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NORTH CAROLINA
PUBLIC STAFF
UTILITIES COMMISSION

August 23, 2019

Ms. Janice H. Fulmore, Deputy Clerk
North Carolina Utilities Commission
4325 Mail Service Center
Raleigh, North Carolina 27699-4300

Re: Docket No. E-22, Sub 562 – Application of Dominion Energy North Carolina for Adjustment of Rates and Charges Applicable to Electric Service in North Carolina

Dear Ms. Fulmore:

In connection with the above-referenced docket, I transmit for filing on behalf of the Public Staff the Testimony and Exhibits of Dr. J. Randall Woolridge.

By copy of this letter, we are providing copies to all other parties of record.

Sincerely,

/s/ Lucy E. Edmondson
Staff Attorney
lucy.edmondson@psncuc.nc.gov

/s/ Heather D. Fennell
Staff Attorney
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BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-22, SUB 562

In the Matter of Application of Dominion Energy North Carolina for Adjustment of Rates and Charges Applicable to Electric Utility Service in North Carolina	TESTIMONY OF DR. J. RANDALL WOOLRIDGE ON BEHALF OF THE PUBLIC STAFF – NORTH CAROLINA UTILITIES COMMISSION

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Dominion Energy North Carolina
Docket No. E-22, Sub 562

Direct Testimony of
Dr. J. Randall Woolridge

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Direct Testimony of
Dr. J. Randall Woolridge

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JRW-1	Recommended Cost of Capital
JRW-2	Summary Financial Statistics for Proxy Groups
JRW-3	Capital Structure Ratios and Debt Cost Rates
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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 the Pennsylvania State University. I am also the Director of the Smeal College Trading Room and President of the Nittany Lion Fund, LLC. A summary of my educational background, research, and related business experience is provided in Appendix A.

I. SUBJECT OF TESTIMONY AND SUMMARY OF RECOMMENDATIONS

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

A. I have been asked by the Public Staff - North Carolina Utilities Commission (“Public Staff”) to provide an overall fair rate of return or cost of capital recommendation for Dominion Energy North Carolina ("DENC" or "Company").[1]

Q. HOW IS YOUR TESTIMONY ORGANIZED?

[1] In my testimony, I use the terms ‘rate of return’ and ‘cost of capital’ interchangeably. This is because the required rate of return of investors on a company’s capital is the cost of capital.

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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 discuss the proxy groups that I have used to estimate an equity cost rate for DENC. Third, I review the Company's recommended capital structure and debt cost rates. Fourth, I estimate the equity cost rate for the Company. Finally, I critique DENC's rate of return analysis and testimony. Appendix A is a summary of my education and business experience.

A. Overview

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

A. A return on equity ("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 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 public utility. The United States Supreme Court established the guiding principles for determining an appropriate level of profitability for regulated public

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utilities in two cases: (1) *Hope*[2] and (2) *Bluefield*.[3] 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 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.

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 on 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.

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

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

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A. As updated in its supplemental testimony filed August 6, 2019, the Company has proposed a capital structure of 46.351% long-term debt and 53.649% common equity. The Company has recommended a long-term debt cost rate of 4.442%. Mr. Hevert has recommended a common equity cost rate of 10.75%. The Company's overall proposed rate of return is 7.83%.

Q. HOW HAVE YOU CONDUCTED YOUR RATE OF RETURN STUDIES FOR THE COMPANY?

A. I have reviewed the Company's proposed capital structure and overall rate of return or cost of capital. The Company's proposed capital structure has a higher common equity ratio than its parent, Dominion Energy, as well as the average of my proxy group of electric utilities ("Electric Proxy Group") and Mr. Hevert's proxy group ("Hevert Proxy Group"). Therefore, as my primary recommendation, I am proposing a capital structure of 50.0% common equity and 50.0% debt, which is more consistent with the capital structures of electric utility companies. 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 the Electric Proxy Group. I have also used the Hevert Proxy Group. My studies indicate that a cost of equity or ROE for the Company is in the range of 7.20% to 8.95%.

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Q. WHAT IS YOUR PRIMARY RATE OF RETURN RECOMMENDATION FOR THE COMPANY?

A. As noted, my equity cost rate studies indicate an ROE between 7.20% and 8.95%. I believe that this range accurately reflects current capital market data. However, I recognize that this range is below the authorized ROEs for electric utility companies nationally. Therefore, as a primary ROE for DENC, I am recommending 9.0%. This recommendation gives weight to the higher authorized ROEs for electric utility companies. Given my recommended capitalization ratios and senior capital cost rates, my rate of return or cost of capital recommendation for the Company is 6.73% and is summarized in Table 1 and Panel A of Exhibit JRW-1.

Table 1
Public Staff's Primary Rate of Return Recommendation

Capital Source	Capitalization Ratios*	Cost Rate	Weighted Cost Rate
Long-Term Debt	**50.00%**	**4.44%**	**2.23%**
Common Equity	**50.00%**	**9.00%**	**4.50%**
Total Capitalization	**100.00%**		**6.73%**

Q. ARE YOU ALSO PROVIDING AN ALTERNATIVE RATE OF RETURN RECOMMENDATION FOR THE COMPANY?

A. Yes. My alternative rate of return recommendation uses DENC's updated recommended capital structure consisting of 46.351% long-term debt, and 53.649% common equity. With respect to the ROE, as indicated above, I believe that my equity cost rate range, 7.20%

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to 8.95%, accurately reflects current capital market data. Capital costs in the U.S. remain low, with low inflation and interest rates and very modest economic growth. To reflect these low capital costs, my alternative ROE recommendation is 8.75%, which is at the high end of my equity cost rate range. Given my recommended capitalization ratios and senior capital cost rates, my alternative rate of return or cost of capital recommendation for the Company is 6.75% and is summarized in Table 2 and Panel B of Exhibit JRW-1.

Table 2
Public Staff's Alternative Rate of Return Recommendation

Capital Source	Capitalization Ratios*	Cost Rate	Weighted Cost Rate
Long-Term Debt	**46.35%**	**4.44%**	**2.09%**
Common Equity	**53.65%**	**8.75%**	**4.69%**
Total Capitalization	**100.00%**		**6.75%**

C. Primary Rate of Return on Equity Issues

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 Market Conditions – Mr. Hevert's analyses, ROE results, and recommendations are based on assumptions of higher interest rates and capital costs. However, I show that despite the Federal Reserve's moves to increase the federal funds rate over the 2015-

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18 time period, interest rates and capital costs remained at low levels. In 2019 interest rates have fallen dramatically with slow economic growth and low inflation, and the 30-year yield has traded at all-time low levels.

Capital Structure – DENC's witness Mr. Richard M. Davis has proposed a capital structure consisting of 46.351% long-term debt and 53.649% common equity. The Company's proposed capital structure has a higher common equity ratio than the average of the Electric and Hevert Proxy Groups. In my primary rate of return recommendation, I am recommending adjusting DENC's proposed capital structure to use a common equity ratio of 50 percent, as that is more in line with the capital structures of the utilities in the two proxy groups as well as that of DENC's parent, Dominion Energy. In my alternative rate of return recommendation, I am using DENC's proposed updated capital structure, but I then employ a lower ROE to reflect the high common equity ratio and lower financial risk of the Company's proposed capitalization.

DENC's Investment Risk is Below the Averages of the Two Proxy Groups – Mr. Hevert cites the Company's capital expenditures to imply that DENC's investment risk is higher than the risk of his proxy group. In addition, he selects an ROE that is near the upper end of his 10.0% to 11.0% range. However, his assessment of DENC's risk is erroneous. The assessment of capital expenditures is part of the

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credit rating process, and DENC's S&P and Moody's credit ratings suggest that the Company's investment risk is below the average of the Hevert Proxy Group.

Disconnect Between Mr. Hevert's Equity Cost Rate Studies and his 10.75% ROE Recommendation – There is a disconnect between Mr. Hevert's equity cost rate results and his 10.75% ROE recommendation. Simply stated, the vast majority of his equity cost rate results point to a lower ROE. In fact, the only results that point to an ROE as high as 10.75% are his CAPM/empirical CAPM ("ECAPM") results using *Value Line* betas and market risk premium ("MRP"), which as I explain later in my testimony are flawed. As a result, Mr. Hevert's ROE recommendation is based on: (1) the results of only one model (the CAPM); and, even more narrowly, (2) only one source of financial information for betas and MRP (*Value Line*). Otherwise, Mr. Hevert provides no other equity cost rate studies that support his 10.75% ROE recommendation.

DCF Equity Cost Rate - The DCF Equity Cost Rate is estimated by summing the stock's dividend yield and investors' expected long-run growth rate in dividends paid per share. There are several errors in Mr. Hevert's DCF analyses: (1) he has given very little weight to his constant-growth DCF results; and (2) he has relied exclusively on the overly optimistic and upwardly biased earnings per share ("EPS") growth-rate forecasts of Wall Street analysts and *Value Line.* On the

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other hand, when developing the DCF growth rate that I have used in my analysis, I have reviewed thirteen growth-rate measures, including historical and projected growth-rate measures, and have evaluated growth in dividends, book value, and earnings per share.

CAPM Approach - The CAPM approach requires an estimate of the risk-free interest rate, the beta, and the market or equity risk premium. There are three primary issues with Mr. Hevert's CAPM analyses. First, Mr. Hevert employs an excessively high, projected long-term risk-free interest rate. Second, his market risk premiums of 10.65% and 13.77% are exaggerated and do not reflect current market fundamentals. Mr. Hevert has employed analysts' three-to-five-year growth-rate projections for EPS to compute an expected market return and market risk premiums. These EPS growth-rate projections and the resulting expected market returns and market risk premiums include highly unrealistic assumptions regarding future economic and earnings growth and stock returns. Third, Mr. Hevert has employed an ad hoc version of the CAPM, the ECAPM, which makes inappropriate adjustments to the risk-free rate and the market risk premium and is an untested model in academic and profession research.

As I highlight in my testimony, there are three procedures for estimating a market or equity risk premium – historic returns, surveys, and expected return models. I have used an MRP of 5.50%,

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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 MRP. As I note, my MRP reflects the MRPs: (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.

Alternative Risk Premium Model - Mr. Hevert estimates an equity cost rate using an alternative risk premium model which he calls the Bond Yield Risk Premium ("BYRP") approach. The risk premium in his BYRP method is based on the historical relationship between the yields on long-term Treasury yields and authorized ROEs for electric utility companies. There are several issues with this approach: (1) This approach is a gauge of commission behavior and not investor behavior. Capital costs are determined in the market place through the financial decisions of investors and are reflected in such fundamental factors as dividend yields, expected growth rates, interest rates, and investors' assessment of the risk and expected return of different investments; (2) Mr. Hevert's methodology produces an inflated measure of the risk premium because his approach uses historical authorized ROEs and Treasury yields, and the resulting risk premium is applied to projected Treasury yields; and

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(3) the risk premium is inflated as a measure of investor's required risk premium, because electric utility companies have been selling at market-to-book ratios in excess of 1.0. This indicates that the authorized rates of return have been greater than the return that investors require.

Expected Earnings Approach - Mr. Hevert also uses the Expected Earnings approach to estimate an equity cost rate for the Company. Mr. Hevert computes the expected ROE as forecasted by *Value Line* for his proxy group of electric utilities. As I discuss in my critique of Mr. Hevert's presentation, the so-called "Expected Earnings" approach does not measure the market cost of equity capital, is independent of most cost of capital indicators, and has several other empirical issues. Therefore, the Commission should ignore Mr. Hevert's "Expected Earnings" approach in determining the appropriate ROE for DENC.

Other Issues - Mr. Hevert also considers two other factors in arriving at his 10.75% ROE recommendation. First, Mr. Hevert cites the Company's high level of capital expenditures in the coming years. However, as I note, capital expenditures are considered as a risk factor in the credit-rating process used by major rating agencies. In addition, as I noted above, DENC's investment risk as measured by S&P and Moody's is below the average of the two proxy groups. Second, Mr. Hevert also considers flotation costs in making his ROE

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recommendation of 10.75%. However, he has not identified any flotation costs for DENC.[4]

North Carolina Economic Conditions – Mr. Hevert evaluates a number of factors such as employment and income levels and comes to the conclusion that DENC's proposed ROE of 10.75% is fair and reasonable to DENC, its shareholders, and its customers in light of the effect of those changing economic conditions. While I agree economic conditions have improved in North Carolina, the improvements do not necessarily justify such a high rate of return and ROE. Specifically, I highlight the following: (1) DENC's ROE request of 10.75% is over 100 basis points above the average authorized ROEs for electric utilities over the 2018-19 time period; (2) whereas North Carolina's unemployment rate has fallen by one-third since its peak in the 2009-2010 period and is slightly below the national average of 3.90%, the unemployment rate in DENC's

[4] In NC, flotation costs cannot lawfully be recovered when the Company does not expect to issue stock in the near future. In State ex rel. Utilities Com. v. Public Staff, 331 N.C. 215; 415 S.E.2d 354 (1992), the Court noted that:

> Prompted by the statement of Duke's chairman, Mr. Lee, that "the company's 'present expectation is that we will be back into the capital markets for new funds in about three to four years,'" the only evidence in the record on the probability of Duke's issuing new stock, we noted the record included no evidence that Duke would issue any new stock sooner than three or four years from the time of the hearing.

Id. at 219. The Court then ruled that,

> In light of the whole record on this issue, particularly the absence of any evidence that Duke intended to issue stock in the immediate future, there is simply no substantial evidentiary support for the Commission's addition of a 0.1% increment to Duke's rate of return on common equity to cover future stock issuance costs.

Id. at 221-222.

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service territory is 4.95%, over 100 basis points higher than the national and North Carolina averages; and (3) whereas North Carolina's residential electric rates are below the national average, North Carolina's median household income is more than 10% below the U.S. norm.

II. CAPITAL MARKET CONDITIONS AND AUTHORIZED ROES

Q. PLEASE REVIEW THE FEDERAL RESERVE'S DECISIONS TO RAISE THE FEDERAL FUNDS RATE IN RECENT YEARS.

A. On December 16, 2015, the Federal Reserve increased its target rate for federal funds from 0.25 to 0.50 percent.[5] This increase came after the rate was kept in the 0.00 to 0.25 percent range for over five years in order to spur economic growth in the wake of the financial crisis associated with the Great Recession. As the economy has improved, with lower unemployment, steady but slow GDP growth, the Federal Reserve has increased the target federal funds rate on eight additional occasions: December 2016; March, June, and December of 2017; and March, June, September, and December of 2018.

[5] The federal funds rate is set by the Federal Reserve and is the borrowing rate applicable to the most creditworthy financial institutions when they borrow and lend funds overnight to each other.

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Q. HOW HAVE LONG-TERM RATES RESPONDED TO THE ACTIONS OF THE FEDERAL RESERVE?

A. Figure 1, below, shows the yield on 30-year Treasury bonds over the period of 2015-2019. I have highlighted the dates when the Federal Reserve increased the federal funds rate. The 30-year Treasury yield hit its lowest point in the 2015 – 2016 timeframe in the summer of 2016 and subsequently increased with improvements in the economy. Financial markets moved significantly in the wake of the results in the U.S. presidential election on November 8, 2016. The stock market gained more than 10% and the 30-year Treasury yield increased about 50 basis points to 3.2% by year-end 2016. However, over the past three years, even as the Federal Reserve has increased the federal funds rate, the yield on thirty-year bonds remained in the 2.8% to 3.4% range through 2018. These yields peaked at 3.48% in November of 2018, shortly before the December 2018 rate increase by the Federal Reserve.

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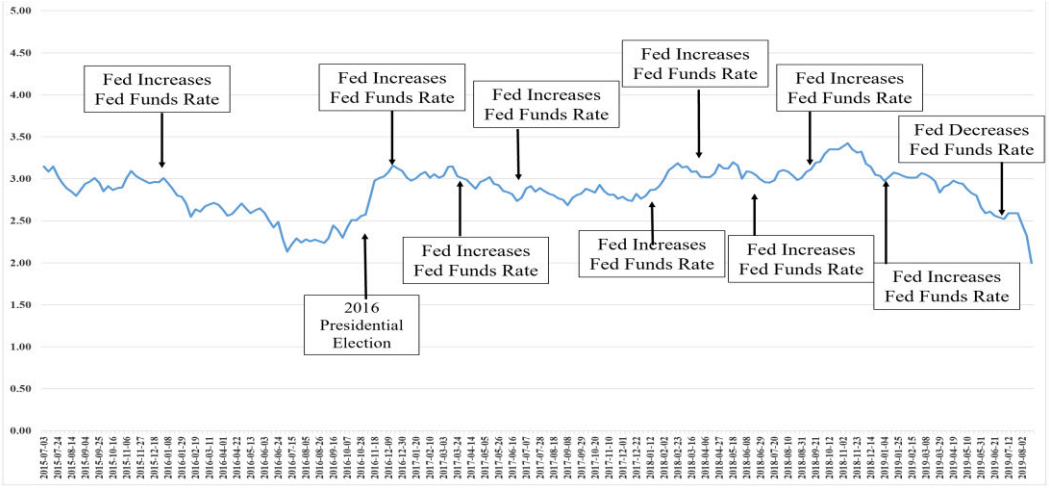
Figure 1
Thirty-Year Treasury Yield and Federal Reserve Fed Funds Rate Increases
2015-2019



Q. PLEASE REVIEW LONG-TERM TREASURY YIELDS IN 2019.

A. Despite the Fed's efforts to stimulate the economy, economic growth and inflation have remained low, even with record low unemployment levels. The rate increase in December of 2018 was seen by many as maybe too aggressive. And with the imposition of trade tariffs aimed at China, and with continued slow growth in Europe, concerns have grown that a recession is on the horizon in the U.S. This led the Federal Reserve to cut the federal fund rate to the 2.0%-2.25% range in July of 2019. Thirty-year Treasury yields, which began the year in the 3.0% range, have fallen to almost 2.0%. In fact, in August of 2019 the 30-year Treasury yield fell to record lows and even traded below 2.0%. The irony is, despite the record low levels, the 30-year Treasury yield in the U.S. is still somewhat higher than the

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government bond rates in Japan, the U.K., Germany, and much of the rest of Europe.

Q. WHY HAVE LONG-TERM TREASURY YIELDS REMAINED IN THE 2.0%-3.0% RANGE DESPITE THE FEDERAL RESERVE INCREASING SHORT-TERM RATES?

A. Whereas the Federal Reserve can directly affect short-term rates by adjustments to the federal funds rate, long-term rates are primarily driven by expected economic growth and inflation.[6] The relationship between short- and long-term rates is normally evaluated using the yield curve. The yield curve depicts the relationship between the yield-to-maturity and the time-to-maturity for U.S. Treasury bills, notes, and bonds. Figure 2, below, shows the yield curve on a semi-annual basis since the Federal Reserve started increasing the federal funds rate at the end of 2015. It shows that, from the time the Federal Reserve began increasing the federal fund rate in 2015 and until 2018, with the exception of mid-year 2016, the 30-year Treasury yield has remained in the 2.8%-3.4% range despite the fact that short-term rates have increased from near 0.0% to about 2.50%. As such, long-term interest rates and capital costs have not increased in any meaningful way even with the Federal Reserve's actions and the increase in short-term rates.

[6] Whereas economic growth picked up in 2018, partly in response to the personal and corporate tax cuts, projected real GDP growth for 2019 and beyond remains in the 2.0% to 2.5% range. In addition, inflation remains low and is also in the 2.0% to 2.5% range.

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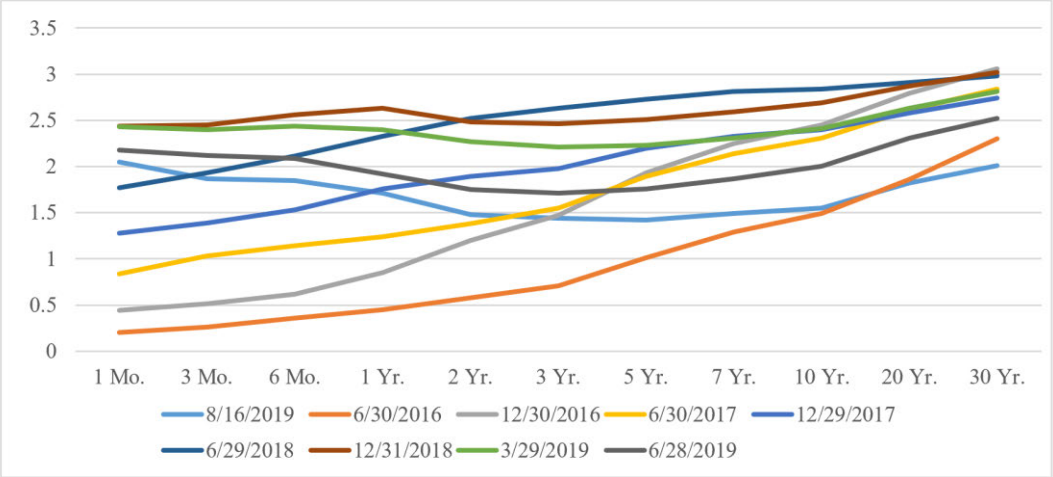
In 2019, with the large decline in long-term Treasury rates, the concern has been about an "inverted yield curve." An inverted yield curve occurs when short-term Treasury yields are above long-term Treasury yields and is commonly associated with a pending recession. In Figure 2, the yield curve for August 16, 2019, is shown in Carolina blue and is slightly inverted.

Figure 2
Semi-Annual Yield Curves
2015-2019



Date Source: https://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/TextView.aspx?data=yieldYear&year=2019

Q. DO YOU RECOMMEND THE COMMISSION ACCEPT MR. HEVERT'S FORECASTS OF HIGHER INTEREST RATES AND CAPITAL COSTS?

A. No. I suggest that the Commission set an equity cost rate based on current indicators of market-cost rates and not speculate on the future direction of interest rates.

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Economists have been predicting that interest rates would be going up for a decade, and they consistently have been wrong. For example, after the announcement of the end of the Quantitative Easing III ("QE III") program in 2014, all the economists in Bloomberg's interest rate survey forecast that interest rates would increase in 2014, and 100% of the economists were wrong. According to the *Market Watch* article:[7]

> The survey of economists' yield projections is generally skewed toward rising rates — only a few times since early 2009 have a majority of respondents to the Bloomberg survey thought rates would fall. But the unanimity of the rising rate forecasts in the spring was a stark reminder of how one-sided market views can become. It also teaches us that economists can be universally wrong.

Two other financial publications produced studies on how economists consistently predict higher interest rates, and yet they too, have been wrong. The first publication, entitled "How Interest Rates Keep Making People on Wall Street Look Like Fools," evaluated economists' forecasts for the yield on 10-year Treasury bonds at the beginning of the year for the last ten years.[8] The results

[7] Ben Eisen, "Yes, 100% of economists were dead wrong about yields," *Market Watch*, (Oct. 22, 2014), https://www.marketwatch.com/story/yes-100-of-economists-were-dead-wrong-about-yields-2014-10-21**.** Perhaps reflecting this fact, *Bloomberg* reported that the Federal Reserve Bank of New York has stopped using the interest rate estimates of professional forecasters in the Bank's interest rate model due to the unreliability of those interest rate forecasts. *See* Susanne Walker and Liz Capo McCormick, "Unstoppable $100 Trillion Bond Market Renders Models Useless," *Bloomberg.com* (June 2, 2014), http://www.bloomberg.com/news/2014-06-01/the-unstoppable-100-trillion-bond-market-renders-models-useless.html.

[8] Joe Weisenthal, "How Interest Rates Keep Making People on Wall Street Look Like Fools,"

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demonstrated that economists consistently predict that interest rates will go higher, and interest rates have not fulfilled those predictions.

The second study tracked economists' forecasts for the yield on 10-year Treasury bonds on an ongoing basis from 2010 until 2015.[9] The study, entitled "Interest Rate Forecasters are Shockingly Wrong Almost All of the Time," indicates that economists are continually forecasting that interest rates are going up, yet they do not. Indeed, as Bloomberg has reported, economists' continued failure in forecasting increasing interest rates has caused the Federal Reserve Bank of New York to stop using the interest-rate estimates of professional forecasters in the Bank's interest-rate model due to the unreliability of those interest-rate forecasts.[10]

Obviously, investors are aware of the consistently wrong forecasts of higher interest rates, and therefore place little weight on such forecasts. Investors would not be buying long-term Treasury bonds or utility stocks at their current yields if they expected interest rates to suddenly increase, thereby producing higher yields and negative returns. For example, consider a utility that pays a dividend

Bloomberg.com, (March 16, 2015), http://www.bloomberg.com/news/articles/2015-03-16/how-interest-rates-keep-making-people-on-wall-street-look-like-fools.

[9] Akin Oyedele, "Interest Rate Forecasters are Shockingly Wrong Almost All of the Time," *Business Insider*, (July 18, 2015), http://www.businessinsider.com/interest-rate-forecasts-are-wrong-most-of-the-time-2015-7.

[10] Ben Eisen, "Yes, 100% of economists were dead wrong about yields," *Market Watch*, (Oct. 22, 2014), https://www.marketwatch.com/story/yes-100-of-economists-were-dead-wrong-about-yields-2014-10-21.

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of $2.00 with a stock price of $50.00. The current dividend yield in that example is 4.0%. If, as Mr. Hevert suggests, interest rates and required utility yields increase, the price of the utility stock would decline. In the example above, if higher return requirements led the dividend yield to increase from 4.0% to 5.0% in the next year, the stock price would have to decline to $40, which would be a -20% return on the stock. Obviously, investors would not buy the utility stock with an expected return of -20% due to higher dividend yield requirements.

In sum, it is practically impossible to accurately forecast interest rates and prices of investments that are determined in financial markets, such as interest rates and prices for stocks and commodities. For interest rates, I am not aware of any study that suggests one forecasting service is consistently better than others or that interest-rate forecasts are consistently better than just assuming the current interest rate will be the rate in the future. As discussed above, investors would not be buying long-term Treasury bonds or utility stocks at their current yields if they expected interest rates to suddenly increase, thereby producing higher yields and negative returns.

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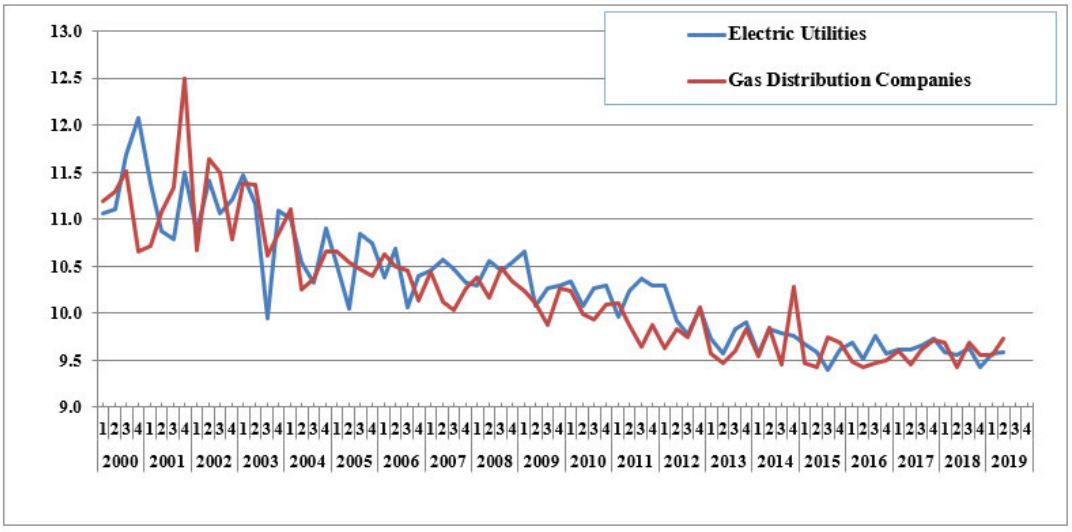
Q. PLEASE DISCUSS THE TREND IN AUTHORIZED RETURN ON EQUITY FOR ELECTRIC AND GAS COMPANIES.

A. Over the past five years, with the historically low interest rates and capital costs, authorized ROEs for electric utility and gas distribution companies have slowly declined to reflect the low capital cost environment. In Figure 3, below, I have graphed the quarterly authorized ROEs for electric and gas companies from 2000 to 2018. There is a clear downward trend in the data. On an annual basis, these authorized ROEs for electric utilities have declined from an average of 10.01% in 2012, 9.8% in 2013, 9.76% in 2014, 9.58% in 2015, 9.60% in 2016, 9.68% in 2017, 9.56% in 2018, and 9.56% in the first half of 2019, according to Regulatory Research Associates.[11]

Figure 3
Authorized ROEs for Electric Utility and Gas Distribution Companies
2000-2019



[11] *Regulatory Focus*, Regulatory Research Associates, 2019. The electric utility authorized ROEs exclude the authorized ROEs in Virginia, which include generation adders.

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III. PROXY GROUP SELECTION

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

A. To develop a fair rate of return recommendation for DENC, I have evaluated the return requirements of investors on the common stock of a proxy group of publicly-held electric utility companies ("Electric Proxy Group"). I have also used the group developed by Mr. Hevert ("Hevert Proxy Group").

Q. PLEASE DESCRIBE YOUR PROXY GROUP OF COMPANIES.

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

(1) At least 50% of revenues come from regulated electric operations as reported in SEC Form 10-K Report;

(2) Listed as an Electric Utility by *Value Line Investment Survey*;

(3) An investment-grade corporate credit and bond rating;

(4) Has paid a cash dividend for the past six months, with no cuts or omissions;

(5) Not involved in an acquisition of another utility, and not the target of an acquisition; and

(6) Analysts' long-term EPS growth rate forecasts available from Yahoo, Reuters, and/or Zack's.

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The Electric Proxy Group includes twenty-seven companies. Summary financial statistics for the proxy group are listed in Exhibit JRW-2. The median operating revenues and net plant among members of the Electric Proxy Group are $6,873.0 million and $22,810.0 million, respectively. The group on average receives 81% of its revenues from regulated electric operations, has a BBB+ bond rating from Standard & Poor's and a Baa1 rating from Moody's, a current average common equity ratio of 46.0%, and an earned return on common equity of 9.7%.

Q. PLEASE DESCRIBE THE HEVERT PROXY GROUP.

A. Mr. Hevert's group is smaller (twenty-one companies). Summary financial statistics for Mr. Hevert's proxy group are provided in Panel B of page 1 of Exhibit JRW-2. The median operating revenues and net plant for the Hevert Proxy Group are $4,275.9 million and $18,126.0 million, respectively. The group on average receives 77% of its revenues from regulated electric operations, has a BBB+ bond rating from Standard & Poor's ("S&P's") and a Baa1 rating from Moody's, a common equity ratio of 47.5%, and a current earned return on common equity of 9.7%.

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Q. HOW DOES THE INVESTMENT RISK OF THE COMPANY COMPARE TO THAT OF YOUR ELECTRIC PROXY GROUP AND THE HEVERT PROXY GROUP?

A. I believe that bond ratings provide a good assessment of the investment risk of a company. The S&P and Moody's issuer credit ratings for DENC are BBB+ and A2, respectively. However, DENC and Dominion's S&P rating was A- but was downgraded on February 1, 2016 due to risk associated with Dominion's acquisition of Questar. This downgrade had nothing to do with the risk of DENC.[12] In addition, it should be noted that the Moody's rating for DENC's parent, Dominion Energy, is Baa2, which is three rating notches below DENC's A2 rating.

The average S&P and Moody's ratings for the Electric and Hevert Proxy Groups are BBB+ and Baa1. DENC's S&P rating is equal to the two groups (BBB+ vs. BBB+), while DENC's Moody's rating is two rating notches above the two groups (A2 vs. Baa1). This indicates that the investment risk of DENC is below the electric utilities in the two proxy groups.

On page 2 of Exhibit JRW-2, I have assessed the riskiness of the two proxy groups using five different risk measures. These

[12] Standard & Poor's Rating Services, Ratings Direct, "Dominion Resources Inc. and Subsidiaries Downgraded to 'BBB+' On Acquisition of Questar Corp.; Outlook Stable" (Feb. 1, 2016).

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measures include Beta, Financial Strength, Safety, Earnings Predictability, and Stock Price Stability. These risk measures indicate that the two proxy groups are similar in risk. The comparisons of the risk measures include Beta (0.59 vs. 0.58), Financial Strength (A vs. A), Safety (1.9 vs. 1.8), Earnings Predictability (78 vs. 81), and Stock Price Stability (96 vs. 96). On balance, these measures suggest that the two proxy groups – that is my Electric Proxy Group and the Hevert Proxy Group – are similar in risk.

Q. WHAT DO YOU CONCLUDE FROM YOUR RISK ANALYSIS?

A. First, based on the credit ratings from S&P and Moody's, I conclude that the Company is less risky than the average of the two proxy groups. Second, the S&P and Moody's credit ratings and the five *Value Line* risk ratings are very similar for the two groups, and therefore I conclude that the two groups are similar in risk. And third, the five *Value Line* risk ratings for the two groups suggest that electric utilities are very low risk. This is indicated by the low Betas as well as the high ratings for safety, financial strength, earnings predictability, and stock price stability.

IV. CAPITAL STRUCTURE RATIOS AND DEBT COST RATES

Q. PLEASE DESCRIBE DENC'S PROPOSED CAPITAL STRUCTURE AND SENIOR CAPITAL COST RATES.

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A. DENC witness Mr. Richard M. Davis has proposed a capital structure of 46.351% long-term debt and 53.649% common equity and a long-term debt cost rate of 4.442%.

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

A. DENC's proposed capital structure ratios include a common equity ratio of 53.649%. As shown in Exhibit JRW-4, the average quarterly common equity ratio for the Electric and Hevert Proxy Groups as of December 31, 2018 were 46.0% and 47.5%, respectively. As such, DENC has proposed a capital structure that includes much more common equity in financing its utility operations than the average of the proxy group.

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

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

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

A. Yes. I am following North Carolina precedent and not recommending short-term debt in DENC's capital structure. However, in comparing the common equity ratios of the holding companies with DENC'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.

Q. WHAT IS THE AVERAGE COMMON EQUITY RATIO AUTHORIZED FOR ELECTRIC UTILITIES BY STATE REGULATORY COMMISSIONS?

A. According to Regulatory Research Associates, the average authorized common equity ratio for electric utilities in (1) calendar

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year 2018 and (2) for the first six months of 2019, were 48.95% and 50.10%, respectively.[13]

Q. HOW DO DENC'S PROPOSED CAPITAL STRUCTURE RATIOS COMPARE TO THE CAPITALIZATION RATIOS OF ITS PARENT, DOMINION ENERGY?

A. Panel B of Exhibit JRW-3 also provides Dominion Energy's December 31, 2018 average capitalization ratios both including and excluding short-term debt. Dominion Energy's common equity ratio was 36.5% including short-term debt and 39.1% excluding short-term debt. As a result, the Company's proposed capital structure includes a much higher common equity ratio (53.649%) than the common equity ratio of its parent, Dominion Energy.

Q. IS DOMINION ENERGY'S HIGH DEBT RATIO AND LOW EQUITY RATIO A FACTOR IN THE RISK ASSESSMENT OF DENC?

A. Yes. As previously noted, DENC's Moody's rating of A2 is three rating notches above Dominion Energy's rating of Baa2. In addition, Moody's noted that Dominion Energy's high debt level, or leverage, is a credit negative for DENC.[14]

[13] *Regulatory Focus*, Regulatory Research Associates, (2019).

[14] Moody's Investors' Service, "Virginia Electric and Power Company: Update to Credit Analysis," January 10, 2019, p. 1.

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Q. PLEASE DISCUSS THE ISSUE OF PUBLIC UTILITY HOLDING COMPANIES SUCH AS DOMINION ENERGY 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: [15]

> US 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.

This financial strategy has traditionally been known as double leverage. Moody's defined double leverage in the following way:[16]

> 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.

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

[16] *Ibid.* p. 5.

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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.[17]

> **"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.

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.

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

[17] *Ibid.* p. 1.

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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.

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Q. HOW HAVE UTILITIES TYPICALLY STRUCK THIS BALANCE?

A. Due to regulation and the essential nature of its output, a regulated utility is exposed 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 DENC HAS PROPOSED AN EQUITY RATIO THAT IS HIGHER THAN (1) THE AVERAGE COMMON EQUITY RATIOS OF THE ELECTRIC AND HEVERT'S PROXY GROUPS, (2) THE AVERAGE AUTHORIZED COMMON EQUITY RATIO FOR ELECTRIC UTILITY COMPANIES, AND (3) THE COMMON EQUITY RATIO OF ITS PARENT COMPANY, WHAT OPTIONS DOES THE COMMISSION HAVE 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; or (2) to recognize the downward impact that an unusually high equity ratio will have on the financial

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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 maintain an unusually high equity 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 PRIMARY CAPITAL STRUCTURE RECOMMENDATION FOR DENC.

A. My primary capital structure recommendation is presented in Panel C of Exhibit JRW-3. As previously noted, DENC's proposed capital structure consists of more common equity and less financial risk than any of the other proxy electric companies. Therefore, in my primary rate of return recommendation, I am proposing a capital structure that includes a common equity ratio of 50.0%. This capital structure includes a common equity ratio that is about half-way between DENC's proposed capital structure of 53.649% and the average

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common equity ratios of the proxy groups of 46.00% and 47.75%. As shown in Table 3 and Panel C of Exhibit JRW-3, in this capital structure, I have grossed up the percentage amount of long-term debt to 50.0% and reduced the amount of common equity from 53.649% to 50.0%. As noted above, in my primary rate of return recommendation, I am using a ROE of 9.0%.

Table 3
Staff's Primary Capital Structure Recommendation

	DENC Proposed	Adjustment	Staff Proposed	Cost
Long-Term Debt	**46.65%**	**1.078725**	**50.00%**	**4.44%**
Common Equity	**53.35%**	**0.931984**	**50.00%**	
Total Capital	**100.00%**		**100.00%**	

Q. DO YOU BELIEVE THAT YOUR PROPOSED 50% EQUITY CAPITAL STRUCTURE IS FAIR TO DENC?

A. Yes, for two reasons: (1) It includes a common equity ratio that is higher than the average common equity ratio for the Electric and Hevert Proxy Groups and therefore affords DENC with more common equity and less financial risk than other electric utility companies; and (2) it is in line with the average authorized common equity ratios for electric utility companies.

Q. WHAT IS THE CAPITAL STRUCTURE IN YOUR ALTERNATIVE RATE OF RETURN RECOMMENDATION?

A. In my alternative rate of return recommendation, I am using DENC's proposed capital structure which consists of 46.351% long-term debt

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and 53.649%. I am also using DENC's proposed long-term debt cost rate of 4.442%. As noted above, in my alternative rate of return recommendation, I am using an ROE of 8.75%. I believe that the 8.75% ROE reflects the current market cost of equity. In addition, if the Commission adopts DENC's proposed capital structure with its high common equity ratio, I believe that the Commission should employ a lower ROE to reflect the lower financial risk associated with a higher common equity ratio.

Table 4
Public Staff's Alternative Capital Structure Recommendation

	Percent of Total	Cost
Long-Term Debt	**46.99%**	**4.442%**
Common Equity	**53.01%**	
Total Capital	**100.00%**	

V. 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 and the construction of utility

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infrastructure facilities, many 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

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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 a competitive market, 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 those 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:[18]

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

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> 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, 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 a 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.

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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:[19]

> 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*

To assess the relationship by industry, as suggested above, I performed a regression study between estimated ROE and market-to-book ratios using *Value Line*'s electric utilities and gas distribution companies. I used all electric utility and gas distribution companies 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 R-square for the regression of estimated ROEs and market-to-book

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

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ratios is 0.50.[20] This demonstrates the strong positive relationship between ROEs and market-to-book ratios for electric 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-5 provides indicators of public utility equity cost rates.

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. They peaked in November 2008 at 7.75% during the Great Recession. These yields have generally declined since then, dropping below 4.0% on five occasions - in mid-2013, in the first quarter of 2015, in the summer of 2016, in late 2018. In 2019, these yields have declined significantly are in the 3.50% to 3.75% range.

Page 2 of Exhibit JRW-5 provides the average dividend yields for electric utility companies over the past 16 years. 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

[20] 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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declined steadily since that time. The average dividend yield was 3.2% in 2018.

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 2018, the average market-to-book for the group was 1.80X. This means that, for at least the last decade, returns on common equity for electric utilities 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 rates. The perceived risk of a firm is the predominant factor

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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 0.60, 0.67, and 0.70, respectively.[21] As such,

[21] The beta for the *Value Line* Electric Utilities is the simple average of *Value Line*'s Electric East (0.55), Central (0.63), and West (0.62) group betas.

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the cost of equity for utilities is the lowest of all industries in the U.S. based on modern capital market theory.

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

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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.

Q. HOW DID YOU 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.

B. Discounted Cash Flow Analysis

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

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

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

where P is the current stock price, D_1, D_2, D_n is the dividends in year 1, 2, and in the future years 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 Exhibit JRW-6, Page 1 of 2. This model presumes that a company's dividend payout progresses initially through a growth stage, then

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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.

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

In using the 3-stage 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

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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 P is the current stock price, D_1 represents the expected dividend over the coming year, k is investor's required return on equity, 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:

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

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

A. Yes. The economics of the public utility business indicate that the industry is in the steady-state 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 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

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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 the 30-day, 90-day, and 180-day average stock prices. These dividend yields are provided in Panels A and B of page 2 of Exhibit JRW-7. I have shown the mean and median dividend yields using 30-day, 90-day, and 180-day average stock prices. Using both the means and medians, the dividend yields range from 2.8% to 3.3% for the Electric Proxy Group and 2.9% to 3.2% for the Hevert Proxy Group. Therefore, I will use a dividend yields of 3.10% and 3.05% for my Electric Proxy Group and the Hevert Proxy Group, respectively.

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

A. According to the traditional DCF model, the dividend yield term relates the dividend paid over the coming period to the current stock price. 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 dividend over the coming quarter by 4, and (2) dividing this dividend by the current

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stock price to determine the appropriate dividend yield for a firm that pays dividends on a quarterly basis.[22]

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 computed based on 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.

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 to reflect growth over the coming year. The DCF equity cost rate ("K") is computed as:

$$K = [(D/P) * (1 + 0.5g)] + g$$

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

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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 GROUPS?

A. I have analyzed a number of measures of growth for companies in the proxy groups. 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, Reuters and Zacks. These services solicit five-year earnings growth rate projections from securities analysts and compile and publish the means and medians of these forecasts. Finally, I also assessed prospective growth as measured

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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.

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 ten 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

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internal growth rate is computed as the retention rate times the return on equity. Internal growth is significant in determining long-run 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. PLEASE DISCUSS THE SERVICES THAT PROVIDE ANALYSTS' EPS FORECASTS.

A. Analysts' EPS forecasts for companies are collected and published by several different investment information services, including Institutional Brokers Estimate System ("I/B/E/S"), Bloomberg, FactSet, Zacks, First Call, and Reuters, among others. Thompson Reuters publishes analysts' EPS forecasts under different product names, including I/B/E/S, First Call, and Reuters. Bloomberg, FactSet, and Zacks each publish their own set of analysts' EPS forecasts for companies. These services do not reveal (1) the analysts who are solicited for forecasts or (2) the identity of the analysts who actually provide the EPS forecasts that are used in the compilations published by the services. I/B/E/S, Bloomberg, FactSet, and First Call are fee-based services. These services usually provide detailed reports and other data in addition to analysts' EPS forecasts. In contrast, Thompson Reuters and Zacks provide limited EPS forecast data free-of-charge on the Internet. Yahoo finance

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(http://finance.yahoo.com) lists Thompson Reuters as the source of its summary EPS forecasts. The Reuters website (www.reuters.com) also publishes EPS forecasts from Thompson Reuters, but with more detail. Zacks (www.zacks.com) publishes its summary forecasts on its website. Zacks estimates are also available on other websites, such as MSN.money (http://money.msn.com).

Q. PLEASE PROVIDE AN EXAMPLE OF THESE EPS FORECASTS.

A. The following example provides the EPS forecasts compiled by Reuters for Consolidated Edison (stock symbol "ED"). The figures are provided on page 2 of Exhibit JRW-6. Line one shows that twelve analysts have provided EPS estimates for the quarter ending September 30, 2019. The mean, high, and low estimates are $1.60, $1.70, and $1.53, respectively. The second line shows the quarterly EPS estimates for the quarter ending December 31, 2019 of $0.77 (mean), $0.85 (high), and $0.66 (low). Line three shows the annual EPS estimates for the fiscal year ending December 2019 of $4.35 (mean), $4.99 (high), and $4.30 (low). Line four shows the annual EPS estimates for the fiscal year ending December 2020 of $4.57 (mean), $4.73 (high), and $4.47 (low). The quarterly and annual EPS forecasts in lines 1-4 are expressed in dollars and cents. As in the ED case shown here, it is common for more analysts to provide estimates of annual EPS as opposed to quarterly EPS. The bottom line (5) shows the projected long-term EPS growth rate, which is

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expressed as a percentage. For ED, four analysts have provided a long-term EPS growth rate forecast, with mean, high, and low growth rates of 3.44%, 4.89%, and 2.00%.

Q. WHICH OF THESE EPS FORECASTS IS USED IN DEVELOPING A DCF GROWTH RATE?

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 issues with using the EPS growth rate forecasts of Wall Street analysts as DCF growth rates. 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, dividend and earnings will have to grow at a similar growth rate. Therefore, consideration must be given to other indicators of growth, including prospective dividend growth, internal growth, as well as projected earnings growth. Second, a study by Lacina, Lee, and Xu (2011) has shown that analysts' three-to-five year EPS growth rate forecasts are not more accurate at forecasting future earnings than naïve random

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walk forecasts of future earnings.[23] Employing data over a twenty-year period, these authors demonstrate that using the most recent year's actual EPS figure to forecast EPS in the next 3-5 years proved to be just as accurate as using the EPS estimates from analysts' three-to-five year EPS 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 has been demonstrated in a number of academic studies over the years.[24] 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

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

[24] 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, *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).

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forecasts leads to an upward bias in estimates of the cost of equity capital of almost 3.0 percentage points.[25]

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 therefore stock prices reflect the upward bias.

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 I believe that investors are aware of the upward bias in analysts' long-term EPS growth rate forecasts, stock prices reflect the bias. But the DCF growth rate needs to be adjusted downward from the projected EPS growth rate to reflect the upward bias in the DCF model.

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

A. Page 3 of Exhibit JRW-7 provides the 5- and 10- year historical growth rates for EPS, DPS, and BVPS for the companies in the two

[25] 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).

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proxy groups, 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 6.5%, with an average of the medians of 4.8%. For the Hevert 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 4.0% 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 5.1%. The range of the medians for the Hevert Proxy Group, shown in Panel B of page 4 of Exhibit JRW-7, is from 4.0% to 6.0%, with an average of the medians of 5.2%.

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 retention rate and return on shareholders' equity. As noted above, sustainable growth

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is a significant and a primary driver of long-run earnings growth. For the Electric and Hevert Proxy Groups, the median prospective sustainable growth rates are 3.8% and 3.7%, respectively.

Q. PLEASE ASSESS GROWTH FOR THE PROXY GROUPS AS MEASURED BY ANALYSTS' FORECASTS OF EXPECTED 5-YEAR EPS GROWTH.

A. Yahoo, Zacks, and Reuters collect, summarize, and publish Wall Street analysts' 5-year 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. Since there is considerable overlap in analyst coverage between the three 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 three 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 and Hevert Proxy Groups are 5.2%/5.5% and 5.7%/5.9%, respectively.[26]

[26] Given variation in the measures of central tendency of analysts' projected EPS growth rates proxy groups, I have considered both the means and medians 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 4.8%. The average of the projected EPS, DPS, and BVPS growth rates from *Value Line* is 5.1%, and *Value Line*'s projected sustainable growth rate is 3.8%. The projected EPS growth rates of Wall Street analysts for the Electric Proxy Group are 5.0% and 5.5% as measured by the mean and median growth rates. The overall range for the projected growth-rate indicators (ignoring historical growth) is 3.7% to 5.5%. Giving primary weight to the projected EPS growth rate of Wall Street analysts, I believe that the appropriate projected growth rate is 5.35%, which is the average of the mean and median projected EPS growth rates. This growth rate figure is in the upper end of the range of historic and projected growth rates for the Electric Proxy Group.

For the Hevert Proxy Group, the historical growth rate indicators suggest a growth rate of 4.7%. The average of the projected EPS, DPS, and BVPS growth rates from *Value Line* is 5.2%, and *Value Line*'s projected sustainable growth rate is 3.7%. The projected EPS growth rates of Wall Street analysts are 5.7% and 5.9% as measured by the mean and median growth rates. The

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overall range for the projected growth rate indicators is 3.7% to 5.9%. Giving primary weight to the projected EPS growth rate of Wall Street analysts, I believe that the appropriate projected growth rate is 5.80%, which is the average of the mean and median projected EPS growth rates. This growth rate figure is in the upper end of the range of historic and projected growth rates for the Hevert 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 5 below.

Table 5
DCF-Derived Equity Cost Rate/ROE

	Dividend Yield	1 + ½ Growth Adjustment	DCF Growth Rate	Equity Cost Rate
Electric Proxy Group	**3.10%**	**1.02675**	**5.35%**	**8.55%**
Hevert Proxy Group	**3.05%**	**1.02900**	**5.80%**	**8.95%**

The result for the Electric Proxy Group is the 3.10% dividend yield, times the one and one-half growth adjustment of 1.02675, plus the DCF growth rate of 5.35%, which results in an equity cost rate of 8.55%. The result for the Hevert Proxy Group is 8.95%, which includes a dividend yield of 3.05%, an adjustment factor of 1.02900, and a DCF growth rate of 5.80%.

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C. Capital Asset Pricing Model

Q. PLEASE DISCUSS THE CAPITAL ASSET PRICING MODEL ("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:

$$k = R_f + RP$$

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 risk 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:

$$K = (R_f) + ß * [E(R_m) - (R_f)]$$

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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*—(ß) 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 (ß), 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. ß, 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, an even more 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.

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Q. PLEASE DISCUSS EXHIBIT JRW-8.

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. The yield on long-term U.S. Treasury bonds, in turn, 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 2.0% to 4.0% range over the 2013–2019 time period. The current 30-year Treasury yield is near the bottom of this range as interest rates have declined significantly in 2019. Given the recent range of yields, I have chosen to use the top end of the range as my risk-free interest rate. Therefore, I am using 4.0% as the risk-free rate, or R_f, in my CAPM.

Q. DOES YOUR 4.0% 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 4.0% risk-free interest

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rate takes into account the range of interest rates in the past and effectively synchronizes the risk-free rate with the market-risk premium ("MRP"). The risk-free rate and the MRP are interrelated in that the MRP is developed in relation to the risk-free rate. As discussed below, my MRP is based on the results of many studies and surveys that have been published over time. Therefore, my risk-free interest rate of 4.0% is effectively a normalized risk-free rate of interest.

Q. WHAT BETAS ARE YOU EMPLOYING IN YOUR CAPM?

A. Beta (ß) 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 whose price movement is 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 ß. A steeper line indicates that the stock is more sensitive to the return on the overall market. This means that

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the stock has a higher ß and greater-than-average market risk. A less steep line indicates a lower ß 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 ß is measured; and (2) any adjustments that are made to reflect the fact that betas tend to regress to 1.0 over time. In estimating an equity cost rate for the proxy groups, I am using the betas for the companies as provided in the *Value Line Investment Survey*. As shown on page 3 of Exhibit JRW-8, the median betas for the companies in the Electric and Hevert Proxy Groups are 0.60 and 0.58, respectively.

Q. PLEASE DISCUSS THE MARKET RISK PREMIUM.

A. The MRP 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 MRP is the difference in the expected total return between investing in equities and investing in "safe" fixed-income assets, such as long-term government bonds. However, while the MRP is easy to define conceptually, it is difficult to measure because it requires an estimate of the expected return on the market - $E(R_m)$. As discussed below, there are different ways to measure $E(R_m)$, and studies have come up with significantly different magnitudes for $E(R_m)$. As Merton Miller, the 1990 Nobel Prize winner in economics

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indicated, $E(R_m)$ is very difficult to measure and is one of the great mysteries in finance.[27]

Q. PLEASE DISCUSS THE ALTERNATIVE APPROACHES TO ESTIMATING THE MRP.

A. Page 4 of Exhibit JRW-8 highlights the primary approaches to, and issues in, estimating the expected MRP. The traditional way to measure the MRP was to use the difference between historical average stock and bond returns. In this case, historical stock and bond returns, also called *ex post* returns, were used as the measures of the market's expected return (known as the *ex ante* or forward-looking expected return). This type of historical evaluation of stock and bond returns is often called the "Ibbotson approach" after Professor Roger Ibbotson, who popularized this method of using historical financial market returns as measures of expected returns. However, this historical evaluation of returns can be a problem because: (1) *ex post* returns are not the same as *ex ante* expectations; (2) market risk premiums can change over time, increasing when investors become more risk-averse and decreasing when investors become less risk-averse; and (3) market conditions can change such that *ex post* historical returns are poor estimates of *ex ante* expectations.

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

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The use of historical returns as market expectations has been criticized in numerous academic studies as discussed later in my testimony. The general theme of these studies is that the large equity risk premium discovered in historical stock and bond returns cannot be justified by the fundamental data. These studies, which fall under the category "*Ex Ante* Models and Market Data," compute *ex ante* expected returns using market data to arrive at an expected equity risk premium. These studies have also been called "Puzzle Research" after the famous study by Mehra and Prescott in which the authors first questioned the magnitude of historical equity risk premiums relative to fundamentals.[28]

In addition, there are a number of surveys of financial professionals regarding the MRP. There have also been several published surveys of academics on the equity risk premium. *CFO Magazine* conducts a quarterly survey of CFOs, which includes questions regarding their views on the current expected returns on stocks and bonds. Usually, over 200 CFOs participate in the survey.[29] Questions regarding expected stock and bond returns are also included in the Federal Reserve Bank of Philadelphia's annual survey of financial forecasters, which is published as the *Survey of*

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

[29] DUKE/CFO Magazine Global Business Outlook Survey, (June 2019), https://www.cfosurvey.org/wp-content/uploads/2019/06/Q2-2019-US-Toplines-1.pdf.

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Professional Forecasters.[30] This survey of professional economists has been published for almost fifty years. In addition, Pablo Fernandez conducts annual surveys of financial analysts and companies regarding the equity risk premiums they use in their investment and financial decision-making.[31]

Q. PLEASE PROVIDE A SUMMARY OF THE MRP STUDIES.

A. Derrig and Orr (2003), Fernandez (2007), and Song (2007) completed the most comprehensive review of the research on the MRP.[32] Derrig and Orr's study evaluated the various approaches to estimating MRPs, as well as the issues with the alternative approaches and summarized the findings of the published research on the MRP. Fernandez examined four alternative measures of the MRP – historical, expected, required, and implied. He also reviewed the major studies of the MRP and presented the summary MRP

[30] Federal Reserve Bank of Philadelphia*, Survey of Professional Forecasters* (Mar. 22, 2019),

https://www.philadelphiafed.org/-/media/research-and-data/real-time-center/survey-of-professional-forecasters/2019/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.

[31] Pablo Fernandez, Vitaly Pershin, and Isabel Fernandez Acín, "Market Risk Premium and Risk-Free Rate used for 59 countries in 2019: a survey," *IESE Business School,* (Apr. 2019), available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3358901.

[32] *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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results. Song provides an annotated bibliography and highlights the alternative approaches to estimating the MRP.

Page 5 of Exhibit JRW-8 provides a summary of the results of the primary risk premium studies reviewed by Derrig and Orr, Fernandez, and Song, as well as other more recent studies of the MRP. In developing page 5 of Exhibit JRW-8, I have categorized the studies as discussed on page 4 of Exhibit JRW-8. I have also included the results of studies of the "Building Blocks" approach to estimating the equity 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 MRP studies that I have reviewed. These include the results of: (1) the various studies of the historical risk premium, (2) *ex ante* MRP studies, (3) MRP surveys of CFOs, financial forecasters, analysts, companies and academics, and (4) the Building Blocks approach to the MRP. There are results reported for over thirty surveys and studies, and the median MRP is 4.83%.

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

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A. The studies cited on page 5 of Exhibit JRW-8 include every MRP study and survey I could identify that was published over the past fifteen years and that provided an MRP 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 fifty years of data) and so were not estimating an MRP as of a specific point in time (e.g., the year 2001). To assess the effect of the earlier studies on the MRP, 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. The median for this subset of studies is 5.09%.

Q. PLEASE SUMMARIZE THE MRP STUDIES AND SURVEYS.

A. As noted above, there are three approaches to estimating the MRP – historic stock and bond returns, ex ante or expected returns models, and surveys. The studies on pages 5 and 6 of Exhibit JRW-8 can be summarized in the following manners:

Historic Stock and Bond Returns - Historic stock and bond returns suggest an MRP in the 4.40% to 6.26% range, depending on whether one uses arithmetic or geometric mean returns.

Ex Ante Models - MRP studies that use expected or ex ante return models indicate MRPs in the range of 4.49% to 6.00%.

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Surveys - MRPs developed from surveys of analysts, companies, financial professionals, and academics find lower MRPs, with a range from 1.85% to 5.7%.

Q. PLEASE HIGHLIGHT THE EX ANTE MRP STUDIES AND SURVEYS THAT YOU BELIEVE ARE MOST TIMELY AND RELEVANT.

A. I will highlight several studies/surveys.

CFO Magazine conducts a quarterly survey of CFOs, which includes questions regarding their views on the current expected returns on stocks and bonds. In the June 2019 CFO survey conducted by *CFO Magazine* and Duke University, which included approximately 200 responses, the expected 10-year MRP was 4.05%.[33] Figure 4, below, shows the MRP associated with the CFO Survey, which has been in the 4.0% range in recent years.

[33] DUKE/CFO Magazine Global Business Outlook Survey, at 33, (June 2019), https://www.cfosurvey.org/wp-content/uploads/2019/06/Q2-2019-US-Toplines-1.pdf.

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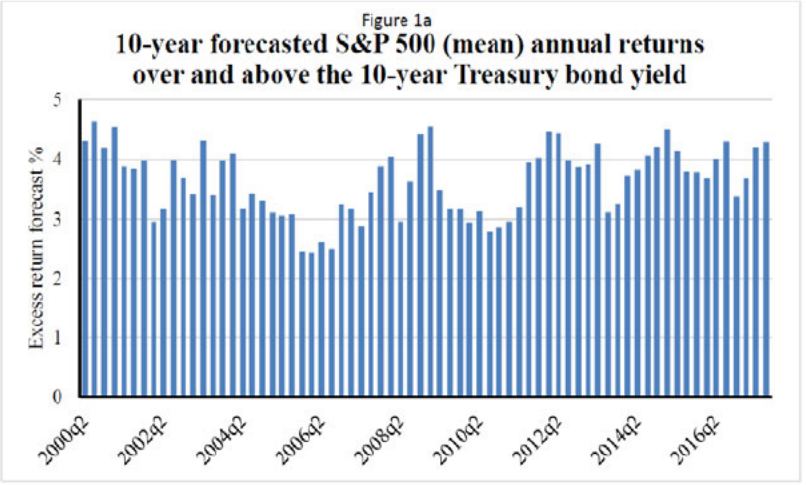
Figure 4
Market Risk Premium
CFO Survey



Source: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3151162

Pablo Fernandez conducts annual surveys of financial analysts and companies regarding the equity risk premiums they use in their investment and financial decision-making.[34] His survey results are included on pages 5 and 6 of Exhibit JRW-8. The results of his 2019 survey of academics, financial analysts, and companies, which included 4,000 responses, indicated a mean MRP employed by U.S. analysts and companies of 5.6%.[35] His estimated MRP for the U.S. has been in the 5.00%-5.50% range in recent years.

Professor Aswath Damodaran of NYU, a leading expert on valuation and the MRP, provides a monthly updated MRP which is

[34] Pablo Fernandez, Vitaly Pershin, and Isabel Fernandez Acín, "Market Risk Premium and Risk-Free Rate used for 59 countries in 2019: a survey," *IESE Business School,* (Apr. 2019), available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3358901.

[35] *Ibid.,* p. 3.

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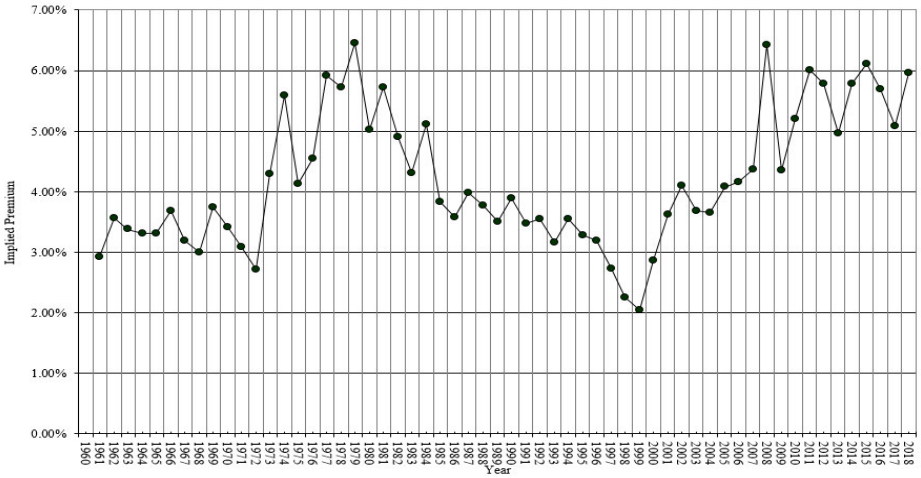
based on projected S&P 500 EPS and stock price level and long-term interest rates. His estimated MRP, shown graphically in Figure 5, below, for the past twenty years, has primarily been in the range of 5.0% to 6.0% since 2010.

Figure 5
Damodaran Market Risk Premium



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

Duff & Phelps, an investment advisory firm, provides recommendations for the risk-free interest rate and MRPs to be used in calculating the cost of capital data. Their recommendations over the 2008-2019 time periods are shown on page 7 of Exhibit JRW-8. Duff & Phelps' recommended MRP has been in the 5.0% to 6.0% over the past decade. Most recently, effective December 31, 2018,

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Duff & Phelps increased its recommended MRP from 5.00% to 5.50%.[36]

KPMG is one of the largest public accounting firms in the world. Its recommended MRP over the 2013-2019 time period is shown in Panel A of page 8 of Exhibit JRW-8. KPMG's recommended MRP has been in the 5.50% to 6.50% range over this time period. Since the third quarter of 2018, KPMG has recommended an MRP of 5.50%.[37]

Finally, the website *market-risk-premia.com* provides risk-free interest rates, implied MRPs, and overall cost of capital for thirty-six countries around the world. These parameters for the U.S. over the 2002-2019 time period are shown in Panel B of page 8 of Exhibit JRW-8. As of May 31, 2019, *market-risk-premia.com* estimated an implied cost of capital for the U.S. of 6.40%, consisting of a risk-free rate of 2.14% and an implied MRP of 4.26%.[38]

Q. GIVEN THESE RESULTS, WHAT MRP ARE YOU USING IN YOUR CAPM?

[36] Duff & Phelps, "U.S. Equity Risk Premium Recommendation," (Feb. 19, 2019), https://www.duffandphelps.com/insights/publications/cost-of-capital/recommended-us-equity-risk-premium-and-corresponding-risk-free-rates.

[37] KPMG, "Equity Market Risk Premium Research Summary," (Dec. 31, 2019), https://assets.kpmg/content/dam/kpmg/nl/pdf/2019/advisory/equity-market-research-summary.pdf.

[38] Market-Risk-Premia.com, "Implied Market-risk-premia (IMRP): USA," http://www.market-risk-premia.com/us.html.

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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 MRP in the U.S. is in the 4.0% to 6.0% range. I will use an expected MRP of 5.50%, which is in the upper end of the range, as the MRP. I gave most weight to the MRP estimates of the CFO Survey, Duff & Phelps, the Fernandez survey, and Damodaran. This is a conservatively high estimate of the MRP considering the many studies and surveys of the MRP.

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

A. The results of my CAPM study for the proxy groups are summarized on page 1 of Exhibit JRW-8 and in Table 6 below.

Table 6
CAPM-Derived Equity Cost Rate/ROE
K = (R_f) + ß * [E(R_m) - (R_f)]

	Risk-Free Rate	Beta	Equity Risk Premium	Equity Cost Rate
Electric Proxy Group	**4.0%**	**0.60**	**5.5%**	**7.3%**
Hevert Proxy Group	**4.0%**	**0.58**	**5.5%**	**7.2%**

For the Electric Proxy Group, the risk-free rate of 4.0% plus the product of the beta of 0.60 times the equity risk premium of 5.5% results in a 7.3% equity cost rate. For the Hevert Proxy Group, the risk-free rate of 4.0% plus the product of the beta of 0.58 times the equity risk premium of 5.5% results in a 7.2% equity cost rate.

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Q. THESE CAPM EQUITY COST RATES SEEM LOW. WHY IS THAT?

A. One major factor is that the riskiness of utilities has declined in recent years, and this lower risk is reflected in their betas. Utility betas have been in the .70 to .75 range in recent years. But they have declined in the past year and are now are primarily in the 0.55 to 0.60 range.

D. Equity Cost Rate Summary

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

A. My DCF analyses for the Electric and Hevert Proxy Groups indicate equity cost rates of 8.55% and 8.95%, respectively. The CAPM equity cost rates for the groups are 7.3% and 7.2%. Table 7, below, shows these results.

Table 7
ROEs Derived from DCF and CAPM Models

	DCF	CAPM
Electric Proxy Group	**8.55%**	**7.30%**
Hevert Proxy Group	**8.95%**	**7.20%**

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

A. I conclude that the appropriate equity cost rate for companies in the Electric and Hevert Proxy Groups is in the 7.2% to 8.95% range.

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Q. WHAT EQUITY COST RATE ARE YOU RECOMMENDING FOR DENC?

A. Given these results, I am recommending an equity cost rate or ROE for DENC of 8.75%. I believe that this equity cost rate accurately reflects the market cost of equity capital currently. As I previously noted, capital costs in the U.S. remain low, with low inflation and interest rates, very modest economic growth, and the stock market at an all-time high.

Q. PLEASE INDICATE WHY YOUR EQUITY COST RATE RECOMMENDATION IS APPROPRIATE FOR DENC.

A. There are a number of reasons why an equity cost rate of 8.75% is appropriate and fair for the Company in this case:

1. DENC's investment risk, as indicated by its S&P and Moody's credit ratings, is below the averages of the Electric and Hevert Proxy Groups;

2. As shown in Exhibits JRW-5, capital costs for utilities, as indicated by long-term utility bond yields, are still at historically low levels. In addition, given low inflationary expectations and slow global economic growth, interest rates are likely to remain at low levels for some time;

3. As shown in Exhibit JRW-5, the electric utility industry is among the lowest risk industries in the U.S. as measured by beta.

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Most notably, the betas for electric utilities have been declining in recent years, which indicates the risk of the industry has declined. Overall, the cost of equity capital for this industry is the lowest in the U.S., according to the CAPM;

4. I have recommended an equity cost rate at the high end of the range of my ROE outcomes;

5. As shown in Figure 3, the authorized ROEs for electric utility and gas distribution companies have declined in recent years. The authorized ROEs for electric utilities have declined from 10.01% in 2012, to 9.8% in 2013, to 9.76% in 2014, 9.58% in 2015, 9.60% in 2016, 9.68% in 2017, 9.56% in 2018, and 9.56% in the first half of 2019, according to Regulatory Research Associates.[39] In my opinion, these 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 ten percent. Hence, I believe that my recommended ROE reflects the low capital cost rates in today's markets, and these low capital cost rates are finally being recognized by state utility commissions.

[39] *Regulatory Focus*, Regulatory Research Associates, 2019. The electric utility authorized ROEs exclude the authorized ROEs in Virginia, which include generation adders.

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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.

Q. PLEASE ALSO DISCUSS YOUR RECOMMENDATION IN LIGHT OF A MOODY'S PUBLICATION ON ROES AND CREDIT QUALITY.

A. Moody's published an article on utility ROEs and credit quality. In the article, Moody's recognizes that authorized ROEs for electric and gas companies are declining due to lower interest rates. The article explains:[40]

> The credit profiles of US regulated utilities will remain intact over the next few years despite our expectation that regulators will continue to trim the sector's profitability by lowering its authorized returns on equity (ROE). Persistently low interest rates and a comprehensive suite of cost recovery mechanisms ensure a low business risk profile for utilities, prompting regulators to scrutinize their profitability, which is defined as the ratio of net income to book equity. We view cash flow measures as a more important rating driver than authorized ROEs, and we note that regulators can lower authorized ROEs without hurting

[40] Moody's Investors Service, "Lower Authorized Equity Returns Will Not Hurt Near-Term Credit Profiles," March 10, 2015.

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> cash flow, for instance by targeting depreciation, or through special rate structures.

Moody's indicates that with the lower authorized ROEs, electric and gas companies are earning ROEs of 9.0% to 10.0%, yet this is not impairing their credit profiles and is not deterring them from raising record amounts of capital.

With respect to authorized ROEs, Moody's recognizes that utilities and regulatory commissions are having trouble justifying higher ROEs in the face of lower interest rates and cost recovery mechanisms:[41]

> Robust cost recovery mechanisms will help ensure that US regulated utilities' credit quality remains intact over the next few years. As a result, falling authorized ROEs are not a material credit driver at this time, but rather reflect regulators' struggle to justify the cost of capital gap between the industry's authorized ROEs and persistently low interest rates. We also see utilities struggling to defend this gap, while at the same time recovering the vast majority of their costs and investments through a variety of rate mechanisms.

Overall, this article further supports the prevailing/emerging belief that lower authorized ROEs are unlikely to hurt the financial integrity of utilities or their ability to attract capital.

[41] *Id.*

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Q. ARE UTILITIES ABLE TO ATTRACT CAPITAL WITH THE LOWER ROES?

A. Moody's also highlights in the article that utilities are raising about $50 billion a year in debt capital, despite the lower ROEs.

VI. CRITIQUE OF DENC'S RATE OF RETURN TESTIMONY

Q. PLEASE SUMMARIZE THE COMPANY'S COST OF EQUITY CAPITAL RECOMMENDATION.

A. The Company has proposed a capital structure of 46.351% long-term debt and 53.649% common equity and a long-term debt cost rate of 4.442%. Mr. Hevert has recommended a common equity cost rate of 10.75%. The Company's overall proposed rate of return is 7.83%.

Q. WHAT ISSUES DO YOU HAVE WITH THE COMPANY'S COST OF EQUITY CAPITAL POSITION?

A. I have a number of issues with the Company's ROE position:

1. Capital Structure – The Company has proposed a capital structure consisting of 46.351% long-term debt and 53.649% common equity. The Company's proposed capital structure has a higher common equity ratio than the average of the Electric and Hevert Proxy Groups. In my primary rate of return recommendation, I am recommending adjusting DENC's proposed capital structure to use a common equity ratio of 50

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percent, as that is more in line with the capital structures of the utilities in the proxy group as well as DENC's parent, Dominion Energy. In my alternative rate of return recommendation, I am using DENC's proposed updated capital structure, but I then employ a lower ROE to reflect the high common equity ratio and lower financial risk of the Company's proposed capitalization.

2. Capital Market Conditions – Mr. Hevert's analyses and ROE results and recommendations reflect the assumption of higher interest rates and capital costs. However, I show that despite the Federal Reserve's moves to increase the federal funds rate over the 2015-18 time period, interest rates and capital costs remained at low levels. In 2019 interest rates have fallen dramatically with slow economic growth and low inflation, and the 30-year yield has traded at all-time low levels.

3. DENC's Investment Risk is Below the Averages of the Two Proxy Groups – Mr. Hevert cites the Company's capital expenditures to imply that DENC is riskier than his proxy group. In addition, he selects an ROE that is near the upper end of his 10.0% to 11.0% range. However, his assessment of DENC's risk is erroneous. The assessment of capital expenditures is part of the credit rating process, and DENC's S&P and Moody's credit rating suggest that the Company's investment risk is below the averages of the proxy groups.

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4. Disconnect Between Mr. Hevert's Equity Cost Rate Studies and his 10.75% ROE Recommendation – There is a disconnect between Mr. Hevert's equity cost rate results and his 10.75% ROE recommendation. Simply stated, the vast majority of his equity cost rate results point to a lower ROE. In fact, the only results that point to an ROE as high as 10.75% are his CAPM/ECAPM results using *Value Line* betas and market risk premium ("MRP"), which as I explain later in my testimony are flawed. As a result, Mr. Hevert's ROE recommendation is based on: (1) the results of only one model (the CAPM); and, even more narrowly, (2) only one source of financial information for betas and MRP (*Value Line*). Otherwise, Mr. Hevert provides no other equity cost rate studies that support his 10.75% ROE recommendation.

5. DCF Equity Cost Rate - The DCF Equity Cost Rate is estimated by summing the stock's dividend yield and investors' expected long-run growth rate in dividends paid per share. There are several errors regarding Mr. Hevert's DCF analyses: (1) he has given very little weight to his constant-growth DCF results; and (2) he has relied exclusively on the overly optimistic and upwardly biased earnings per share ("EPS") growth-rate forecasts of Wall Street analysts and *Value Line.*

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6. CAPM Approach - The CAPM approach requires an estimate of the risk-free interest rate, the beta, and the market or equity risk premium. There are three primary issues with Mr. Hevert's CAPM analyses: (1) he employs an excessively high, projected long-term risk-free interest rate; (2) his MRPs of 10.65% and 13.77% are exaggerated and do not reflect current market fundamentals. Mr. Hevert has employed analysts' three-to-five-year growth-rate projections for EPS to compute an expected market return and MRP. These EPS growth-rate projections and the resulting expected market returns and MRPs include highly unrealistic assumptions regarding future economic and earnings growth and stock returns; and (3) Mr. Hevert has employed an ad hoc version of the CAPM, the empirical CAPM ("ECAPM"), which makes inappropriate adjustments to the risk-free rate and the market risk premium and is an untested model in academic and profession research.

7. Alternative Risk Premium Model - Mr. Hevert estimates an equity cost rate using an alternative risks premium model which he calls the Bond Yield Risk Premium ("BYRP") approach. The risk premium in his BYRP method is based on the historical relationship between the yields on long-term Treasury yields and authorized ROEs for electric utility companies. There are several issues with this approach including: (1) this approach is a gauge

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of commission behavior and not investor behavior; (2) Mr. Hevert's methodology produces an inflated measure of the risk premium because his approach uses historical authorized ROEs and Treasury yields, and the resulting risk premium is applied to projected Treasury yields; and (3) the risk premium is inflated as a measure of investor's required risk premium, because electric utility companies have been selling at market-to-book ratios in excess of 1.0. This indicates that the authorized rates of return have been greater than the return that investors require.

8. Expected Earnings Approach - Mr. Hevert also uses the Expected Earnings approach to estimate an equity cost rate for the Company. Mr. Hevert computes the expected ROE as forecasted by *Value Line* for his proxy group as well as for *Value Line*'s universe of electric utilities. The biggest issue is that the so-called "Expected Earnings" approach does not measure the market cost of equity capital, is independent of most cost of capital indicators, and has several other empirical issues. Therefore, the Commission should ignore Mr. Hevert's "Expected Earnings" approach in determining the appropriate ROE for DENC.

9. Other Issues - Mr. Hevert also considers two other factors in arriving at his 10.75% ROE recommendation. First, Mr. Hevert cites the Company's high level of capital expenditures in the

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coming years. However, as I note, capital expenditures are considered as a risk factor in the credit-rating process used by major rating agencies. In addition, as I noted above, DENC's investment risk as measured by S&P and Moody's is below the average of the proxy groups. Second, Mr. Hevert also considers flotation costs in making his ROE recommendation of 10.75%. However, he has not identified any flotation costs for DENC.

10. North Carolina Economic Conditions – Mr. Hevert evaluates a number of factors such as employment and income levels and comes to the conclusion that DENC's proposed ROE of 10.75% is fair and reasonable to DENC, its shareholders, and its customers in light of the effect of those changing economic conditions. While I agree economic conditions have improved in North Carolina, the improvements do not necessarily justify such a high rate of return and ROE. Specifically, I highlight the following: (1) DENC's ROE request of 10.75% is over 100 basis points above the average authorized ROEs for electric utilities over the 2018-19 time period; (2) whereas North Carolina's unemployment rate has fallen by one-third since its peak in the 2009-2010 period and is slightly below the national average of 3.90%, the unemployment rate in DENC's service territory is 4.95%, over 100 basis points higher than the national and North Carolina averages; and (3) whereas North Carolina's residential

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electric rates are below the national average, North Carolina's median household income is more than 10% below the U.S. norm.

Capital market conditions, DENC's proposed capital structure, and the investment risk of DENC were previously discussed. The other issues are addressed below.

A. The Disconnect Between Mr. Hevert's Equity Cost Rate Results and His 10.75% ROE Recommendation

Q. PLEASE REVIEW MR. HEVERT'S EQUITY COST RATE RESULTS AND HIS 10.75% ROE RECOMMENDATION.

A. Page 1 of Exhibit JRW-9 shows Mr. Hevert's equity cost rate results using the DCF, CAPM, and BYRP approaches. There appears to be a disconnect between these results and his 10.75% ROE recommendation. First, it is very difficult to see exactly how he gets to his 10.75% ROE recommendation. He provides no details on how he weighted his equity cost rate results to get to 10.75%.

Second, the vast majority of his equity cost rate results point to a lower ROE. The average of his DCF results is 9.31%, to which he clearly gave no weight. His BYRP results, which are inflated because he has used projected interest rates, average 10.0%. His CAPM results, calculated using a Bloomberg MRP, are also inflated

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because he has used projected interest rates, and average less than 9.0%. These results clearly received no weight.

Finally, the only results that point to a ROE as high as 10.75% are his CAPM results using *Value Line* betas and MRP. As a result, Mr. Hevert's ROE recommendation is based on: (1) the results of only one model (the CAPM); and, even more narrowly, (2) only one source of financial information for betas and MRP (*Value Line*). In addition, as discussed below, there are a number of empirical issues with the *Value Line* projected EPS growth rates which result in an overstated expected market return and MRP. Otherwise, Mr. Hevert provides no other credible equity cost rate studies that support his 10.75% ROE recommendation. Therefore, his ROE recommendation is based on not only one model (CAPM/ECAPM), but also on only one information source (*Value Line*). There are obvious risks to relying on only one approach and information source to estimate the cost of equity capital.

B. DCF Approach

Q. PLEASE SUMMARIZE MR. HEVERT'S DCF ESTIMATES.

A. On pages 19-26 of his testimony and in Exhibit No. RBH-1, Mr. Hevert develops an equity cost rate by applying the DCF model to the Hevert Proxy Group. Mr. Hevert's DCF results are summarized on page 1 of my Exhibit JRW-9. He uses constant-growth and

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multistage growth DCF models. Mr. Hevert uses three dividend-yield measures (30, 90, and 180 days) in his DCF models. In his constant-growth and quarterly DCF models, Mr. Hevert has relied on the forecasted EPS growth rates of Zacks, IBES, and *Value Line*. For each model, he reports Mean Low, Mean, and Mean High results.

Q. WHAT ARE THE ERRORS IN MR. HEVERT'S DCF ANALYSES?

A. The primary errors in Mr. Hevert's DCF analyses are: (1) the low weight he gives to his constant-growth DCF results, and (2) his exclusive use of the overly optimistic and upwardly biased EPS growth rate forecasts of Wall Street analysts and *Value Line.*

1. The Low Weight Given to the DCF Results

Q. HOW MUCH WEIGHT HAS MR. HEVERT GIVEN HIS DCF RESULTS IN ARRIVING AT AN EQUITY COST RATE FOR THE COMPANY?

A. Apparently, very little, if any. The average of his mean constant-growth and multi-stage DCF equity cost rates is only 9.31%. Had he given these results more weight, he would have arrived at a much lower recommendation for his estimated cost of equity.

Q. IS THERE ANY REASON FOR MR. HEVERT TO IGNORE HIS DCF RESULTS DUE TO CURRENT MARKET CONDITIONS?

A. Mr. Hevert had expressed concerns with the constant-growth DCF model results because of current capital market conditions which

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includes high utility stock valuations. However, as discussed in the Moody's article I cite above, utilities have achieved higher market valuations due to cost recovery mechanisms that have reduced the risk of the utility industry, which have led to higher valuation levels.[42]

> As utilities increasingly secure more up-front assurance for cost recovery in their rate proceedings, we think regulators will increasingly view the sector as less risky. The combination of low capital costs, high equity market valuation multiples (which are better than or on par with the broader market despite the regulated utilities' low risk profile), and a transparent assurance of cost recovery tend to support the case for lower authorized returns, although because utilities will argue they should rise, or at least stay unchanged.

Therefore, Mr. Hevert's suggestion that the constant-growth DCF results may provide low results due to current market conditions is incorrect. As indicated by Moody's, the lower risk of utilities has led to higher valuation levels.

2. Wall Street Analysts' EPS Growth Rate Forecasts

Q. PLEASE DISCUSS MR. HEVERT'S EXCLUSIVE RELIANCE ON THE PROJECTED GROWTH RATES OF WALL STREET ANALYSTS AND *VALUE LINE* FOR HIS DCF ANALYSIS.

A. It seems highly unlikely that investors today would rely exclusively on the EPS growth rate forecasts of Wall Street analysts and ignore

[42] *Id*. p. 3.

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other growth rate measure in arriving at their expected growth rates for equity investments. As I previously stated, 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.

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.

Hence, using these growth rates as a DCF growth rate produces an overstated equity cost rate. A 2007 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.[43]

Q. WHY IS MR. HEVERT'S EXCLUSIVE RELIANCE ON THE PROJECTED GROWTH RATES OF WALL STREET ANALYSTS AND *VALUE LINE* PROBLEMATIC?

A. As previously discussed, the long-term EPS growth rate estimates of Wall Street analysts have been shown to be upwardly biased and overly optimistic. Therefore, exclusive reliance on these forecasts for

[43] 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.

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a DCF growth rate results in failure of one the basic inputs in the equation.

Q. ON PAGES 23-24 OF HIS TESTIMONY, MR. HEVERT CITES NINE DIFFERENT STUDIES TO SUPPORT HIS USE OF ANALYSTS' EPS GROWTH RATE FORECASTS. PLEASE DISCUSS THESE STUDIES.

A. The studies Mr. Hevert cites to support his exclusive use of analysts' EPS growth rate forecasts are all at least twenty years old. There have been many research studies on this topic over the past twenty years. I reviewed these studies earlier in my testimony. The conclusion from the more recent studies is universal – analysts' three-to-five-year EPS growth rate forecasts are overly optimistic and upwardly biased.

C. CAPM Approach

Q. PLEASE DISCUSS MR. HEVERT'S CAPM.

A. On pages 26-34 of his testimony and in Exhibit Nos. RBH-2-RBH-4, Mr. Hevert develops an equity cost rate by applying the CAPM model to the companies in his proxy group. The CAPM approach requires an estimate of the risk-free interest rate, beta, and the MRP. Mr. Hevert uses two different measures of the 30-Year Treasury bond yield: (a) current yield of 3.04% and a near-term projected yield of 3.25%; (b) two different Betas (an average Bloomberg Beta of 0.49

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and an average *Value Line* Beta of 0.59); and (c) two MRP measures – a Bloomberg, DCF-derived MRP of 10.65% and a *Value Line* DCF-derived MRP of 13.77%. Based on these figures, he finds a CAPM equity cost rate range from 8.25% to 11.34%. Mr. Hevert also employs an ad hoc version of the CAPM, the ECAPM, which makes inappropriate adjustments to the risk-free rate and the market risk premium and is an untested model in academic and profession research. Mr. Hevert's CAPM/ECAPM results are summarized on page 1 of Exhibit JRW-9.

Q. WHAT ARE THE ERRORS IN MR. HEVERT'S CAPM ANALYSES?

A. As explained further below, there are three issues with Mr. Hevert' CAPM analyses: (1) he has used current and projected risk-free rates of 3.04% and 3.25%; (2) Mr. Hevert's MRPs of 10.65% and 13.77% include highly unrealistic assumptions regarding future economic and earnings growth and stock returns; and (3) Mr. Hevert has employed an ad hoc version of the CAPM, the empirical CAPM ("ECAPM").

1. Current and Projected Risk-Free Interest Rates

Q. PLEASE DISCUSS THE RISK-FREE RATE OF INTEREST IN MR. HEVERT'S CAPM/ECAPM.

A. Mr. Hevert has used current sand projected risk-free rates of 3.04% and 3.25% in his CAPM/ECAPM analyses. The actual yield on 30-year

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Treasury bonds has been in the 2.6% range in recent months. As such, Mr. Hevert's current and projected risk-free rates are 44 and 65 basis points above the current yield on long-term Treasury bonds. This forecasted yield is excessive for two reasons. First, as discussed previously, economists are always predicting that interest rates are going up, and yet they are almost always wrong. Obviously, investors are well aware of the consistently wrong forecasts of higher interest rates, and therefore place little weight on such forecasts. Second, investors would not be buying long-term Treasury bonds at their current yields if they expected interest rates to suddenly increase. If interest rates do increase, the prices of the bonds investors bought at today's yields, go down, thereby producing a negative return.

2. Market Risk Premiums

Q. PLEASE ASSESS MR. HEVERT'S MRPS DERIVED FROM APPLYING THE DCF MODEL TO THE S&P 500 AND *VALUE LINE INVESTMENT SURVEY*.

A. For his Bloomberg and *Value Line* MRPs, Mr. Hevert computes MRPs of 10.65% and 13.77%, respectively, by: (1) calculating an expected market return by applying the DCF model to the S&P 500; and then (2) subtracting the current 30-year Treasury bond yield of 3.04% from his estimate of the expected market return. Mr. Hevert also uses (1) a dividend yield of 2.21% and an expected DCF growth rate of 11.48% for Bloomberg and (2) a dividend yield of 2.08% and

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an expected DCF growth rate of 14.73% for *Value Line.* The resulting expected annual S&P 500 stock market returns using this approach are 13.68% (using Bloomberg three- to five-year EPS growth rate estimates) and 16.81% (using *Value Line* three- to five-year EPS growth rate estimates). These results are not realistic in today's market.

Q. ARE MR. HEVERT'S MRPS OF 10.65% AND 13.77% REFLECTIVE OF THE MRPS FOUND IN STUDIES AND SURVEYS OF THE MRP?

A. No. These are well in excess of MRPs: (1) found in studies of the MRP by leading academic scholars; (2) produced by analyses of historic stock and bond returns; and (3) found in surveys of financial professionals. Page 5 of Exhibit JRW-8 provides the results of over thirty MRP studies from the past fifteen years. Historic stock and bond returns suggest an MRP in the 4.5% to 7.0% range, 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 MRP results vary from as low as 2.0% to as high as 7.31%. Finally, the MRPs developed from surveys of analysts, companies, financial professionals, and academics suggest lower MRPs, in a range of from 1.91% to 5.70%. The bottom line is that there is no support in historic return data, surveys, academic studies,

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or reports for investment firms for an MRP as high as those used by Mr. Hevert.

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

A. The key point is that Mr. Hevert's CAPM MRP methodology is based entirely on the concept that analyst projections of companies' three-to-five EPS growth rates reflect investors' expected *long-term* EPS growth for those companies. However, this seems highly unrealistic given the 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.[44] Moreover, a 2011 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.[45] The overly-optimistic inaccuracy of analysts' growth

[44] 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.

[45] M. Lacina, B. Lee, & Z. Xu, *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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rate forecasts leads to an upward bias in equity cost estimates that has been estimated at about 300 basis points.[46]

Q. HAVE CHANGES IN REGULATIONS IMPACTING WALL STREET ANALYSTS AND THEIR RESEARCH IMPACTED THE UPWARD BIAS IN THEIR THREE-TO-FIVE YEAR EPS GROWTH RATE FORECASTS?

A. No. A number of the studies I have cited here 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:[47]

> 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 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

[46] 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).

[47] 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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> 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.[48] 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. IS THERE OTHER EVIDENCE THAT INDICATES THAT MR. HEVERT'S MRPS COMPUTED USING S&P 500 EPS GROWTH RATE ARE EXCESSIVE?

A. Beyond my previous discussion of the upwardly biased nature of analysts' projected EPS growth rates, the fact is that long-term EPS growth rates of 11.48% and 14.73% are inconsistent with both

[48] 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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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 Mr. Hevert's projected EPS growth rates of 11.48% and 14.73%; (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 future.

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 DPS growth since 1960. The results are provided on page 1 of Exhibit JRW-10, and a summary is shown in Table 8, below.

Table 8
GDP, S&P 500 Stock Price, EPS, and DPS Growth
1960-Present

Nominal GDP	**6.46**
S&P 500 Stock Price	**6.71**
S&P 500 EPS	**6.89**
S&P 500 DPS	**5.85**
Average	**6.48**

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, Mr. Hevert's long-run growth rate projections of 11.55% and 15.00% are at best overstated. These estimates suggest that companies in the U.S. would be expected to: (1) increase their

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growth rate of EPS by 100% in the future, and (2) maintain that growth indefinitely in an economy that is expected to grow at about one-third of his projected growth rates.

There is a Direct Link Between Long-Term EPS and GDP Growth - The results in Exhibit JRW-10 and Table 6 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:[49]

> 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.

[49] 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 2018 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 2018 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 5, below, provides the compounded GDP growth rates for 10-, 20-, 30-, 40- and 50- years. Whereas the 50-year compounded GDP growth rate is 6.63%, 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

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that a figure in the range of 4.0% to 5.0% is more appropriate today for the U.S. economy.

Table 9
Historical Nominal GDP Growth Rates

10-Year Average		**3.37%**
20-Year Average		**4.17%**
30-Year Average		**4.65%**
40-Year Average		**5.56%**
50-Year Average		**6.36%**

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 2019) by economists in the recent *Survey of Financial Forecasters* is 4.27%.[50] The Energy Information Administration ("EIA"), in its projections used in preparing *Annual Energy Outlook,* forecasts long-term GDP growth of 4.3% for the period 2017-2050.[51] The Congressional Budget Office ("CBO"), in its forecasts for the period 2018 to 2048, projects a nominal GDP growth rate of 4.0%.[52] Finally, the Social Security

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

[51] U.S. Energy Information Administration, *Annual Energy Outlook 2018*, Table: Macroeconomic Indicators, *https://www.eia.gov/outlooks/aeo/data/browser/#/?id=18-AEO2018&sourcekey=0.*

[52] Congressional Budget Office, The *2018 Long-Term Budget Outlook*, June 1, 2018 https://www.cbo.gov/system/files?file=2018-06/53919-2018ltbo.pdf.

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Administration ("SSA"), in its Annual OASDI Report, provides a projection of nominal GDP from 2018-2095.[53] SSA's projected growth GDP growth rate over this period is 4.4%. Overall, these forecasts suggest long-term GDP growth rate in the 4.0% - 4.4% range. The trends and projections indicating slower GDP growth make Mr. Hevert's MRPs computed using analysts' projected EPS growth rates look even more unrealistic. Simply stated, Mr. Hevert's projected EPS growth rates of 11.48% and 14.73% are almost three times projected GDP growth.

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).[54] 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.

[53] Social Security Administration, *2018 Annual Report of the Board of Trustees of the Old-Age, Survivors, and Disability Insurance (OASDI) Program*, Table VI.G4, p. 211 (June 15, 2018), https://www.ssa.gov/oact/tr/2018/lr6g4.html. The 4.4% represents the compounded growth rate in projected GDP from $20,307 trillion in 2018 to $548,108 trillion in 2095.

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

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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 fifty years. They conclude that even if productivity remains at the rapid rate of the past fifty 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 6 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.[55] Volatility aside, however, it is clear that over the medium to long run, S&P 500 EPS growth does not outpace GDP growth.

[55] 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.

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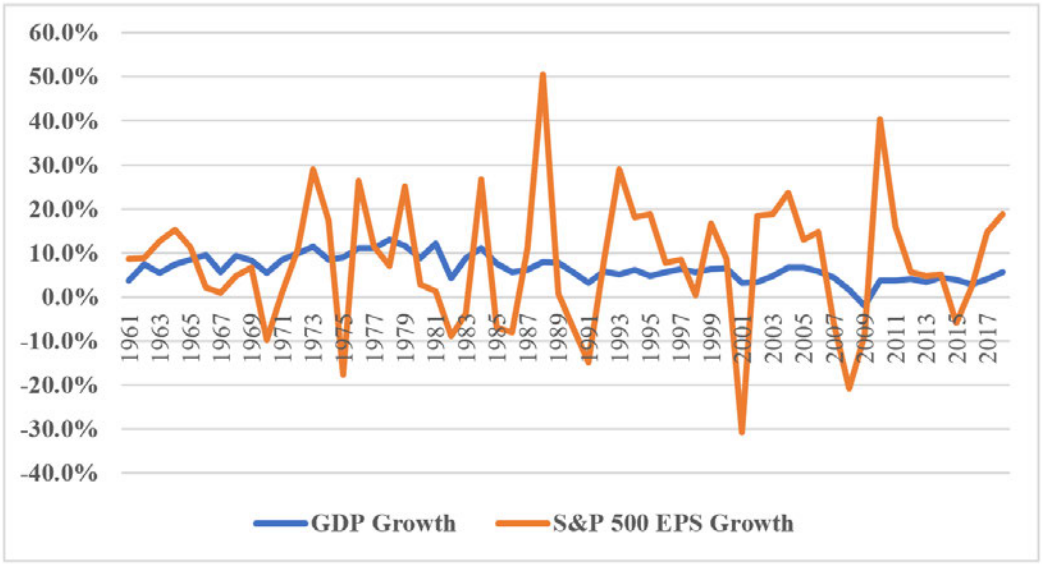
Figure 6
Average Annual Growth Rates
GDP and S&P 500 EPS
1960-2018



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."[56] Friedman also noted in the *Fortune* interview that profits must move back down to their traditional share

[56] 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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of GDP. In Table 10, below, I show that currently the aggregate net income levels for the S&P 500 companies, using 2018 figures, represent 6.73% of nominal GDP.

Table 10
S&P 500 Aggregate Net Income as a Percent of GDP

Aggregate Net Income for S&P 500 Companies ($B)	**$1,406,400.00**
2018 Nominal U.S. GDP ($B)	**$20,891,000.00**
Net Income/GDP (%)	**6.73%**

Data Sources: 2018 Net Income for S&P 500 companies – *Value Line* (March 12, 2019).
2018 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, 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

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between the S&P 500 and GDP.[57] 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 (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.[58]

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.

[57] 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/.

[58] 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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Q. PLEASE PROVIDE ADDITIONAL EVIDENCE ON HOW UNREALISTIC THE S&P 500 EPS GROWTH RATES ARE THAT MR. HEVERT USES TO COMPUTE HIS MRPS.

A. Beyond my previous discussion, I have performed the following analysis of S&P 500 EPS and GDP growth in Table 11 below. Specifically, I started with the 2018 aggregate net income for the S&P 500 companies and 2018 nominal GDP for the U.S. As shown in Table 9, the aggregate profit for the S&P 500 companies represented 6.73% of nominal GDP in 2018. In Table 7, 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 the average of Mr. Hevert's Bloomberg and *Value Line* growth rates, 11.48% and 14.73%, which is 13.11%. As a growth rate for nominal GDP, I used the average of the long-term projected GDP growth rates from CBO, SSA, and EIA (4.0%, 4.4%, and 4.3%), which is 4.23%. The projected 2050 level for the aggregate net income level for the S&P 500 companies is $72.4 trillion. However, over the same period GDP only grows to $78.7 trillion. As such, if the aggregate net income for the S&P 500 grows in accordance with the growth rates used by Mr. Hevert, 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 6.73% of GDP in 2018 to

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91.9% of GDP in 2050. Obviously, it is implausible for the net income of the S&P 500 to become such a large part of GDP.

Table 11
Projected S&P 500 Earnings and Nominal GDP
2018-2050
S&P 500 Aggregate Net Income as a Percent of GDP

	2018 Value	Growth Rate	No. of Years	2050 Value
Aggregate Net Income for S&P 500 Companies	**1,406,400.0**	**13.11%**	**32**	**72,364,670.4**
2018 Nominal U.S. GDP	**20,891,000.0**	**4.23%**	**32**	**78,735,624.7**
Net Income/GDP (%)	**6.73%**			**91.91%**

Data Sources: 2018 Aggregate Net Income for S&P 500 companies – *Value Line* (March 12, 2019).
2018 Nominal GDP – Moody's - https://www.economy.com/united-states/nominal-gross-domestic-product.
S&P 500 EPS Growth Rate - Average of Hevert's Bloomberg and *Value Line* growth rates - 11.48% and 14.73%;
Nominal GDP Growth Rate – The average of the long-term projected GDP growth rates from CBO, SSA, and EIA (4.0%, 4.4%, and 4.3%).

Q. PLEASE PROVIDE A SUMMARY ANALYSIS OF 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

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historically high levels. In a famous 1999 *Fortune* article, Mr. Buffet made the following observation:[59]

> 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, Mr. Hevert's long-term S&P 500 EPS growth rates of 11.48% and 14.73% are grossly overstated and have 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

[59] 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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absurd: "The idea of 8% or 10% or 12% growth is ridiculous. It will not happen."[60]

Q. PLEASE PROVIDE ADDITIONAL INSIGHTS INTO THE CAPM RESULTS FROM USING *VALUE LINE* DATA.

A. The are several additional issues with the *Value Line* results. Simply put, the 16.81% expected stock market return (Mr. Hevert's Exhibit RBH-2 at page 14) is simply outrageous. The compounded annual return in the U.S. stock market is about 10% (9.49% according to Damodaran between 1928-2018).[61] Mr. Hevert's *Value Line* CAPM results assume that return on the U.S. stock market will be more than 50% higher in the future than it has been in the past. The extremely high expected stock market return, and the resulting MRP and equity cost rate results, is directly related to the 14.73% expected EPS growth rate. There are numerous fallacies with this growth rate. First, the expected growth rate is not from today going forward, but instead it is computed from a three-year base period in the past (2015-2017) to a projected three-year period in the future (2021-2023). The problem here is that it incorporates historic growth in the base period, which can inflate projected growth for the future if the base period includes poor earnings. Second, and most significantly, a projected

[60] 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/.

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

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growth rate of 14.73% does not reflect economic reality. As noted above, it assumes that S&P 500 companies can grow their earnings in the future at a rate that is triple the expected GDP growth rate.

3. ECAPM

Q. WHAT ISSUES DO YOU HAVE WITH MR. HEVERT'S ECAPM?

A. Mr. Hevert has employed a variation of the CAPM which he calls the 'ECAPM.' The ECAPM, as popularized by rate of return consultant Dr. Roger Morin, attempts to model the well-known finding of tests of the CAPM that have indicated the Security Market Line ("SML") is not as steep as predicted by the CAPM. As such, the ECAPM is nothing more than an ad hoc version of the CAPM and has not been theoretically or empirically validated in refereed journals. The ECAPM provides for weights which are used to adjust the risk-free rate and MRP in applying the ECAPM. Mr. Hevert uses 0.25 and 0.75 factors in his ECAPM.

Besides the fact that the ECAPM is not a recognized equity cost rate model, Mr. Hevert has already accounted for any empirical issues with the CAPM by using adjusted betas for *Value Line*. Adjusted betas address the empirical issues with the CAPM by increasing the expected returns for low beta stocks and decreasing the returns for high beta stocks.

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D. Bond Yield Risk Premium Approach

Q. PLEASE DISCUSS MR. HEVERT'S BYRP APPROACH.

A. On pages 34-7 of his testimony and in Exhibit No. RBH-5, Mr. Hevert develops an equity cost rate using his BYRP approach. Mr. Hevert develops an equity cost rate by: (1) regressing the average quarterly authorized returns on equity for electric utility companies from the January 1, 1992, to February 27, 2019, time period on the thirty-year Treasury Yield; and (2) adding the appropriate risk premium established in step (1) to three different thirty-year Treasury yields: (a) the current yield of 3.04%; (b) a near-term projected yield of 3.25%; and (c) a long-term projected yield of 4.05%. Mr. Hevert's risk premium results are provided on Exhibit JRW-9. He reports BYRP equity cost rates ranging from 9.93% to 10.17%.

Q. WHAT ARE THE ERRORS IN MR. HEVERT'S BYRP ANALYSIS?

A. The errors include the base yield as well as the measurement and magnitude of the risk premium.

1. Base Yields

Q. PLEASE DISCUSS THE BASE YIELD OF MR. HEVERT'S BYRP ANALYSIS.

A. Mr. Hevert has used current, near-term projected, and long-term projected risk-free rates of 3.04%, 3.25%, and 4.05% in his BYRP analyses. The actual yield on 30-year Treasury bonds has been in the

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2.6% range in recent months. As such, Mr. Hevert's current, near-term projected, and long-term projected risk-free rates are 44, 65, and 145 basis points, respectively, above the current yield on long-term Treasury bonds. These current and forecasted yields are excessive for two reasons. First, as discussed previously, economists are always predicting that interest rates are going up, and yet they are almost always wrong. Obviously, investors are well aware of the consistently wrong forecasts of higher interest rates, and therefore place little weight on such forecasts. Second, investors would not be buying long-term Treasury bonds at their current yields if they expected interest rates to suddenly increase. If interest rates do increase, the prices of the bonds investors bought at today's yields go down, thereby producing a negative return.

2. Risk Premium

Q. WHAT ARE THE ISSUES WITH MR. HEVERT'S RISK PREMIUM?

A. There are several problems with his approach. First, his BYRP methodology produces an inflated measure of the risk premium because the approach uses historic authorized ROEs and Treasury yields, and the resulting risk premium is applied to projected Treasury yields. Since Treasury yields are always forecasted to increase, the resulting risk premium would be smaller if calculated correctly, which would be to use projected Treasury yields in the analysis rather than historic Treasury yields.

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In addition, Mr. Hevert's BYRP approach is a gauge of *commission* behavior and not *investor* behavior. Capital costs are determined in the market place through the financial decisions of investors and are reflected in such fundamental factors as dividend yields, expected growth rates, interest rates, and investors' assessment of the risk and expected return of different investments. Regulatory commissions evaluate capital market data in setting authorized ROEs, but also consider other utility- and rate case-specific information in setting ROEs. As such, Mr. Hevert's approach and results reflect factors such as capital structure, credit ratings and other risk measures, service territory, capital expenditures, energy supply issues, rate design, investment and expense trackers, and other factors used by utility commissions in determining an appropriate ROE in addition to capital costs. This may especially be true when the authorized ROE data includes the results of rate cases that are settled and not fully litigated.

Finally, Mr. Hevert's methodology produces an inflated required rate of return because utilities have been selling at market-to-book ratios well in excess of 1.0 for many years. This indicates that the authorized and earned rates of return on equity have been greater than the return that investors require. The relationship between ROE, the equity cost rate, and market-to-book ratios was explained earlier in this testimony. In short, a market-to-book ratio

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above 1.0 indicates a company's ROE is above its equity cost rate. Therefore, the risk premium produced from the study is overstated as a measure of investor return requirements and produces an inflated equity cost rate.

E. Expected Earnings Approach

Q. PLEASE REVIEW MR. HEVERT'S EXPECTED EARNINGS APPROACH.

A. On pages 42-45 of his testimony and in Exhibit RBH-6, Mr. Hevert develops an equity cost rate using his Expected Earnings approach. Mr. Hevert's approach involves using *Value Line*'s projected ROE for the years 2021-23/2022-24 for his proxy group and then adjusting this ROE to account for the fact that *Value Line* uses year-end equity in computing ROE. Mr. Hevert reports Expected Earnings results of 10.38% and 10.52%.

Q. PLEASE ADDRESS THE ISSUES WITH MR. HEVERT'S EXPECTED EARNINGS APPROACH.

A. There are a number of issues with this so-called Expected Earnings approach. As such, I strongly suggest that the Commission ignore this approach in setting a ROE for DENC. These issues include:

The Expected Earnings Approach Does Not Measure the Market Cost of Equity Capital – First and foremost, this accounting-based methodology does not measure investor return requirements.

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As indicated by Professor Roger Morin, a long-term utility rate of return consultant, "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."[62] As such, this method does not measure the market cost of equity because there is no way to assess whether the earnings are greater than or less than the earnings investors require, and therefore this approach does not measure the market cost of equity capital.

The Expected ROEs are not Related to Investors' Market-Priced Opportunities – The ROE ratios are an accounting measure that do not measure investor return requirements. Investors had no opportunity to invest in the proxy companies at the accounting book value of equity. In other words, the equity's book value *to investors* is tied to market prices, which means that investors' required return on market-priced equity aligns with expected return on book equity only when the equity's market price and book value are aligned. Therefore, a market-based evaluation of the cost of equity to investors in the proxies requires an associated analysis of the proxies' market-to-book ("M/B") ratios. This was discussed at length

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

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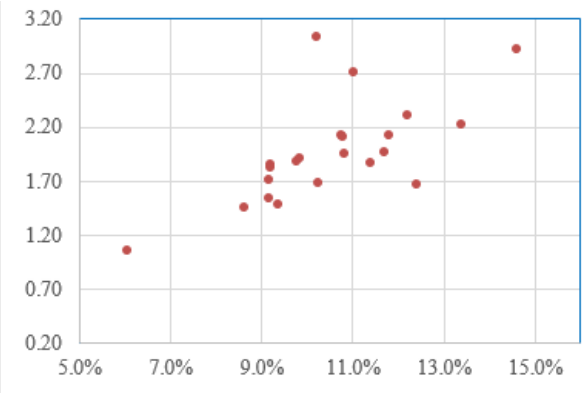
earlier in my testimony. In addition, as shown in Figure 7, below, there is a strong positive relationship between Mr. Hevert's expected ROEs and the M/B ratios for his proxy companies.

Figure 7
Expected ROEs and M/B Ratios
Hevert Proxy Group



Data Sources: ROEs – Exhibit RBH 6, M/B Ratios – Exhibit JRW-2.

Changes in ROE Ratios do not Track Capital Market Conditions - As also indicated by Morin, "The 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."[63]

There is a Strong Negative Relationship between the ROE Ratios and the Common Equity Ratios for the Proxy Companies - As shown in Figure 8 below, there is a strong negative relationship

[63] *Id.*

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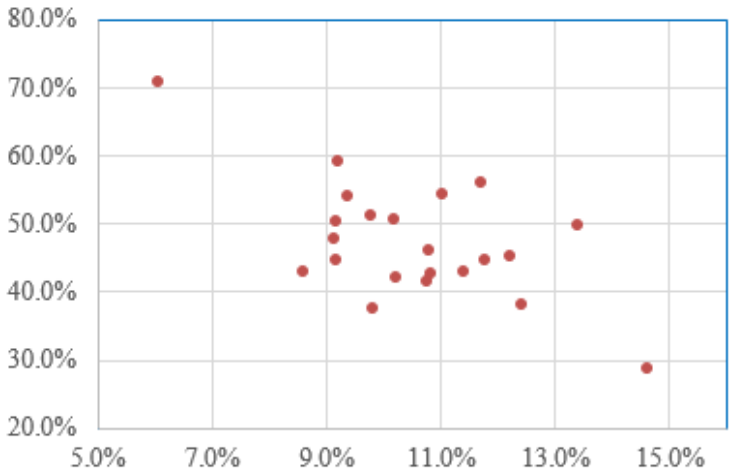
between the proxies' ROEs and their common equity ratios. That is, proxy companies with lower common equity ratios have higher ROEs, and vice-versa. Since the proxy companies have a lower average common equity ratio (45.2%) as opposed to DENC's proposed common equity ratios (51.65%), DENC's lower financial risk associated with a higher common equity ratio implies that DENC would have a lower ROE, if ROEs ratios correlated with equity's risks and costs.

Figure 8
Expected ROEs and Common Equity Ratios
Hevert Proxy Group



Data Sources: ROEs – Exhibit RBH 6, M/B Ratios – Exhibit JRW-2

The Expected Earnings Approach is Circular - The proxies' ROEs ratios are not determined by competitive market forces, but instead are largely the result of federal and state rate regulation, including the present proceedings.

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The Proxies' ROEs Reflect Earnings on Business Activities that are not Representative of DENC'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 regulated electric utility service. These include earnings from: (1) unregulated businesses including merchant generation; (2) electric generation; and (3) international operations.

Q. PLEASE SUMMARIZE YOUR ANALYSIS OF MR. HEVERT'S EXPECTED EARNINGS APPROACH.

A. In short, Mr. Hevert's Expected Earnings approach does not measure the market cost of equity capital, is independent of most cost of capital indicators and, as shown above, has a number of other empirical issues. Therefore, the Commission should ignore this approach in determining the appropriate ROE for DENC.

F. Other Issues

1. DENC's Capital Expenditures

Q. PLEASE ADDRESS MR. HEVERT'S CONSIDERATION OF OTHER UNIQUE RISK FACTORS FACED BY DENC.

A. Mr. Hevert also considers the magnitude of DENC's capital expenditures in arriving at his 10.75% ROE recommendation. Capital expenditures are a risk factor considered as part of the credit-rating

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process used by major rating agencies. In addition, as I noted above, DENC's S&P and Moody's credit ratings of BBB+ and A2 suggest that the Company's investment risk is below the average of the proxy groups.

2. Flotation Costs

Q. PLEASE DISCUSS MR. HEVERT'S ADJUSTMENT FOR FLOTATION COSTS.

A. Mr. Hevert argues that a flotation cost adjustment is appropriate for DENC and he has considered flotation costs in arriving at his 10.75% ROE recommendation.

First and foremost, Mr. Hevert has not identified any flotation cost for DENC. 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 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

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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

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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

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

VII. NORTH CAROLINA ECONOMIC CONDITIONS AND DENC'S RATE OF RETURN RECOMMENDATION

Q. PLEASE DISCUSS MR. HEVERT'S CONSIDERATION OF ECONOMIC CONDITIONS IN NORTH CAROLINA.

A. Mr. Hevert has acknowledged that the North Carolina Utilities Commission must balance the interests of investors and customers in setting the ROE. In addition, Mr. Hevert notes that the Commission's task is to set rates as low as possible consistent with the dictates of the United States and North Carolina Constitutions.[64] On this issue, the ROE should be the minimum amount needed to meet the *Hope* and *Bluefield* standards. Finally, Mr. Hevert also highlights that the North Carolina Supreme Court has indicated that in retail utility service rate cases the Commission must make findings

[64] State of North Carolina Utilities Commission, Docket No. E-7, Sub 1026, Order Granting General Rate Increase, Sept. 24, 2013 at 24; *see also* DEC Remand Order at 40 ("the Commission in every case seeks to comply with the North Carolina Supreme Court's mandate that the Commission establish rates as low as possible within Constitutional limits.").

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of fact regarding the impact of changing economic conditions on customers when determining the proper ROE for a public utility.[65]

With respect to this latter mandate, Mr. Hevert evaluates a number of factors such as employment and income levels and, based on his review of the data, comes to the conclusion that DENC's proposed ROE of 10.75 percent is fair and reasonable to DENC, its shareholders, and its customers in light of the effect of those changing economic conditions.[66]

Q. DO YOU AGREE WITH MR. HEVERT'S ASSESSMENT OF ECONOMIC CONDITIONS IN NORTH CAROLINA?

A. As highlighted by the correlations between U.S. and North Carolina economic data, I agree with Mr. Hevert that economic conditions in North Carolina have improved with the overall economy over the past decade.

Q. DO YOU AGREE WITH MR. HEVERT'S CONCLUSION THAT THE IMPROVEMENT IN ECONOMIC CONDITIONS IN NORTH CAROLINA AND THE COMPANY'S SERVICE TERRITORY JUSTIFY THE COMPANY'S PROPOSED RATE OF RETURN INCLUDING A 10.75% ROE?

[65] *State of North Carolina ex rel. Utilities Commission v. Cooper*, 758 S.E.2d 635, 642 (2014) ("Cooper II").
[66] Hevert Testimony, pp. 57-58.

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A. No. Whereas economic conditions have improved in North Carolina, it does not necessarily justify such a high rate of return and ROE. I have three observations on Mr. Hevert's assessment of the economic conditions in North Carolina and DENC's service territory and its requested ROE:

1. As previously discussed, DENC's ROE request of 10.75% is over 100 basis points above the average authorized ROEs for electric utilities over the 2018-19 time period;

2. Whereas North Carolina's unemployment rate has fallen by one-third since its peak in the 2009-2010 period and is slightly below the national average of 3.90%, the unemployment rate in DENC's service territory is 4.95%, over 100 basis points higher than the national and North Carolina averages; and

3. Whereas North Carolina's residential electric rates are below the national average, North Carolina's median household income is more than 10% below the U.S. norm.

Q. WHAT IS YOUR CONCLUSION REGARDING THE ECONOMIC CONDITIONS IN NORTH CAROLINA AND THE COMPANY'S SERVICE TERRITORY?

A. The lower level of household income in the state and the higher level of unemployment in DENC's service territory suggest that affordability can be an issue for an essential utility service such as

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electricity. Certainly, it does not justify an authorized ROE that is over 100 basis points above the national average. And DENC's overall rate of return request has a significant impact on its overall requested increase in revenues.

Q DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes, it does.

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APPENDIX A
PAGE 1 OF 3

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.

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Over the past twenty-five years, Dr. Woolridge has prepared testimony and/or provided consultation services in regulatory rate cases in the rate of return area in the 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, and Wisconsin, as well as in Washington, D.C. He has also testified before the Federal Energy Regulatory Commission.

J. Randall Woolridge

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State College, PA 16801
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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.

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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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Docket No. E-22, SUB 562
Exhibit JRW-1
Recommended Cost of Capital
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Exhibit JRW-1

Dominion Energy North Carolina
Recommended Cost of Capital

Panel A - Primary Cost of Capital Recommendation

Capital Source	Capitalization Ratios*	Cost Rate	Weighted Cost Rate
Long-Term Debt	50.00%	4.44%	2.22%
Common Equity	50.00%	9.00%	4.50%
Total Capitalization	100.00%		6.72%

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

Panel B - Alternative Cost of Capital Recommendation

Capital Source	Capitalization Ratios*	Cost Rate	Weighted Cost Rate
Long-Term Debt	46.35%	4.44%	2.06%
Common Equity	53.65%	8.75%	4.69%
Total Capitalization	100.00%		6.75%

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

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Exhibit JRW-2

Dominion Energy North Carolina

Panel A
Electric Proxy Group

Company	Ticker	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)	ALE	$1,498.6	71%	0%	$3,904.4	$3,993.8	BBB+	Baa1	3.34	MN, WI	59.2%	8.2%	1.85
Alliant Energy Corporation (NYSE-LNT)	LNT	$3,534.5	85%	13%	$12,462.4	$10,172.3	A-	Baa1	3.31	WI,IA,IL,MN	44.6%	11.4%	2.13
Ameren Corporation (NYSE-AEE)	AEE	$6,291.0	85%	15%	$22,810.0	$16,366.8	BBB+	Baa1	3.64	IL,MO	46.2%	10.9%	2.11
American Electric Power Co. (NYSE-AEP)	AEP	$16,195.7	88%	0%	$55,099.1	$37,379.9	A-	Baa1	2.99	10 States	42.7%	10.3%	1.96
AVANGRID, Inc. (NYSE-AGR)	AGR	$6,291.0	56%	23%	$22,810.0	$16,366.8	BBB+	Baa1	3.53	NY,CT,ME	70.8%	3.9%	1.06
CMS Energy Corporation (NYSE-CMS)	CMS	$6,873.0	66%	28%	$18,126.0	$13,966.2	BBB+	Baa1	2.67	MI	28.9%	14.2%	2.91
Consolidated Edison, Inc. (NYSE-ED)	ED	$12,337.0	70%	19%	$41,749.0	$25,673.3	A-	A3	3.03	NY,PA	44.8%	8.6%	1.52
Duke Energy Corporation (NYSE-DUK)	DUK	$24,521.0	90%	7%	$91,694.0	$63,736.1	A-	Baa1	2.47	NC,OH,FL,SC,KY	43.1%	6.2%	1.45
Edison International (NYSE-EIX)	EIX	$12,657.0	100%	0%	$41,348.0	$18,107.4	BBB	Baa3	(0.48)	CA	45.1%	-2.4%	1.43
Entergy Corporation (NYSE-ETR)	ETR	$11,009.5	85%	1%	$31,974.4	$16,448.0	BBB+	Baa2	0.69	LA,AR,MS,TX	32.8%	10.2%	1.86
Eversource Energy (NYSE-ES)	ES	$8,448.2	79%	10%	$25,610.4	$21,470.9	A-	Baa1	3.67	CT,NH,MA	46.7%	9.2%	1.87
Exelon Corporation (NYSE-EXC)	EXC	$11,009.5	56%	5%	$31,974.4	$46,448.0	BBB+	Baa2	2.44	PA,NJ,IL,MD,DCDE	47.8%	6.4%	1.40
FirstEnergy Corporation (NYSE-FE)	FE	$11,261.0	91%	0%	$29,911.0	$18,851.1	BBB	Baa3	2.17	OH,PA,NY,NJ,WV,MD	25.8%	25.1%	2.77
Hawaiian Electric Industries (NYSE-HEC)	HE	$2,860.8	89%	0%	$4,830.1	$4,060.1	BBB-	NR	3.87	HI	51.2%	9.6%	1.88
IDACORP, Inc. (NYSE-IDA)	IDA	$1,370.8	100%	0%	$4,395.7	$8,562.5	BBB	Baa1	3.85	ID	56.4%	9.8%	3.60
MGE Energy, Inc. (NYSE-MGEE)	MGEE	$559.8	72%	28%	$1,509.4	$2,303.7	AA-	Aa2	7.69	WI	61.5%	10.6%	2.82
NextEra Energy, Inc. (NYSE-NEE)	NEE	$16,727.0	71%	0%	$70,334.0	$83,224.6	A-	Baa1	5.87	FL	49.8%	17.3%	2.22
NorthWestern Corporation (NYSE-NWE)	NWE	$1,192.0	77%	23%	$4,521.3	$2,991.2	BBB	NR	2.94	MT,SD,NE	47.8%	10.5%	1.54
OGE Energy Corp. (NYSE-OGE)	OGE	$2,270.3	100%	0%	$8,643.8	$7,899.1	BBB+	NR	4.19	OK,AR	56.0%	10.8%	1.97
Pinnacle West Capital Corp. (NYSE-PNW)	PNW	$3,691.2	95%	0%	$14,029.6	$16,260.8	A-	A3	4.04	AZ	50.6%	10.1%	3.04
PNM Resources, Inc. (NYSE-PNM)	PNM	$1,436.6	100%	0%	$5,234.6	$3,360.4	BBB+	Baa3	1.73	NM,TX	37.6%	5.8%	1.92
Portland General Electric Company (NYSE-POR)	POR	$1,991.0	100%	0%	$6,887.0	$4,287.2	BBB+	A3	2.85	OR	50.3%	8.6%	1.71
PPL Corporation (NYSE-PPL)	PPL	$7,785.0	94%	4%	$34,458.0	$20,457.2	A-	Baa2	3.37	PA,KY	34.6%	16.3%	1.75
Sempra Energy (NYSE-SRE)	SRE	$1,991.0	56%	44%	$6,887.0	$31,467.5	BBB+	Baa1	2.02	CA,TX	43.1%	6.5%	1.63
Southern Company (NYSE-SO)	SO	$23,495.0	65%	14%	$80,797.0	$48,493.6	A-	Baa2	2.49	GA,FL,NJ,IL,VA,TN,MS	38.3%	8.4%	1.67
WEC Energy Group (NYSE-WEC)	WEC	$7,679.5	58%	42%	$22,000.9	$22,541.0	A-	Baa1	3.76	WI,IL,MN,MI	45.3%	3.3%	2.30
Xcel Energy Inc. (NYSE-XEL)	XEL	$11,537.0	84%	15%	$36,944.0	$25,972.7	A-	Baa1	3.21	MN,WI,ND,SD,MI	41.5%	10.7%	2.13
Mean		$8,019.0	81%	11%	$27,072.1	$21,883.8	BBB+	Baa1	3.16		46.0%	9.7%	2.02
Median		$6,873.0	85%	5%	$22,810.0	$16,448.0	BBB+	Baa1	3.21		45.3%	9.8%	1.88

Data Source Company 2018 SEC 10-K filings; *Value Line Investment Survey* , 2019.

Panel B
Hevert Proxy Group

Company	Ticker	Operating Revenue ($mil)	Percent Reg Elec Revenue	Percent Reg Gas Revenue	Net Plant ($mil)	Market Cap ($bil)	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)	ALE	$1,498.6	71%	0%	$3,904.4	$3,993.8	BBB+	A3	3.34	MN, WI	59.2%	8.2%	1.85
Alliant Energy Corporation (NYSE-LNT)	LNT	$3,534.5	85%	13%	$12,462.4	$10,172.3	A-	Baa1	3.31	WI,IA,IL,MN	44.6%	11.4%	2.13
Ameren Corporation (NYSE-AEE)	AEE	$6,291.0	85%	15%	$22,810.0	$16,366.8	BBB+	Baa1	3.64	IL,MO	46.2%	10.9%	2.11
American Electric Power Co. (NYSE-AEP)	AEP	$16,195.7	88%	0%	$55,099.1	$37,379.9	A-	Baa1	2.99	10 States	42.7%	10.3%	1.96
AVANGRID, Inc. (NYSE-AGR)	AGR	$6,291.0	56%	23%	$22,810.0	$16,366.8	BBB+	Baa1	3.53	NY,CT,ME	70.8%	3.9%	1.06
Black Hills Corporation (NYSE-BKH)	BKH	$1,754.3	41%	58%	$4,854.9	$3,842.7	BBB+	Baa2	2.77	CO,SD,WY,MT	42.1%	13.3%	1.68
CMS Energy Corporation (NYSE-CMS)	CMS	$6,873.0	66%	28%	$18,126.0	$13,966.2	BBB+	Baa1	2.67	MI	28.9%	14.2%	2.91
DTE Energy Company (NYSE-DTE)	DTE	$14,212.0	37%	39%	$21,650.0	$20,066.4	BBB+	Baa1	3.15	MI	42.9%	10.8%	1.87
Duke Energy Corporation (NYSE-DUK)	DUK	$24,521.0	90%	7%	$91,694.0	$63,736.1	A-	Baa1	2.47	NC,OH,FL,SC,KY	43.1%	6.2%	1.45
Evergy (NYSE:EVRG)	EVRG	$4,275.9	100%	0%	$18,782.5	$14,840.0	A-	Baa1	3.11	KS,MO	54.2%	7.9%	1.49
Hawaiian Electric Industries (NYSE-HEC)	HE	$2,860.8	89%	0%	$4,830.1	$4,060.1	BBB-	NR	3.87	HI	51.2%	9.6%	1.88
NextEra Energy, Inc. (NYSE-NEE)	NEE	$16,727.0	71%	0%	$70,334.0	$83,224.6	A-	Baa1	5.87	FL	49.8%	17.3%	2.22
NorthWestern Corporation (NYSE-NWE)	NWE	$1,192.0	77%	23%	$4,521.3	$2,991.2	BBB	NR	2.94	MT,SD,NE	47.8%	10.5%	1.54
OGE Energy Corp. (NYSE-OGE)	OGE	$2,270.3	100%	0%	$8,643.8	$7,899.1	BBB+	Baa1	4.19	OK,AR	56.0%	10.8%	1.97
Otter Tail Corporation (NDQ-OTTR)	OTTR	$916.4	49%	0%	$1,581.1	$1,975.3	BBB	Baa2	4.19	OK,AR	54.5%	11.6%	2.71
Pinnacle West Capital Corp. (NYSE-PNW)	PNW	$3,691.2	95%	0%	$14,029.6	$16,260.8	A-	A3	4.04	AZ	50.6%	10.1%	3.04
PNM Resources, Inc. (NYSE-PNM)	PNM	$1,436.6	100%	0%	$5,234.6	$3,360.4	BBB+	Baa3	1.73	NM,TX	37.6%	5.8%	1.92
Portland General Electric Company (NYSE-POR)	POR	$1,991.0	100%	0%	$6,887.0	$4,287.2	BBB+	A3	2.85	OR	50.3%	8.6%	1.71
Southern Company (NYSE-SO)	SO	$23,495.0	65%	14%	$80,797.0	$48,493.6	A-	Baa2	2.49	GA,FL,NJ,IL,VA,TN,MS	38.3%	8.4%	1.67
WEC Energy Group (NYSE-WEC)	WEC	$7,679.5	58%	42%	$22,000.9	$22,541.0	A-	Baa1	3.76	WI,IL,MN,MI	45.3%	3.3%	2.30
Xcel Energy Inc. (NYSE-XEL)	XEL	$11,537.0	84%	15%	$36,944.0	$25,972.7	A-	A3	3.21	MN,WI,ND,SD,MI	41.5%	10.7%	2.13
Mean		$7,583.0	77%	13%	$25,142.7	$20,085.6	BBB+	Baa1	3.34		47.5%	9.7%	1.98
Median		$4,275.9	84%	7%	$18,126.0	$14,840.0	BBB+	Baa1	3.21		46.2%	10.3%	1.92

Data Source Company 2018 SEC 10-K filings; *Value Line Investment Survey* , 2019.

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Exhibit JRW-2
Dominion Energy North Carolina
***Value Line* Risk Metrics**

Panel A
Electric Proxy Group

Company	Beta	Financial Strength	Safety	Earnings Predictability	Stock Price Stability
ALLETE, Inc. (NYSE-ALE)	0.65	A	2	85	95
Alliant Energy Corporation (NYSE-LNT)	0.60	A	2	85	100
Ameren Corporation (NYSE-AEE)	0.60	A	2	80	95
American Electric Power Co. (NYSE-AEP)	0.55	A+	1	85	100
AVANGRID, Inc. (NYSE-AGR)	0.40	B++	2	NMF	95
CMS Energy Corporation (NYSE-CMS)	0.55	B++	2	90	100
Consolidated Edison, Inc. (NYSE-ED)	0.45	A+	1	95	100
Duke Energy Corporation (NYSE-DUK)	0.50	A	2	85	100
Edison International (NYSE-EIX)	0.60	B+	3	15	85
Entergy Corporation (NYSE-ETR)	0.60	B++	3	60	95
Eversource Energy (NYSE-ES)	0.60	A	1	95	100
Exelon Corporation (NYSE-EXC)	0.70	B++	3	55	90
FirstEnergy Corporation (NYSE-FE)	0.65	B++	2	40	90
Hawaiian Electric Inductries (NYSE-HEC)	0.55	A	2	60	100
IDACORP, Inc. (NYSE-IDA)	0.60	A	2	95	95
MGE Energy, Inc. (NYSE-MGEE)	0.55	A	1	95	85
NextEra Energy, Inc. (NYSE-NEE)	0.60	A+	1	70	100
NorthWestern Corporation (NYSE-NWE)	0.60	B++	2	85	95
OGE Energy Corp. (NYSE-OGE)	0.80	A	2	80	95
Pinnacle West Capital Corp. (NYSE-PNW)	0.55	A+	1	95	100
PNM Resources, Inc. (NYSE-PNM)	0.60	B+	3	75	85
Portland General Electric Company (NYSE-POR)	0.60	B++	2	85	95
PPL Corporation (NYSE-PPL)	0.70	B++	2	70	95
Sempra Energy (NYSE-SRE)	0.75	A	2	75	95
Southern Company (NYSE-SO)	0.50	A	2	90	100
WEC Energy Group (NYSE-WEC)	0.50	A+	1	90	95
Xcel Energy Inc. (NYSE-XEL)	0.50	A+	1	100	100
Mean	0.59	A	1.9	78	96

Data Source: *Value Line Investment Survey* , 2019.

Panel B
Hevert Proxy Group

Company	Beta	Financial Strength	Safety	Earnings Predictability	Stock Price Stability
ALLETE, Inc. (NYSE-ALE)	0.65	A	2	85	95
Alliant Energy Corporation (NYSE-LNT)	0.60	A	2	85	95
Ameren Corporation (NYSE-AEE)	0.60	A	2	80	95
American Electric Power Co. (NYSE-AEP)	0.55	A+	1	85	100
AVANGRID, Inc. (NYSE-AGR)	0.40	B++	2	NMF	95
Black Hills Corporation (NYSE-BKH)	0.75	A	2	55	80
CMS Energy Corporation (NYSE-CMS)	0.55	B++	2	90	100
DTE Energy Company (NYSE-DTE)	0.55	B++	2	85	100
Duke Energy Corporation (NYSE-DUK)	0.45	A	2	85	100
Evergy (NYSE:EVRG)	NMF	B++	2	NMF	NMF
Hawaiian Electric Inductries (NYSE-HEC)	0.55	A	2	60	100
NextEra Energy, Inc. (NYSE-NEE)	0.60	A+	1	70	100
NorthWestern Corporation (NYSE-NWE)	0.60	B++	2	85	95
OGE Energy Corp. (NYSE-OGE)	0.80	A	2	80	95
Otter Tail Corporation (NDQ-OTTR)	0.70	A	2	60	90
Pinnacle West Capital Corp. (NYSE-PNW)	0.55	A+	1	95	100
PNM Resources, Inc. (NYSE-PNM)	0.60	B+	3	75	85
Portland General Electric Company (NYSE-POR)	0.60	B++	2	85	95
Southern Company (NYSE-SO)	0.50	A	2	90	100
WEC Energy Group (NYSE-WEC)	0.50	A+	1	90	95
Xcel Energy Inc. (NYSE-XEL)	0.50	A+	1	100	100
Mean	0.58	A	1.8	81	96

Data Source: *Value Line Investment Survey* , 2019.

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Docket No. E-22, SUB 562
Exhibit JRW-2
Value Line Risk Metrics for Proxy Groups
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Value Line Risk Metrics

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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Exhibit JRW-3
Capital Structure Ratios and Debt Cost Rates
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Exhibit JRW-3

Dominion Energy North Carolina
Capital Structure Ratios and Debt Cost Rates

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

	Percent of Total	Cost
Long-Term Debt	46.35%	4.44%
Common Equity	53.65%	
Total Capital	100.00%	

Panel B - Dominion Energy's Capital Structure Ratios - 12-31-18

	12/31/2018	Percent with Short-Term Debt	Percent without Short-Term Debt
Short-Term Debt	$ 3,650,000	6.6%	0.0%
Long-Term Debt	$ 31,260,000.00	56.8%	60.9%
Common Equity	$ 20,107,000.00	36.5%	39.1%
Total Capital	$ 55,017,000.00	100.0%	100.00%

Panel C Staff's Capital Structure Ratios and Debt Cost Rates

	DENC Proposed	Adjustment	Staff Proposed	Cost
Long-Term Debt	46.35%	1.078725	50.00%	4.44%
Common Equity	53.65%	0.931984	50.00%	
Total Capital	100.00%		100.00%	

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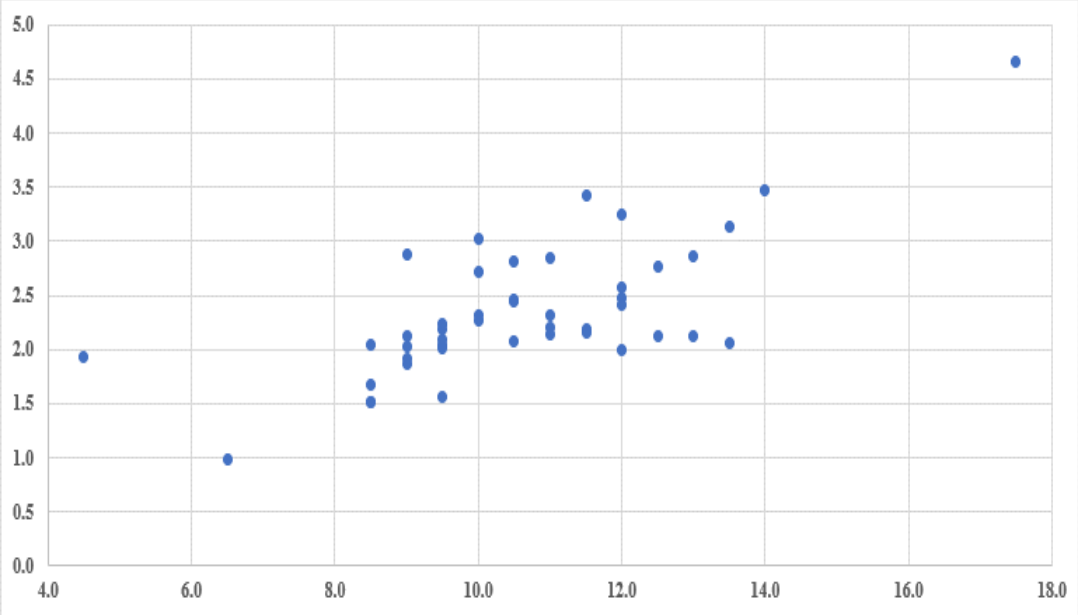
Exhibit JRW-4
Electric Utilities and Gas Distribution Companies

Market-to-Book



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

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Exhibit JRW-5
Long-Term 'A' Rated Public Utility Bonds

Data Source: Mergent Bond Record

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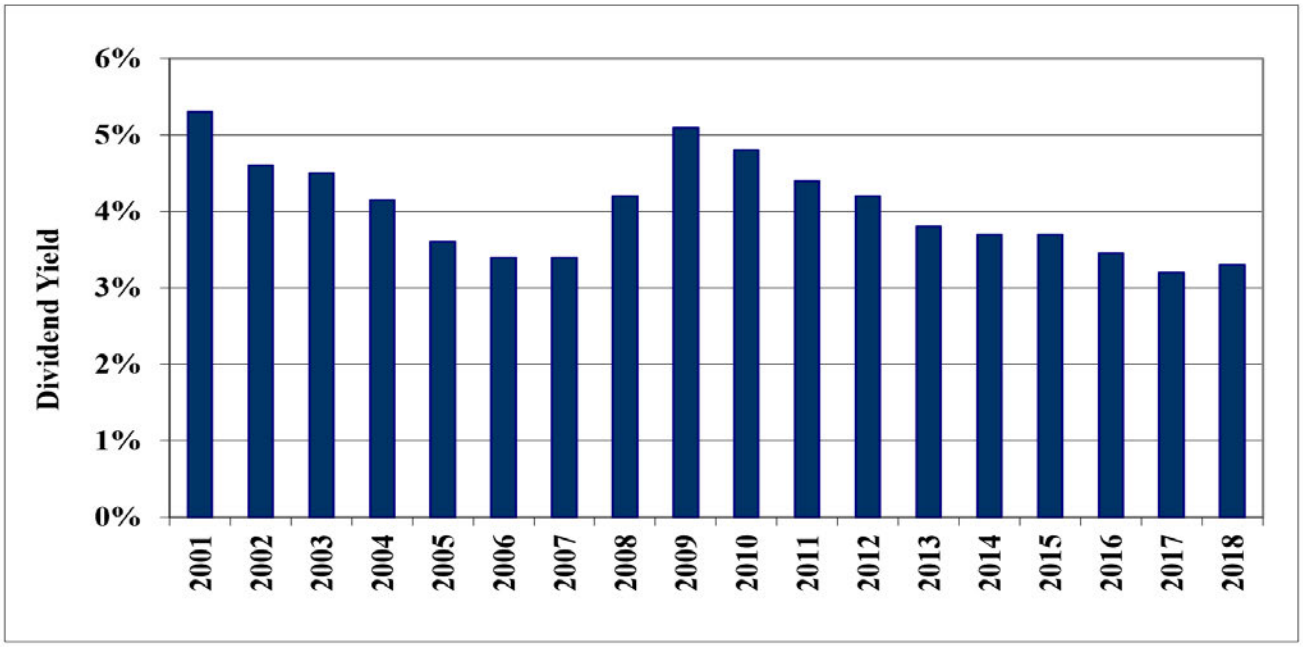
Exhibit JRW-5

Electric Utility Average Dividend Yield



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

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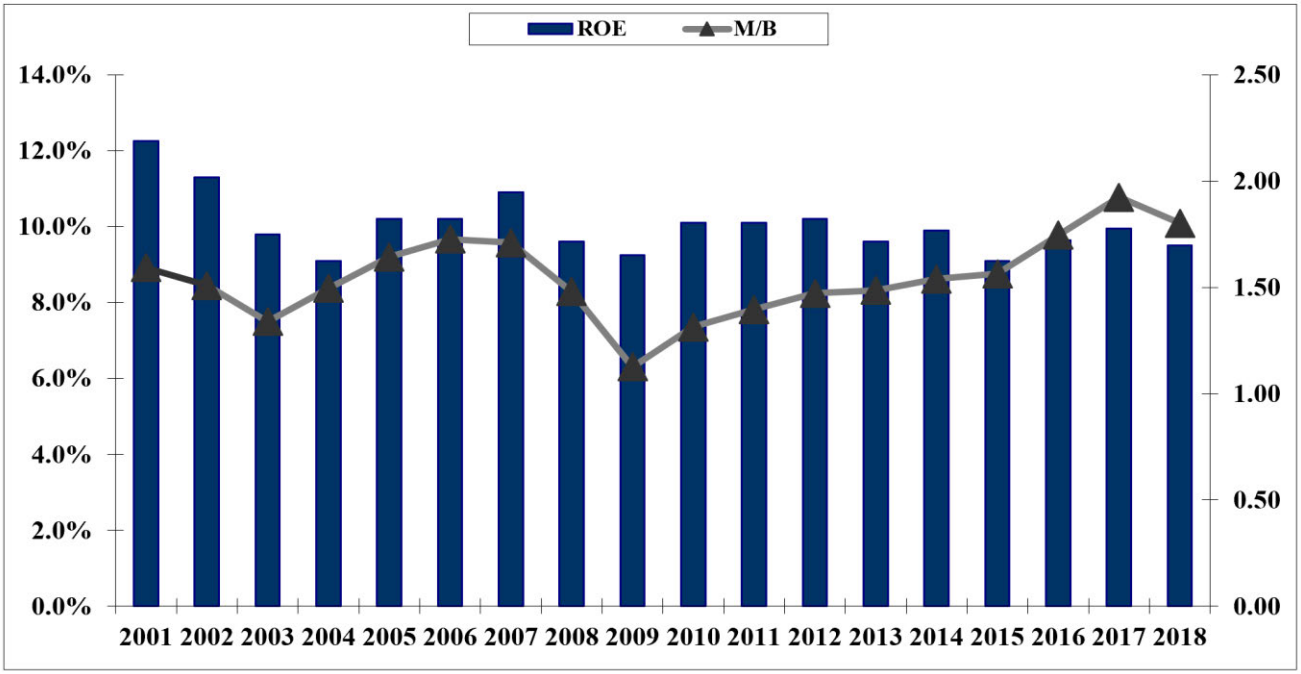
Exhibit JRW-5
Public Utility Capital Cost Indicators
Page 3 of 4

Exhibit JRW-5

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



Data Source: *Value Line Investment Survey.*

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Exhibit JRW-5
Industry Average Betas*
Value Line Investment Survey* Betas*
22-Jan-19

Rank	Industry	Beta	Rank	Industry	Beta	Rank	Industry	Beta
1	Petroleum (Producing)	1.71	34	Telecom. Equipment	1.15	67	Medical Services	1.01
2	Metals & Mining (Div.)	1.64	35	Internet	1.15	68	Recreation	1.01
3	Natural Gas (Div.)	1.63	36	Financial Svcs. (Div.)	1.15	69	IT Services	1.01
4	Oilfield Svcs/Equip.	1.61	37	Retail (Hardlines)	1.14	70	Med Supp Non-Invasive	0.99
5	Maritime	1.51	38	Semiconductor Equip	1.14	71	Telecom. Services	0.99
6	Steel	1.49	39	Entertainment Tech	1.13	72	Retail Store	0.98
7	Oil/Gas Distribution	1.40	40	Publishing	1.13	73	Pharmacy Services	0.98
8	Metal Fabricating	1.37	41	Computer Software	1.13	74	Information Services	0.97
9	Chemical (Specialty)	1.34	42	Paper/Forest Products	1.13	75	Investment Co.(Foreign)	0.96
10	Chemical (Diversified)	1.33	43	Precision Instrument	1.12	76	Healthcare Information	0.96
11	Pipeline MLPs	1.33	44	Public/Private Equity	1.12	77	Funeral Services	0.95
12	Heavy Truck & Equip	1.31	45	Retail Automotive	1.12	78	Med Supp Invasive	0.95
13	Chemical (Basic)	1.30	46	Power	1.12	79	Reinsurance	0.92
14	Building Materials	1.30	47	Wireless Networking	1.12	80	Environmental	0.91
15	Petroleum (Integrated)	1.30	48	Retail Building Supply	1.11	81	Cable TV	0.90
16	Homebuilding	1.28	49	Bank (Midwest)	1.11	82	Insurance (Prop/Cas.)	0.90
17	Railroad	1.27	50	Packaging & Container	1.11	83	Thrift	0.89
18	Auto Parts	1.27	51	Furn/Home Furnishings	1.11	84	Restaurant	0.88
19	Biotechnology	1.27	52	Human Resources	1.10	85	Tobacco	0.88
20	Engineering & Const	1.25	53	Drug	1.10	86	Household Products	0.86
21	Office Equip/Supplies	1.24	54	Advertising	1.10	87	Investment Co.	0.85
22	Hotel/Gaming	1.24	55	Shoe	1.09	88	Beverage	0.83
23	Automotive	1.24	56	Bank	1.09	89	Food Processing	0.82
24	Insurance (Life)	1.24	57	Newspaper	1.08	90	R.E.I.T.	0.82
25	Semiconductor	1.21	58	Toiletries/Cosmetics	1.08	91	Precious Metals	0.82
26	Machinery	1.20	59	Entertainment	1.07	92	Retail/Wholesale Food	0.80
27	Air Transport	1.20	60	Telecom. Utility	1.07	93	Water Utility	0.70
28	Electrical Equipment	1.20	61	Foreign Electronics	1.07	94	Natural Gas Utility	0.67
29	Electronics	1.20	62	Aerospace/Defense	1.05	95	Electric Util. (Central)	0.63
30	Trucking	1.19	63	Industrial Services	1.05	96	Electric Utility (West)	0.62
31	E-Commerce	1.18	64	Apparel	1.05	97	Electric Utility (East)	0.55
32	Computers/Peripherals	1.16	65	Educational Services	1.03			
33	Diversified Co.	1.16	66	Retail (Softlines)	1.02		Mean	1.10

* Industry averages for 97 industries using *Value Line* 's database of 1,710 companies.

** *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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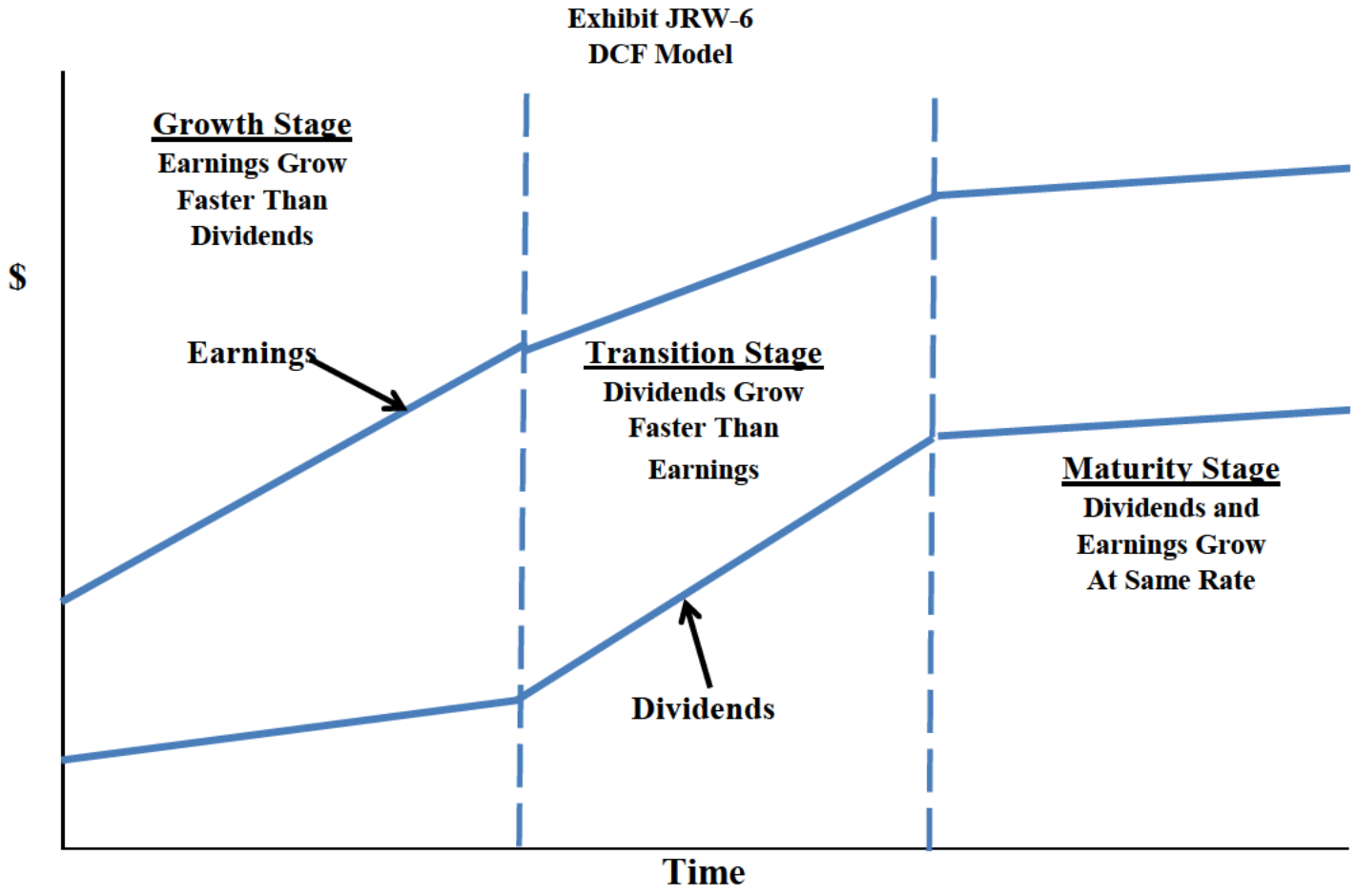

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Exhibit JRW-6

DCF Model
Consensus Earnings Estimates
Consolidated Edison. (ED)
www.reuters.com
7/26/2019

Line	Date	# of Estimates	Mean	High	Low
1	Quarter Ending Sep-19	12	1.60	1.70	1.53
2	Quarter Ending Dec-19	12	0.77	0.85	0.66
3	Year Ending Dec-19	18	4.35	4.39	4.30
4	Year Ending Dec-20	18	4.57	4.73	4.47
5	LT Growth Rate (%)	4	3.44	4.89	2.00

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Exhibit JRW-7
DCF Study
Page 1 of 6

Exhibit JRW-7

Dominion Energy North Carolina
Discounted Cash Flow Analysis

Panel A
Electric Proxy Group

Dividend Yield*	3.10%
Adjustment Factor	1.02675
Adjusted Dividend Yield	3.18%
Growth Rate**	5.35%
Equity Cost Rate	8.55%

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

Panel B
Hevert Proxy Group

Dividend Yield*	3.05%
Adjustment Factor	1.029
Adjusted Dividend Yield	3.14%
Growth Rate**	5.80%
Equity Cost Rate	8.95%

* 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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Exhibit JRW-7

Dominion Energy North Carolina
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)	$2.35	2.75%	2.83%	2.91%
Alliant Energy Corporation (NYSE-LNT)	$1.42	2.85%	2.95%	3.07%
Ameren Corporation (NYSE-AEE)	$1.90	2.49%	2.56%	2.65%
American Electric Power Co. (NYSE-AEP)	$2.68	2.98%	3.08%	3.24%
Avangrid (NYSE-AVG)	$1.76	3.50%	3.48%	3.51%
CMS Energy Corporation (NYSE-CMS)	$1.53	2.61%	2.70%	2.81%
Consolidated Edison, Inc. (NYSE-ED)	$2.96	3.36%	3.42%	3.57%
Duke Energy Corporation (NYSE-DUK)	$3.78	4.26%	4.27%	4.28%
Edison International (NYSE-EIX)	$2.45	3.60%	3.84%	4.01%
Entergy Corporation (NYSE-ETR)				
Eversource Energy (NYSE-ES)	$2.14	2.78%	2.89%	3.01%
Exelon Corp. (NYSE-EXC)				
FirstEnergy Corporation (ASE-FE)				
Hawaiian Electric Industries (NYSE-HE)	$1.28	2.90%	3.02%	3.19%
IDACORP, Inc. (NYSE-IDA)	$2.52	2.44%	2.49%	2.54%
MGE Energy, Inc. (NYSE-MGEE)	$1.35	1.85%	1.94%	2.02%
NextEra Energy Inc. (NYSE-NEE)	$5.00	2.40%	2.51%	2.63%
NorthWestern Corporation (NYSE-NWE)	$2.30	3.17%	3.23%	3.39%
OGE Energy Corp. (NYSE-OGE)	$1.46	3.40%	3.43%	3.51%
Pinnacle West Capital Corp. (NYSE-PNW)	$2.95	3.12%	3.10%	3.20%
PNM Resources, Inc. (NYSE-PNM)	$1.16	2.29%	2.40%	2.54%
Portland General Electric Company (NYSE-POR)	$1.54	2.80%	2.89%	3.03%
PPL Corporation (NYSE-PPL)	$1.65	5.36%	5.33%	5.36%
SEMPRA Energy (NYSE-SRE)	$3.87	2.78%	2.91%	3.11%
Southern Company (NYSE-SO)	$2.48	4.44%	4.59%	4.87%
WEC Energy Group (NYSE-WEC)	$2.36	2.76%	2.90%	3.06%
Xcel Energy Inc. (NYSE-XEL)	$1.62	2.67%	2.78%	2.93%
Mean		3.1%	3.1%	3.3%
Median		2.8%	2.9%	3.1%

Data Sources: http://quote yahoo com, July, 2019
* Entergy, Exelon, and FirstEnergy was excluded from the DCF analysis due to negative projected EPS growth rates

Panel B
Hevert Proxy Group

Company	Annual Dividend	Dividend Yield 30 Day	Dividend Yield 90 Day	Dividend Yield 180 Day
ALLETE, Inc. (NYSE-ALE)	$2.35	2.75%	2.83%	2.91%
Alliant Energy Corporation (NYSE-LNT)	$1.42	2.85%	2.95%	3.07%
Ameren Corporation (NYSE-AEE)	$1.90	2.49%	2.56%	2.65%
American Electric Power Co. (NYSE-AEP)	$2.68	2.98%	3.08%	3.24%
Avangrid (NYSE-AVG)	$1.76	3.50%	3.48%	3.51%
Black Hills Corporation (NYSE-BKH)	$2.02	2.54%	2.65%	2.82%
CMS Energy Corporation (NYSE-CMS)	$1.53	2.61%	2.70%	2.81%
DTE Energy Company (NYSE-DTE)	$3.78	2.91%	2.98%	3.09%
Duke Energy Corporation (NYSE-DUK)	$3.78	4.26%	4.27%	4.28%
Evergy, Inc. (NYSE-EVRG)	$1.90	3.12%	3.22%	3.26%
Hawaiian Electric Industries (NYSE-HE)	$1.28	2.90%	3.02%	3.19%
NextEra Energy Inc. (NYSE-NEE)	$5.00	2.40%	2.51%	2.63%
NorthWestern Corporation (NYSE-NWE)	$2.30	3.17%	3.23%	3.39%
OGE Energy Corp. (NYSE-OGE)	$1.46	3.40%	3.43%	3.51%
Otter Tail Corporation (NDQ-OTTR)	$1.40	2.67%	2.73%	2.79%
Pinnacle West Capital Corp. (NYSE-PNW)	$2.95	3.12%	3.10%	3.20%
PNM Resources, Inc. (NYSE-PNM)	$1.16	2.29%	2.40%	2.54%
Portland General Electric Company (NYSE-POR)	$1.54	2.80%	2.89%	3.03%
Southern Company (NYSE-SO)	$2.48	4.44%	4.59%	4.87%
WEC Energy Group (NYSE-WEC)	$2.36	2.76%	2.90%	3.06%
Xcel Energy Inc. (NYSE-XEL)	$1.62	2.67%	2.78%	2.93%
Mean		3.0%	3.1%	3.2%
Median		2.9%	3.0%	3.1%

Data Sources: http://quote yahoo com, July, 2019

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Exhibit JRW-7

Dominion Energy North Carolina
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)	1.0	3.0	5.5	4.0	3.0	5.5
Alliant Energy Corporation (NYSE-LNT)	4.5	7.5	4.0	4.5	7.0	4.5
Ameren Corporation (NYSE-AEE)	0.5	-3.5	-0.5	4.5	2.5	0.5
American Electric Power Co. (NYSE-AEP)	3.0	4.5	4.0	5.0	5.0	3.5
Avangrid (NYSE-AVG)						
CMS Energy Corporation (NYSE-CMS)	10.0	21.5	4.5	7.0	7.0	5.5
Consolidated Edison, Inc. (NYSE-ED)	2.5	2.0	4.0	2.0	2.5	4.0
Duke Energy Corporation (NYSE-DUK)	2.5	7.0	1.0	0.5	3.0	1.5
Edison International (NYSE-EIX)	-3.5	6.5	3.0	-9.0	11.0	3.0
Entergy Corporation (NYSE-ETR)						
Eversource Energy (NYSE-ES)	8.0	9.5	6.5	7.0	8.0	5.0
Exelon Corporation (NYSE-EXC)						
FirstEnergy Corporation (NYSE-FE)						
Hawaiian Electric Industries (NYSE-HE)	5.0		3.0	4.0		3.5
IDACORP, Inc. (NYSE-IDA)	7.0	6.5	5.5	4.0	10.0	5.0
MGE Energy, Inc. (NYSE-MGEE)	4.5	3.0	5.5	3.5	4.0	6.0
Nextera Energy, Inc. (NYSE-NEE)	6.0	9.0	8.5	6.0	10.5	9.5
NorthWestern Corporation (NYSE-NWE)	8.5	5.0	5.5	7.0	7.0	8.0
OGE Energy Corp. (NYSE-OGE)	4.0	6.5	7.5	1.0	9.5	6.0
Pinnacle West Capital Corp. (NYSE-PNW)	4.5	2.5	2.5	5.0	3.0	4.5
PNM Resources, Inc. (NYSE-PNM)	7.0	2.5		6.0	11.0	1.0
Portland General Electric Company (NYSE-POR)	3.5	4.5	2.5	4.0	4.5	3.5
PPL Corporation (NYSE-PPL)		2.5	1.0	-0.5	2.0	-4.0
SEMPRA Energy (NYSE-SRE)	1.0	10.0	5.5	2.0	7.5	4.0
Southern Company (NYSE-SO)	3.0	3.5	4.0	2.5	3.5	3.0
WEC Energy Group (NYSE-WEC)	8.5	15.5	8.5	6.0	11.0	10.5
Xcel Energy Inc. (NYSE-XEL)	5.5	4.5	4.5	5.0	6.0	4.5
Mean	4.4	6.1	4.4	3.5	6.3	4.3
Median	4.5	4.8	4.3	4.0	6.5	4.5
Data Source: *Value Line Investment Survey.*	Average of Median Figures =			4.8		

* Entergy, Exelon, and FirstEnergy was excluded from the DCF analysis due to negative projected EPS growth rates

Panel B
Hevert 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)	1.0	3.0	5.5	4.0	3.0	5.5
Alliant Energy Corporation (NYSE-LNT)	4.5	7.5	4.0	4.5	7.0	4.5
Ameren Corporation (NYSE-AEE)	0.5	-3.5	-0.5	4.5	2.5	0.5
American Electric Power Co. (NYSE-AEP)	3.0	4.5	4.0	5.0	5.0	3.5
Avangrid (NYSE-AVG)						
Black Hills Corporation (NYSE-BKH)	6.5	3.0	2.5	11.0	4.0	3.0
CMS Energy Corporation (NYSE-CMS)	10.0	21.5	4.5	7.0	7.0	5.5
DTE Energy Company (NYSE-DTE)	8.0	4.5	4.0	8.0	6.5	4.5
Duke Energy Corporation (NYSE-DUK)	2.5	10.0	0.5	0.5	2.5	2.0
Evergy (NYSE-EVRG)						
Hawaiian Electric Industries (NYSE-HE)	5.0		3.0	4.0		3.5
Nextera Energy, Inc. (NYSE-NEE)	6.0	9.0	8.5	6.0	10.5	9.5
NorthWestern Corporation (NYSE-NWE)	8.5	5.0	5.5	7.0	7.0	8.0
OGE Energy Corp. (NYSE-OGE)	4.0	6.5	7.5	1.0	9.5	6.0
Otter Tail Corporation (NDQ-OTTR)	2.0	1.0		14.0	1.5	3.5
Pinnacle West Capital Corp. (NYSE-PNW)	4.5	2.5	2.5	5.0	3.0	4.5
PNM Resources, Inc. (NYSE-PNM)	7.0	2.5		6.0	11.0	1.0
Portland General Electric Company (NYSE-POR)	3.5	4.5	2.5	4.0	4.5	3.5
Southern Company (NYSE-SO)	3.0	3.5	4.0	2.5	3.5	3.0
WEC Energy Group (NYSE-WEC)	7.5	15.5	8.5	5.5	14.0	10.5
Xcel Energy Inc. (NYSE-XEL)	5.5	4.5	4.5	5.0	6.0	4.5
Mean	4.9	5.8	4.2	5.5	6.0	4.6
Median	4.5	4.5	4.0	5.0	5.5	4.5
Data Source: *Value Line Investment Survey.*	Average of Median Figures =			4.7		

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Exhibit JRW-7

Dominion Energy North Carolina
DCF Equity Cost Growth Rate Measures
***Value Line* Projected Growth Rates**

Panel A
Electric Proxy Group

Company	*Value Line* Projected Growth Est'd. '16-'18 to '22-'24			*Value Line* Sustainable Growth		
	Earnings	Dividends	Book Value	Return on Equity	Retention Rate	Internal Growth
ALLETE, Inc. (NYSE-ALE)	5.0	5.0	3.0	9.0%	35.0%	3.2%
Alliant Energy Corporation (NYSE-LNT)	6.5	5.5	7.5	10.0%	38.0%	3.8%
Ameren Corporation (NYSE-AEE)	6.5	6.0	5.0	10.5%	41.0%	4.3%
American Electric Power Co. (NYSE-AEP)	4.0	6.0	4.5	10.5%	30.0%	3.2%
Avangrid (NYSE-AVG)	10.0	3.0	1.5	6.0%	35.0%	2.1%
CMS Energy Corporation (NYSE-CMS)	7.0	7.0	7.5	14.0%	41.0%	5.7%
Consolidated Edison, Inc. (NYSE-ED)	3.0	3.5	3.0	8.5%	34.0%	2.9%
Duke Energy Corporation (NYSE-DUK)	6.0	3.0	2.5	8.5%	28.0%	2.4%
Edison International (NYSE-EIX)	NMF	3.5	4.5	11.5%	47.0%	5.4%
Entergy Corporation (NYSE-ETR)						
Eversource Energy (NYSE-ES)	5.5	5.5	5.0	9.0%	37.0%	3.3%
Exelon Corporation (NYSE-EXC)						
FirstEnergy Corporation (NYSE-FE)						
Hawaiian Electric Inductries (NYSE-HEC)	4.5	3.0	4.0	10.0%	40.0%	4.0%
IDACORP, Inc. (NYSE-IDA)	3.5	6.0	4.0	9.5%	40.0%	3.8%
MGE Energy, Inc. (NYSE-MGEE)	9.0	4.5	6.0	11.5%	56.0%	6.4%
Nextera Energy, Inc. (NYSE-NEE)	10.0	10.0	5.5	13.5%	39.0%	5.3%
NorthWestern Corporation (NYSE-NWE)	3.0	4.5	3.0	9.0%	34.0%	3.1%
OGE Energy Corp. (NYSE-OGE)	6.5	7.5	3.5	11.5%	28.0%	3.2%
Pinnacle West Capital Corp. (NYSE-PNW)	5.5	6.0	4.0	10.5%	36.0%	3.8%
PNM Resources, Inc. (NYSE-PNM)	7.0	7.0	4.0	10.0%	43.0%	4.3%
Portland General Electric Company (NYSE-POR)	4.5	6.5	3.0	9.0%	34.0%	3.1%
PPL Corporation (NYSE-PPL)	1.5	2.0	6.0	13.0%	35.0%	4.6%
SEMPRA Energy (NYSE-SRE)	11.0	8.0	6.5	12.0%	42.0%	5.0%
Southern Company (NYSE-SO)	3.5	3.0	3.5	12.5%	27.0%	3.4%
WEC Energy Group (NYSE-WEC)	6.0	6.0	3.5	12.0%	33.0%	4.0%
Xcel Energy Inc. (NYSE-XEL)	5.5	6.0	4.5	11.0%	38.0%	4.2%
Mean	5.8	5.3	4.4	10.5%	37.1%	3.9%
Median	5.5	5.8	4.0	10.5%	36.5%	3.8%
Average of Median Figures =		5.1			Median =	3.8%

*** 'Est'd. '16-'17 to '22-'24' is the estimated growth rate from the base period 2016 to 2018 until the future period 2022 to 2024.**

Data Source: *Value Line Investment Survey.*

* Entergy, Exelon, and FirstEnergy was excluded from the DCF analysis due to negative projected EPS growth rates

Panel B
Hevert Proxy Group

Company	*Value Line* Projected Growth Est'd. '16-'18 to '22-'24			*Value Line* Sustainable Growth		
	Earnings	Dividends	Book Value	Return on Equity	Retention Rate	Internal Growth
ALLETE, Inc. (NYSE-ALE)	5.0	5.0	3.0	9.0%	35.0%	3.2%
Alliant Energy Corporation (NYSE-LNT)	6.5	5.5	7.5	10.0%	38.0%	3.8%
Ameren Corporation (NYSE-AEE)	6.5	6.0	5.0	10.5%	41.0%	4.3%
American Electric Power Co. (NYSE-AEP)	4.0	6.0	4.5	10.5%	30.0%	3.2%
Avangrid (NYSE-AVG)	10.0	3.0	1.5	6.0%	35.0%	2.1%
Black Hills Corporation (NYSE-BKH)	5.0	6.5	5.5	9.5%	39.0%	3.7%
CMS Energy Corporation (NYSE-CMS)	7.0	7.0	7.5	14.0%	41.0%	5.7%
DTE Energy Company (NYSE-DTE)	5.5	6.0	5.5	10.5%	37.0%	3.9%
Duke Energy Corporation (NYSE-DUK)	6.0	3.0	2.5	8.5%	28.0%	2.4%
Evergy (NYSE-EVRG)				8.5%	31.0%	2.6%
Hawaiian Electric Inductries (NYSE-HE)	3.5	2.0	4.0	9.5%	40.0%	3.8%
Nextera Energy, Inc. (NYSE-NEE)	10.0	10.0	5.5	13.5%	39.0%	5.3%
NorthWestern Corporation (NYSE-NWE)	3.0	4.5	3.0	9.0%	34.0%	3.1%
OGE Energy Corp. (NYSE-OGE)	6.5	7.5	3.5	11.5%	28.0%	3.2%
Otter Tail Corporation (NDQ-OTTR)	5.0	4.0	4.5	10.5%	34.0%	3.6%
Pinnacle West Capital Corp. (NYSE-PNW)	5.5	6.0	4.0	10.5%	36.0%	3.8%
PNM Resources, Inc. (NYSE-PNM)	7.0	7.0	4.0	10.0%	43.0%	4.3%
Portland General Electric Company (NYSE-POR)	4.5	6.5	3.0	9.0%	34.0%	3.1%
Southern Company (NYSE-SO)	3.5	3.0	3.5	12.5%	27.0%	3.4%
WEC Energy Group (NYSE-WEC)	6.0	6.0	3.5	12.0%	33.0%	4.0%
Xcel Energy Inc. (NYSE-XEL)	5.5	6.0	4.5	11.0%	38.0%	4.2%
Mean	5.8	5.5	4.3	10.3%	35.3%	3.6%
Median	5.5	6.0	4.0	10.5%	35.0%	3.7%
Average of Median Figures =		5.2			Median =	3.7%

*** 'Est'd. '16-'17 to '22-'24' is the estimated growth rate from the base period 2016 to 2018 until the future period 2022 to 2024.**

Data Source: *Value Line Investment Survey.*

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Exhibit JRW-7

Dominion Energy North Carolina
DCF Equity Cost Growth Rate Measures
Analysts Projected EPS Growth Rate Estimates

Panel A
Electric Proxy Group

Company	Yahoo	Reuters	Zacks	Mean
ALLETE, Inc. (NYSE-ALE)	6.0%	NA	7.2%	6.6%
Alliant Energy Corporation (NYSE-LNT)	5.0%	5.0%	5.5%	5.2%
Ameren Corporation (NYSE-AEE)	5.0%	5.0%	6.5%	5.5%
American Electric Power Co. (NYSE-AEP)	6.1%	6.1%	5.7%	6.0%
Avangrid (NYSE-AVG)	6.6%	7.3%	7.5%	7.1%
CMS Energy Corporation (NYSE-CMS)	7.1%	7.2%	6.4%	6.9%
Consolidated Edison, Inc. (NYSE-ED)	3.4%	3.4%	2.0%	3.0%
Duke Energy Corporation (NYSE-DUK)	7.2%	7.2%	4.9%	6.4%
Edison International (NYSE-EIX)	5.9%	3.8%	5.4%	5.0%
Entergy Corporation (NYSE-ETR)	-1.9%	-1.9%	7.0%	
Eversource Energy (NYSE-ES)	5.6%	5.6%	5.6%	5.6%
Exelon Corporation (NYSE-EXC)	-1.9%	-0.3%	3.6%	
FirstEnergy Corporation (NYSE-FE)	-6.6%	NA	6.0%	
Hawaiian Electric Inductries (NYSE-HE)	6.1%	6.1%	5.6%	5.9%
IDACORP, Inc. (NYSE-IDA)	2.4%	2.4%	3.8%	2.9%
MGE Energy, Inc. (NYSE-MGEE)	4.0%	NA	NA	4.0%
Nextera Energy, Inc. (NYSE-NEE)	8.0%	7.0%	8.0%	7.7%
NorthWestern Corporation (NYSE-NWE)	3.5%	3.6%	3.0%	3.4%
OGE Energy Corp. (NYSE-OGE)	3.8%	3.8%	4.6%	4.1%
Pinnacle West Capital Corp. (NYSE-PNW)	5.3%	5.3%	5.1%	5.3%
PNM Resources, Inc. (NYSE-PNM)	6.3%	6.3%	5.5%	6.0%
Portland General Electric Company (NYSE-POR)	5.2%	5.2%	4.9%	5.1%
PPL Corporation (NYSE-PPL)	0.6%	NA	N/A	0.6%
SEMPRA Energy (NYSE-SRE)	8.2%	8.2%	7.7%	8.0%
Southern Company (NYSE-SO)	2.2%	3.4%	4.5%	3.4%
WEC Energy Group (NYSE-WEC)	5.9%	5.9%	5.9%	5.9%
Xcel Energy Inc. (NYSE-XEL)	5.8%	5.8%	5.6%	5.7%
Mean	4.2%	4.8%	5.5%	5.2%
Median	5.3%	5.3%	5.6%	5.5%

Data Sources: www reuters com, www zacks com, http://quote yahoo com, July, 2019
* Entergy, Exelon, and FirstEnergy was excluded from the DCF analysis due to negative projected EPS growth rates

Panel B
Hevert Proxy Group

Company	Yahoo	Reuters	Zacks	Mean
ALLETE, Inc. (NYSE-ALE)	6.0%	NA	7.2%	6.6%
Alliant Energy Corporation (NYSE-LNT)	5.0%	5.0%	5.5%	5.2%
Ameren Corporation (NYSE-AEE)	5.0%	5.0%	6.5%	5.5%
American Electric Power Co. (NYSE-AEP)	6.1%	6.1%	5.7%	6.0%
Avangrid (NYSE-AVG)	6.6%	7.3%	7.5%	7.1%
Black Hills Corporation (NYSE-BKH)	3.0%	3.0%	4.3%	3.4%
CMS Energy Corporation (NYSE-CMS)	7.1%	7.2%	6.4%	6.9%
DTE Energy Company (NYSE-DTE)	7.1%	7.2%	6.4%	6.9%
Duke Energy Corporation (NYSE-DUK)	7.2%	7.2%	4.9%	6.4%
Evergy (NYSE-EVRG)	6.2%	6.2%	6.6%	6.3%
Hawaiian Electric Inductries (NYSE-HE)	6.1%	6.1%	5.6%	5.9%
Nextera Energy, Inc. (NYSE-NEE)	8.0%	7.0%	8.0%	7.7%
NorthWestern Corporation (NYSE-NWE)	3.5%	3.6%	3.0%	3.4%
OGE Energy Corp. (NYSE-OGE)	3.8%	3.8%	4.6%	4.1%
Otter Tail Corporation (NDQ-OTTR)	9.0%	NA	7.0%	8.0%
Pinnacle West Capital Corp. (NYSE-PNW)	5.3%	5.3%	5.1%	5.3%
PNM Resources, Inc. (NYSE-PNM)	6.3%	6.3%	5.5%	6.0%
Portland General Electric Company (NYSE-POR)	5.2%	5.2%	4.9%	5.1%
Southern Company (NYSE-SO)	2.2%	3.4%	4.5%	3.4%
WEC Energy Group (NYSE-WEC)	5.9%	5.9%	5.9%	5.9%
Xcel Energy Inc. (NYSE-XEL)	5.8%	5.8%	5.6%	5.7%
Mean	5.7%	5.6%	5.7%	5.7%
Median	6.0%	5.9%	5.6%	5.9%

Data Sources: www reuters com, www zacks com, http://quote yahoo com, July, 2019

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Exhibit JRW-7

Dominion Energy North Carolina
DCF Growth Rate Indicators

Electric and Hevert Proxy Groups

Growth Rate Indicator	Electric Proxy Group	Hevert Proxy Group
Historic *Value Line* Growth in EPS, DPS, and BVPS	4.8%	4.7%
Projected *Value Line* Growth in EPS, DPS, and BVPS	5.1%	5.2%
Sustainable Growth ROE * Retention Rate	3.8%	3.7%
Projected EPS Growth from Yahoo, Zacks, and Reuters - Mean/Median	5.2%/5.5%	5.7%/5.9%

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Exhibit JRW-8
CAPM Study
Page 1 of 8

Exhibit JRW-8

Dominion Energy North Carolina
Capital Asset Pricing Model

Panel A
Electric Proxy Group

Risk-Free Interest Rate	**4.00%**
Beta*	**0.60**
Ex Ante Equity Risk Premium**	**5.50%**
CAPM Cost of Equity	**7.3%**

* See page 3 of Exhibit JRW-8

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

Panel B
Hevert Proxy Group

Risk-Free Interest Rate	**4.00%**
Beta*	**0.58**
Ex Ante Equity Risk Premium**	**5.50%**
CAPM Cost of Equity	**7.2%**

* See page 3 of Exhibit JRW-8

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

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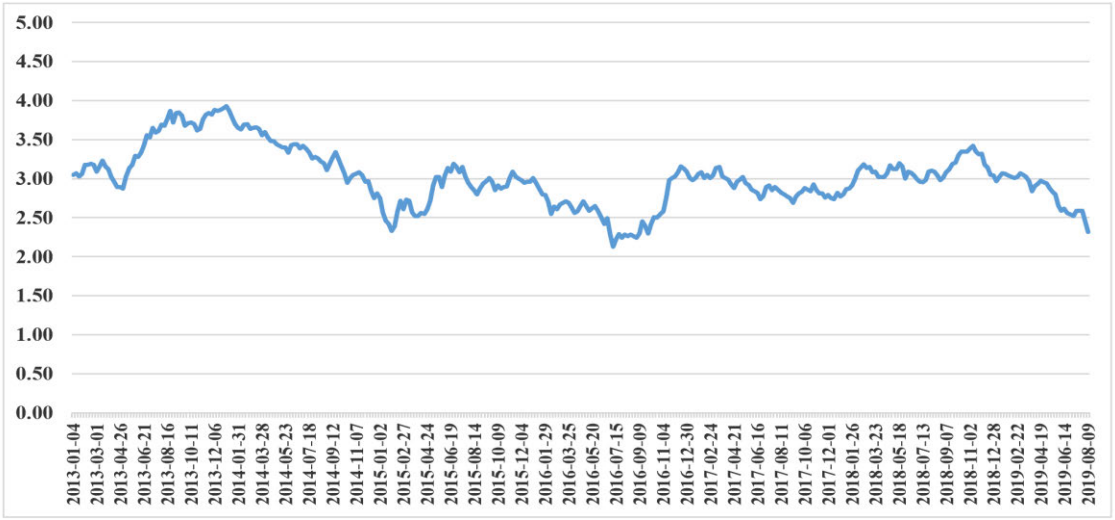
Exhibit JRW-8

Thirty-Year U.S. Treasury Yields
2013-2019



Source: Federal Reserve Bank of St Louis, FRED Database

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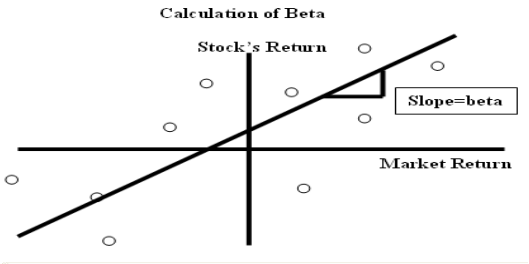

Panel A
Electric Proxy Group

Company Name	Beta
ALLETE, Inc. (NYSE-ALE)	0.65
Alliant Energy Corporation (NYSE-LNT)	0.60
Ameren Corporation (NYSE-AEE)	0.60
American Electric Power Co. (NYSE-AEP)	0.55
AVANGRID, Inc. (NYSE-AGR)	0.40
CMS Energy Corporation (NYSE-CMS)	0.55
Consolidated Edison, Inc. (NYSE-ED)	0.45
Duke Energy Corporation (NYSE-DUK)	0.50
Edison International (NYSE-EIX)	0.60
Entergy Corporation (NYSE-ETR)	0.60
Eversource Energy (NYSE-ES)	0.60
Exelon Corporation (NYSE-EXC)	0.70
FirstEnergy Corporation (NYSE-FE)	0.65
Hawaiian Electric Industries (NYSE-HEC)	0.55
IDACORP, Inc. (NYSE-IDA)	0.60
MGE Energy, Inc. (NYSE-MGEE)	0.55
NextEra Energy, Inc. (NYSE-NEE)	0.60
NorthWestern Corporation (NYSE-NWE)	0.60
OGE Energy Corp. (NYSE-OGE)	0.80
Pinnacle West Capital Corp. (NYSE-PNW)	0.55
PNM Resources, Inc. (NYSE-PNM)	0.60
Portland General Electric Company (NYSE-POR)	0.60
PPL Corporation (NYSE-PPL)	0.70
Sempra Energy (NYSE-SRE)	0.75
Southern Company (NYSE-SO)	0.50
WEC Energy Group (NYSE-WEC)	0.50
Xcel Energy Inc. (NYSE-XEL)	0.50
Mean	0.59
Median	0.60

Data Source *Value Line Investment Survey* , 2019.

Panel B
Hevert Proxy Group

Company	Beta
ALLETE, Inc. (NYSE-ALE)	0.65
Alliant Energy Corporation (NYSE-LNT)	0.60
Ameren Corporation (NYSE-AEE)	0.60
American Electric Power Co. (NYSE-AEP)	0.55
Avangrid (NYSE-AVG)	0.40
Black Hills Corporation (NYSE-BKH)	0.75
CMS Energy Corporation (NYSE-CMS)	0.55
DTE Energy Company (NYSE-DTE)	0.55
Duke Energy Corporation (NYSE-DUK)	0.45
Evergy (NYSE-EVRG)	NMF
Hawaiian Electric Industries (NYSE-HE)	0.55
Nextera Energy, Inc. (NYSE-NEE)	0.60
NorthWestern Corporation (NYSE-NWE)	0.60
OGE Energy Corp. (NYSE-OGE)	0.80
Otter Tail Corporation (NDQ-OTTR)	0.70
Pinnacle West Capital Corp. (NYSE-PNW)	0.55
PNM Resources, Inc. (NYSE-PNM)	0.60
Portland General Electric Company (NYSE-POR)	0.60
Southern Company (NYSE-SO)	0.50
WEC Energy Group (NYSE-WEC)	0.50
Xcel Energy Inc. (NYSE-XEL)	0.50
Mean	0.58
Median	0.58

Data Source *Value Line Investment Survey* , 2019.

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Exhibit JRW-8
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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Exhibit JRW-8

Capital Asset Pricing Model
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	2019	1928-2018	Historical Stock Returns - Bond Returns	Arithmetic				6.26%	
					Geometric				4.66%	
	Dimson, Marsh, Staunton _Credit Suisse Repor	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	Geometric				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	2019	Projection	Normalized with 3.5% Long-Term Treasury Yield					5.50%	
	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	2019	Projection	Fundamental Economic and Market Factors					4.29%	
	KPMG	2019	Projection	Fundamental Economic and Market Factors					5.50%	
	Damodaran - 3-1-19	2019	Projection	Fundamentals - Implied from FCF to Equity Model (Trailing 12 month, with adjusted payout)					4.98%	
	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 Year	Fundamentals (D/P, GDP Growth)		3.00%	4.80%	3.90%	3.90%	
	John Shoven	2001	Projected for 75 Year	Fundamentals (D/P P/E GDP Growth)		3.00%	3.50%	3.25%	3.25%	
	Median									4.29%
Surveys										
	New York Fed	2015	Five-Year	Survey of Wall Street Firms					5.70%	
	Survey of Financial Forecasters	2019	10-Year Projection	About 20 Financial Forecastsers					1.85%	
	Duke - CFO Magazine Survey	2019	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 Compar	2019	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										**4.80%**
Median										**4.83%**

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Exhibit JRW-8

Capital Asset Pricing Model
Market Risk Premium

Summary of 2010-19 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	2019	1928-2018	Historical Stock Returns - Bond Returns	Arithmetic				6.26%	
					Geometric				4.66%	
	Dimson, Marsh, Staunton _Credit Suisse Report	2019	1900-2018	Historical Stock Returns - Bond Returns	Arithmetic				5.50%	
					Geometric					
	Median									5.36%
Ex Ante Models (Puzzle Research)										
	Siegel - Rethink ERP	2011	Projection	Real Stock Returns and Components					5.50%	
	Duff & Phelps	2019	Projection	Normalized with 3.5% Long-Term Treasury Yield					5.50%	
	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	2019	Projection	Fundamental Economic and Market Factors					4.29%	
	KPMG	2019	Projection	Fundamental Economic and Market Factors					5.50%	
	Damodaran - 3-1-19	2019	Projection	Fundamentals - Implied from FCF to Equity Model (Trailing 12 month, with adjusted payout)					4.98%	
	Median									5.50%
Surveys										
	New York Fed	2015	Five-Year	Survey of Wall Street Firms					5.70%	
	Survey of Financial Forecasters	2019	10-Year Projection	About 20 Financial Forecastsers					1.85%	
	Duke - CFO Magazine Survey	2019	10-Year Projection	Approximately 200 CFOs					4.05%	
	Fernandez - Academics Analysts and Companies	2019	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										**4.94%**
Median										**5.09%**

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

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

For additional information, please visit www.duffandphelps.com/CostofCapital

Date	Risk-free Rate (R_f)	R_f (%)	Duff & Phelps Recommended ERP (%)	What Changed
Current Guidance: December 31, 2018 – UNTIL FURTHER NOTICE	**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.

Source: https://www.duffandphelps.com/-/media/assets/pdfs/publications/valuation/coc/erp-risk-free-rates-jan-2008-present.ashx?la=en

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Panel A
KPMG Equity Risk Premium Recommendation

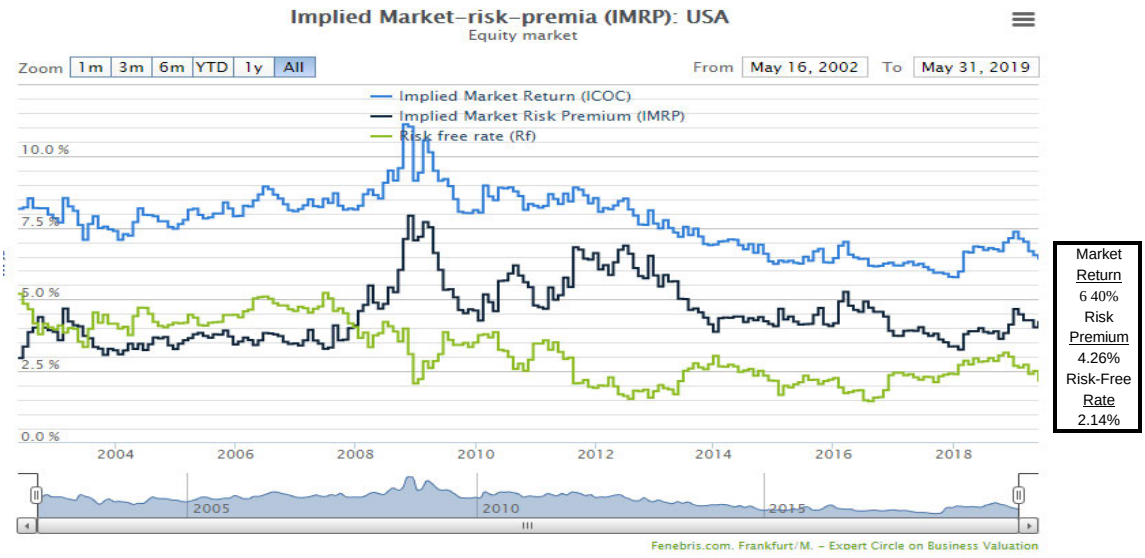
Appendix

Historic MRP estimates

Please find an overview of the historic MRP estimates by KPMG in the graph below.

Source: https://assets.kpmg/content/dam/kpmg/nl/pdf/2019/advisory/equity-market-research-summary.pdf

Panel B
Market-Risk-Premia.com Implied Market Risk Premium
31-May-19



Market Return	6.40%
Risk Premium	4.26%
Risk-Free Rate	2.14%

Source: http://www market-risk-premia com/us html

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Exhibit JRW-9
Dominion Energy North Carolina ROE Results
Page 1 of 1

Panel A
Mr. Hevert's DCF Results

	Mean Low	Mean	Mean High
30-Day Average	8.34%	9.24%	10.23%
90-Day Average	8.40%	9.31%	10.30%
180-Day Average	8.48%	9.39%	10.38%

Panel B
Mr. Hevert's CAPM Results

	Bloomberg Derived Market Risk Premium	Value Line Derived Market Risk Premium
Average Bloomberg Beta Coefficient		
Current 30-Year Treasury (3.04%)	8.25%	9.78%
Near-Term Projected 30-Year Treasury (3.25%)	8.47%	10.00%
Average Value Line Beta Coefficient		
Current 30-Year Treasury (3.04%)	9.29%	11.12%
Near-Term Projected 30-Year Treasury (3.25%)	9.50%	11.34%

	Bloomberg Derived Market Risk Premium	Value Line Derived Market Risk Premium
Average Bloomberg Beta Coefficient		
Current 30-Year Treasury (3.04%)	9.61%	11.54%
Near-Term Projected 30-Year Treasury (3.25%)	9.83%	11.75%
Average Value Line Beta Coefficient		
Current 30-Year Treasury (3.04%)	10.39%	12.54%
Near-Term Projected 30-Year Treasury (3.25%)	10.60%	12.76%

Panel C
Mr. Hevert's Risk Premium Results

	Return on Equity
Current 30-Year Treasury (3.04%)	9.93%
Near-Term Projected 30-Year Treasury (3.25%)	9.96%
Long-Term Projected 30-Year Treasury (4.05%)	10.17%

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Exhibit JRW-10
GDP and S&P 500 Growth Rates
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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	63.10	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	95.10	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	353.40	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	19.41	
45	2005	13036 64	1248.29	76.45	22.38	
46	2006	13814 61	1418.30	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	17521 75	2058.90	113.01	39.44	
55	2015	18219 30	2043.94	106.32	43.16	
56	2016	18707 19	2238.83	108.86	45.03	
57	2017	19485 39	2673.61	124.94	49.73	
58	2018	20500 64	2506.85	148.34	53.61	**Average**
	Growth Rates	**6.46**	**6.71**	**6.89**	**5.85**	**6.48**

A -http://research stlouisfed org/fred2/series/GDPA/downloaddata
, EPS and DPS - http://pages stern nyu edu/~adamodar/

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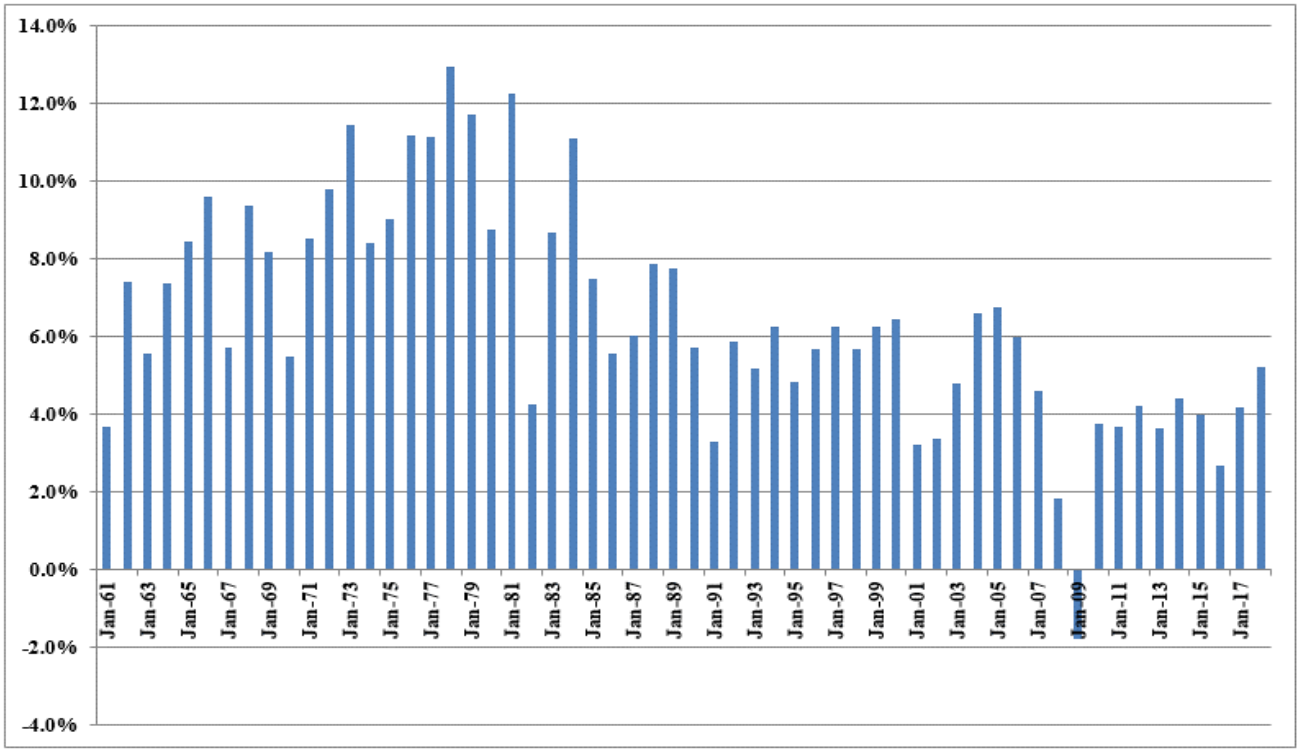
Nominal GDP Growth Rates
Annual Growth Rates - 1961-2018



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

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Exhibit JRW-10
Real GDP Growth Rates
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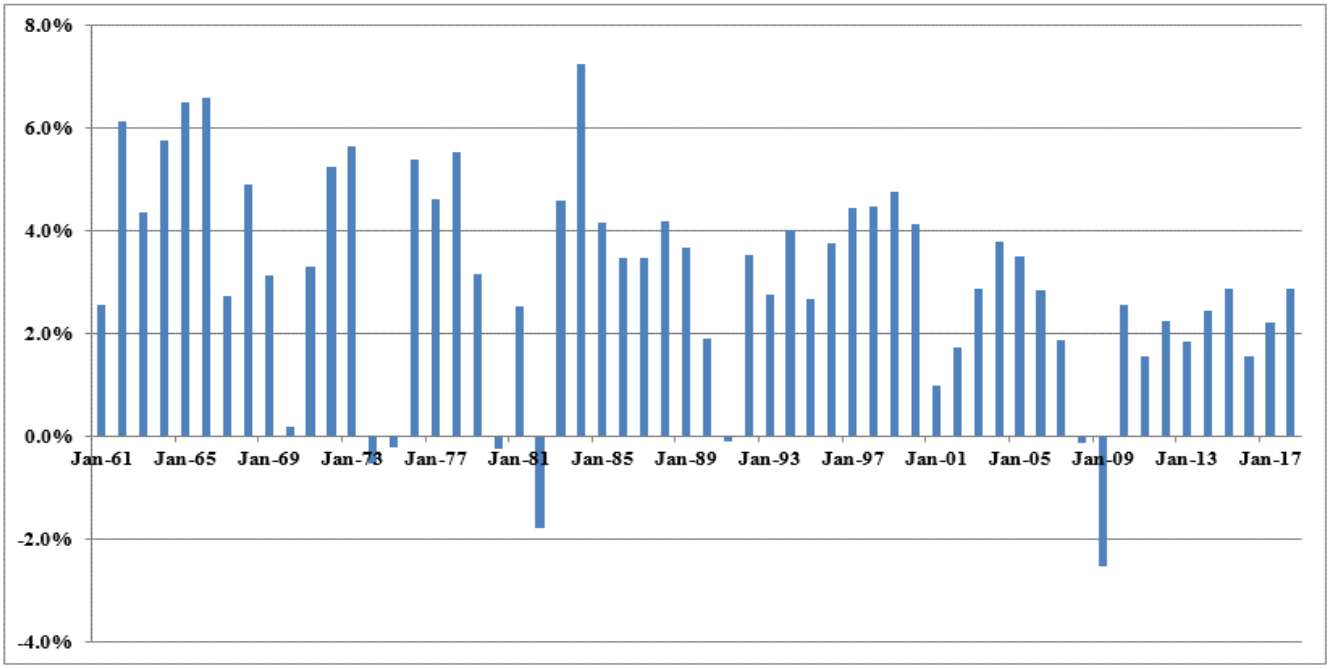
Annual Real GDP Growth Rates
1961-2018



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

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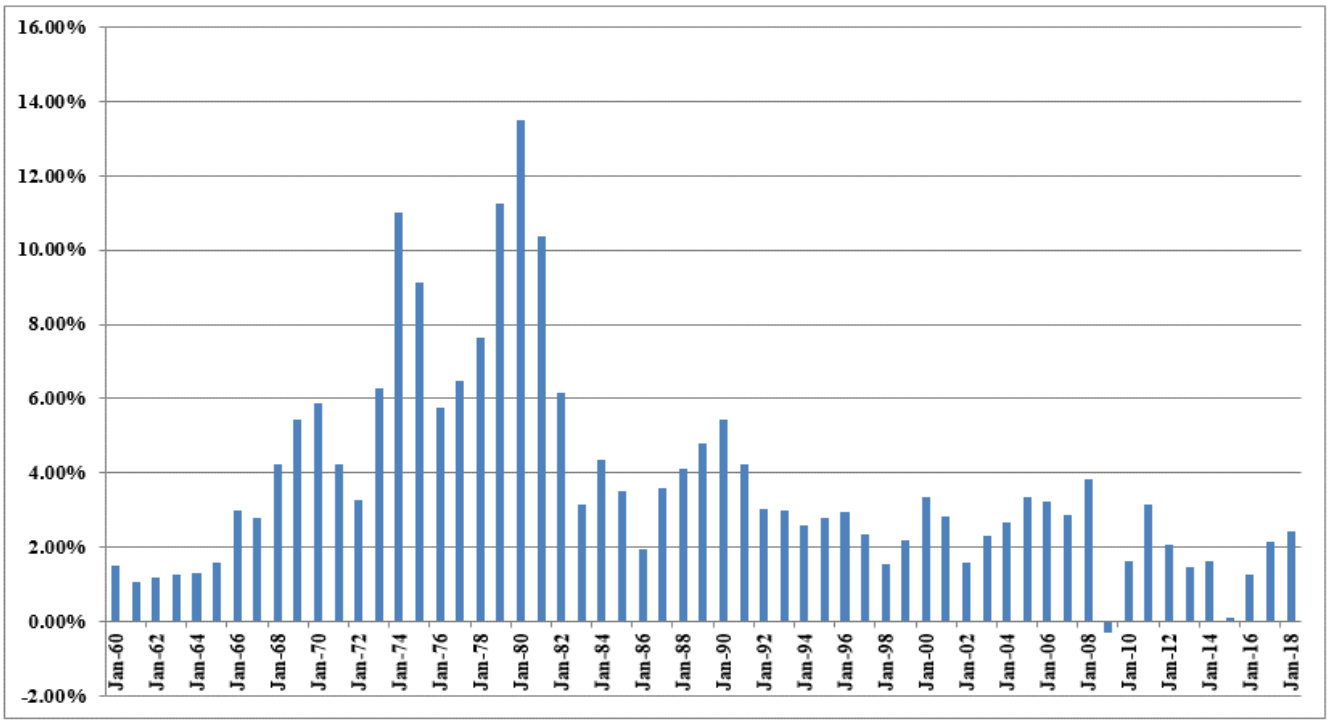
Exhibit JRW-10
Inflation Rates
Page 4 of 6

Annual Inflation Rates
1961-2018



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

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Exhibit JRW-10
Projected Nominal GDP Growth Rates
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Panel A
Historic GDP Growth Rates

10-Year Average		3.37%
20-Year Average		4.17%
30-Year Average		4.65%
40-Year Average		5.56%
50-Year Average		6.36%

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	2018-2048	4.0%
Survey of Financial Forecasters	Ten Year	4.3%
Social Security Administration	2018-2095	4.4%
Energy Information Administration	2017-2050	4.3%

Sources:

Congressional Budget Office,The *2018 Long-Term Budget Outlook*, June 1, 2018.
https://www.cbo.gov/system/files?file=2018-06/53919-2018ltbo.pdf

U.S. Energy Information Administration, *Annual Energy Outlook 2018*, Table: Macroeconomic Indicators, *https://www.eia.gov/outlooks/aeo/data/browser/#/?id=18-AEO2018&sourcekey=0.*

Social Security Administration, 2018 Annual Report of the Board of Trustees of the Old-Age, Survivors, and Disability Insurance (OASDI) Program, Table VI.G4, p. 211(June 15, 2018), https://www.ssa.gov/oact/tr/2018/lr6g4.html. The 4.4% represents the compounded growth rate in projected GDP from $20.307 trillion in 2018 to $548.108 trillion in 2095.

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

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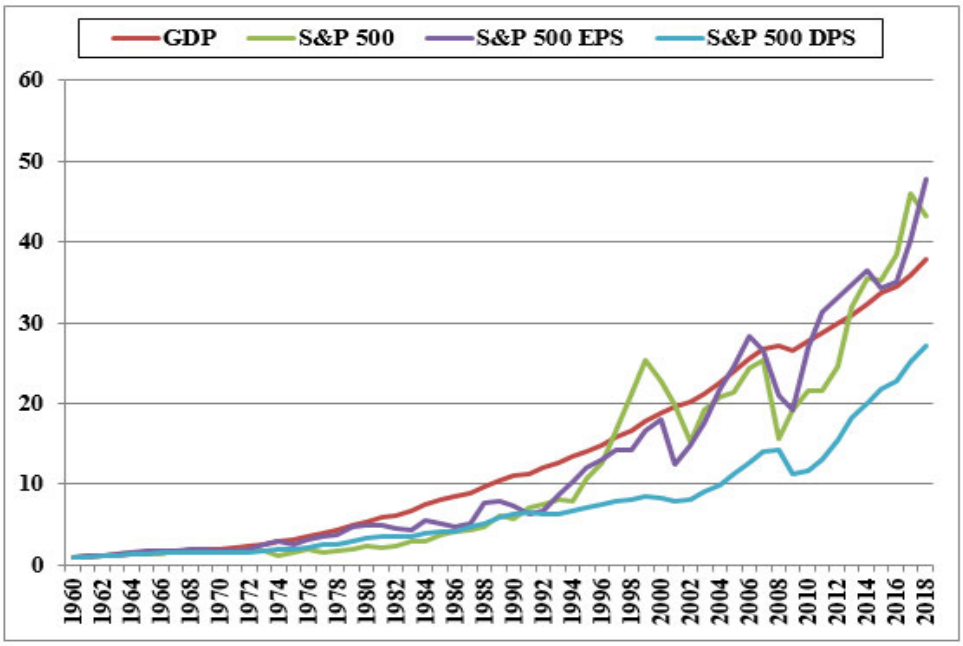
Exhibit JRW-10
GDP and S&P 500 Growth Rates
Page 6 of 6

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	6.47	6.95	6.70	5.82