	Insurance (Life)	1.43	36	Electrical Equipment	1.15	69	Med Supp Non-Invasive	1.01
4	Hotel/Gaming	1.38	37	Electronics	1.14	70	Human Resources	1.01
5	Petroleum (Integrated)	1.38	38	Restaurant	1.14	71	Telecom. Equipment	1.01
6	Petroleum (Producing)	1.37	39	Computers/Peripherals	1.14	72	Investment Co.(Foreign)	1.00
7	Metal Fabricating	1.33	40	Bank (Midwest)	1.14	73	Investment Co.	1.00
8	Metals & Mining (Div.)	1.32	41	Bank	1.13	74	Computer Software	1.00
9	Natural Gas (Div.)	1.32	42	Automotive	1.13	75	Biotechnology	0.99
10	Building Materials	1.31	43	Retail (Softlines)	1.12	76	E-Commerce	0.99
11	Advertising	1.31	44	Reinsurance	1.11	77	Cable TV	0.96
12	Shoe	1.31	45	Railroad	1.11	78	Trucking	0.95
13	Maritime	1.28	46	Heavy Truck & Equip	1.11	79	Thrift	0.95
14	Steel	1.28	47	Semiconductor Equip	1.10	80	Tobacco	0.94
15	Apparel	1.28	48	R.E.I.T.	1.10	81	Foreign Electronics	0.94
16	Oil/Gas Distribution	1.28	49	Industrial Services	1.10	82	Telecom. Utility	0.93
17	Air Transport	1.27	50	Power	1.10	83	Environmental	0.93
18	Pipeline MLPs	1.27	51	Precision Instrument	1.09	84	Healthcare Information	0.92
19	Public/Private Equity	1.26	52	Wireless Networking	1.09	85	Beverage	0.89
20	Aerospace/Defense	1.26	53	Toiletries/Cosmetics	1.09	86	Telecom. Services	0.88
21	Retail Automotive	1.26	54	Internet	1.08	87	Electric Util. (Central)	0.88
22	Office Equip/Supplies	1.24	55	Semiconductor	1.07	88	Electric Utility (East)	0.87
23	Retail (Hardlines)	1.23	56	Retail Building Supply	1.07	89	Natural Gas Utility	0.85
24	Financial Svcs. (Div.)	1.22	57	Newspaper	1.07	90	Electric Utility (West)	0.85
25	Auto Parts	1.22	58	Packaging & Container	1.06	91	Entertainment Tech	0.84
26	Paper/Forest Products	1.22	59	Retail Store	1.05	92	Household Products	0.82
27	Chemical (Diversified)	1.21	60	Med Supp Invasive	1.05	93	Retail/Wholesale Food	0.79
28	Furn/Home Furnishings	1.21	61	Educational Services	1.05	94	Water Utility	0.78
29	Chemical (Specialty)	1.20	62	Information Services	1.04	95	Food Processing	0.77
30	Medical Services	1.20	63	Entertainment	1.04	96	Pharmacy Services	0.73
31	Chemical (Basic)	1.18	64	Funeral Services	1.04	97	Precious Metals	0.70
32	Engineering & Const	1.18	65	IT Services	1.03			
33	Machinery	1.17	66	Drug	1.03		Mean	1.10

* Industry averages for 97 industries using *Value Line*'s database of 1,704 companies - Updated 7-6-20.

** *Value Line* computes betas using monthly returns regressed against the New York Stock Exchange Index for five years. These betas are then adjusted as follows: *VL* Beta = [{(2/3) * Regressed Beta} + {(1/3) * (1.0)}] to account to tendency for Betas to regress toward average of 1.0. See M. Blume, "On the Assessment of Risk," *Journal of Finance*, March 1971.

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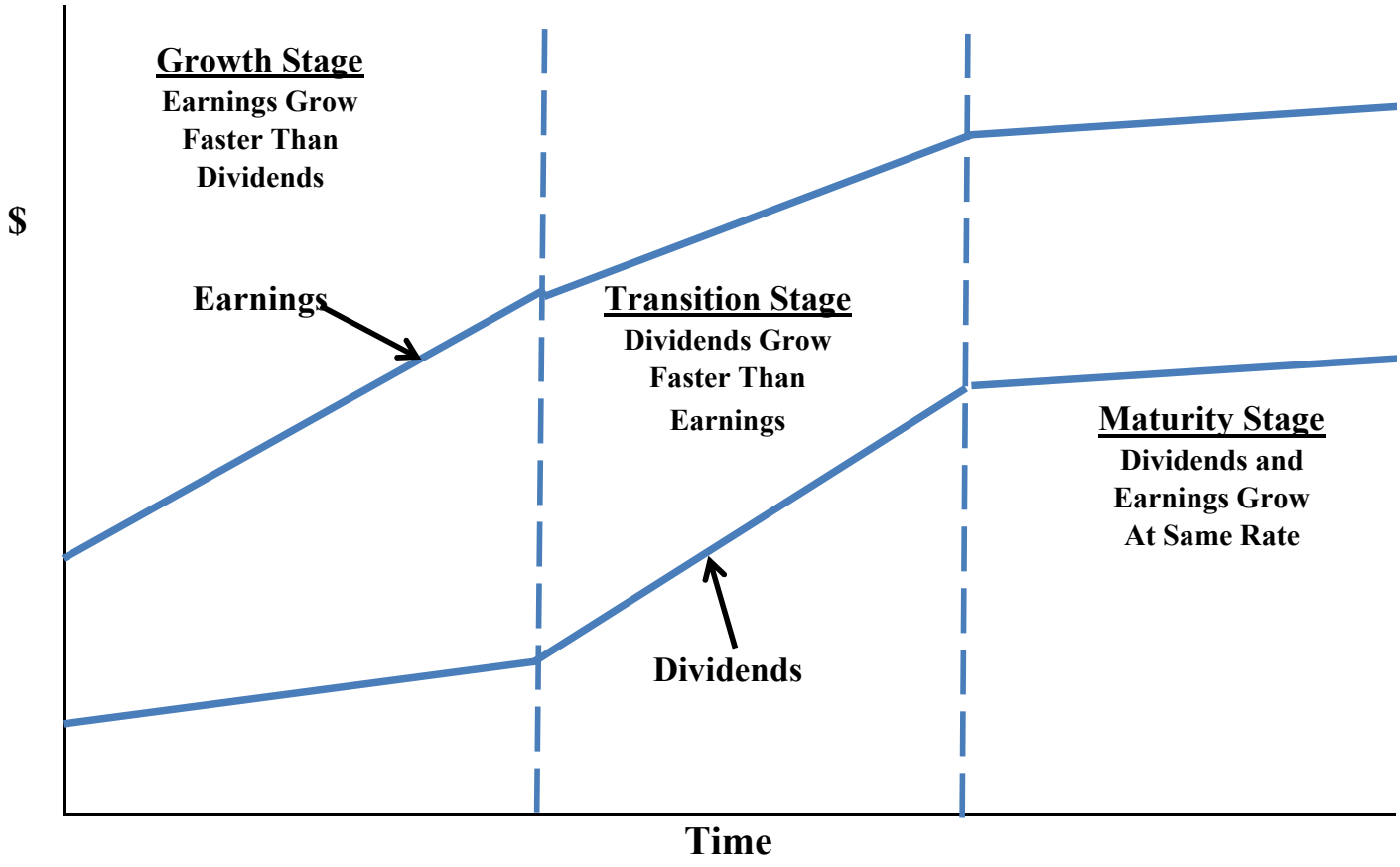
Office of Regulatory Staff
DCF Model
Dominion Energy South Carolina, Inc.
Docket No. 2020-125-E

DCF Model



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Office of Regulatory Staff
DCF Study
Dominion Energy South Carolina, Inc.
Docket No. 2020-125-E

Discounted Cash Flow Analysis

Panel A
Electric Proxy Group

Dividend Yield*	3.80%
Adjustment Factor	1.025
Adjusted Dividend Yield	3.90%
Growth Rate**	5.00%
Equity Cost Rate	8.90%

* Page 2 of Exhibit JRW-7
** Based on data provided on pages 3, 4, 5, and 6 of Exhibit JRW-7

Panel B
Vander Weide Proxy Group

Dividend Yield*	3.75%
Adjustment Factor	1.025
Adjusted Dividend Yield	3.84%
Growth Rate**	5.00%
Equity Cost Rate	8.85%

* Page 2 of Exhibit JRW-7
** Based on data provided on pages 3, 4, 5, and 6 of Exhibit JRW-7

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Office of Regulatory Staff

DCF Study

Dominion Energy South Carolina, Inc.

Docket No. 2020-125-E

Monthly Dividend Yields

Panel A
Electric Proxy Group*

Company	Annual Dividend	Dividend Yield 30 Day	Dividend Yield 90 Day	Dividend Yield 180 Day
ALLETE, Inc. (NYSE-ALE)	$2.47	4.65%	4.49%	4.25%
Alliant Energy Corporation (NYSE-LNT)	$1.52	2.86%	2.92%	2.98%
Ameren Corporation (NYSE-AEE)	$2.06	2.58%	2.64%	2.71%
American Electric Power Co. (NYSE-AEP)	$2.96	3.47%	3.56%	3.53%
Avista Corporation (NYSE-AVA)	$1.62	4.72%	4.55%	4.16%
CMS Energy Corporation (NYSE-CMS)	$1.63	2.60%	2.66%	2.71%
Consolidated Edison, Inc. (NYSE-ED)	$3.06	3.58%	3.52%	3.75%
Dominion Energy Inc. (NYSE-D)	$3.76	4.71%	4.77%	4.79%
Duke Energy Corporation (NYSE-DUK)	$3.86	4.36%	4.61%	4.57%
Edison International (NYSE-EIX)	$2.55	4.74%	4.77%	4.55%
Entergy Corporation (NYSE-ETR)	$3.72	3.65%	3.74%	3.69%
Evergy, Inc. (NYSE-EVRG)	$2.02	3.85%	3.63%	3.50%
Eversource Energy (NYSE-ES)	$2.27	2.61%	2.64%	2.68%
Exelon Corporation (NYSE-EXC)	$1.53	4.03%	4.08%	4.03%
FirstEnergy Corporation (NYSE-FE)	$1.56	5.17%	4.89%	4.23%
Hawaiian Electric Industries (NYSE-HE)	$1.32	3.91%	3.79%	3.48%
IDACORP, Inc. (NYSE-IDA)	$2.84	3.37%	3.25%	3.15%
MGE Energy, Inc. (NYSE-MGEE)	$1.48	2.29%	2.29%	2.24%
NextEra Energy, Inc. (NYSE-NEE)	$5.60	1.93%	2.03%	2.17%
NorthWestern Corporation (NYSE-NWE)	$2.40	4.74%	4.57%	4.42%
OGE Energy Corp. (NYSE-OGE)	$1.61	5.27%	5.19%	5.08%
Otter Tail Corporation (NDQ-OTTR)	$1.48	3.91%	3.86%	3.60%
Pinnacle West Capital Corp. (NYSE-PNW)	$3.13	4.03%	4.07%	4.00%
Portland General Electric Company (NYSE-POR)	$1.63	4.48%	4.14%	3.72%
PPL Corporation (NYSE-PPL)	$1.66	5.98%	6.17%	6.21%
SEMPRA Energy (NYSE-SRE)	$4.18	3.41%	3.42%	3.39%
Southern Company (NYSE-SO)	$2.56	4.57%	4.74%	4.62%
WEC Energy Group (NYSE-WEC)	$2.53	2.58%	2.70%	2.73%
Xcel Energy Inc. (NYSE-XEL)	$1.72	2.44%	2.52%	2.63%
Mean		3.8%	3.8%	3.7%
Median		3.9%	3.8%	3.7%

Data Sources: http://quote.yahoo.com, October, 2020.

Panel B
Vander Weide Proxy Group

Company	Annual Dividend	Dividend Yield 30 Day	Dividend Yield 90 Day	Dividend Yield 180 Day
ALLETE, Inc. (NYSE-ALE)	$2.47	4.65%	4.49%	4.25%
Alliant Energy Corporation (NYSE-LNT)	$1.52	2.86%	2.92%	2.98%
Ameren Corporation (NYSE-AEE)	$2.06	2.58%	2.64%	2.71%
American Electric Power Co. (NYSE-AEP)	$2.96	3.47%	3.56%	3.53%
Avista Corporation (NYSE-AVA)	$1.62	4.72%	4.55%	4.16%
Black Hills Corporation (NYSE-BKH)	$2.14	3.83%	3.77%	3.53%
CMS Energy Corporation (NYSE-CMS)	$1.63	2.60%	2.66%	2.71%
Consolidated Edison, Inc. (NYSE-ED)	$3.06	3.58%	3.52%	3.75%
Dominion Energy Inc. (NYSE-D)	$3.76	4.71%	4.77%	4.79%
Duke Energy Corporation (NYSE-DUK)	$3.86	4.36%	4.61%	4.57%
DTE Energy Company (NYSE-DTE)	$4.05	3.46%	3.55%	3.72%
Edison International (NYSE-EIX)	$2.55	4.74%	4.77%	4.55%
Entergy Corporation (NYSE-ETR)	$3.72	3.65%	3.74%	3.69%
Evergy, Inc. (NYSE-EVRG)	$2.02	3.85%	3.63%	3.50%
Eversource Energy (NYSE-ES)	$2.27	2.61%	2.64%	2.68%
Exelon Corporation (NYSE-EXC)	$1.53	4.03%	4.08%	4.03%
FirstEnergy Corporation (NYSE-FE)	$1.56	5.17%	4.89%	4.23%
Fortis Inc. (NYSE-FTS)	$1.52	3.73%	3.82%	3.90%
Hawaiian Electric Industries (NYSE-HE)	$1.32	3.91%	3.79%	3.48%
IDACORP, Inc. (NYSE-IDA)	$2.84	3.37%	3.25%	3.15%
MGE Energy, Inc. (NYSE-MGEE)	$1.48	2.29%	2.29%	2.24%
NextEra Energy, Inc. (NYSE-NEE)	$5.60	1.93%	2.03%	2.17%
NorthWestern Corporation (NYSE-NWE)	$2.40	4.74%	4.57%	4.42%
OGE Energy Corp. (NYSE-OGE)	$1.61	5.27%	5.19%	5.08%
Otter Tail Corporation (NDQ-OTTR)	$1.48	3.91%	3.86%	3.60%
Pinnacle West Capital Corp. (NYSE-PNW)	$3.13	4.03%	4.07%	4.00%
Portland General Electric Company (NYSE-POR)	$1.63	4.48%	4.14%	3.72%
PPL Corporation (NYSE-PPL)	$1.66	5.98%	6.17%	6.21%
Public Service Enterprise Group Inc. (NYSE:PEG)	$1.96	3.51%	3.68%	3.83%
SEMPRA Energy (NYSE-SRE)	$4.18	3.41%	3.42%	3.39%
Southern Company (NYSE-SO)	$2.56	4.57%	4.74%	4.62%
WEC Energy Group (NYSE-WEC)	$2.53	2.58%	2.70%	2.73%
Xcel Energy Inc. (NYSE-XEL)	$1.72	2.44%	2.52%	2.63%
Mean		3.8%	3.8%	3.7%
Median		3.8%	3.8%	3.7%

Data Sources: http://quote.yahoo.com, October, 2020.

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Office of Regulatory Staff
DCF Study
Dominion Energy South Carolina, Inc.
Docket No. 2020-125-E

DCF Equity Cost Growth Rate Measures
***Value Line* Historic Growth Rates**

Panel A
Electric Proxy Group

Company	*Value Line* Historic Growth					
	Past 10 Years			Past 5 Years		
	Earnings	Dividends	Book Value	Earnings	Dividends	Book Value
ALLETE, Inc. (NYSE-ALE)	2.5	3.0	5.0	4.0	3.5	5.0
Alliant Energy Corporation (NYSE-LNT)	5.0	7.0	4.0	5.0	7.0	5.0
Ameren Corporation (NYSE-AEE)	1.0	-2.0	-0.5	6.5	3.0	2.5
American Electric Power Co. (NYSE-AEP)	3.0	4.5	4.0	4.0	5.5	3.0
Avista Corporation (NYSE-AVA)	6.5	8.0	4.0	7.0	4.0	4.5
CMS Energy Corporation (NYSE-CMS)	9.5	15.0	4.5	7.0	7.0	5.5
Consolidated Edison, Inc. (NYSE-ED)	2.5	2.0	4.0	2.0	3.0	4.5
Dominion Energy Inc. (NYSE-D)	1.5	7.5	6.0		8.0	9.5
Duke Energy Corporation (NYSE-DUK)	3.0	3.0	2.0	2.5	3.0	1.0
Edison International (NYSE-EIX)	-3.5	7.0	2.0	-10.5	11.5	2.5
Entergy Corporation (NYSE-ETR)	-0.5	2.5	1.0	0.5	1.5	-2.5
Evergy, Inc. (NYSE-EVRG)						
Eversource Energy (NYSE-ES)	6.0	9.0	6.5	7.0	7.0	3.5
Exelon Corporation (NYSE-EXC)	-4.5	-3.5	6.5	4.5	-3.0	4.0
FirstEnergy Corporation (NYSE-FE)	-7.0	-3.0	-8.5		-2.0	-17.5
Hawaiian Electric Industries (NYSE-HE)	6.0		2.5	2.0		3.5
IDACORP, Inc. (NYSE-IDA)	7.0	7.0	5.5	4.0	9.0	5.0
MGE Energy, Inc. (NYSE-MGEE)	4.5	3.5	5.5	2.5	4.0	5.5
Nextera Energy, Inc. (NYSE-NEE)	6.5	9.5	9.0	7.0	11.0	10.5
NorthWestern Corporation (NYSE-NWE)	7.0	5.5	6.0	6.0	7.5	7.0
OGE Energy Corp. (NYSE-OGE)	5.0	7.0	7.0	2.0	10.0	5.5
Otter Tail Corporation (NDQ-OTTR)	5.5	1.5		9.0	2.5	4.5
Pinnacle West Capital Corp. (NYSE-PNW)	6.5	3.0	3.0	5.0	3.5	4.0
Portland General Electric Company (NYSE-POR)	3.5	4.0	3.0	4.0	5.5	3.5
PPL Corporation (NYSE-PPL)	1.0	2.0	1.0	-1.0	2.0	-3.5
Sempra Energy (NYSE-SRE)	2.0	10.0	5.0	4.0	7.5	4.5
Southern Company (NYSE-SO)	3.0	3.5	3.5	3.0	3.5	3.0
WEC Energy Group (NYSE-WEC)	8.5	14.5	8.0	6.0	9.5	10.5
Xcel Energy Inc. (NYSE-XEL)	5.5	5.0	4.5	5.0	6.5	4.5
Mean	3.4	5.0	3.9	3.8	5.2	3.5
Median	4.0	4.5	4.0	4.0	5.5	4.5
	Average of Median Figures =			4.4		

Data Source: *Value Line Investment Survey.*

Panel B
Vander Weide Proxy Group

Company	*Value Line* Historic Growth					
	Past 10 Years			Past 5 Years		
	Earnings	Dividends	Book Value	Earnings	Dividends	Book Value
ALLETE, Inc. (NYSE-ALE)	2.5	3.0	5.0	4.0	3.5	5.0
Alliant Energy Corporation (NYSE-LNT)	5.0	7.0	4.0	5.0	7.0	5.0
Ameren Corporation (NYSE-AEE)	1.0	-2.0	-0.5	6.5	3.0	2.5
American Electric Power Co. (NYSE-AEP)	3.0	4.5	4.0	4.0	5.5	3.0
Avista Corporation (NYSE-AVA)	6.5	8.0	4.0	7.0	4.0	4.5
Black Hills Corporation (NYSE-BKH)	7.0	3.5	3.0	7.0	5.0	4.0
CMS Energy Corporation (NYSE-CMS)	9.5	15.0	4.5	7.0	7.0	5.5
Consolidated Edison, Inc. (NYSE-ED)	2.5	2.0	4.0	2.0	3.0	4.5
Dominion Energy Inc. (NYSE-D)	1.5	7.5	6.0		8.0	9.5
Duke Energy Corporation (NYSE-DUK)	3.0	3.0	2.0	2.5	3.0	1.0
DTE Energy Company (NYSE-DTE)	8.0	5.5	4.5	7.5	7.0	5.0
Edison International (NYSE-EIX)	-3.5	7.0	2.0	-10.5	11.5	2.5
Entergy Corporation (NYSE-ETR)	-0.5	2.5	1.0	0.5	1.5	-2.5
Evergy, Inc. (NYSE-EVRG)						
Eversource Energy (NYSE-ES)	6.0	9.0	6.5	7.0	7.0	3.5
Exelon Corporation (NYSE-EXC)	-4.5	-3.5	6.5	4.5	-3.0	4.0
FirstEnergy Corporation (NYSE-FE)	-7.0	-3.0	-8.5		-2.0	-17.5
Fortis Inc. (NYSE-FTS)	6.0	6.5	7.0	11.0	7.0	8.5
Hawaiian Electric Industries (NYSE-HE)	6.0		2.5	2.0		3.5
IDACORP, Inc. (NYSE-IDA)	7.0	7.0	5.5	4.0	9.0	5.0
MGE Energy, Inc. (NYSE-MGEE)	4.5	3.5	5.5	2.5	4.0	5.5
Nextera Energy, Inc. (NYSE-NEE)	6.5	9.5	9.0	7.0	11.0	10.5
NorthWestern Corporation (NYSE-NWE)	7.0	5.5	6.0	6.0	7.5	7.0
OGE Energy Corp. (NYSE-OGE)	5.0	7.0	7.0	2.0	10.0	5.5
Otter Tail Corporation (NDQ-OTTR)	5.5	1.5		9.0	2.5	4.5
Pinnacle West Capital Corp. (NYSE-PNW)	6.5	3.0	3.0	5.0	3.5	4.0
Portland General Electric Company (NYSE-POR)	3.5	4.0	3.0	4.0	5.5	3.5
PPL Corporation (NYSE-PPL)	1.0	2.0	1.0	-1.0	2.0	-3.5
Public Service Enterprise Group Inc. (NYSE:PEG)	1.0	3.5	6.0	4.0	4.5	4.5
Sempra Energy (NYSE-SRE)	2.0	10.0	5.0	4.0	7.5	4.5
Southern Company (NYSE-SO)	3.0	3.5	3.5	3.0	3.5	3.0
WEC Energy Group (NYSE-WEC)	8.5	14.5	8.0	6.0	9.5	10.5
Xcel Energy Inc. (NYSE-XEL)	5.5	5.0	4.5	5.0	6.5	4.5
Mean	3.7	5.0	4.0	4.3	5.3	3.8
Median	4.8	4.5	4.5	4.3	5.5	4.5
	Average of Median Figures =			4.7		

Data Source: *Value Line Investment Survey.*

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Office of Requlatory Staff
DCF Study
Dominion Energy South Carolina, Inc.
Docket No. 2020-125-E

DCF Equity Cost Growth Rate Measures
***Value Line* Projected Growth Rates**

Panel A
Electric Proxy Group

Company	*Value Line* Projected Growth Est'd. '17-'19 to '23-'25			*Value Line* Sustainable Growth		
	Earnings	Dividends	Book Value	Return on Equity	Retention Rate	Internal Growth
ALLETE, Inc. (NYSE-ALE)	4.5	4.5	3.5	8.0%	32.0%	2.6%
Alliant Energy Corporation (NYSE-LNT)	5.5	7.0	6.5	10.5%	33.0%	3.5%
Ameren Corporation (NYSE-AEE)	6.0	5.0	6.0	10.0%	46.0%	4.6%
American Electric Power Co. (NYSE-AEP)	6.0	5.5	5.5	10.5%	33.0%	3.5%
Avista Corporation (NYSE-AVA)	1.0	4.0	2.5	8.0%	25.0%	2.0%
CMS Energy Corporation (NYSE-CMS)	7.5	7.0	7.5	13.5%	39.0%	5.3%
Consolidated Edison, Inc. (NYSE-ED)	3.0	3.5	3.0	8.0%	34.0%	2.7%
Dominion Energy Inc. (NYSE-D)	3.0	-0.5	5.5	11.0%	29.0%	3.2%
Duke Energy Corporation (NYSE-DUK)	5.0	2.5	2.5	8.5%	29.0%	2.5%
Edison International (NYSE-EIX)	NMF	4.0	4.0	12.0%	40.0%	4.8%
Entergy Corporation (NYSE-ETR)	3.0	4.0	5.0	11.0%	36.0%	4.0%
Evergy, Inc. (NYSE-EVRG)	4.5	5.5	2.0	8.5%	29.0%	2.5%
Eversource Energy (NYSE-ES)	5.5	6.0	5.0	9.0%	35.0%	3.2%
Exelon Corporation (NYSE-EXC)	5.0	5.5	4.0	9.0%	48.0%	4.3%
FirstEnergy Corporation (NYSE-FE)	8.5	3.0	10.0	15.5%	40.0%	6.2%
Hawaiian Electric Industries (NYSE-HE)	1.5	2.0	3.5	8.5%	33.0%	2.8%
IDACORP, Inc. (NYSE-IDA)	3.5	6.5	4.0	9.5%	38.0%	3.6%
MGE Energy, Inc. (NYSE-MGEE)	4.0	5.5	5.0	9.5%	41.0%	3.9%
Nextera Energy, Inc. (NYSE-NEE)	10.0	10.5	6.0	12.5%	34.0%	4.3%
NorthWestern Corporation (NYSE-NWE)	2.5	4.0	3.0	8.5%	31.0%	2.6%
OGE Energy Corp. (NYSE-OGE)	3.0	6.0	0.5	12.0%	22.0%	2.6%
Otter Tail Corporation (NDQ-OTTR)	5.0	5.0	4.5	11.5%	34.0%	3.9%
Pinnacle West Capital Corp. (NYSE-PNW)	4.5	5.5	4.0	10.5%	35.0%	3.7%
Portland General Electric Company (NYSE-POR)	4.0	6.0	2.5	9.0%	31.0%	2.8%
PPL Corporation (NYSE-PPL)	2.5	2.0	4.5	12.5%	33.0%	4.1%
Sempra Energy (NYSE-SRE)	10.5	7.5	8.5	11.0%	42.0%	4.6%
Southern Company (NYSE-SO)	3.0	3.0	3.5	12.5%	25.0%	3.1%
WEC Energy Group (NYSE-WEC)	6.0	6.5	3.5	12.5%	32.0%	4.0%
Xcel Energy Inc. (NYSE-XEL)	6.0	6.0	5.5	10.5%	38.0%	4.0%
Mean	4.8	4.9	4.5	10.5%	34.4%	3.6%
Median	4.5	5.5	4.0	10.5%	34.0%	3.6%
Average of Median Figures =		4.7			Median =	3.6%

*** 'Est'd. '17-'19 to '23-'25' is the estimated growth rate from the base period 2017 to 2019 until the future period 2023 to 2025.**
Data Source: *Value Line Investment Survey.*

Panel B
Vander Weide Proxy Group

Company	*Value Line* Projected Growth Est'd. '17-'19 to '23-'25			*Value Line* Sustainable Growth		
	Earnings	Dividends	Book Value	Return on Equity	Retention Rate	Internal Growth
ALLETE, Inc. (NYSE-ALE)	4.5	4.5	3.5	8.0%	32.0%	2.6%
Alliant Energy Corporation (NYSE-LNT)	5.5	7.0	6.5	10.5%	33.0%	3.5%
Ameren Corporation (NYSE-AEE)	6.0	5.0	6.0	10.0%	46.0%	4.6%
American Electric Power Co. (NYSE-AEP)	6.0	5.5	5.5	10.5%	33.0%	3.5%
Avista Corporation (NYSE-AVA)	1.0	4.0	2.5	8.0%	25.0%	2.0%
Black Hills Corporation (NYSE-BKH)	3.5	6.0	4.5	9.0%	34.0%	3.1%
CMS Energy Corporation (NYSE-CMS)	7.5	7.0	7.5	13.5%	39.0%	5.3%
Consolidated Edison, Inc. (NYSE-ED)	3.0	3.5	3.0	8.0%	34.0%	2.7%
Dominion Energy Inc. (NYSE-D)	3.0	-0.5	5.5	11.0%	29.0%	3.2%
Duke Energy Corporation (NYSE-DUK)	5.0	2.5	2.5	8.5%	29.0%	2.5%
DTE Energy Company (NYSE-DTE)	5.0	6.5	5.5	10.5%	37.0%	3.9%
Edison International (NYSE-EIX)	NMF	4.0	4.0	12.0%	40.0%	4.8%
Entergy Corporation (NYSE-ETR)	3.0	4.0	5.0	11.0%	36.0%	4.0%
Evergy, Inc. (NYSE-EVRG)	4.5	5.5	2.0	8.5%	29.0%	2.5%
Eversource Energy (NYSE-ES)	5.5	6.0	5.0	9.0%	35.0%	3.2%
Exelon Corporation (NYSE-EXC)	5.0	5.5	4.0	9.0%	48.0%	4.3%
FirstEnergy Corporation (NYSE-FE)	8.5	3.0	10.0	15.5%	40.0%	6.2%
Fortis Inc. (NYSE-FTS)	1.0	6.0	4.0	6.5%	45.0%	2.9%
Hawaiian Electric Industries (NYSE-HE)	1.5	2.0	3.5	8.5%	33.0%	2.8%
IDACORP, Inc. (NYSE-IDA)	3.5	6.5	4.0	9.5%	38.0%	3.6%
MGE Energy, Inc. (NYSE-MGEE)	4.0	5.5	5.0	9.5%	41.0%	3.9%
Nextera Energy, Inc. (NYSE-NEE)	10.0	10.5	6.0	12.5%	34.0%	4.3%
NorthWestern Corporation (NYSE-NWE)	2.5	4.0	3.0	8.5%	31.0%	2.6%
OGE Energy Corp. (NYSE-OGE)	3.0	6.0	0.5	12.0%	22.0%	2.6%
Otter Tail Corporation (NDQ-OTTR)	5.0	5.0	4.5	11.5%	34.0%	3.9%
Pinnacle West Capital Corp. (NYSE-PNW)	4.5	5.5	4.0	10.5%	35.0%	3.7%
Portland General Electric Company (NYSE-POR)	4.0	6.0	2.5	9.0%	31.0%	2.8%
PPL Corporation (NYSE-PPL)	2.5	2.0	4.5	12.5%	33.0%	4.1%
Public Service Enterprise Group Inc. (NYSE:PEG)	5.0	4.0	5.0	11.0%	46.0%	5.1%
Sempra Energy (NYSE-SRE)	10.5	7.5	8.5	11.0%	42.0%	4.6%
Southern Company (NYSE-SO)	3.0	3.0	3.5	12.5%	25.0%	3.1%
WEC Energy Group (NYSE-WEC)	6.0	6.5	3.5	12.5%	32.0%	4.0%
Xcel Energy Inc. (NYSE-XEL)	6.0	6.0	5.5	10.5%	38.0%	4.0%
Mean	4.6	5.0	4.5	10.3%	35.1%	3.6%
Median	4.5	5.5	4.5	10.5%	34.0%	3.6%
Average of Median Figures =		4.8			Median =	3.6%

*** 'Est'd. '17-'19 to '23-'25' is the estimated growth rate from the base period 2017 to 2019 until the future period 2023 to 2025.**
Data Source: *Value Line Investment Survey.*

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Office of Regulatory Staff
DCF Study
Dominion Energy South Carolina, Inc.
Docket No. 2020-125-E

DCF Equity Cost Growth Rate Measures
Analysts Projected EPS Growth Rate Estimates

Panel A
Electric Proxy Group

Company	Yahoo	Zacks	Mean
ALLETE, Inc. (NYSE-ALE)	7.0%	N/A	7.0%
Alliant Energy Corporation (NYSE-LNT)	5.5%	5.8%	5.6%
Ameren Corporation (NYSE-AEE)	6.0%	6.9%	6.4%
American Electric Power Co. (NYSE-AEP)	5.4%	5.6%	5.5%
Avista Corporation (NYSE-AVA)	5.8%	5.1%	5.5%
CMS Energy Corporation (NYSE-CMS)	7.1%	7.0%	7.0%
Consolidated Edison, Inc. (NYSE-ED)	2.6%	2.0%	2.3%
Dominion Energy Inc. (NYSE-D)	2.7%	3.6%	3.2%
Duke Energy Corporation (NYSE-DUK)	2.1%	3.6%	2.9%
Edison International (NYSE-EIX)	1.4%	3.1%	2.2%
Entergy Corporation (NYSE-ETR)	5.4%	5.4%	5.4%
Evergy, Inc. (NYSE-EVRG)	6.8%	6.3%	6.5%
Eversource Energy (NYSE-ES)	6.4%	6.6%	6.5%
Exelon Corporation (NYSE-EXC)	-3.5%	4.0%	0.3%
FirstEnergy Corporation (NYSE-FE)	-2.4%	NA	
Hawaiian Electric Industries (NYSE-HE)	3.3%	1.7%	2.5%
IDACORP, Inc. (NYSE-IDA)	2.6%	2.6%	2.6%
MGE Energy, Inc. (NYSE-MGEE)	4.4%	4.4%	4.4%
Nextera Energy, Inc. (NYSE-NEE)	8.1%	7.9%	8.0%
NorthWestern Corporation (NYSE-NWE)	3.7%	3.4%	3.5%
OGE Energy Corp. (NYSE-OGE)	2.4%	3.7%	3.0%
Otter Tail Corporation (NDQ-OTTR)	9.0%	N/A	9.0%
Pinnacle West Capital Corp. (NYSE-PNW)	3.4%	3.6%	3.5%
Portland General Electric Company (NYSE-POR)	4.3%	5.0%	4.7%
PPL Corporation (NYSE-PPL)	-16.2%	N/A	
Sempra Energy (NYSE-SRE)	6.3%	7.4%	6.8%
Southern Company (NYSE-SO)	4.6%	4.0%	4.3%
WEC Energy Group (NYSE-WEC)	6.0%	5.9%	5.9%
Xcel Energy Inc. (NYSE-XEL)	5.9%	5.8%	5.8%
Mean	3.7%	4.8%	4.8%
Median	4.6%	4.7%	5.0%

Data Sources: www.zacks.com, http://quote.yahoo.com, October, 2020.
* FirstEnergy and PPL were excluded from the DCF analysis due to negative projected EPS growth rate

Panel B
Vander Weide Proxy Group

Company	Yahoo	Zacks	Mean
ALLETE, Inc. (NYSE-ALE)	7.00%	N/A	7.0%
Alliant Energy Corporation (NYSE-LNT)	5.50%	5.76%	5.6%
Ameren Corporation (NYSE-AEE)	6.00%	6.89%	6.4%
American Electric Power Co. (NYSE-AEP)	5.40%	5.60%	5.5%
Avista Corporation (NYSE-AVA)	5.80%	5.14%	5.5%
Black Hills Corporation (NYSE-BKH)	4.69%	5.76%	5.2%
CMS Energy Corporation (NYSE-CMS)	7.08%	7.01%	7.0%
Consolidated Edison, Inc. (NYSE-ED)	2.55%	2.00%	2.3%
Dominion Energy Inc. (NYSE-D)	2.74%	3.58%	3.2%
Duke Energy Corporation (NYSE-DUK)	2.10%	3.60%	2.9%
DTE Energy Company (NYSE-DTE)	5.95%	5.67%	5.8%
Edison International (NYSE-EIX)	1.40%	3.08%	2.2%
Entergy Corporation (NYSE-ETR)	5.40%	5.43%	5.4%
Evergy, Inc. (NYSE-EVRG)	6.80%	6.25%	6.5%
Eversource Energy (NYSE-ES)	6.44%	6.59%	6.5%
Exelon Corporation (NYSE-EXC)	-3.48%	4.00%	0.3%
FirstEnergy Corporation (NYSE-FE)	-2.40%	NA	
Fortis Inc. (NYSE-FTS)	N/A	6.11%	6.1%
Hawaiian Electric Industries (NYSE-HE)	3.30%	1.67%	2.5%
IDACORP, Inc. (NYSE-IDA)	2.60%	2.63%	2.6%
MGE Energy, Inc. (NYSE-MGEE)	4.40%	4.38%	4.4%
Nextera Energy, Inc. (NYSE-NEE)	8.14%	7.94%	8.0%
NorthWestern Corporation (NYSE-NWE)	3.67%	3.39%	3.5%
OGE Energy Corp. (NYSE-OGE)	2.40%	3.69%	3.0%
Otter Tail Corporation (NDQ-OTTR)	9.00%	N/A	9.0%
Pinnacle West Capital Corp. (NYSE-PNW)	3.38%	3.55%	3.5%
Portland General Electric Company (NYSE-POR)	4.30%	5.00%	4.7%
PPL Corporation (NYSE-PPL)	-16.22%	N/A	
Public Service Enterprise Group Inc. (NYSE:PEG)	1.47%	3.46%	2.5%
Sempra Energy (NYSE-SRE)	6.27%	7.36%	6.8%
Southern Company (NYSE-SO)	4.55%	4.00%	4.3%
WEC Energy Group (NYSE-WEC)	5.95%	5.94%	5.9%
Xcel Energy Inc. (NYSE-XEL)	5.85%	5.81%	5.8%
Mean	3.7%	4.9%	4.8%
Median	4.6%	5.1%	5.4%

* FirstEnergy and PPL were excluded from the DCF analysis due to negative projected EPS growth rates.
Data Sources: www.zacks.com, http://quote.yahoo.com, October, 2020.

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Office of Regulatory Staff
DCF Study
Dominion Energy South Carolina, Inc.
Docket No. 2020-125-E

DCF Growth Rate Indicators

Electric and Vander Weide Proxy Groups

Growth Rate Indicator	Electric Proxy Group	Vander Weide Proxy Group
Historic *Value Line* Growth in EPS, DPS, and BVPS	4.4%	4.7%
Projected *Value Line* Growth in EPS, DPS, and BVPS	4.7%	4.8%
Sustainable Growth ROE * Retention Rate	3.6%	3.6%
Projected EPS Growth from Yahoo and Zacks - Mean/Median	4.8%/5.0%	4.8%/5.4%

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Office of Regulatory Staff
CAPM Study
Dominion Energy South Carolina
Docket No. 2020-125-E

Capital Asset Pricing Model

Panel A
Electric Proxy Group

Risk-Free Interest Rate	**2.50%**
Beta*	**0.85**
Ex Ante Equity Risk Premium**	**6.00%**
CAPM Cost of Equity	**7.6%**

* See page 3 of Exhibit JRW-8

** See pages 5 and 6 of Exhibit JRW-8

Panel B
Vander Weide Proxy Group

Risk-Free Interest Rate	**2.50%**
Beta*	**0.85**
Ex Ante Equity Risk Premium**	**6.00%**
CAPM Cost of Equity	**7.6%**

* See page 3 of Exhibit JRW-8

** See pages 5 and 6 of Exhibit JRW-8

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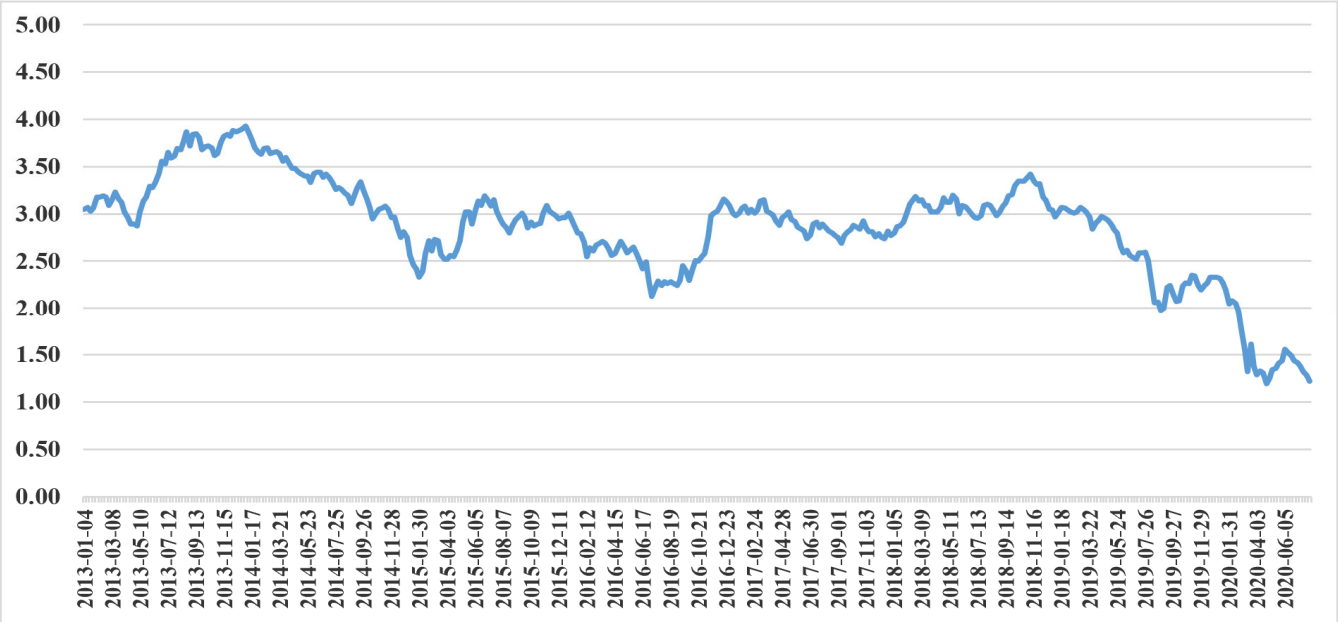
Office of Regulatory Staff
Thirty-Year U.S. Treasury Yields
Dominion Energy South Carolina
Docket No. 2020-125-E

Thirty-Year U.S. Treasury Yields
2013-2020



Source: Federal Reserve Bank of St. Louis, FRED Database.

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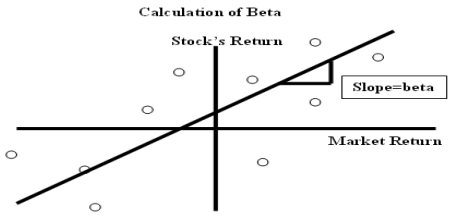
Office of Regulatory Staff
CAPM Study
Dominion Energy South Carolina
Docket No. 2020-125-E



Panel A
Electric Proxy Group

Company Name	Beta
ALLETE, Inc. (NYSE-ALE)	0.85
Alliant Energy Corporation (NYSE-LNT)	0.85
Ameren Corporation (NYSE-AEE)	0.80
American Electric Power Co. (NYSE-AEP)	0.75
Avista Corporation (NYSE-AVA)	0.90
CMS Energy Corporation (NYSE-CMS)	0.80
Consolidated Edison, Inc. (NYSE-ED)	0.75
Dominion Energy Inc. (NYSE-D)	0.80
Duke Energy Corporation (NYSE-DUK)	0.85
Edison International (NYSE-EIX)	0.90
Entergy Corporation (NYSE-ETR)	0.95
Evergy, Inc. (NYSE-EVRG)	1.00
Eversource Energy (NYSE-ES)	0.90
Exelon Corporation (NYSE-EXC)	0.95
FirstEnergy Corporation (NYSE-FE)	0.85
Hawaiian Electric Industries (NYSE-HE)	0.80
IDACORP, Inc. (NYSE-IDA)	0.80
MGE Energy, Inc. (NYSE-MGEE)	0.70
NextEra Energy, Inc. (NYSE-NEE)	0.85
NorthWestern Corporation (NYSE-NWE)	0.90
OGE Energy Corp. (NYSE-OGE)	1.05
Otter Tail Corporation (NDQ-OTTR)	0.85
Pinnacle West Capital Corp. (NYSE-PNW)	0.85
Portland General Electric Company (NYSE-POR)	0.85
PPL Corporation (NYSE-PPL)	1.10
Sempra Energy (NYSE-SRE)	0.95
Southern Company (NYSE-SO)	0.90
WEC Energy Group (NYSE-WEC)	0.80
Xcel Energy Inc. (NYSE-XEL)	0.80
Mean	0.87
Median	0.85

Data Source: *Value Line Investment Survey*, 2020.

Panel B
Vander Weide Proxy Group

Company Name	Beta
ALLETE, Inc. (NYSE-ALE)	0.85
Alliant Energy Corporation (NYSE-LNT)	0.85
Ameren Corporation (NYSE-AEE)	0.80
American Electric Power Co. (NYSE-AEP)	0.75
Avista Corporation (NYSE-AVA)	0.90
Black Hills Corporation (NYSE-BKH)	0.95
CMS Energy Corporation (NYSE-CMS)	0.80
Consolidated Edison, Inc. (NYSE-ED)	0.75
Dominion Energy Inc. (NYSE-D)	0.80
DTE Energy Company (NYSE-DTE)	0.90
Duke Energy Corporation (NYSE-DUK)	0.85
Edison International (NYSE-EIX)	0.90
Entergy Corporation (NYSE-ETR)	0.95
Evergy, Inc. (NYSE-EVRG)	1.00
Eversource Energy (NYSE-ES)	0.90
Exelon Corporation (NYSE-EXC)	0.95
FirstEnergy Corporation (NYSE-FE)	0.85
Fortis Inc. (NYSE-FTS)	0.80
Hawaiian Electric Industries (NYSE-HE)	0.80
IDACORP, Inc. (NYSE-IDA)	0.80
MGE Energy, Inc. (NYSE-MGEE)	0.70
NextEra Energy, Inc. (NYSE-NEE)	0.85
NorthWestern Corporation (NYSE-NWE)	0.90
OGE Energy Corp. (NYSE-OGE)	1.05
Otter Tail Corporation (NDQ-OTTR)	0.85
Pinnacle West Capital Corp. (NYSE-PNW)	0.85
Portland General Electric Company (NYSE-POR)	0.85
PPL Corporation (NYSE-PPL)	1.10
Public Service Enterprise Group Inc. (NYSE:PEG	0.90
Sempra Energy (NYSE-SRE)	0.95
Southern Company (NYSE-SO)	0.90
WEC Energy Group (NYSE-WEC)	0.80
Xcel Energy Inc. (NYSE-XEL)	0.80
Mean	0.87
Median	0.85

Data Source: *Value Line Investment Survey*, 2020.

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CAPM Study
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Docket No. 2020-125-E

Risk Premium Approaches

	Historical Ex Post Returns	**Surveys**	**Expected Return Models and Market Data**
Means of Assessing The Market Risk Premium	Historical Average Stock Minus Bond Returns	Surveys of CFOs, Financial Forecasters, Companies, Analysts on Expected Returns and Market Risk Premiums	Use Market Prices and Market Fundamentals (such as Growth Rates) to Compute Expected Returns and Market Risk Premiums
Problems/Debated Issues	Time Variation in Required Returns, Measurement and Time Period Issues, and Biases such as Market and Company Survivorship Bias	Questions Regarding Survey Histories, Responses, and Representativeness Surveys may be Subject to Biases, such as Extrapolation	Assumptions Regarding Expectations, Especially Growth

Source: Adapted from Antti Ilmanen, Expected Returns on Stocks and Bonds,"*Journal of Portfolio Management* , (Winter 2003).

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Office of Regulatory Staff
CAPM Study
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Docket No. 2020-125-E

Market Risk Premium

Category	Study Authors	Publication Date	Time Period Of Study	Methodology	Return Measure	Range Low	Range High	Midpoint of Range	Mean	Median
Historical Risk Premium										
	Ibbotson	2016	1928-2015	Historical Stock Returns - Bond Returns	Arithmetic				6.00%	
					Geometric				4.40%	
	Damodaran	2020	1928-2019	Historical Stock Returns - Bond Returns	Arithmetic				6.43%	
					Geometric				4.83%	
	Dimson, Marsh, Staunton _Credit Suisse Report	2019	1900-2018	Historical Stock Returns - Bond Returns	Arithmetic				5.50%	
					Geometric					
	Bate	2008	1900-2007	Historical Stock Returns - Bond Returns	Geometric				4.50%	
	Shiller	2006	1926-2005	Historical Stock Returns - Bond Returns	Arithmetic				7.00%	
					Geometric				5.50%	
	Siegel	2005	1926-2005	Historical Stock Returns - Bond Returns	Arithmetic				6.10%	
					Geometric				4.60%	
	Dimson, Marsh, and Staunton	2006	1900-2005	Historical Stock Returns - Bond Returns	Arithmetic				5.50%	
	Goyal & Welch	2006	1872-2004	Historical Stock Returns - Bond Returns					4.77%	
	Median									5.50%
Ex Ante Models (Puzzle Research)										
	Claus Thomas	2001	1985-1998	Abnormal Earnings Model					3.00%	
	Arnott and Bernstein	2002	1810-2001	Fundamentals - Div Yld + Growth					2.40%	
	Constantinides	2002	1872-2000	Historical Returns & Fundamentals - P/D & P/E					6.90%	
	Cornell	1999	1926-1997	Historical Returns & Fundamental GDP/Earnings		3.50%	5.50%	4.50%	4.50%	
	Easton, Taylor, et al	2002	1981-1998	Residual Income Model					5.30%	
	Fama French	2002	1951-2000	Fundamental DCF with EPS and DPS Growth		2.55%	4.32%		3.44%	
	Harris & Marston	2001	1982-1998	Fundamental DCF with Analysts' EPS Growth					7.14%	
	McKinsey	2002	1962-2002	Fundamental (P/E, D/P, & Earnings Growth)		3.50%	4.00%		3.75%	
	Siegel	2005	1802-2001	Historical Earnings Yield					2.50%	
	Grabowski	2006	1926-2005	Historical and Projected		3.50%	6.00%	4.75%	4.75%	
	Maheu & McCurdy	2006	1885-2003	Historical Excess Returns, Structural Breaks,		4.02%	5.10%	4.56%	4.56%	
	Bostock	2004	1960-2002	Bond Yields, Credit Risk, and Income Volatility		3.90%	1.30%	2.60%	2.60%	
	Bakshi & Chen	2005	1982-1998	Fundamentals - Interest Rates					7.31%	
	Donaldson, Kamstra, & Kramer	2006	1952-2004	Fundamental, Dividend yld., Returns,, & Volatility		3.00%	4.00%	3.50%	3.50%	
	Campbell	2008	1982-2007	Historical & Projections (D/P & Earnings Growth)		4.10%	5.40%		4.75%	
	Best & Byrne	2001	Projection	Fundamentals - Div Yld + Growth					2.00%	
	Fernandez	2007	Projection	Required Equity Risk Premium					4.00%	
	DeLong & Magin	2008	Projection	Earnings Yield - TIPS					3.22%	
	Siegel - Rethink ERP	2011	Projection	Real Stock Returns and Components					5.50%	
	Duff & Phelps	2020	Projection	Normalized with 3.5% Long-Term Treasury Yield					6.00%	
	Mschchowski - VL - 2014	2014	Projection	Fundamentals - Expected Return Minus 10-Year Treasury Rate					5.50%	
	American Appraisal Quarterly ERP	2015	Projection	Fundamental Economic and Market Factors					6.00%	
	Market Risk Premia	2020	Projection	Fundamental Economic and Market Factors					5.24%	
	KPMG	2020	Projection	Fundamental Economic and Market Factors					6.75%	
	Damodaran -11-20	2020	Projection	Fundamentals - Implied from FCF to Equity Model (Trailing 12 month, with adjusted payout)					5.35%	
	Social Security									
	Office of Chief Actuary		1900-1995							
	John Campbell	2001	1860-2000	Historical & Projections (D/P & Earnings Growth)	Arithmetic	3.00%	4.00%	3.50%	3.50%	
			Projected for 75 Years		Geometric	1.50%	2.50%	2.00%	2.00%	
	Peter Diamond	2001	Projected for 75 Years	Fundamentals (D/P, GDP Growth)		3.00%	4.80%	3.90%	3.90%	
	John Shoven	2001	Projected for 75 Years	Fundamentals (D/P, P/E, GDP Growth)		3.00%	3.50%	3.25%	3.25%	
	Median									4.50%
Surveys										
	New York Fed	2015	Five-Year	Survey of Wall Street Firms					5.70%	
	Survey of Financial Forecasters	2020	10-Year Projection	About 20 Financial Forecastsers					3.36%	
	Duke - CFO Magazine Survey	2020	10-Year Projection	Approximately 200 CFOs					4.05%	
	Welch - Academics	2008	30-Year Projection	Random Academics		5.00%	5.74%	5.37%	5.37%	
	Fernandez - Academics, Analysts, and Companie	2020	Long-Term	Survey of Academics, Analysts, and Companies					5.60%	
	Median									5.37%
Building Block										
	Ibbotson and Chen	2015	Projection	Historical Supply Model (D/P & Earnings Growth)	Arithmetic			6.22%	5.21%	
					Geometric			4.20%		
	Chen - Rethink ERP	2010	20-Year Projection	Combination Supply Model (Historic and Projection)	Geometric				4.00%	
	Ilmanen - Rethink ERP	2010	Projection	Current Supply Model (D/P & Earnings Growth)	Geometric				3.00%	
	Grinold, Kroner, Siegel - Rethink ERP	2011	Projection	Current Supply Model (D/P & Earnings Growth)	Arithmetic			4.63%	4.12%	
					Geometric			3.60%		
	Median									4.06%
Mean										**4.86%**
Median										**4.83%**

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Office of Regulatory Staff
CAPM Study
Dominion Energy South Carolina
Docket No. 2020-125-E

Summary of 2010-20 Equity Risk Premium Studies

Category	Study Authors	Publication Date	Time Period Of Study	Methodology	Return Measure	Range Low	Range High	Midpoint of Range	Mean	Average
Historical Risk Premium										
	Ibbotson	2016	1928-2015	Historical Stock Returns - Bond Returns	Arithmetic				6.00%	
					Geometric				4.40%	
	Damodaran	2020	1928-2019	Historical Stock Returns - Bond Returns	Arithmetic				6.43%	
					Geometric				4.83%	
	Dimson, Marsh, Staunton _Credit Suisse Report	2019	1900-2018	Historical Stock Returns - Bond Returns	Arithmetic				5.50%	
					Geometric					
	Median									5.43%
Ex Ante Models (Puzzle Research)										
	Siegel - Rethink ERP	2011	Projection	Real Stock Returns and Components					5.50%	
	Duff & Phelps	2020	Projection	Normalized with 3.5% Long-Term Treasury Yield					6.00%	
	Mschchowski - VL - 2014	2014	Projection	Fundamentals - Expected Return Minus 10-Year Treasury Rate					5.50%	
	American Appraisal Quarterly ERP	2015	Projection	Fundamental Economic and Market Factors					6.00%	
	Market Risk Premia	2020	Projection	Fundamental Economic and Market Factors					5.24%	
	KPMG	2020	Projection	Fundamental Economic and Market Factors					6.75%	
	Damodaran -11-20	2020	Projection	Fundamentals - Implied from FCF to Equity Model (Trailing 12 month, with adjusted payout)					5.35%	
	Median									5.50%
Surveys										
	New York Fed	2015	Five-Year	Survey of Wall Street Firms					5.70%	
	Survey of Financial Forecasters	2020	10-Year Projection	About 20 Financial Forecastsers					3.36%	
	Duke - CFO Magazine Survey	2020	10-Year Projection	Approximately 200 CFOs					4.05%	
	Fernandez - Academics, Analysts, and Companie	2020	Long-Term	Survey of Academics, Analysts, and Companies					5.60%	
	Median									4.83%
Building Block										
	Ibbotson and Chen	2015	Projection	Historical Supply Model (D/P & Earnings Growth)	Arithmetic			6.22%	5.21%	
					Geometric			4.20%		
	Chen - Rethink ERP	2010	20-Year Projection	Combination Supply Model (Historic and Projection)	Geometric				4.00%	
	Ilmanen - Rethink ERP	2010	Projection	Current Supply Model (D/P & Earnings Growth)	Geometric				3.00%	
	Grinold, Kroner, Siegel - Rethink ERP	2011	Projection	Current Supply Model (D/P & Earnings Growth)	Arithmetic			4.63%	4.12%	
					Geometric			3.60%		
	Median									4.06%
Mean										**4.95%**
Median										**5.13%**

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Duff & Phelps Risk-Free Interest Rates and Equity Risk Premium Estimates

DUFF & PHELPS

Table: Equity Risk Premium & Risk-free Rates

June 30, 2020

For additional information, please visit https://www.duffandphelps.com/insights/publications/cost-of-capital

Duff & Phelps Recommended U.S. Equity Risk Premium (ERP) and Corresponding Risk-free Rates (R_f); January 2008–Present

Date	Risk-free Rate (R_f)	R_f (%)	Duff & Phelps Recommended ERP (%)	What Changed
Current Guidance:				
June 30, 2020 – UNTIL FURTHER NOTICE	Normalized 20-year U.S. Treasury yield	2.50	6.00	Rf
March 25, 2020 – June 29, 2020	Normalized 20-year U.S. Treasury yield	3.00	6.00	ERP
December 19, 2019 – March 24, 2020	Normalized 20-year U.S. Treasury yield	3.00	5.00	ERP
September 30, 2019 – December 18, 2019	Normalized 20-year U.S. Treasury yield	3.00	5.50	R_f
December 31, 2018 – September 29, 2019	Normalized 20-year U.S. Treasury yield	3.50	5.50	ERP
September 5, 2017 – December 30, 2018	Normalized 20-year U.S. Treasury yield	3.50	5.00	ERP
November 15, 2016 – September 4, 2017	Normalized 20-year U.S. Treasury yield	3.50	5.50	R_f
January 31, 2016 – November 14, 2016	Normalized 20-year U.S. Treasury yield	4.00	5.50	ERP
December 31, 2015	Normalized 20-year U.S. Treasury yield	4.00	5.00	
December 31, 2014	Normalized 20-year U.S. Treasury yield	4.00	5.00	
December 31, 2013	Normalized 20-year U.S. Treasury yield	4.00	5.00	
February 28, 2013 – January 30, 2016	Normalized 20-year U.S. Treasury yield	4.00	5.00	ERP
December 31, 2012	Normalized 20-year U.S. Treasury yield	4.00	5.50	
January 15, 2012 – February 27, 2013	Normalized 20-year U.S. Treasury yield	4.00	5.50	ERP
December 31, 2011	Normalized 20-year U.S. Treasury yield	4.00	6.00	
September 30, 2011 – January 14, 2012	Normalized 20-year U.S. Treasury yield	4.00	6.00	ERP
July 1 2011 – September 29, 2011	Normalized 20-year U.S. Treasury yield	4.00	5.50	R_f
June 1, 2011 – June 30, 2011	Spot 20-year U.S. Treasury yield	Spot	5.50	R_f
May 1, 2011 – May 31, 2011	Normalized 20-year U.S. Treasury yield	4.00	5.50	R_f
December 31, 2010	Spot 20-year U.S. Treasury yield	Spot	5.50	
December 1, 2010 – April 30, 2011	Spot 20-year U.S. Treasury yield	Spot	5.50	R_f
June 1, 2010 – November 30, 2010	Normalized 20-year U.S. Treasury yield	4.00	5.50	R_f
December 31, 2009	Spot 20-year U.S. Treasury yield	Spot	5.50	
December 1, 2009 – May 31, 2010	Spot 20-year U.S. Treasury yield	Spot	5.50	ERP
June 1, 2009 – November 30, 2009	Spot 20-year U.S. Treasury yield	Spot	6.00	R_f
December 31, 2008	Normalized 20-year U.S. Treasury yield	4.50	6.00	
November 1, 2008 – May 31, 2009	Normalized 20-year U.S. Treasury yield	4.50	6.00	R_f
October 27, 2008 – October 31, 2008	Spot 20-year U.S. Treasury yield	Spot	6.00	ERP
January 1, 2008 – October 26, 2008	Spot 20-year U.S. Treasury yield	Spot	5.00	Initialized

"Normalized" in this context means that in months where the risk-free rate is deemed to be abnormally low, a proxy for a longer-term sustainable risk-free rate is used.

To learn more about cost of capital issues, and to ensure that you are using the most recent Duff & Phelps Recommended ERP, visit www.duffandphelps.com/insights/publications/cost-of-capital.
This and other related resources can also be found in the online Cost of Capital Navigator platform. To learn more about the Cost of Capital Navigator and other Duff & Phelps valuation and industry data products, visit www.DPCostofCapital.com.

Source: https://www.duffandphelps.com/-/media/assets/pdfs/publications/articles/dp-erp-rf-table-2020.pdf?la=en&hash=CEC22C0DD9928B72337F9B7E7536C753B0513063

EXHIBIT JRW-9

Office of Regulatory Staff

DESC Recommended Cost of Capital

Dominion Energy South Carolina

Docket No. 2020-125-E

Capital Source	Capitalization Ratios	Cost Rate	Weighted Cost Rate
Long-Term Debt	46.35%	6.46%	2.99%
Preferred Stock	0.00%	6.75%	0.00%
Common Equity	53.65%	10.20%	5.47%
Total Capital	100.00%		8.47%

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Office of Regulatory Staff
GDP and S&P 500 Growth Rates
Dominion Energy South Carolina
Docket No. 2020-125-E

Growth Rates
GDP, S&P 500 Price, EPS, and DPS

		GDP	S&P 500	S&P 500 EPS	S&P 500 DPS	
	1960	542.38	58.11	3.10	1.98	
1	1961	562.21	71.55	3.37	2.04	
2	1962	603.92	63.1	3.67	2.15	
3	1963	637.45	75.02	4.13	2.35	
4	1964	684.46	84.75	4.76	2.58	
5	1965	742.29	92.43	5.30	2.83	
6	1966	813.41	80.33	5.41	2.88	
7	1967	859.96	96.47	5.46	2.98	
8	1968	940.65	103.86	5.72	3.04	
9	1969	1017.62	92.06	6.10	3.24	
10	1970	1073.30	92.15	5.51	3.19	
11	1971	1164.85	102.09	5.57	3.16	
12	1972	1279.11	118.05	6.17	3.19	
13	1973	1425.38	97.55	7.96	3.61	
14	1974	1545.24	68.56	9.35	3.72	
15	1975	1684.90	90.19	7.71	3.73	
16	1976	1873.41	107.46	9.75	4.22	
17	1977	2081.83	95.1	10.87	4.86	
18	1978	2351.60	96.11	11.64	5.18	
19	1979	2627.33	107.94	14.55	5.97	
20	1980	2857.31	135.76	14.99	6.44	
21	1981	3207.04	122.55	15.18	6.83	
22	1982	3343.79	140.64	13.82	6.93	
23	1983	3634.04	164.93	13.29	7.12	
24	1984	4037.61	167.24	16.84	7.83	
25	1985	4338.98	211.28	15.68	8.20	
26	1986	4579.63	242.17	14.43	8.19	
27	1987	4855.22	247.08	16.04	9.17	
28	1988	5236.44	277.72	24.12	10.22	
29	1989	5641.58	353.4	24.32	11.73	
30	1990	5963.14	330.22	22.65	12.35	
31	1991	6158.13	417.09	19.30	12.97	
32	1992	6520.33	435.71	20.87	12.64	
33	1993	6858.56	466.45	26.90	12.69	
34	1994	7287.24	459.27	31.75	13.36	
35	1995	7639.75	615.93	37.70	14.17	
36	1996	8073.12	740.74	40.63	14.89	
37	1997	8577.55	970.43	44.09	15.52	
38	1998	9062.82	1229.23	44.27	16.20	
39	1999	9630.66	1469.25	51.68	16.71	
40	2000	10252.35	1320.28	56.13	16.27	
41	2001	10581.82	1148.09	38.85	15.74	
42	2002	10936.42	879.82	46.04	16.08	
43	2003	11458.25	1111.91	54.69	17.88	
44	2004	12213.73	1211.92	67.68	19.407	
45	2005	13036.64	1248.29	76.45	22.38	
46	2006	13814.61	1418.3	87.72	25.05	
47	2007	14451.86	1468.36	82.54	27.73	
48	2008	14712.85	903.25	65.39	28.05	
49	2009	14448.93	1115.10	59.65	22.31	
50	2010	14992.05	1257.64	83.66	23.12	
51	2011	15542.58	1257.60	97.05	26.02	
52	2012	16197.01	1426.19	102.47	30.44	
53	2013	16784.85	1848.36	107.45	36.28	
54	2014	17527.26	2058.90	113.01	39.44	
55	2015	18224.78	2043.94	106.32	43.16	
56	2016	18715.04	2238.83	108.86	45.03	
57	2017	19519.42	2673.61	124.94	49.73	
58	2018	20580.22	2506.85	148.34	53.61	
	2019	21427.10	3230.78	156.27	58.80	Average
	Growth Rates	6.43	7.05	6.87	5.91	6.57

Data Sources: GDPA -http://research.stlouisfed.org/fred2/series/GDPA/downloaddata

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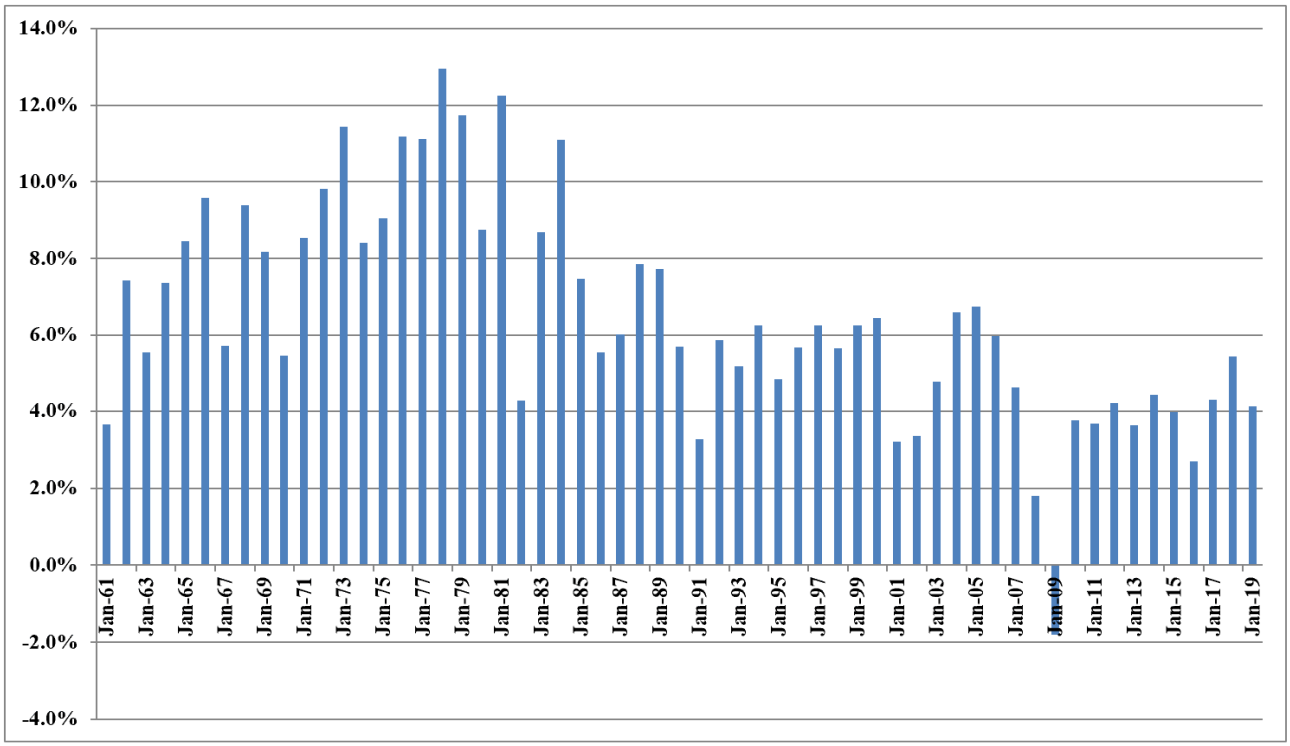
Office of Regulatory Staff
Annual Nominal GDP Growth Rates
Dominion Energy South Carolina
Docket No. 2020-125-E

Annual Growth Rates - 1961-2019



Data Sources: GDPA -https://fred.stlouisfed.org/series/GDPA

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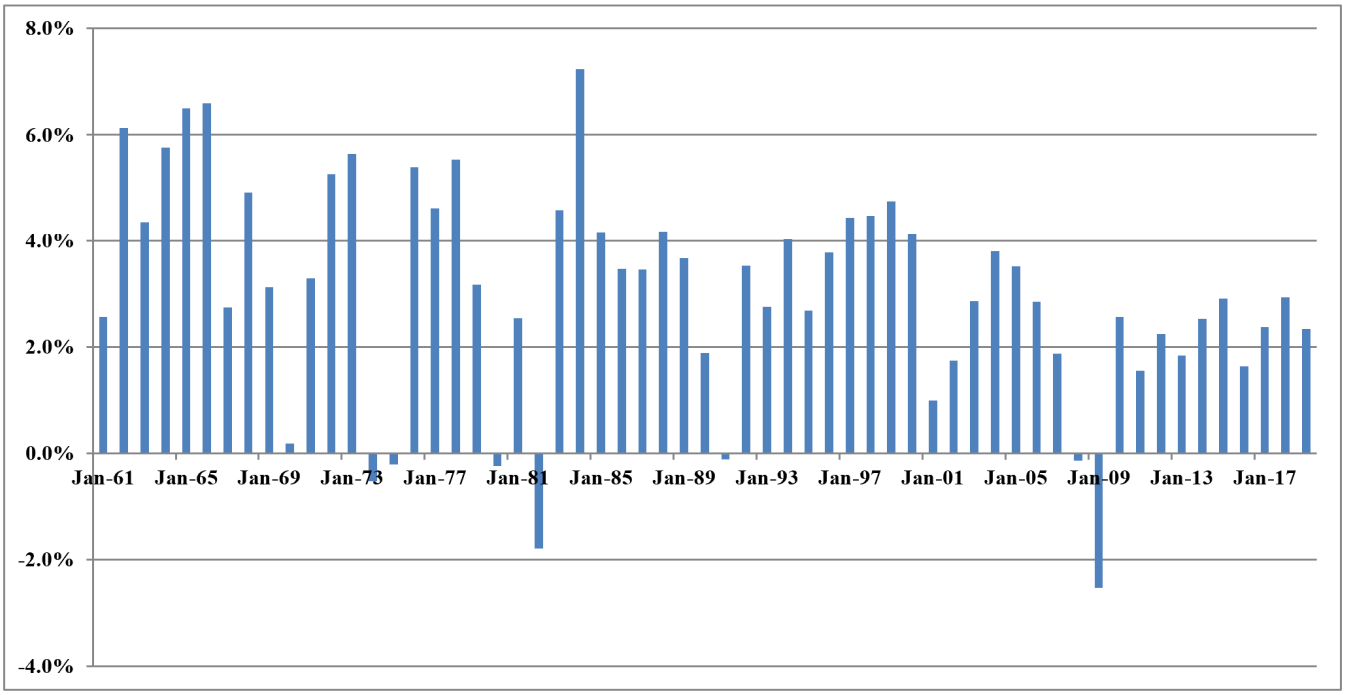
Office of Regulatory Staff
Real GDP Growth Rates
Dominion Energy South Carolina
Docket No. 2020-125-E

Annual Real GDP Growth Rates
1961-2019



Data Sources: GDPC1 - https://fred.stlouisfed.org/series/GDPCA

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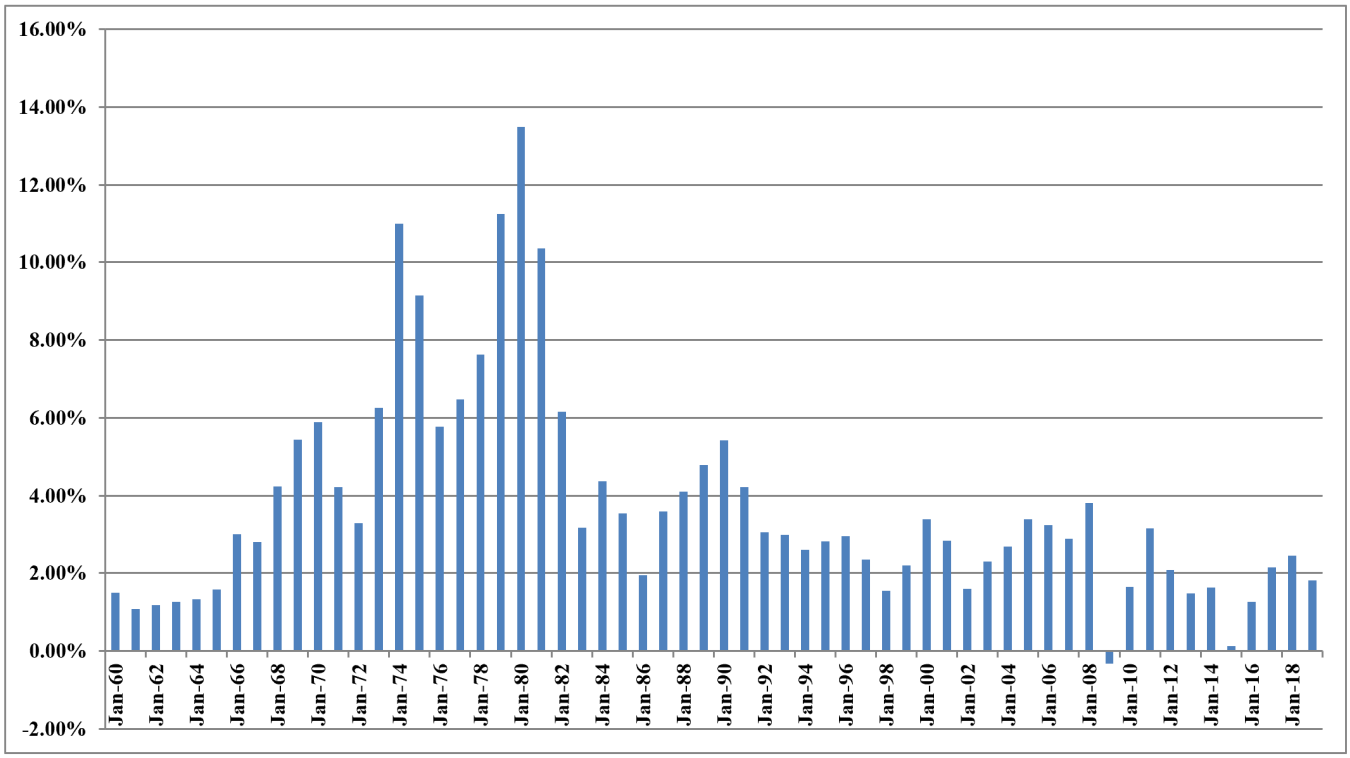
Office of Regulatory Staff
Inflation Rates
Dominion Energy South Carolina
Docket No. 2020-125-E

Annual Inflation Rates
1961-2019



Data Sources: CPIAUCSL - https://fred.stlouisfed.org/series/CPIAUCSL

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Office of Regulatory Staff
Projected Nominal GDP Growth Rates
Dominion Energy South Carolina
Docket No. 2020-125-E

Panel A
Historic GDP Growth Rates

10-Year Average		4.02%
20-Year Average		4.08%
30-Year Average		4.55%
40-Year Average		5.39%
50-Year Average		6.28%

Calculated using GDP data on Page 1 of Exhibit JRW-10

Panel B
Projected GDP Growth Rates

	Time Frame	Projected Nominal GDP Growth Rate
Congressional Budget Office	2019-29	3.8%
Survey of Financial Forecasters	Ten Year	4.3%
Social Security Administration	2020-2095	4.1%
Energy Information Administration	2019-2050	4.2%

Sources:
Congressional Budget Office,The *2020 Long-Term Budget Outlook* , June 25, 2020.
U.S. Energy Information Administration, *Annual Energy Outlook 2020* , Table: Macroeconomic Indicators,
Social Security Administration, 2020 Annual Report of the Board of Trustees of the Old-Age,
Survivors, and Disability Insurance (OASDI) Program, Table VI.G4, p. 211(July 15, 2020),
The 4.1% growth rate is the growth in projected GDP from $22,341 trillion in 2020 to $450,425 trillion in 2095.
https://www.philadelphiafed.org/research-and-data/real-time-center/survey-of-professional-forecasters/

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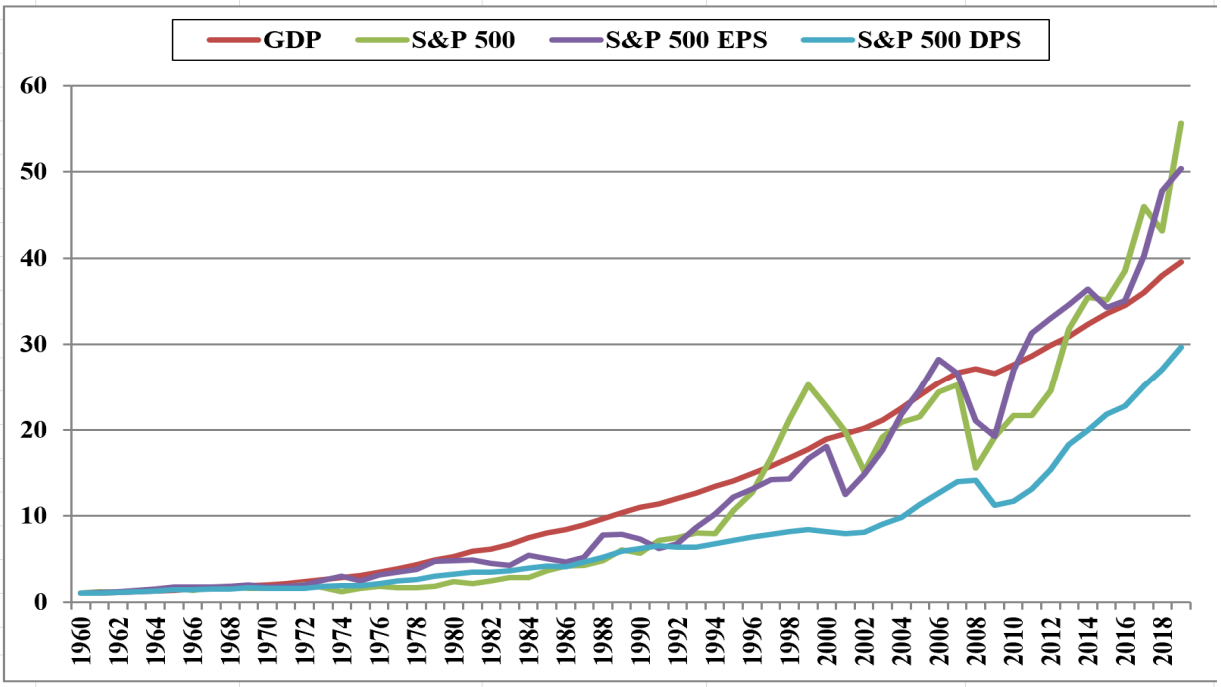
Office of Regulatory Staff
GDP and S&P 500 Growth Rates
Dominion Energy South Carolina
Docket No. 2020-125-E

Long-Term Growth of GDP, S&P 500, S&P 500 EPS, and S&P 500 DPS



	GDP	S&P 500	S&P 500 EPS	S&P 500 DPS
Growth Rates	6.43%	7.05%	6.87%	5.91%

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Appendix A
Educational Background, Research, and Related Business Experience
J. Randall Woolridge

J. Randall Woolridge is a Professor of Finance and the Goldman, Sachs & Co. and Frank P. Smeal Endowed Faculty Fellow in Business Administration in the College of Business Administration of the Pennsylvania State University in University Park, PA. In addition, Professor Woolridge is Director of the Smeal College Trading Room and President and CEO of the Nittany Lion Fund, LLC.

Professor Woolridge received a Bachelor of Arts degree in Economics from the University of North Carolina, a Master of Business Administration degree from the Pennsylvania State University, and a Doctor of Philosophy degree in Business Administration (major area-finance, minor area-statistics) from the University of Iowa. He has taught Finance courses including corporation finance, commercial and investment banking, and investments at the undergraduate, graduate, and executive MBA levels.

Professor Woolridge's research has centered on empirical issues in corporation finance and financial markets. He has published over 35 articles in the best academic and professional journals in the field, including the *Journal of Finance,* the *Journal of Financial Economics,* and the *Harvard Business Review.* His research has been cited extensively in the business press. His work has been featured in the *New York Times*, *Forbes, Fortune, The Economist*, *Barron's*, *Wall Street Journal*, *Business Week*, *Investors' Business Daily*, *USA Today*, and other publications. In addition, Dr. Woolridge has appeared as a guest to discuss the implications of his research on CNN's *Money Line*, CNBC's *Morning Call* and *Business Today*, and Bloomberg's *Morning Call*.

Professor Woolridge's stock valuation book, *The StreetSmart Guide to Valuing a Stock* (McGraw-Hill, 2003), was released in its second edition. He has also co-authored *Spinoffs and Equity Carve-Outs: Achieving Faster Growth and Better Performance* (Financial Executives Research Foundation, 1999) as well as a textbook entitled *Basic Principles of Finance* (Kendall Hunt, 2011).

Professor Woolridge has also consulted with corporations, financial institutions, and government agencies. In addition, he has directed and participated in university- and company-sponsored professional development programs for executives in 25 countries in North and South America, Europe, Asia, and Africa.

Over the past thirty-five years Dr. Woolridge has prepared testimony and/or provided consultation services in regulatory rate cases in the rate of return area in following states: Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, Florida, Hawaii, Indiana, Kansas, Kentucky, Maryland, Massachusetts, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New Mexico, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, South Carolina, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, and Washington, D.C. He has also testified before the Federal Energy Regulatory Commission.

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Academic Experience

Professor of Finance, the Smeal College of Business Administration, the Pennsylvania State University (July 1, 1990 to the present).

President, Nittany Lion Fund LLC, (January 1, 2005 to the present)

Director, the Smeal College Trading Room (January 1, 2001 to the present)

Goldman, Sachs & Co. and Frank P. Smeal Endowed University Fellow in Business Administration (July 1, 1987 to the present).

Associate Professor of Finance, College of Business Administration, the Pennsylvania State University (July 1, 1984 to June 30, 1990).

Assistant Professor of Finance, College of Business Administration, the Pennsylvania State University (September, 1979 to June 30, 1984).

Education

Doctor of Philosophy in Business Administration, the University of Iowa. Major field: Finance.
Master of Business Administration, the Pennsylvania State University.
Bachelor of Arts, the University of North Carolina. Major field: Economics.

Books

James A. Miles and J. Randall Woolridge*, Spinoffs and Equity Carve-Outs: Achieving Faster Growth and Better Performance* (Financial Executives Research Foundation), 1999

Patrick Cusatis, Gary Gray, and J. Randall Woolridge, *The StreetSmart Guide to Valuing a Stock* (2nd Edition, McGraw-Hill), 2003.

J. Randall Woolridge and Gary Gray, *The New Corporate Finance, Capital Markets, and Valuation: An Introductory Text* (Kendall Hunt, 2003).

Research

Dr. Woolridge has published over 35 articles in the best academic and professional journals in the field, including the *Journal of Finance,* the *Journal of Financial Economics,* and the *Harvard Business Review*.

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Appendix B

The Cost of Common Equity Capital

A. Overview

Q. WHY MUST AN OVERALL COST OF CAPITAL OR FAIR RATE OF RETURN BE ESTABLISHED FOR A PUBLIC UTILITY?

A. In a competitive industry, the return on a firm's common equity capital is determined through the competitive market for its goods and services. Due to the capital requirements needed to provide utility services and the economic benefit to society from avoiding duplication of these services, some public utilities are monopolies. Because of the lack of competition and the essential nature of their services, it is not appropriate to permit monopoly utilities to set their own prices. Thus, regulation seeks to establish prices that are fair to consumers and, at the same time, sufficient to meet the operating and capital costs of the utility (*i.e.*, provide an adequate return on capital to attract investors).

Q. PLEASE PROVIDE AN OVERVIEW OF THE COST OF CAPITAL IN THE CONTEXT OF THE THEORY OF THE FIRM.

A. The total cost of operating a business includes the cost of capital. The cost of common equity capital is the expected return on a firm's common stock that the marginal investor would deem sufficient to compensate for risk and the time value of money. In equilibrium, the expected and required rates of return on a company's common stock are equal.

Normative economic models of a company or firm, developed under very restrictive assumptions, provide insight into the relationship between firm performance or profitability, capital costs, and the value of the firm. Under the economist's ideal model

of perfect competition, where entry and exit are costless, products are undifferentiated, and there are increasing marginal costs of production, firms produce up to the point where price equals marginal cost. Over time, a long-run equilibrium is established where price equals average cost, including the firm's capital costs. In equilibrium, total revenues equal total costs, and because capital costs represent investors' required return on the firm's capital, actual returns equal required returns, and the market value must equal the book value of the firm's securities.

In the real world, firms can achieve competitive advantage due to product market imperfections. Most notably, companies can gain competitive advantage through product differentiation (adding real or perceived value to products) and by achieving economies of scale (decreasing marginal costs of production). Competitive advantage allows firms to price products above average cost and thereby earn accounting profits greater than those required to cover capital costs. When these profits are in excess of that required by investors, or when a firm earns a return on equity in excess of its cost of equity, investors respond by valuing the firm's equity in excess of its book value.

James M. McTaggart, founder of the international management consulting firm Marakon Associates, described this essential relationship between the return on equity, the cost of equity, and the market-to-book ratio in the following manner:[1]

> Fundamentally, the value of a company is determined by the cash flow it generates over time for its owners, and the minimum acceptable rate of return required by capital investors. This "cost of equity capital" is used to discount the expected equity cash flow, converting it to a present value. The cash flow is, in turn, produced by the interaction of a company's return on equity and the annual rate of equity growth. High return on equity (ROE) companies in low-growth markets, such as Kellogg, are prodigious generators of cash flow, while low ROE companies in high-growth markets,

[1] James M. McTaggart, "The Ultimate Poison Pill: Closing the Value Gap," *Commentary* (Spring 1986), p.3.

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> such as Texas Instruments, barely generate enough cash flow to finance growth.
>
> A company's ROE over time, relative to its cost of equity, also determines whether it is worth more or less than its book value. If its ROE is consistently greater than the cost of equity capital (the investor's minimum acceptable return), the business is economically profitable and its market value will exceed book value. If, however, the business earns an ROE consistently less than its cost of equity, it is economically unprofitable and its market value will be less than book value.

As such, the relationship between a firm's return on equity, cost of equity, and market-to-book ratio is relatively straightforward. A firm that earns a return on equity above its cost of equity will see its common stock sell at a price above its book value. Conversely, a firm that earns a return on equity below its cost of equity will see its common stock sell at a price below its book value.

Q. PLEASE PROVIDE ADDITIONAL INSIGHTS INTO THE RELATIONSHIP BETWEEN ROE AND MARKET-TO-BOOK RATIOS.

A. This relationship is discussed in a classic Harvard Business School case study entitled "Note on Value Drivers." On page 2 of that case study, the author describes the relationship very succinctly:[2]

> For a given industry, more profitable firms – those able to generate higher returns per dollar of equity– should have higher market-to-book ratios. Conversely, firms which are unable to generate returns in excess of their cost of equity should sell for less than book value.

Profitability	*Value*
If ROE > K	*then Market/Book > 1*
If ROE = K	*then Market/Book =1*
If ROE < K	*then Market/Book < 1*

[2] Benjamin Esty, "Note on Value Drivers," Harvard Business School, Case No. 9-297-082, April 7, 1997.

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To assess the relationship by industry, as suggested above, I performed a regression study between estimated ROE and market-to-book ratios using natural gas distribution and electric utility companies. I used all companies in these two industries that are covered by *Value Line* and have estimated ROE and market-to-book ratio data. The results are presented in Exhibit JRW-4. The average R-square is 0.50.[3] This demonstrates the strong positive relationship between ROEs and market-to-book ratios for public utilities. Given that the market-to-book ratios have been above 1.0 for a number of years, this also demonstrates that utilities have been earnings ROEs above the cost of equity capital for many years.

Q. WHAT ECONOMIC FACTORS HAVE AFFECTED THE COST OF EQUITY CAPITAL FOR PUBLIC UTILITIES?

A. Exhibit JRW-7 provides indicators of public utility equity cost rates over the past decade.

Page 1 shows the yields on long-term A-rated public utility bonds. These yields decreased from 2000 until 2003, and then hovered in the 5.50%-6.50% range from mid-2003 until mid-2008. These yields peaked in November 2008 at 7.75% during the Great Recession. These yields have generally declined since then, dropping below 4.0% on four occasions - in mid-2013, in early 2015, in the summer of 2016, and in late 2017. These yields increased in 2018 but have fallen back with the decline in interest rates in 2019 and 2020 now are below 3.00% range.

[3] R-square measures the percent of variation in one variable (*e.g.*, market-to-book ratios) explained by another variable (*e.g.*, expected ROE). R-squares vary between zero and 1.0, with values closer to 1.0 indicating a higher relationship between two variables.

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Page 2 of Exhibit JRW-5 provides the dividend yields for electric and gas groups over the past decade. The dividend yields for the electric group declined from 5.3% to 3.4% between the years 2001 to 2007, increased to over 5.0% in 2009, and have declined steadily since that time. The average dividend yield was 3.1% in 2019.

Average earned returns on common equity and market-to-book ratios for electric utilities are on page 3 of Exhibit JRW-5. For the electric group, earned returns on common equity have declined gradually over the years. In the past three years, the average earned ROE for the group has been in the 9.0% to 10.0% range. The average market-to-book ratios for this group declined to about 1.1X in 2009 during the financial crisis and have increased since that time. As of 2019, the average market-to-book for the group was 2.10X.

In summary, these data indicate that capital costs for utilities have declined over the past decade. In addition, electric utility and gas distribution companies have been earning ROEs in the 8.0% to 10.0% range and selling at market-to-book ratios in the 1.75 to 2.0 range. This means that, for at least the last decade, returns on common equity have been greater than the cost of capital, or more than necessary to meet investors' required returns. This also means that customers have been paying more than necessary to support an appropriate profit level for regulated utilities.

Q. WHAT FACTORS DETERMINE INVESTORS' EXPECTED OR REQUIRED RATE OF RETURN ON EQUITY?

A. The expected or required rate of return on common stock is a function of market-wide as well as company-specific factors. The most important market factor is the time value of money as indicated by the level of interest rates in the economy. Common stock investor requirements generally increase and decrease with like changes in interest

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rates. The perceived risk of a firm is the predominant factor that influences investor return requirements on a company-specific basis. A firm's investment risk is often separated into business risk and financial risk. Business risk encompasses all factors that affect a firm's operating revenues and expenses. Financial risk results from incurring fixed obligations in the form of debt in financing its assets.

Q. HOW DOES THE INVESTMENT RISK OF PUBLIC UTILITIES COMPARE WITH THAT OF OTHER INDUSTRIES?

A. Due to the essential nature of their service as well as their regulated status, public utilities are exposed to a lesser degree of business risk than other, non-regulated businesses. The relatively low level of business risk allows public utilities to meet much of their capital requirements through borrowing in the financial markets, thereby incurring greater than average financial risk. Nonetheless, the overall investment risk of public utilities is below most other industries.

Page 4 of Exhibit JRW-5 provides an assessment of investment risk for 97 industries as measured by beta, which according to modern capital market theory, is the only relevant measure of investment risk. These betas come from the *Value Line Investment Survey.* The study shows that the investment risk of utilities is very low. The average betas for electric, gas, and water utility companies are 0.86, 0.85, and 0.78, respectively.[4] As such, the cost of equity for utilities is the lowest of all industries in the U.S. based on modern capital market theory.

[4] The beta for the *Value Line* Electric Utilities is the simple average of *Value Line*'s Electric East (0.87), Central (0.88), and West (0.85) group betas.

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Q. WHAT IS THE COST OF COMMON EQUITY CAPITAL?

A. The costs of debt and preferred stock are normally based on historical or book values and can be determined with a great degree of accuracy. The cost of common equity capital, however, cannot be determined precisely and must instead be estimated from market data and informed judgment. This return requirement of the stockholder should be commensurate with the return requirement on investments in other enterprises having comparable risks.

According to valuation principles, the present value of an asset equals the discounted value of its expected future cash flows. Investors discount these expected cash flows at their required rate of return that, as noted above, reflects the time value of money and the perceived riskiness of the expected future cash flows. As such, the cost of common equity is the rate at which investors discount expected cash flows associated with common stock ownership.

Q. HOW CAN THE EXPECTED OR REQUIRED RATE OF RETURN ON COMMON EQUITY CAPITAL BE DETERMINED?

A. Models have been developed to ascertain the cost of common equity capital for a firm. Each model, however, has been developed using restrictive economic assumptions. Consequently, judgment is required in selecting appropriate financial valuation models to estimate a firm's cost of common equity capital, in determining the data inputs for these models, and in interpreting the models' results. All of these decisions must take into consideration the firm involved as well as current conditions in the economy and the financial markets.

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Q. HOW DO YOU PLAN TO ESTIMATE THE COST OF EQUITY CAPITAL FOR THE COMPANY?

A. I rely primarily on the discounted cash flow ("DCF") model to estimate the cost of equity capital. Given the investment valuation process and the relative stability of the utility business, the DCF model provides the best measure of equity cost rates for public utilities. I have also performed a capital asset pricing model ("CAPM") study; however, I give these results less weight because I believe that risk premium studies, of which the CAPM is one form, provide a less reliable indication of equity cost rates for public utilities.

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Appendix C

Projected EPS and GDP Growth and the Market Risk Premium

Q. IS THERE OTHER EVIDENCE THAT INDICATES THAT WITNESS VANDER WEIDE'S MARKET RISK PREMIUM OF 9.89% COMPUTED USING S&P 500 EPS GROWTH RATE IS EXCESSIVE?

A. Beyond my previous discussion of the upwardly biased nature of analysts' projected earnings per share (EPS) growth rates, the fact is that a long-term EPS growth rate of 8.40% is inconsistent with both historic and projected economic and earnings growth in the U.S for several reasons: (1) long-term EPS and economic growth is about one-half of witness Vander Weide's projected EPS growth rate of 8.40%; (2) as discussed below, long-term EPS and GDP growth are directly linked; and (3) more recent trends in GDP growth, as well as projections of GDP growth, suggest slower economic and earnings growth in the near future, during the period when the rates from this case will be effective.

Long-Term Historic EPS and GDP Growth have been in the 6%-7% Range – I performed a study of the growth in nominal GDP, S&P 500 stock price appreciation, and S&P 500 EPS and dividends per share (DPS) growth since 1960. The results are provided on page 1 of Exhibit JRW-10, and a summary is shown in Table C-1, below.

Table C-1
GDP, S&P 500 Stock Price, EPS, and DPS Growth %
1960-Present

Nominal GDP	**6.43**
S&P 500 Stock Price	**7.05**
S&P 500 EPS	**6.87**
S&P 500 DPS	**5.91**
Average	**6.43**

The results show that the historical long-run growth rates for GDP, S&P EPS, and S&P DPS are in the 6% to 7% range. By comparison, witness Vander Weide's long-run growth rate projections of 8.40% is at best overstated. His estimates suggest that companies in the U.S. would be expected to: (1) increase their growth rate of EPS by more than 25% in the future, and (2) maintain that growth indefinitely in an economy that is currently expected to grow at about one-half of witness Vander Weide's projected growth rates.

There is a Direct Link Between Long-Term EPS and GDP Growth – The results in Exhibit JRW-10 and Table C-1 show that historically there has been a close link between long-term EPS and GDP growth rates. Brad Cornell of the California Institute of Technology published a study on GDP growth, earnings growth, and equity returns. He finds that long-term EPS growth in the U.S. is directly related to GDP growth, with GDP growth providing an upward limit on EPS growth. In addition, he finds that long-term stock returns are determined by long-term earnings growth. He concludes with the following observations:[1]

> The long-run performance of equity investments is fundamentally linked to growth in earnings. Earnings growth, in turn, depends on growth in real GDP. This article demonstrates that both theoretical research and empirical research in development economics suggest relatively strict limits on future growth. In particular, real GDP growth in excess of 3 percent in the long run is highly unlikely in the developed world. In light of ongoing dilution in earnings per share, this finding implies that investors should anticipate real returns on U.S. common stocks to average no more than about 4–5 percent in real terms.

[1] Bradford Cornell, "Economic Growth and Equity Investing," *Financial Analysts Journal* (January- February 2010), p. 63.

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The Trend and Projections Indicate Slower GDP Growth in the Future – The components of nominal GDP growth are real GDP growth and inflation. Page 3 of Exhibit JRW-10 shows annual real GDP growth rate over the 1961 to 2019 time period. Real GDP growth has gradually declined from the 5.0% to 6.0% range in the 1960s to the 2.0% to 3.0% range during the most recent five-year period. The second component of nominal GDP growth is inflation. Page 4 of Exhibit JRW-10 shows inflation as measured by the annual growth rate in the Consumer Price Index ("CPI") over the 1961 to 2019 time period. The large increase in prices from the late 1960s to the early 1980s is readily evident. Equally evident is the rapid decline in inflation during the 1980s as inflation declined from above 10% to about 4%. Since that time, inflation has gradually declined and has been in the 2.0% range or below over the past five years.

The graphs on pages 2, 3, and 4 of Exhibit JRW-10 provide clear evidence of the decline, in recent decades, in nominal GDP as well as its components, real GDP and inflation. To gauge the magnitude of the decline in nominal GDP growth, Table C-2, below, provides the compounded GDP growth rates for 10-, 20-, 30-, 40- and 50- years. Whereas the 50-year compounded GDP growth rate is 6.28%, there has been a monotonic and significant decline in nominal GDP growth over subsequent 10-year intervals. These figures strongly suggest that nominal GDP growth in recent decades has slowed and that a figure in the range of 4.0% to 5.0% is more appropriate today for the U.S. economy.

Table C-2
Historical Nominal GDP Growth Rates

10-Year Average	**4.02%**
20-Year Average	**4.08%**
30-Year Average	**4.55%**
40-Year Average	**5.39%**

50-Year Average	6.28%

Long-Term GDP Projections also Indicate Slower GDP Growth in the Future – A lower range is also consistent with long-term GDP forecasts. There are several forecasts of annual GDP growth that are available from economists and government agencies. These are listed in Panel B of on page 5 of Exhibit JRW-10. The mean 10-year nominal GDP growth forecast (as of March 2020) by economists in the recent *Survey of Financial Forecasters* is 4.30%.[2] The Energy Information Administration ("EIA"), in its projections used in preparing *Annual Energy Outlook,* forecasts long-term GDP growth of 4.2% for the period 2019-2050.[3] The Congressional Budget Office ("CBO"), in its forecasts for the period 2019 to 2029, projects a nominal GDP growth rate of 3.8%.[4] Finally, the Social Security Administration ("SSA"), in its Annual OASDI Report, provides a projection of nominal GDP from 2020-2095.[5] SSA's projected growth GDP growth rate over this period is 4.1%. Overall, these forecasts suggest long-term GDP growth rate in the 4.0% - 4.3% range. The trends and projections indicating slower GDP growth make witness Vander Weide's market risk premium of 9.89%, which is computed by using a growth rate of 8.40% from analysts' EPS growth projections, look even more unrealistic. Simply stated, witness Vander Weide's projected EPS growth rate of 8.40% is almost two times projected GDP growth.

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[2] https://www.philadelphiafed.org/research-and-data/real-time-center/survey-of-professional-forecasters/

[3] U.S. Energy Information Administration, *Annual Energy Outlook 2020*, Table: Macroeconomic Indicators..

[4] Congressional Budget Office, The *2020 Long-Term Budget Outlook*, June 25, 2020.

[5] Social Security Administration, *2020 Annual Report of the Board of Trustees of the Old-Age, Survivors, and Disability Insurance (OASDI) Program*, Table VI.G4, (July 1, 2020), The 4.1% growth rate is the growth in projected GDP from $22,341 trillion in 2020 to $450,425 trillion in 2095.

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Q. WHAT ARE THE FUNDAMENTAL FACTORS THAT HAVE LED TO THE DECLINE IN PROSPECTIVE GDP GROWTH?

A. As addressed in a study by the consulting firm McKinsey & Co., two factors drive real GDP growth over time: (a) the number of workers in the economy (employment); and (2) the productivity of those workers (usually defined as output per hour).[6] According to McKinsey, real GDP growth over the past 50 years was driven by population and productivity growth which grew at compound annual rates of 1.7% and 1.8%, respectively.

However, global economic growth is projected to slow significantly in the years to come. The primary factor leading to the decline is slow growth in employment (working-age population), which results from slower population growth and longer life expectancy. McKinsey estimates that employment growth will slow to 0.3% over the next 50 years. They conclude that even if productivity remains at the rapid rate of the past 50 years of 1.8%, real GDP growth will fall by 40 percent to 2.1%.

Q. PLEASE PROVIDE MORE INSIGHTS INTO THE RELATIONSHIP BETWEEN S&P 500 EPS AND GDP GROWTH.

A. Figure C-1 shows the average annual growth rates for GDP and the S&P 500 EPS since 1960. The one very apparent difference between the two is that the S&P 500 EPS growth rates are much more volatile than the GDP growth rates, when compared using the relatively short, and somewhat arbitrary, annual conventions used in these data.[7] Volatility

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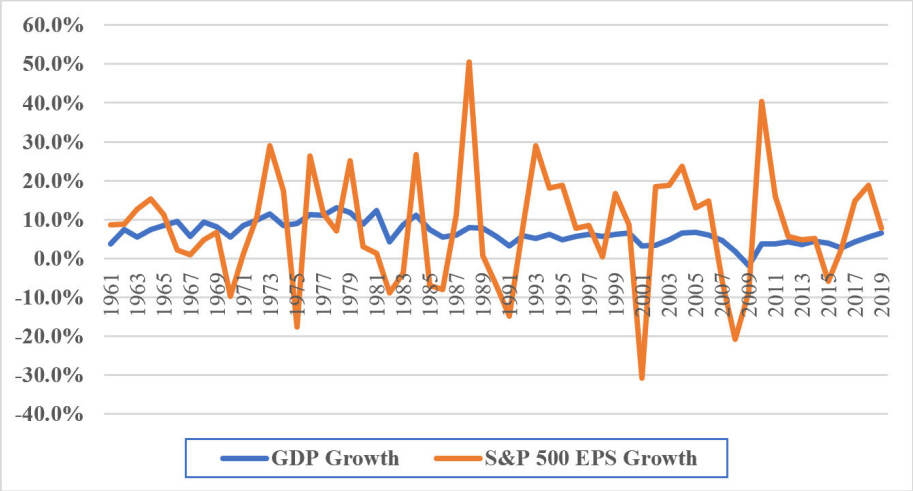
[6] McKinsey & Co., "Can Long-Term Growth be Saved?", McKinsey Global Institute, (Jan. 2015).

[7] Timing conventions such as years and quarters are needed for measurement and benchmarking but are somewhat arbitrary. In reality, economic growth and profit accrual occur on continuous bases. A 2014 study evaluated the timing relationship between corporate profits and nominal GDP growth. The authors found that aggregate accounting earnings growth is a leading indicator of the GDP growth with a quarter-ahead forecast horizon. *See* Yaniv Konchitchki and Panos N. Patatoukas, "Accounting Earnings and Gross Domestic Product," *Journal of Accounting and Economics* 57 (2014), pp. 76–88.

aside, however, it is clear that over the medium to long run, S&P 500 EPS growth does not outpace GDP growth.

Figure C-1
Average Annual Growth Rates
GDP and S&P 500 EPS
1960-2019



Data Sources: GDPA - http://research.stlouisfed.org/fred2/series/GDPA/downloaddata.
S&P EPS - http://pages.stern.nyu.edu/~adamodar/

A fuller understanding of the relationship between GDP and S&P 500 EPS growth requires consideration of several other factors.

Corporate Profits are Constrained by GDP – Milton Friedman, the noted economist, warned investors and others not to expect corporate profit growth to sustainably exceed GDP growth, stating, "Beware of predictions that earnings can grow faster than the economy for long periods. When earnings are exceptionally high, they don't just keep booming."[8] Friedman also noted in the same *Fortune* interview that profits must move back down to their traditional share of GDP. In Table C-3 below, I show that currently the

[8] Shaun Tully, "Corporate Profits Are Soaring. Here's Why It Can't Last," Fortune, (Dec. 7, 2017), http://fortune.com/2017/12/07/corporate-earnings-profit-boom-end/.

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aggregate net income levels for the S&P 500 companies, using 2019 figures, represent 6.53% of nominal GDP.

Table C-3
S&P 500 Aggregate Net Income as a Percent of GDP

	$ Billion
Aggregate Net Income for S&P 500	**$1,399.46**
2019 Nominal U.S. GDP	**$21,427.10**
Net Income/GDP (%)	**6.53%**

Data Sources: 2019 Net Income for S&P 500 companies – *Value Line* (March 3, 2020).
2019 Nominal GDP – Moody's - https://www.economy.com/united-states/nominal-gross-domestic-product.

Short-Term Factors Impact S&P 500 EPS – The growth rates in the S&P 500 EPS and GDP can diverge on a year-to-year basis due to short-term factors that impact S&P 500 EPS in a much greater way than GDP. As shown above in Figure C-1, S&P EPS growth rates are much more volatile than GDP growth rates. The EPS growth for the S&P 500 companies has been influenced by low labor costs and interest rates, commodity prices, the recovery of different sectors such as the energy and financial sectors, the cut in corporate tax rates, etc. These short-term factors can make it appear that there is a disconnect between the economy and corporate profits.

The Differences Between the S&P 500 EPS and GDP – In the last two years, as the EPS for the S&P 500 has grown at a faster rate than U.S. nominal GDP, some have pointed to the differences between the S&P 500 and GDP.[9] These differences include: (a) corporate profits are about 2/3 manufacturing driven, while GDP is 2/3 services driven; (b) consumer discretionary spending accounts for a smaller share of S&P 500 profits (15%) than of GDP

[9] *See* the following studies: Burt White and Jeff Buchbinder, "The S&P and GDP are not the Same Thing," LPL Financial, (Nov. 4, 2014), https://www.businessinsider.com/sp-is-not-gdp-2014-11; Matt Comer, "How Do We Have 18.4% Earnings Growth In A 2.58% GDP Economy?," Seeking Alpha, (Apr. 2018), https://seekingalpha.com/article/4164052-18_4-percent-earnings-growth-2_58-percent-gdp-economy; Shaun Tully, "How on Earth Can Profits Grow at 10% in a 2% Economy?," Fortune, (July 27, 2017), http://fortune.com/2017/07/27/profits-economic-growth/.

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(23%); (c) corporate profits are more international-trade driven, while exports minus imports tend to drag on GDP; and (d) S&P 500 EPS is impacted not just by corporate profits but also by share buybacks on the positive side (fewer shares boost EPS) and by share dilution on the negative side (new shares dilute EPS). While these differences may seem significant, it must be remembered that the Income Approach to measure GDP includes corporate profits (in addition to employee compensation and taxes on production and imports) and therefore effectively accounts for the first three factors.[10]

The bottom line is that despite the intertemporal short-term differences between S&P 500 EPS and nominal GDP growth, the long-term link between corporate profits and GDP is inevitable.

Q. PLEASE PROVIDE ADDITIONAL EVIDENCE ON HOW UNREALISTIC THE S&P 500 EPS GROWTH RATE IS THAT WITNESS VANDER WEIDE USES TO COMPUTE HISMARKET RISK PREMIUM.

A. Beyond my previous discussion, I have performed the following analysis of S&P 500 EPS and GDP growth in Table 8 below. Specifically, I started with the 2019 aggregate net income for the S&P 500 companies and 2019 nominal GDP for the U.S. As shown in Table 8, the aggregate profit for the S&P 500 companies represented 6.53% of nominal GDP in 2019. In Table C-4, I then projected the aggregate net income level for the S&P 500 companies and GDP as of the year 2050. For the growth rate for the S&P 500 companies, I used witness Vander Weide's projected S&P 500 EPS growth rate of 8.40%.

[10] The Income Approach to measuring GDP includes wages, salaries, and supplementary labor income, corporate profits, interest and miscellaneous investment income, farmers' incomes, and income from non-farm unincorporated businesses

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As a growth rate for nominal GDP, I used the average of the long-term projected GDP growth rates from SFF, CBO, SSA, and EIA (4.3%, 3.8%, 4.1%, and 4.0%), which is 4.09%. The projected 2050 level for the aggregate net income level for the S&P 500 companies is $17.1 trillion. However, over the same period GDP grows to $74.2 trillion. As such, if the aggregate net income for the S&P 500 grows in accordance with the growth rate used by witness Vander Weide, and if nominal GDP grows at rates projected by major government agencies, the net income of the S&P 500 companies will represent growth from 6.53% of GDP in 2019 to 22.97% of GDP in 2050. Obviously, it is implausible for the net income of the S&P 500 to become such a high percentage of GDP.

Table C-4
Projected S&P 500 Earnings and Nominal GDP
2019-2050
S&P 500 Aggregate Net Income as a Percent of GDP

	2019 $ Billion	Growth Rate	No. of Years	2050 Value
Net Income for S&P 500 Companies	**$1,399.46**	**8.40%**	**31**	**$17,055.65**
Nominal U.S. GDP	**$21,427.10**	**4.09%**	**31**	**$74,240.80**
Net Income/GDP (%)	**6.53%**			**22.97%**

Data Sources: 2019 Aggregate Net Income for S&P 500 companies – *Value Line* (March 3, 2020).
2019 Nominal GDP – Moody's - https://www.economy.com/united-states/nominal-gross-domestic-product.
S&P 500 EPS Growth Rate - Dr. Vander Weide's projected S&P 500 growth rate of 8.40%;
Nominal GDP Growth Rate – The average of the long-term projected GDP growth rates from SFF, CBO, SSA, and EIA (4.3%, 3.8%, 4.0%, and 4.1%).

Q. PLEASE PROVIDE A SUMMARY ANALYSIS ON GDP AND S&P 500 EPS GROWTH RATES.

A. As noted above, the long-term link between corporate profits and GDP is inevitable. The short-term differences in growth between the two has been highlighted by some notable market observers, including Warren Buffet, who indicated that corporate profits as a share of GDP tend to go far higher after periods where they are depressed, and then drop

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sharply after they have been hovering at historically high levels. In a famous 1999 *Fortune* article, Mr. Buffet made the following observation:[11]

> You know, someone once told me that New York has more lawyers than people. I think that's the same fellow who thinks profits will become larger than GDP. When you begin to expect the growth of a component factor to forever outpace that of the aggregate, you get into certain mathematical problems. In my opinion, you have to be wildly optimistic to believe that corporate profits as a percent of GDP can, for any sustained period, hold much above 6%. One thing keeping the percentage down will be competition, which is alive and well. In addition, there's a public-policy point: If corporate investors, in aggregate, are going to eat an ever-growing portion of the American economic pie, some other group will have to settle for a smaller portion. That would justifiably raise political problems – and in my view a major reslicing of the pie just isn't going to happen.

In sum, witness Vander Weide's long-term S&P 500 EPS growth rate of 8.40% is grossly overstated and has no basis in economic reality. In the end, the big question remains as to whether corporate profits can grow faster than GDP. Jeremy Siegel, the renowned finance professor at the Wharton School of the University of Pennsylvania, believes that going forward, earnings per share can grow about half a point faster than nominal GDP, or about 5.0%, due to the big gains in the technology sector. But he also believes that sustained EPS growth matching analysts' near-term projections is absurd: "The idea of 8% or 10% or 12% growth is ridiculous. It will not happen."[12]

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[11] Carol Loomis, "Mr. Buffet on the Stock Market," *Fortune*, (Nov. 22, 1999), https://money.cnn.com/magazines/fortune/fortune_archive/1999/11/22/269071/.

[12] Shaun Tully, "Corporate Profits Are Soaring. Here's Why It Can't Last," *Fortune*, (Dec. 7, 2017), http://fortune.com/2017/12/07/corporate-earnings-profit-boom-end/.

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