



**NORTH CAROLINA  
PUBLIC STAFF  
UTILITIES COMMISSION**

February 18, 2020

Ms. Kimberley A. Campbell, Chief Clerk  
North Carolina Utilities Commission  
4325 Mail Service Center  
Raleigh, North Carolina 27699-4300

Re: Docket No. E-7, Sub 1213 – Application for Approval of Proposed  
Prepaid Advantage Program; and Docket No. E-7, Sub 1214 –  
Application for General Rate Case

Dear Ms. Campbell:

In connection with the above-referenced dockets, I transmit herewith for  
filing on behalf of the Public Staff the testimony and exhibit(s) of J. Randall  
Woolridge, PH.D.

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

Sincerely,

/s/ Dianna W. Downey  
Staff Attorney  
[dianna.downey@psncuc.nc.gov](mailto:dianna.downey@psncuc.nc.gov)

DWD/cla

Attachment(s)

Executive Director  
(919) 733-2435

Communications  
(919) 733-5610

Economic Research  
(919) 733-2267

Legal  
(919) 733-6110

Transportation  
(919) 733-7766

Accounting  
(919) 733-4279

Consumer Services  
(919) 733-9277

Electric  
(919) 733-2267

Natural Gas  
(919) 733-4326

Water  
(919) 733-5610

4326 Mail Service Center • Raleigh, North Carolina 27699-4300  
An Equal Opportunity / Affirmative Action Employer

OFFICIAL COPY

Feb 18 2020

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-7, SUB 1213	)	
	)	
In the Matter of	)	
Application of Duke Energy Carolinas,	)	
LLC, for Adjustment of Rates and	)	TESTIMONY OF
Charges Applicable to Electric Utility	)	J. RANDALL WOOLRIDGE
Service in North Carolina	)	FOR THE PUBLIC STAFF –
	)	NORTH CAROLINA
	)	UTILITIES COMMISSION
DOCKET NO. E-7, SUB 1214	)	
	)	
In the Matter of	)	
Application of Duke Energy Carolinas,	)	
LLC, for Adjustment of Rates and	)	
Charges Applicable to Electric Utility	)	
Service in North Carolina	)	

## Contents

1	I.	Subject of Testimony and Summary of Recommendations.....	3
2	A.	Overview .....	4
3	B.	Summary of Positions .....	5
4	C.	Primary Rate of Return on Equity Issues .....	8
5	II.	Capital Market Conditions and Authorized ROEs.....	15
6	III.	Proxy Group Selection .....	24
7	IV.	Capital Structure Ratios and Debt Cost Rates .....	27
8	V.	The Cost of Common Equity Capital .....	38
9	A.	Overview .....	38
10	B.	Discounted Cash Flow Analysis .....	47
11	C.	Capital Asset Pricing Model.....	63
12	D.	Equity Cost Rate Summary .....	79
13	VI.	Critique of DEC's Rate of Return Testimony .....	85
14	A.	The Disconnect Between Mr. Hevert's Equity Cost Rate	
15		Results and His 10.50% ROE Recommendation .....	91
16	B.	DCF Approach.....	92
	1.	The Low Weight Given to the DCF Results .....	93
	2.	The DCF Model Understates the Cost of Equity	
		Capital .....	93
	3.	Wall Street Analysts' EPS Growth Rate Forecasts ..	95
17	C.	CAPM Approach.....	97
	1.	Market Risk Premiums.....	98
	2.	ECAPM.....	116
18	D.	Bond Yield Risk Premium Approach .....	117
	1.	Base Yields.....	118
	2.	Risk Premium .....	118
19	E.	Expected Earnings Approach .....	120
20	F.	Other Issues .....	123
	1.	Other DEC Risk Factors .....	123
	2.	Flotation Costs.....	124
21	VII.	North Carolina Economic Conditions and DEC's Rate of Return	
22		Recommendation .....	128

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

3 A. My name is J. Randall Woolridge, and my business address is 120  
4 Haymaker Circle, State College, PA 16801. I am a Professor of  
5 Finance and the Goldman, Sachs & Co. and Frank P. Smeal  
6 Endowed University Fellow in Business Administration at the  
7 University Park Campus of the Pennsylvania State University. I am  
8 also the Director of the Smeal College Trading Room and President  
9 of the Nittany Lion Fund, LLC. A summary of my educational  
10 background, research, and related business experience is provided  
11 in Appendix A.

12 **I. SUBJECT OF TESTIMONY AND SUMMARY OF**  
13 **RECOMMENDATIONS**

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

16 A. I have been asked by the Public Staff - North Carolina Utilities  
17 Commission (Public Staff) to provide an overall fair rate of return or  
18 cost of capital recommendation for Duke Energy Carolinas, LLC  
19 (DEC or Company).<sup>1</sup>

---

<sup>1</sup> 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.

1     **Q.     HOW IS YOUR TESTIMONY ORGANIZED?**

2     A.     First, I summarize my cost of capital recommendation for the  
3            Company, and review my primary areas of contention with the  
4            Company's position. Second, I discuss the proxy groups that I have  
5            used to estimate an equity cost rate for DEC. Third, I review the  
6            Company's proposed capital structure and debt cost rate. Fourth, I  
7            explain my calculation of my estimate of the appropriate equity cost  
8            rate for the Company. Finally, I critique DEC witness Hevert's rate of  
9            return analysis and testimony. Appendix A is a summary of my  
10          education and business experience.

11                                                             **A.     Overview**

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

13     A.     An ROE is most simply described as the allowed rate of profit for a  
14            regulated company. In a competitive market, a company's profit level  
15            is determined by a variety of factors, including the state of the  
16            economy, the degree of competition a company faces, the ease of  
17            entry into its markets, the existence of substitute or complementary  
18            products and services, the company's cost structure, the impact of  
19            technological changes, and the supply and demand for its services  
20            and products. For a regulated monopoly, the regulator determines  
21            the level of profit available to the public utility. The United States  
22            Supreme Court established the guiding principles for determining an

1 appropriate level of profitability for regulated public utilities in two  
2 cases: (1) *Hope*<sup>2</sup> and (2) *Bluefield*.<sup>3</sup> In those cases, the Court  
3 recognized that the fair rate of return on equity should be: (1)  
4 comparable to returns investors expect to earn on other investments  
5 of similar risk; (2) sufficient to assure confidence in the company's  
6 financial integrity; and (3) adequate to maintain and support the  
7 company's credit and to attract capital.

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

17 **B. Summary of Positions**

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

---

<sup>2</sup> *Federal Power Commission v. Hope Natural Gas Co.*, 320 U.S. 591 (1944) (*Hope*).

<sup>3</sup> *Bluefield Water Works and Improvement Co. v. Public Service Commission of West Virginia*, 262 U.S. 679 (1923) (*Bluefield*).

1 A. The Company has proposed use of a capital structure of 47.00%  
2 long-term debt and 53.00% common equity and a long-term debt  
3 cost rate of 4.51% as set out in the testimony of Company witness  
4 Newlin. Company witness Hevert has recommended a common  
5 equity cost rate of 10.50%. Thus, the Company's overall proposed  
6 rate of return is 7.63%.

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

9 A. I reviewed the Company's proposed capital structure and overall rate  
10 of return or cost of capital. The Company's proposed capital structure  
11 has a higher common equity component than the capital structure of  
12 its parent, Duke Energy Corporation (Duke Energy), as well as the  
13 averages of my proxy group of electric utilities (Electric Proxy Group)  
14 and Mr. Hevert's proxy group (Hevert Proxy Group). Therefore, as  
15 my primary recommendation, I am proposing a capital structure of  
16 50.0% common equity and 50.0% debt, which is more consistent with  
17 the capital structures of comparable electric utility companies. To  
18 estimate an equity cost rate for the Company, I have applied the  
19 Discounted Cash Flow Model (DCF) and the Capital Asset Pricing  
20 Model (CAPM) to the Electric Proxy Group. I have also applied the  
21 DCF and CAPM to the Hevert Proxy Group for comparison purposes.

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

3    A.    My equity cost rate studies indicate that an appropriate ROE for the  
4    Company is in the range of 6.90% and 8.40%. I believe that this  
5    range accurately reflects current capital market data and the market  
6    cost of equity capital. However, I given that I am recommending a  
7    capital structure with a lower common equity ratio and higher  
8    financial risk than proposed by the Company, as a primary ROE for  
9    DEC, I am recommending 9.0%. Given my recommended  
10   capitalization ratios and debt cost rate, my rate of return or cost of  
11   capital recommendation for the Company is 6.76% and is  
12   summarized in Table 1 and Panel A of Exhibit JRW-1.

**Table 1**  
**Public Staff's Primary Rate of Return Recommendation**

<b>Capital Source</b>	<b>Capitalization Ratios</b>	<b>Cost Rate</b>	<b>Weighted Cost Rate</b>
<b>Long-Term Debt</b>	<b>50.00%</b>	<b>4.51%</b>	<b>2.26%</b>
<b>Common Equity</b>	<b>50.00%</b>	<b>9.00%</b>	<b>4.50%</b>
<b>Total Capitalization</b>	<b>100.00%</b>		<b>6.76%</b>

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

15   A.    Yes. My alternative rate of return recommendation uses DEC's  
16   recommended capital structure consisting of 47.00% long-term debt  
17   and 53.00% common equity. With respect to the ROE, as indicated



1 above, I believe that my equity cost rate range, 6.90% to 8.40%,  
 2 accurately reflects current capital market data. Capital costs in the  
 3 U.S. remain low, with low inflation and interest rates and very modest  
 4 economic growth. To reflect these low capital costs, my alternative  
 5 ROE recommendation is 8.40%, which is at the high end of my equity  
 6 cost rate range. Given my recommended capitalization ratios and  
 7 debt capital cost rate, my alternative rate of return or cost of capital  
 8 recommendation for the Company is 6.57% and is summarized in  
 9 Table 2 and Panel B of Exhibit JRW-1.

**Table 2**  
**Public Staff's Alternative Rate of Return Recommendation**

<b>Capital Source</b>	<b>Capitalization Ratios</b>	<b>Cost Rate</b>	<b>Weighted Cost Rate</b>
<b>Long-Term Debt</b>	<b>47.00%</b>	<b>4.51%</b>	<b>2.12%</b>
<b>Common Equity</b>	<b>53.00%</b>	<b>8.40%</b>	<b>4.45%</b>
<b>Total Capitalization</b>	<b>100.00%</b>		<b>6.57%</b>

10 **C. Primary Rate of Return on Equity Issues**

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

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

15 Capital Structure – The Company has proposed a capital structure  
 16 consisting of 47.00% long-term debt and 53.00% common equity.  
 17 The Company's proposed capital structure has a higher common

1 equity ratio than the average of the Electric and Hevert Proxy  
2 Groups. In my primary rate of return recommendation, I recommend  
3 adjusting DEC's proposed capital structure to use a common equity  
4 component of 50 percent, as that is more in line with the capital  
5 structures of the utilities in both proxy groups as well as DEC's  
6 parent, Duke Energy. In my alternative rate of return  
7 recommendation, I use DEC's proposed capital structure, but I then  
8 employ a lower ROE to reflect the high common equity component  
9 in the capital structure and lower financial risk of the Company's  
10 proposed capitalization.

11 Capital Market Conditions – Mr. Hevert's analyses, ROE results, and  
12 recommendations reflect an assumption of higher interest rates and  
13 capital costs that is inconsistent with current trends. Despite the  
14 Federal Reserve's moves to increase the federal funds rate over the  
15 2015-18 time period, interest rates and capital costs remained at low  
16 levels. In 2019, interest rates fell dramatically with moderate  
17 economic growth and low inflation. The Federal Reserve cut the  
18 federal fund rate three times (July, September, and October) and the  
19 30-year yield traded at all-time low levels.

20 The Company's ROE Analysis is Out-of-Date - The Company's ROE  
21 study was prepared in June, 2019, about eight months ago. Since  
22 that time, the Federal Reserve has cut the federal funds rate three

1 times and the 30-year Treasury rate has fallen over seventy basis  
2 points. Capital costs are much lower now, not only than when the  
3 Company's ROE study was prepared, but also than when the request  
4 to increase rates was filed.

5 DEC's Investment Risk is Below the Averages of the Two Proxy  
6 Groups – Mr. Hevert cites the Company's capital expenditures and  
7 North Carolina's regulatory environment to imply that DEC is riskier  
8 than his proxy group. However, his assessment of DEC's risk is  
9 erroneous. The assessment of capital expenditures is part of the  
10 credit rating process, and DEC's Standard & Poor's (S&P's) and  
11 Moody's credit ratings suggest that the Company's investment risk is  
12 below the averages of the proxy groups.

13 Disconnect Between Mr. Hevert's Equity Cost Rate Studies and his  
14 10.50% ROE Recommendation – There is a disconnect between Mr.  
15 Hevert's equity cost rate results and his 10.50% ROE  
16 recommendation. Simply stated, the vast majority of his equity cost  
17 rate results point to a lower ROE. In fact, the only results that point  
18 to an ROE as high as 10.50% are some of his CAPM/Empirical  
19 CAPM (ECAPM) results, which, as I explain later in my testimony,  
20 are derived from seriously flawed analyses. As a result, Mr. Hevert's  
21 ROE recommendation is based on: (1) the results of only one model  
22 (the CAPM); and, even more narrowly, (2) primarily *Value Line* data.

1 Otherwise, Mr. Hevert provides no other equity cost rate studies that  
2 support his 10.50% ROE recommendation.

3 DCF Equity Cost Rate - The DCF Equity Cost Rate is estimated by  
4 summing the stock's dividend yield and investors' expected long-run  
5 growth rate in dividends paid per share. I have three central issues  
6 regarding Mr. Hevert's DCF analysis: (1) Mr. Hevert has given very  
7 little weight to his constant-growth DCF results in determining his  
8 recommended ROE; (2) he has claimed that the DCF results  
9 underestimate the market-determined cost of equity capital due to  
10 high utility stock valuations and low dividend yields; and (3) he relies  
11 exclusively on the overly optimistic and upwardly biased EPS growth  
12 rate forecasts of Wall Street analysts and *Value Line*. By comparison,  
13 my DCF growth rate is supported by 13 growth rate measures  
14 including historical and projected growth rate measures and my  
15 evaluation of growth in dividends, book value, and earnings per  
16 share of proxy group companies.

17 CAPM Approach - The CAPM approach requires an estimate of the  
18 risk-free interest rate, the beta, and the market or equity risk  
19 premium. There are two primary issues with Mr. Hevert's CAPM  
20 analyses: (1) he has employed an ad hoc version of the CAPM, the  
21 ECAPM, which is a model untested in academic and profession  
22 research, and that makes inappropriate adjustments to the risk-free

1 rate and the market risk premium and; and (2) his market risk  
2 premiums of 12.25% and 12.15% are excessive and do not reflect  
3 current market fundamentals. Mr. Hevert has employed analysts'  
4 three-to-five-year growth-rate projections for EPS to compute an  
5 expected market return and market risk premium. These EPS  
6 growth-rate projections and the resulting expected market returns  
7 and market risk premiums include highly unrealistic assumptions  
8 regarding future economic and earnings growth and stock returns.

9 Alternative Risk Premium Model - Mr. Hevert estimates an equity  
10 cost rate using an alternative risk premium model which he calls the  
11 Bond Yield Risk Premium (BYRP) approach. The risk premium in his  
12 BYRP method is based on the historical relationship between the  
13 yields on long-term Treasury yields and authorized ROEs for electric  
14 utility companies. There are several issues with this approach  
15 including: (1) it is a gauge of commission behavior and not investor  
16 behavior; (2) Mr. Hevert's methodology produces an inflated measure  
17 of the risk premium he uses historical authorized ROEs and Treasury  
18 yields, and applies the resulting risk premium to projected Treasury  
19 yields; and (3) the risk premium is inflated as a measure of investor's  
20 required risk premium because electric utility companies have been  
21 selling at market-to-book ratios in excess of 1.0. This indicates that  
22 the authorized rates of return have been greater than the return that  
23 investors require.

1        Expected Earnings Approach - Mr. Hevert also uses the Expected  
2        Earnings approach to corroborate his recommended equity cost  
3        range for the Company. Mr. Hevert computes the expected ROE as  
4        forecasted by *Value Line* for his proxy group as well as for *Value*  
5        *Line's* universe of electric utilities. Mr. Hevert's Expected Earnings  
6        approach does not measure the market cost of equity capital, is  
7        independent of most cost of capital indicators, and has several other  
8        empirical issues. Therefore, the Commission should ignore Mr.  
9        Hevert's Expected Earnings approach in determining the appropriate  
10       ROE for DEC.

11       Other Issues - Mr. Hevert also considers two other factors in arriving  
12       at his 10.50% ROE recommendation. Mr. Hevert has cited as risk  
13       factors North Carolina's Renewable Energy and Energy Efficiency  
14       Portfolio Standard (REPS), the Company's high level of capital  
15       expenditures, environmental regulations, and the Company's coal-  
16       fired and nuclear generation. However, these risk factors are already  
17       considered in the credit-rating process used by major rating  
18       agencies. As I noted above, DEC's investment risk as measured by  
19       S&P and Moody's is below the average of the proxy groups. Second,  
20       Mr. Hevert also considers flotation costs in making his ROE

1 recommendation of 10.50%. However, he has not identified any  
2 flotation costs for DEC.<sup>4</sup>

3 North Carolina Economic Conditions – Mr. Hevert evaluates a  
4 number of factors such as employment and income levels and comes  
5 to the conclusion that DEC's proposed ROE of 10.50% is fair and  
6 reasonable to DEC, its shareholders, and its customers in light of the  
7 effect of those changing economic conditions. While I agree  
8 economic conditions have improved in North Carolina, the  
9 improvements do not necessarily justify such a high rate of return  
10 and ROE. Specifically, I highlight the following: (1) DEC's ROE  
11 request of 10.50% is almost 100 basis points above the average  
12 authorized ROEs for electric utilities over the 2018-19 time period;  
13 (2) while the unemployment rates in North Carolina and DEC's  
14 service territory have fallen by two-thirds since their peaks in the  
15 2009-2010 period, they are both above the national average of  
16 3.90%; and (3) while North Carolina's residential electric rates are  
17 below the national average, North Carolina's median household  
18 income is more than 10% below the U.S. norm.

---

<sup>4</sup> In NC, flotation costs cannot lawfully be recovered when the Company does not expect to issue stock in the near future. Utilities Com. v. Public Staff, 331 N.C. 215; 415 S.E.2d 354 (1992).

1     **II. CAPITAL MARKET CONDITIONS AND AUTHORIZED ROES**

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

4     A. On December 16, 2015, the Federal Reserve increased its target  
5     rate for federal funds from 0.25 to 0.50 percent.<sup>5</sup> This increase came  
6     after the rate was kept in the 0.00 to 0.25 percent range for over five  
7     years in order to spur economic growth in the wake of the financial  
8     crisis associated with the Great Recession. As the economy  
9     improved, with lower unemployment, steady but slow Gross  
10    Domestic Product (GDP) growth, the Federal Reserve has increased  
11    the target federal funds rate on eight additional occasions: December  
12    2016; March, June, and December of 2017; and March, June,  
13    September, and December of 2018.

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

16    A. Figure 1, below, shows the yield on 30-year Treasury bonds over the  
17    period of 2015-2019. I have highlighted the dates when the Federal  
18    Reserve increased the federal funds rate. The 30-year Treasury yield  
19    hit its lowest point in the 2015-2016 timeframe in the summer of 2016  
20    and subsequently increased with improvements in the economy.

---

<sup>5</sup> 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.



1 Financial markets moved significantly in the wake of the results of  
2 the presidential election on November 8, 2016. The stock market  
3 gained more than 10% and the 30-year Treasury yield increased  
4 about 50 basis points to 3.2% by year-end 2016. However, over the  
5 past three years, even as the Federal Reserve has increased the  
6 federal funds rate, the yield on 30-year bonds remained in the 2.8%  
7 to 3.4% range through 2018. These yields peaked at 3.48% in  
8 November of 2018, shortly before the December 2018 rate increase  
9 by the Federal Reserve.

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

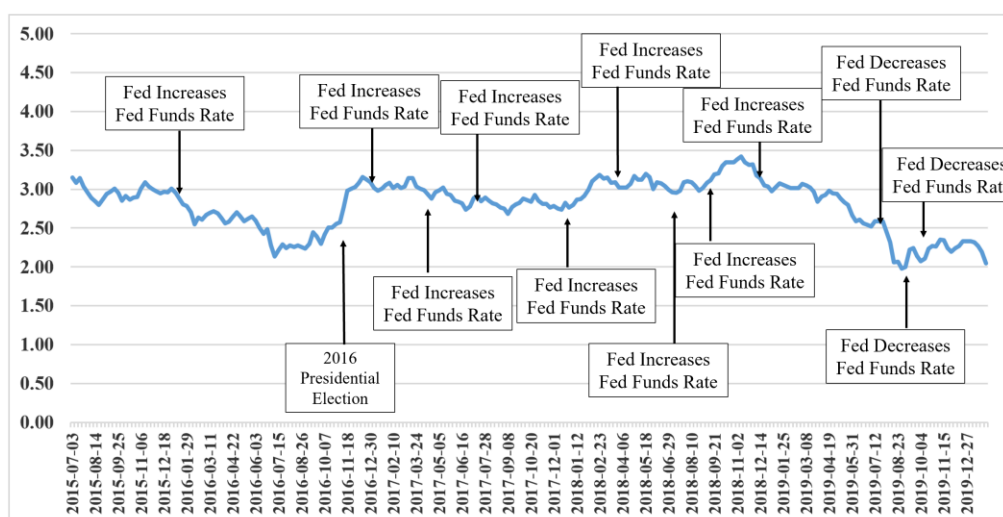
11 A. Despite the Federal Reserve's efforts to stimulate the economy,  
12 economic growth and inflation remained low, even with record low  
13 unemployment levels. The rate increase in December of 2018 was  
14 seen by many as maybe too aggressive.<sup>6</sup> Also, with the imposition of  
15 trade tariffs aimed at China, economic growth and inflation in the U.S.  
16 remained at low levels. This led the Federal Reserve to cut the  
17 federal fund rate to the 2.0%-2.25% range in July of 2019. Thirty-  
18 year Treasury yields, which began the year in the 3.0% range,  
19 declined significantly in the second quarter and, in August, declined  
20 to record lows and even traded below 2.0%. As a result, the Federal  
21 Reserve cut the discount rate two more times since the July rate cut

---

<sup>6</sup> Patti Domm, "Here's What Spooked the Market About the Fed Today," CNBC Market Insider (December 19, 2018). <https://www.cnbc.com/2018/12/19/fed-delivers-.html>.

1 – in September and October. As of year-end, the 30-Treasury yield  
 2 settled at 2.30% and has declined since that time. The irony is,  
 3 despite the record low levels in 2019, the 30-year Treasury yield in  
 4 the U.S. is still somewhat higher than the government bond rates in  
 5 Japan, the U.K., Germany, and much of the rest of Europe.

**Figure 1**  
**Thirty-Year Treasury Yield and Federal Reserve Fed Funds Rate**  
**Increases**  
**2015-2020**



6 **Q. WHY HAVE LONG-TERM TREASURY YIELDS REMAINED IN**  
 7 **THE 2.0%-3.0% RANGE DESPITE THE FEDERAL RESERVE**  
 8 **INCREASING THE FEDERAL FUNDS RATE?**

9 **A.** While the Federal Reserve can directly affect short-term rates by  
 10 adjustments to the federal funds rate, long-term rates are primarily

1 driven by expected economic growth and inflation.<sup>7</sup> The relationship  
2 between short- and long-term rates is normally evaluated using the  
3 yield curve. The yield curve depicts the relationship between the  
4 yield-to-maturity and the time-to-maturity for U.S. Treasury bills,  
5 notes, and bonds. Figure 2, below, shows the yield curve on a semi-  
6 annual basis since the Federal Reserve started increasing the  
7 federal funds rate at the end of 2015. It shows that, from the time the  
8 Federal Reserve began increasing the federal fund rate in 2015 and  
9 until 2018, with the exception of mid-year 2016, the 30-year Treasury  
10 yield has remained in the 2.8%-3.4% range over this time frame  
11 despite the fact that short-term rates have increased from near 0.0%  
12 to about 2.50%. As such, long-term interest rates and capital costs  
13 did not increase in any meaningful way even with the Federal  
14 Reserve's actions and the increase in short-term rates.

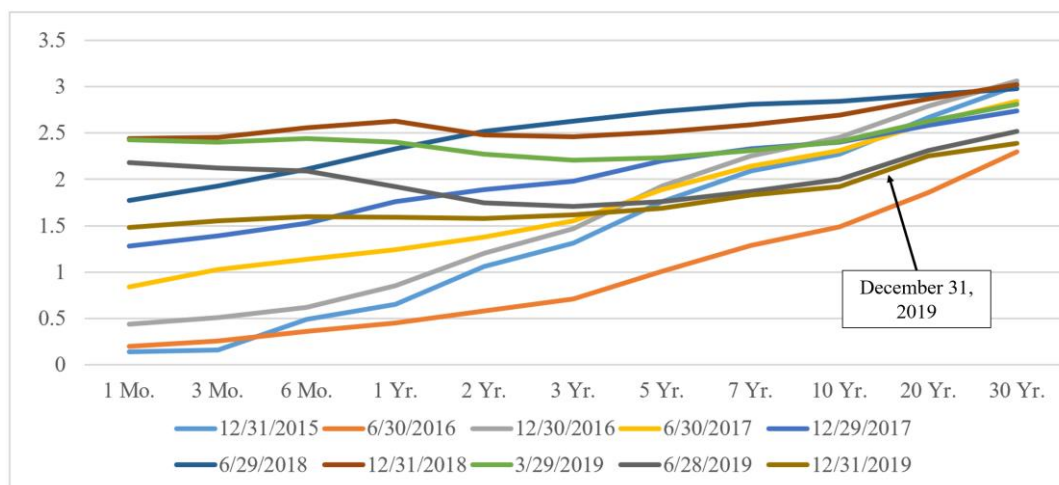
15 In 2019, with the large decline in long-term Treasury rates, the  
16 concern was an "inverted yield curve." An inverted yield curve occurs  
17 when short-term Treasury yields are above long-term Treasury  
18 yields and is commonly associated with a pending recession. The  
19 yield curve did invert a few times in the third quarter of 2019. In Figure

---

<sup>7</sup> While 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% - 2.5% range. In addition, inflation remains low and is also in the 2.0% - 2.5% range.

1           2, the yield curve for December 31, 2019, is shown in dark orange  
2           and is not inverted, due in large part to the three rate cuts.

**Figure 2**  
**Semi-Annual Yield Curves**  
**2015-2020**



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

3       **Q.    WHAT DO YOU RECOMMEND THE COMMISSION DO**  
4       **REGARDING MR. HEVERT'S FORECASTS OF HIGHER**  
5       **INTEREST RATES AND CAPITAL COSTS?**

6       A.    I suggest that the Commission disregard Mr. Hevert's forecasts and set  
7       an equity cost rate based on current indicators of market-cost rates  
8       rather than speculating on the future direction of interest rates.

9       Economists have been predicting that interest rates would be going up  
10      for a decade, and they consistently have been wrong. Several studies  
11      in recent years have highlighted the bias in economists' forecasts  
12      toward higher interest rates: (1) after the announcement of the end of

1 the Quantitative Easing III (QEIII) program in 2014, all of the  
2 economists in Bloomberg's interest rate survey forecasted interest  
3 rates would increase in 2014, and 100% of the economists were  
4 wrong<sup>8</sup>; (2) *Bloomberg* reported that the Federal Reserve Bank of  
5 New York has gone as far as stopping use of interest rate estimates  
6 of professional forecasters in its interest rate model<sup>9</sup>; (3) a study  
7 entitled "How Interest Rates Keep Making People on Wall Street  
8 Look Like Fools," which evaluated economists' forecasts at the  
9 beginning of each year of the yield on ten-year Treasury bonds over  
10 the last ten years,<sup>10</sup> demonstrated that economists consistently  
11 predict that interest rates will go higher, and interest rates have not  
12 fulfilled the predictions; and (4) a study that tracked economists'  
13 forecasts for the yield on ten-year Treasury bonds on an ongoing  
14 basis from 2010 until 2015.<sup>11</sup> The results of this study, which was  
15 entitled "Interest Rate Forecasters Are Shockingly Wrong Almost All

---

<sup>8</sup> Ben Eisen, "Yes, 100% of economists were dead wrong about yields" *Market Watch*, October 22, 2014. <https://www.marketwatch.com/story/yes-100-of-economists-were-dead-wrong-about-yields-2014-10-21>

<sup>9</sup> 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>.

<sup>10</sup> Joe Weisenthal, "How Interest Rates Keep Making People on Wall Street Look Like Fools," *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>.

<sup>11</sup> 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>.

1 of the Time,” demonstrate how economists continually forecast that  
2 interest rates would rise, and they did not.

3 More recently, in an end-of-decade financial markets review series  
4 in the *Wall Street Journal*, Gregory Ip highlighted how economists’  
5 forecasts of higher interest rates over the 2010s continued to be  
6 erroneous. He provided evidence that economists forecast that  
7 short-term and long-term interest rates would go up, and these  
8 forecasts were consistently wrong. The article provides insights as  
9 to why the longest economic expansion on record that has resulted  
10 in a record-breaking stock market run and a 50-year low  
11 unemployment rate, was coupled with inflation that consistently ran  
12 below the Fed’s 2% target and record low interest rates.<sup>12</sup> The  
13 bottom line – over the past decade - economists have consistently  
14 forecasted higher interest rates, and they have consistently been  
15 wrong!

16 Obviously, investors are aware of the consistently wrong forecasts of  
17 higher interest rates, and therefore place little weight on such  
18 forecasts. Investors would not be buying long-term Treasury bonds or  
19 utility stocks at their current yields if they expected interest rates to  
20 suddenly increase, thereby producing higher yields and negative

---

<sup>12</sup> Gregory Ip, “Economists Got it Wrong for a Decade. They’re Trying to Figure Out Why,” *Wall Street Journal*, (December 14, 2019). P. C1.

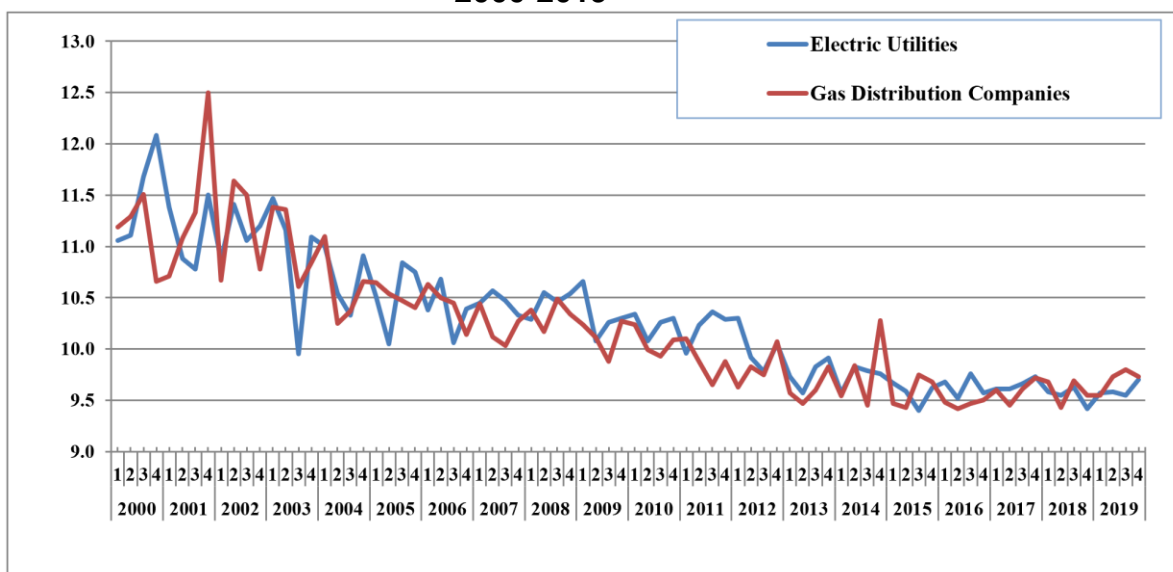
1 returns. For example, consider a utility that pays a dividend of \$2.00  
2 with a stock price of \$50.00. The current dividend yield in that example  
3 is 4.0%. If, as Mr. Hevert suggests, interest rates and required utility  
4 yields increase, the price of the utility stock would decline. In the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

10 In sum, it is practically impossible to accurately forecast interest rates  
11 and prices of investments that are determined in financial markets,  
12 such as interest rates and prices for stocks and commodities. For  
13 interest rates, I am not aware of any study that suggests one  
14 forecasting service is consistently better than others or that interest  
15 rate forecasts are consistently better than just assuming the current  
16 interest rate will be the rate in the future. As discussed above, investors  
17 would not be buying long-term Treasury bonds or utility stocks at their  
18 current yields if they expected interest rates to suddenly increase,  
19 thereby producing higher yields and negative returns. Thus, I  
20 recommend that the Commission not rely on interest rate forecasts but  
21 use current interest rates in estimating the appropriate ROE for the  
22 Company.

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

3 A. Over the past five years, with historically low interest rates and  
 4 capital costs, authorized ROEs for electric utility and gas distribution  
 5 companies have slowly declined to reflect the low capital cost  
 6 environment. In Figure 3, below, I have graphed the quarterly  
 7 authorized ROEs for electric and gas companies from 2000 to 2019.  
 8 There is a clear downward trend in the data. On an annual basis,  
 9 these authorized ROEs for electric utilities have declined from an  
 10 average of 10.01% in 2012, 9.8% in 2013, 9.76% in 2014, 9.58% in  
 11 2015, 9.60% in 2016, 9.68% in 2017, 9.56% in 2018, and 9.64% in  
 12 of 2019, according to Regulatory Research Associates.<sup>13</sup>

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



<sup>13</sup> S&P Global Market Intelligence, RRA *Regulatory Focus*, 2019.



1 **III. PROXY GROUP SELECTION**

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

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

10 **Q. PLEASE DESCRIBE YOUR PROXY GROUP OF COMPANIES.**

11 A. The selection criteria for the companies in Electric Proxy Group  
12 include the following:

13 (1) Received at least 50% of revenues from regulated electric  
14 operations as reported in SEC Form 10-K Report;

15 (2) Is listed as a U.S.-based Electric Utility by *Value Line*  
16 *Investment Survey*;

17 (3) Has an investment-grade corporate credit and bond rating;

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

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

1 (6) Has analysts' long-term EPS growth rate forecasts available  
2 from Yahoo or Zack's.

3 The Electric Proxy Group includes 30 companies. Summary financial  
4 statistics for the proxy group are listed in Exhibit JRW-2. The median  
5 operating revenues and net plant among members of the Electric  
6 Proxy Group are \$6,852.0 million and \$22,405.5 million, respectively.  
7 The group on average receives 81% of its revenues from regulated  
8 electric operations, and has a BBB+ bond rating from S&P's and a  
9 Baa1 rating from Moody's, a current average common equity ratio of  
10 46.0%, and an earned return on common equity of 9.6%.

11 **Q. PLEASE DESCRIBE THE HEVERT PROXY GROUP.**

12 A. Mr. Hevert's group is smaller (19 companies). Summary financial  
13 statistics for Mr. Hevert's proxy group are provided in Panel B of page  
14 1 of Exhibit JRW-2. The median operating revenues and net plant for  
15 the Hevert Proxy Group are \$4,275.9 million and \$18,126.0 million,  
16 respectively. The group on average receives 78% of its revenues  
17 from regulated electric operations, and has a BBB+ bond rating from  
18 S&P's and a Baa1 rating from Moody's, an average common equity  
19 ratio of 48.0%, and earned return on common equity of 9.7%.

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

1 A. I believe that bond ratings provide a good assessment of the  
2 investment risk of a company. The S&P and Moody's issuer credit  
3 ratings for DEC are A- and A1, respectively. The average S&P and  
4 Moody's ratings for the Electric and Hevert Proxy Group are BBB+  
5 and Baa1. Therefore, DEC's S&P rating is one notch above the  
6 average of the two groups (A- vs. BBB+), and DEC's Moody's rating  
7 is three rating notches above the average of the two groups (A1 vs.  
8 Baa1). This indicates that the investment risk of DEC is below the  
9 average of the electric utilities in the two proxy groups.

10 On page 2 of Exhibit JRW-2, I have assessed the riskiness of the two  
11 proxy groups using five different risk measures from *Value Line*.  
12 These measures are beta, Financial Strength, Safety, Earnings  
13 Predictability, and Stock Price Stability.<sup>14</sup> These risk measures  
14 indicate that the two proxy groups are similar in risk. The  
15 comparisons of the risk measures of the Electric Proxy Group and  
16 the Hevert Proxy Group show beta (0.57 vs. 0.56), Financial Strength  
17 (A vs. A) Safety (1.8 vs. 1.8), Earnings Predictability (77 vs. 83), and  
18 Stock Price Stability (96 vs. 97), respectively. On balance, these  
19 measures suggest that the two proxy groups are similar in risk.

20 **Q. WHAT DO YOU CONCLUDE FROM YOUR RISK ANALYSIS?**

---

<sup>14</sup> These risk metrics are described in detail on Page 3 of Exhibit JRW-2.

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

10 **IV. CAPITAL STRUCTURE RATIOS AND DEBT COST RATES**

11 **Q. PLEASE DESCRIBE DEC'S PROPOSED CAPITAL STRUCTURE**  
12 **AND SENIOR CAPITAL COST RATES.**

13 A. DEC witness Newlin has proposed a hypothetical capital structure of  
14 47.00% long-term debt and 53.00% common equity and a long-term  
15 debt cost rate of 4.51% based on its weighted average cost of long-  
16 term debt as of December 31, 2018.

17 **Q. HOW DOES MR. NEWLIN DEVELOP THE COMPANY'S**  
18 **PROPOSED CAPITAL STRUCTURE WITH A COMMON EQUITY**  
19 **RATIO OF 53.0%?**

20 A. Mr. Newlin simply maintains that a capital structure with a common  
21 equity ratio of 53.0% is needed to ensure the financial integrity of  
22 DEC.

1    **Q.    HAS MR. NEWLIN PREPARED ANY STUDIES TO DEFEND HIS**  
2           **PROPOSED CAPITAL STRUCTURE WITH A COMMON EQUITY**  
3           **RATIO OF 53.0%?**

4    A.    No. He simply notes that the Company's common equity ratio as of  
5           December 31, 2018 was 51.5%.

6    **Q.    HAS MR. NEWLIN COMPARED THE COMPANY'S PROPOSED**  
7           **CAPITAL STRUCTURE WITH A COMMON EQUITY RATIO OF**  
8           **53.0% WITH THE CAPITAL STRUCTURE RATIOS OF OTHER**  
9           **ELECTRIC UTILITY COMPANIES?**

10   A.    No.

11   **Q.    HAS MR. NEWLIN TAKEN INTO ACCOUNT THE FACT THAT**  
12           **DEC'S S&P AND MOODY'S RATINGS OF A- AND A+ ARE**  
13           **ABOVE THE S&P AND MOODY'S RATINGS OF OTHER**  
14           **ELECTRIC UTILITIES?**

15   A.    No.

16   **Q.    HOW DO DEC'S PROPOSED CAPITAL STRUCTURE RATIOS**  
17           **COMPARE TO THE AVERAGE CAPITALIZATION RATIOS FOR**  
18           **COMPANIES IN THE PROXY GROUPS?**

19   A.    DEC's proposed capital structure ratios include a common equity  
20           ratio of 53.00%. As shown on Page 1 of Exhibit JRW-2, the average  
21           quarterly common equity ratio for the Electric and Hevert Proxy Groups  
22           as of December 31, 2018, was 46.0% and 48.0%, respectively. As

1 such, DEC has proposed a capital structure that includes much more  
2 common equity in financing its utility operations than the average of the  
3 proxy group.

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

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

13 **Q. IS IT APPROPRIATE TO INCLUDE SHORT-TERM DEBT IN THE**  
14 **CAPITALIZATION IN COMPARING THE COMMON EQUITY**  
15 **RATIOS OF THE HOLDING COMPANIES WITH DEC'S**  
16 **PROPOSED CAPITALIZATION?**

17 A. Yes. I am following North Carolina precedent and not recommending  
18 short-term debt in DEC's capital structure. However, in comparing the  
19 common equity ratios of the holding companies with DEC's  
20 recommendation, it is appropriate to include short-term debt when  
21 computing the holding company common equity ratios. That is  
22 because short-term debt, like long-term debt, has a higher claim on the

1 assets and earnings of the company and requires timely payment of  
2 interest and repayment of principal. In addition, the financial risk of a  
3 company is based on total debt, which includes both short-term and  
4 long-term debt. This is why credit rating agencies use total debt in  
5 assessing the leverage and financial risk of companies.

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

9 A. According to S&P Global Market Intelligence, the average authorized  
10 common equity ratio for electric utilities in calendar years 2018 and  
11 2019 was 50.98%. This percentage excludes the common equity  
12 ratios of utilities in states which include cost-free capital items in  
13 authorized capital structures.<sup>15</sup>

14 **Q. HOW DO DEC'S PROPOSED CAPITAL STRUCTURE RATIOS**  
15 **COMPARE TO THE CAPITALIZATION RATIOS OF DEC AND ITS**  
16 **PARENT, DUKE ENERGY?**

17 A. DEC and Duke Energy's quarterly common equity ratio for the eight  
18 quarters ending September 30, 2019 (as provided in Panel B on Page  
19 1 of Exhibit JRW-3), were 51.2% and 43.4%, respectively. As a result,  
20 the Company's proposed capital structure includes a higher common  
21 equity ratio than it has maintained in the past two years and a much

---

<sup>15</sup> S&P Global Market Intelligence, RRA *Regulatory Focus*, 2018 and 2019.

1 higher common equity ratio than its parent company, Duke Energy  
2 Corporation.

3 **Q. IS DUKE ENERGY'S HIGH DEBT RATIO AND LOW EQUITY**  
4 **RATIO A FACTOR IN THE RISK ASSESSMENT OF DEC?**

5 A. Yes. As previously noted, DEC's Moody's rating of A1 is three rating  
6 notches above Duke Energy's rating of Baa1.

7 **Q. PLEASE DISCUSS THE ISSUE OF PUBLIC UTILITY HOLDING**  
8 **COMPANIES SUCH AS DUKE ENERGY USING DEBT TO**  
9 **FINANCE THE EQUITY IN SUBSIDIARIES SUCH AS THE**  
10 **COMPANY.**

11 A. Moody's published an article on the use of low-cost debt financing by  
12 public utility holding companies to increase their ROEs. The  
13 summary observations included the following:<sup>16</sup>

14 US utilities use leverage at the holding-company level  
15 to invest in other businesses, make acquisitions and  
16 earn higher returns on equity. In some cases, an  
17 increase in leverage at the parent can hurt the credit  
18 profiles of its regulated subsidiaries.

19 This financial strategy has traditionally been known as double  
20 leverage. Moody's defined double leverage in the following way:<sup>17</sup>

21 Double leverage is a financial strategy whereby the  
22 parent raises debt but downstreams the proceeds to its

---

<sup>16</sup> Moody's Investors' Service, "High Leverage at the Parent Often Hurts the Whole Family," May 11, 2015, p.1.

<sup>17</sup> *Ibid.* p. 5.



1 operating subsidiary, likely in the form of an equity  
2 investment. Therefore, the subsidiary's operations are  
3 financed by debt raised at the subsidiary level and by  
4 debt financed at the holding-company level. In this way,  
5 the subsidiary's equity is leveraged twice, once with the  
6 subsidiary debt and once with the holding-company  
7 debt. In a simple operating-company / holding-company  
8 structure, this practice results in a consolidated debt-to-  
9 capitalization ratio that is higher at the parent than at the  
10 subsidiary because of the additional debt at the parent.

11 Moody's goes on to discuss the potential risk to utilities of the  
12 strategy, and specifically notes that regulators could take it into  
13 consideration in setting authorized ROEs.<sup>18</sup>

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

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

25 A. A utility's decision as to the amount of equity capital it will incorporate  
26 into its capital structure involves fundamental trade-offs relating to  
27 the amount of financial risk the firm carries, the overall revenue

---

<sup>18</sup> *Ibid.* p. 1.

1 requirements its customers are required to bear through the rates  
2 they pay, and the return on equity that investors will require.

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

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

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

18 A. Just as there is a direct correlation between the utility's authorized  
19 return on equity and the utility's revenue requirements (the higher the  
20 return, the greater the revenue requirement), there is a direct  
21 correlation between the amount of equity in the capital structure and  
22 the revenue requirements that customers are called on to bear.

1 Again, equity capital is more expensive than debt. Not only does  
2 equity command a higher cost rate, it also adds more to the income  
3 tax burden that ratepayers are required to pay through rates. As the  
4 equity ratio increases, the utility's revenue requirements increase  
5 and the rates paid by customers increase. If the proportion of equity  
6 is too high, rates will be higher than they need to be. For this reason,  
7 the utility's management should pursue a capital acquisition strategy  
8 that results in the proper balance in the capital structure.

9 **Q. HOW HAVE UTILITIES TYPICALLY STRUCK THIS BALANCE?**

10 A. Due to regulation and the essential nature of its output, a regulated  
11 utility is exposed to less business risk than other companies that are  
12 not regulated. This means that a utility can reasonably carry relatively  
13 more debt in its capital structure than can most unregulated  
14 companies. Thus, a utility should take appropriate advantage of its  
15 lower business risk to employ cheaper debt capital at a level that will  
16 benefit its customers through lower revenue requirement.

17 **Q. GIVEN THAT DEC HAS PROPOSED AN EQUITY RATIO THAT IS**  
18 **HIGHER THAN (1) THE AVERAGE COMMON EQUITY RATIOS**  
19 **OF THE ELECTRIC AND HEVERT'S PROXY GROUPS, (2) THE**  
20 **AVERAGE AUTHORIZED COMMON EQUITY RATIO FOR**  
21 **ELECTRIC UTILITY COMPANIES, AND (3) THE COMMON**

1           **EQUITY RATIO OF ITS PARENT COMPANY, WHAT SHOULD**  
2           **THE COMMISSION DO IN THIS RATEMAKING PROCEEDING?**

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

11   **Q.    PLEASE ELABORATE ON THIS "DOWNWARD IMPACT."**

12   A.    As I stated earlier, there is a direct correlation between the amount  
13          of debt in a utility's capital structure and the financial risk that an  
14          equity investor will associate with that utility. A relatively lower  
15          proportion of debt translates into a lower required return on equity,  
16          all other things being equal. Stated differently, a utility cannot expect  
17          to "have it both ways." Specifically, a utility cannot maintain an  
18          unusually high equity ratio and not expect to have the resulting lower  
19          risk reflected in its authorized return on equity. The fundamental  
20          relationship between lower risk and the appropriate authorized return  
21          should not be ignored.

1 **Q. GIVEN THIS DISCUSSION, PLEASE DISCUSS YOUR PRIMARY**  
2 **CAPITAL STRUCTURE RECOMMENDATION FOR DEC.**

3 A. My primary capital structure recommendation is presented in Panel  
4 C of Exhibit JRW-3. As previously noted, DEC's proposed capital  
5 structure consists of more common equity and less financial risk than  
6 any of the other proxy groups of electric companies. Therefore, in my  
7 primary rate of return recommendation, I am proposing a capital  
8 structure that includes a common equity ratio of 50.0%. This capital  
9 structure includes a common equity ratio that is about halfway  
10 between DEC's proposed capital structure of 53.00% and the  
11 average common equity ratios of the proxy groups of 46.00% and  
12 48.00%. As shown in Table 3 and Panel C of Exhibit JRW-3, in this  
13 capital structure, I have grossed up the percentage amount of long-  
14 term debt to 50.0% and reduced the amount of common equity from  
15 53.00% to 50.0%. As noted above, in my primary rate of return  
16 recommendation, I am using a ROE of 9.0%.

**Table 3**  
**Staff's Primary Capital Structure Recommendation**

	<b>DEC Proposed</b>	<b>Adjustment</b>	<b>Staff Proposed</b>	<b>Cost</b>
<b>Long-Term Debt</b>	<b>47.00%</b>	<b>1.063830</b>	<b>50.00%</b>	<b>4.51%</b>
<b>Common Equity</b>	<b>53.00%</b>	<b>0.943396</b>	<b>50.00%</b>	<b>-</b>
<b>Total Capital</b>	<b>100.00%</b>		<b>100.00%</b>	

17 **Q. DO YOU BELIEVE THAT YOUR PROPOSED 50% EQUITY**  
18 **CAPITAL STRUCTURE IS FAIR TO DEC?**

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

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

9 A. In my alternative rate of return recommendation, I am using DEC's  
10 proposed capital structure which consists of 47.00% long-term debt  
11 and 53.00%. I am also using DEC's proposed long-term debt cost  
12 rate of 4.51%. As noted above, in my alternative rate of return  
13 recommendation, I am using an ROE of 8.40%. I believe that the  
14 8.40% ROE reflects the current market cost of equity. In addition, if  
15 the Commission adopts DEC's proposed capital structure with its  
16 high common equity ratio, I believe that the Commission should  
17 employ a lower ROE to reflect the lower financial risk associated with  
18 a higher common equity ratio.

**Table 4**  
**Public Staff's Alternative Capital Structure Recommendation**

	<b>Percent of Total</b>	<b>Cost</b>
<b>Long-Term Debt</b>	<b>47.00%</b>	<b>4.51%</b>
<b>Common Equity</b>	<b>53.00%</b>	
<b>Total Capital</b>	<b>100.00%</b>	

1                                    **V.     THE COST OF COMMON EQUITY CAPITAL**

2                                    **A.           Overview**

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

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

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

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

1 expected and required rates of return on a company's common stock  
2 are equal.

3 Normative economic models of a company or firm, developed under  
4 very restrictive assumptions, provide insight into the relationship  
5 between firm performance or profitability, capital costs, and the value  
6 of the firm. Under the economist's ideal model of perfect competition,  
7 where entry and exit are costless, products are undifferentiated, and  
8 there are increasing marginal costs of production, firms produce up  
9 to the point where price equals marginal cost. Over time, a long-run  
10 equilibrium is established where price equals average cost, including  
11 the firm's capital costs. In equilibrium, total revenues equal total  
12 costs, and because capital costs represent investors' required return  
13 on the firm's capital, actual returns equal required returns, and the  
14 market value must equal the book value of the firm's securities.

15 In a competitive market, firms can achieve competitive advantage  
16 due to product market imperfections. Most notably, companies can  
17 gain competitive advantage through product differentiation (adding  
18 real or perceived value to products) and by achieving economies of  
19 scale (decreasing marginal costs of production). Competitive  
20 advantage allows firms to price products above average cost and  
21 thereby earn accounting profits greater than those required to cover  
22 capital costs. When these profits are in excess of those required by



1 investors, or when a firm earns a return on equity in excess of its cost  
2 of equity, investors respond by valuing the firm's equity in excess of  
3 its book value.

4 James M. McTaggart, founder of the international management  
5 consulting firm Marakon Associates, described this essential  
6 relationship between the return on equity, the cost of equity, and the  
7 market-to-book ratio in the following manner:<sup>19</sup>

8 Fundamentally, the value of a company is  
9 determined by the cash flow it generates over time  
10 for its owners, and the minimum acceptable rate of  
11 return required by capital investors. This "cost of  
12 equity capital" is used to discount the expected  
13 equity cash flow, converting it to a present value.  
14 The cash flow is, in turn, produced by the interaction  
15 of a company's return on equity and the annual rate  
16 of equity growth. High return on equity (ROE)  
17 companies in low-growth markets, such as Kellogg,  
18 are prodigious generators of cash flow, while low  
19 ROE companies in high-growth markets, such as  
20 Texas Instruments, barely generate enough cash  
21 flow to finance growth.

22 A company's ROE over time, relative to its cost of  
23 equity, also determines whether it is worth more or  
24 less than its book value. If its ROE is consistently  
25 greater than the cost of equity capital (the investor's  
26 minimum acceptable return), the business is  
27 economically profitable and its market value will  
28 exceed book value. If, however, the business earns  
29 a ROE consistently less than its cost of equity, it is  
30 economically unprofitable and its market value will  
31 be less than book value.

---

<sup>19</sup> James M. McTaggart, "The Ultimate Poison Pill: Closing the Value Gap," *Commentary* (Spring 1986), p.3.

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

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

10 A. This relationship is discussed in a classic Harvard Business School  
 11 case study entitled "Note on Value Drivers." On page 2 of that case  
 12 study, the author describes the relationship very succinctly:<sup>20</sup>

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

<i>Profitability</i>	<i>Value</i>
<i>If ROE &gt; K</i>	<i>then</i>
<i>Market/Book &gt; 1</i>	
<i>If ROE = K</i>	<i>then</i>
<i>Market/Book = 1</i>	
<i>If ROE &lt; K</i>	<i>then</i>
<i>Market/Book &lt; 1</i>	

---

<sup>20</sup> Benjamin Esty, "Note on Value Drivers," Harvard Business School, Case No. 9-297-082, April 7, 1997.

1 To assess the relationship by industry, as suggested above, I  
2 performed a regression study between estimated ROE and market-  
3 to-book ratios using *Value Line*'s electric utilities and gas distribution  
4 companies. I used all electric utility and gas distribution companies  
5 that are covered by *Value Line* and have estimated ROE and market-  
6 to-book ratio data. The results are presented in Exhibit JRW-4. The  
7 R-square for the regression of estimated ROEs and market-to-book  
8 ratios is 0.50.<sup>21</sup> This demonstrates a statistically significant positive  
9 relationship between ROEs and market-to-book ratios for electric  
10 utilities and gas companies. Given that the market-to-book ratios  
11 have been above 1.0 for a number of years, this also demonstrates  
12 that utilities have been earnings ROEs above the cost of equity  
13 capital for many years.

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

16 A. Exhibit JRW-5 provides indicators of public utility equity cost rates.  
  
17 Page 1 shows the yields on long-term A-rated public utility bonds.  
18 These yields decreased from 2000 until 2003, and then hovered in  
19 the 5.50%-6.50% range from mid-2003 until mid-2008. The yields  
20 peaked in November 2008 at 7.75% during the Great Recession.

---

<sup>21</sup> 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.

1        These yields have generally declined since then, dropping below  
2        4.0% on five occasions - in mid-2013, in the first quarter of 2015, in  
3        the summer of 2016, in late 2018, and in 2019. The yields were about  
4        3.5% as of the end of 2019.

5        Page 2 of Exhibit JRW-5 provides the average dividend yields for  
6        electric utility companies over the past 16 years. The dividend yields  
7        for the electric group declined from 5.3% to 3.4% between 2001 to  
8        2007, increased to over 5.0% in 2009, and have steadily since that  
9        time. The average dividend yield was 3.2% in 2018.

10       Average earned returns on common equity and market-to-book  
11       ratios for electric utilities are on page 3 of Exhibit JRW-5. For the  
12       electric group, earned returns on common equity have declined  
13       gradually over the years. In the past three years, the average earned  
14       ROE for the group has been in the 9.0% to 10.0% range. The  
15       average market-to-book ratios for this group declined to about 1.1X  
16       in 2009 during the financial crisis and have increased since that time.  
17       As of 2018, the average market-to-book for the group was 1.80X.  
18       This means that, for at least the last decade, returns on common  
19       equity for electric utilities have been greater than the cost of capital,  
20       or more than necessary to meet investors' required returns. This also  
21       means that customers have been paying more than necessary to  
22       support an appropriate profit level for regulated utilities.

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

3    A.    The expected or required rate of return on common stock is a  
4           function of market-wide as well as company-specific factors. The  
5           most important market factor is the time value of money as indicated  
6           by the level of interest rates in the economy. Common stock investor  
7           requirements generally increase and decrease with like changes in  
8           interest rates. The perceived risk of a firm is the predominant factor  
9           that influences investor return requirements on a company-specific  
10          basis. A firm's investment risk is often separated into business risk  
11          and financial risk. Business risk encompasses all factors that affect  
12          a firm's operating revenues and expenses. Financial risk results from  
13          incurring fixed obligations in the form of debt in financing its assets.

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

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

1 Page 4 of Exhibit JRW-5 provides an assessment of investment risk  
2 for 97 industries as measured by beta, which according to modern  
3 capital market theory, is the only relevant measure of investment risk.  
4 These betas come from the *Value Line Investment Survey*. The study  
5 shows that the investment risk of utilities is very low. The average  
6 betas for electric, gas, and water utility companies are 0.58, 0.67,  
7 and 0.68, respectively.<sup>22</sup> As such, the cost of equity for utilities is  
8 among the lowest of all industries in the U.S. based on modern  
9 capital market theory.

10 **Q. WHAT IS THE COST OF COMMON EQUITY CAPITAL?**

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

18 According to valuation principles, the present value of an asset  
19 equals the discounted value of its expected future cash flows.  
20 Investors discount these expected cash flows at their required rate

---

<sup>22</sup> The beta for the *Value Line* Electric Utilities is the simple average of *Value Line*'s Electric East (0.56), Central (0.61), and West (0.59) group betas.

1 of return that, as noted above, reflects the time value of money and  
2 the perceived riskiness of the expected future cash flows. As such,  
3 the cost of common equity is the rate at which investors discount  
4 expected cash flows associated with common stock ownership.

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

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

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

17 A. I rely primarily on the DCF model to estimate the cost of equity  
18 capital. Given the investment valuation process and the relative  
19 stability of the utility business, the DCF model provides the best  
20 measure of equity cost rates for public utilities. I have also performed  
21 a CAPM study; however, I give these results less weight because I  
22 believe that risk premium studies, of which the CAPM is one form,

1 provide a less reliable indication of equity cost rates for public  
2 utilities.

3 **B. Discounted Cash Flow Analysis**

4 **Q. PLEASE DESCRIBE THE THEORY BEHIND THE TRADITIONAL**  
5 **DCF MODEL.**

6 A. According to the DCF model, the current stock price is equal to the  
7 discounted value of all future dividends that investors expect to  
8 receive from investment in the firm. As such, stockholders' returns  
9 ultimately result from current as well as future dividends. As owners  
10 of a corporation, common stockholders are entitled to a *pro rata*  
11 share of the firm's earnings. The DCF model presumes that earnings  
12 that are not paid out in the form of dividends are reinvested in the  
13 firm to provide for future growth in earnings and dividends. The rate  
14 at which investors discount future dividends, which reflects the timing  
15 and riskiness of the expected cash flows, is interpreted as the  
16 market's expected or required return on the common stock.  
17 Therefore, this discount rate represents the cost of common equity.  
18 Algebraically, the DCF model can be expressed as:

$$19 \quad P = \frac{D_1}{(1+k)^1} + \frac{D_2}{(1+k)^2} + \dots + \frac{D_n}{(1+k)^n}$$

22 where P is the current stock price,  $D_1$ ,  $D_2$ , and  $D_n$  are the dividends in  
23 year 1, 2, and the future years n, and k is the cost of common equity.



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

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

13           1.    Growth stage: Characterized by rapidly expanding sales, high  
14           profit margins, and an abnormally high growth in earnings per share.  
15           Because of highly profitable expected investment opportunities, the  
16           payout ratio is low. Competitors are attracted by the unusually high  
17           earnings, leading to a decline in the growth rate.

18           2.    Transition stage: In later years, increased competition  
19           reduces profit margins and earnings growth slows. With fewer new  
20           investment opportunities, the company begins to pay out a larger  
21           percentage of earnings.

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

7           In using the 3-stage model to estimate a firm's cost of equity capital,  
8           dividends are projected into the future using the different growth  
9           rates in the alternative stages, and then the equity cost rate is the  
10          discount rate that equates the present value of the future dividends  
11          to the current stock price.

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

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

$$\begin{array}{l} 18 \\ 19 \\ 20 \end{array} \qquad P \quad = \quad \frac{D_1}{k - g}$$

21          where P is the current stock price, D<sub>1</sub> represents the expected  
22          dividend over the coming year, k is investor's required return on  
23          equity, and g is the expected growth rate of dividends. This is known

1 as the constant-growth version of the DCF model. To use the  
2 constant-growth DCF model to estimate a firm's cost of equity, one  
3 solves for k in the above expression to obtain the following:

$$\begin{array}{l} 4 \\ 5 \quad k = \frac{D_1}{P} + g \\ 6 \end{array}$$

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

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

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

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

11    **Q.     WHAT DIVIDEND YIELDS HAVE YOU REVIEWED?**

12    A.     I have calculated the dividend yields for the companies in the proxy  
13          groups using the current annual dividend and the 30-day, 90-day,  
14          and 180-day average stock prices. These dividend yields are  
15          provided in Panels A and B of page 2 of Exhibit JRW-7. I have shown  
16          the mean and median dividend yields using 30-day, 90-day, and 180-  
17          day average stock prices. Using both the means and medians, the  
18          dividend yields range from 3.1% to 3.2% for the Electric Proxy Group  
19          and 2.8% to 3.0% for the Hevert Proxy Group. Therefore, I will use a  
20          dividend yields of 3.15% and 2.90% for the Electric Proxy Group and  
21          the Hevert Proxy Group, respectively.

1     **Q.     PLEASE DISCUSS THE APPROPRIATE ADJUSTMENT TO THE**  
2     **SPOT DIVIDEND YIELD.**

3     A.     According to the traditional DCF model, the dividend yield term  
4           relates the dividend paid over the coming period to the current stock  
5           price. As indicated by Professor Myron Gordon, who is commonly  
6           associated with the development of the DCF model for popular use,  
7           this is obtained by: (1) multiplying the expected dividend over the  
8           coming quarter by 4, and (2) dividing this dividend by the current  
9           stock price to determine the appropriate dividend yield for a firm that  
10          pays dividends on a quarterly basis.<sup>23</sup>

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

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

---

<sup>23</sup> *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).

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

$$4 \quad K = [ (D/P) * (1 + 0.5g) ] + g$$

5 **Q. PLEASE DISCUSS THE GROWTH RATE COMPONENT OF THE**  
6 **DCF MODEL.**

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

13 **Q. WHAT GROWTH DATA HAVE YOU REVIEWED FOR THE PROXY**  
14 **GROUPS?**

15 A. I have analyzed a number of measures of growth for companies in  
16 the proxy groups. I reviewed *Value Line's* historical and projected  
17 growth rate estimates for EPS, dividends per share (DPS), and book  
18 value per share (BVPS). In addition, I utilized the average EPS  
19 growth rate forecasts of Wall Street analysts as provided by Yahoo,  
20 Reuters and Zacks. These services solicit five-year earnings growth  
21 rate projections from securities analysts and compile and publish the  
22 means and medians of these forecasts. Finally, I also assessed

1 prospective growth as measured by prospective earnings retention  
2 rates and earned returns on common equity.

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

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

21 Internally generated growth is a function of the percentage of  
22 earnings retained within the firm (the earnings retention rate) and the

1 rate of return earned on those earnings (the return on equity). The  
2 internal growth rate is computed as the retention rate times the return  
3 on equity. Internal growth is significant in determining long-run  
4 earnings and, therefore, dividends. Investors recognize the  
5 importance of internally generated growth and pay premiums for  
6 stocks of companies that retain earnings and earn high returns on  
7 internal investments.

8 **Q. PLEASE DISCUSS THE SERVICES THAT PROVIDE ANALYSTS'**  
9 **EPS FORECASTS.**

10 A. Analysts' EPS forecasts for companies are collected and published  
11 by several different investment information services, including  
12 Institutional Brokers Estimate System (I/B/E/S), Bloomberg, S&L  
13 Global Market Intelligence FactSet, Zacks, First Call, and Reuters,  
14 among others. Thompson Reuters publishes analysts' EPS forecasts  
15 under different product names, including I/B/E/S, First Call, and  
16 Reuters. S&P, Bloomberg, FactSet, and Zacks each publish their  
17 own set of analysts' EPS forecasts for companies. These services  
18 do not reveal (1) the analysts who are solicited for forecasts or (2)  
19 the identity of the analysts who actually provide the EPS forecasts  
20 that are used in the compilations published by the services. S&P,  
21 I/B/E/S, Bloomberg, FactSet, and First Call are fee-based services.  
22 These services usually provide detailed reports and other data in  
23 addition to analysts' EPS forecasts. In contrast, Thompson Reuters



1 and Zacks do provide limited EPS forecast data free-of-charge on  
2 the Internet. Yahoo finance (<http://finance.yahoo.com>) lists  
3 Thompson Reuters as the source of its summary EPS forecasts.  
4 Zacks ([www.zacks.com](http://www.zacks.com)) publishes its summary forecasts on its  
5 website. Zacks estimates are also available on other websites, such  
6 as MSN.money (<http://money.msn.com>).

7 **Q. WHICH OF THE EPS FORECASTS IS USED IN DEVELOPING A**  
8 **DCF GROWTH RATE?**

9 A. I am using the three-to-five- year EPS growth rate forecasts of  
10 analysts, which are often referred to as the long-term EPS growth  
11 rate forecasts.

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

15 A. There are several issues with using the EPS growth rate forecasts of  
16 Wall Street analysts as DCF growth rates. First, the appropriate  
17 growth rate in the DCF model is the dividend growth rate, not the  
18 earnings growth rate. Nonetheless, over the very long term, dividend  
19 and earnings will grow at a similar growth rate. Therefore,  
20 consideration must be given to other indicators of growth, including  
21 prospective dividend growth, internal growth, as well as projected  
22 earnings growth. Second, a study by Lacina, Lee, and Xu has shown

1           that analysts' three-to-five year EPS growth rate forecasts are not  
2           more accurate at forecasting future earnings than naïve random walk  
3           forecasts of future earnings.<sup>24</sup> Employing data over a 20-year period,  
4           these authors demonstrate that using the most recent year's actual  
5           EPS figure to forecast EPS in the next three-to-five years proved to  
6           be just as accurate as using the EPS estimates from analysts' three-  
7           to-five year EPS growth rate forecasts. In the authors' opinion, these  
8           results indicate that analysts' long-term earnings growth-rate  
9           forecasts should be used with caution as inputs for valuation and cost  
10          of capital purposes. Finally, and most significantly, it is well known  
11          that the long-term EPS growth-rate forecasts of Wall Street securities  
12          analysts are overly optimistic and upwardly biased. This has been  
13          demonstrated in a number of academic studies over the years.<sup>25</sup>  
14          Hence, using these growth rates as a DCF growth rate will provide  
15          an overstated equity cost rate. On this issue, a study by Easton and  
16          Sommers found that optimism in analysts' growth rate forecasts

---

<sup>24</sup> 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(2011), pp.77-101.

<sup>25</sup> 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).

1 leads to an upward bias in estimates of the cost of equity capital of  
2 almost 3.0 percentage points.<sup>26</sup>

3 **Q. ARE THE PROJECTED EPS GROWTH RATES OF VALUE LINE**  
4 **ALSO OVERLY OPTIMISTIC AND UPWARDLY BIASED?**

5 A. Yes. A study by Szakmary, Conover, and Lancaster evaluated the  
6 accuracy of *Value Line's* three-to-five-year EPS growth rate  
7 forecasts using companies in the Dow Jones Industrial Average over  
8 a 30-year time period and found these forecasted EPS growth rates  
9 to be significantly higher than the EPS growth rates that these  
10 companies subsequently achieved.<sup>27</sup>

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

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

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

18 A. According to the DCF model, the equity cost rate is a function of the  
19 dividend yield and expected growth rate. Because I believe that

---

<sup>26</sup> 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).

<sup>27</sup> Szakmary, A., Conover, C., & Lancaster, C. (2008). "An Examination of *Value Line's* Long-Term Projections," *Journal of Banking & Finance*, May 2008, pp. 820-33.

1 investors are aware of the upward bias in analysts' long-term EPS  
2 growth rate forecasts, stock prices reflect the bias. Thus, the DCF  
3 growth rate must be adjusted downward from the projected EPS  
4 growth rate to reflect this upward bias.

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

8 A. Page 3 of Exhibit JRW-7 provides the five- and ten- year historical  
9 growth rates for EPS, DPS, and BVPS for the companies in the two  
10 proxy groups, as published in the *Value Line Investment Survey*. The  
11 median historical growth measures for EPS, DPS, and BVPS for the  
12 Electric Proxy Group, as provided in Panel A, range from 4.0% to  
13 5.0%, with an average of the medians of 4.3%. For the Hevert Proxy  
14 Group, as shown in Panel B of page 3 of Exhibit JRW-7, the historical  
15 growth measures in EPS, DPS, and BVPS, as measured by the  
16 medians, range from 4.0% to 6.3%, with an average of the medians  
17 of 4.8%.

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

20 A. *Value Line's* projections of EPS, DPS, and BVPS growth for the  
21 companies in the proxy groups are shown on page 4 of Exhibit JRW-  
22 7. As stated above, due to the presence of outliers, the medians are

1 used in the analysis. For the Electric Proxy Group, as shown in Panel  
2 A of page 4 of Exhibit JRW-7, the medians range from 4.5% to 5.8%,  
3 with an average of the medians of 5.1%. The range of the medians  
4 for the Hevert Proxy Group, shown in Panel B of page 4 of Exhibit  
5 JRW-7, is from 4.3% to 5.8%, with an average of the medians of  
6 5.1%.

7 Also provided on page 4 of Exhibit JRW-7 are the prospective  
8 sustainable growth rates for the companies in the two proxy groups  
9 as measured by *Value Line's* average projected retention rate and  
10 return on shareholders' equity. As noted above, sustainable growth  
11 is a significant and a primary driver of long-run earnings growth. For  
12 the Electric and Hevert Proxy Groups, the median prospective  
13 sustainable growth rates are 3.6% and 3.4%, respectively.

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

17 A. Yahoo, Zacks, and Reuters collect, summarize, and publish Wall  
18 Street analysts' five-year EPS growth-rate forecasts for the  
19 companies in the proxy groups. These forecasts are provided for the  
20 companies in the proxy groups on page 5 of Exhibit JRW-7. I have  
21 reported both the mean and median growth rates for the groups.  
22 Since there is considerable overlap in analyst coverage between the

1 three services, and not all of the companies have forecasts from the  
2 different services, I have averaged the expected five-year EPS growth  
3 rates from the three services for each company to arrive at an expected  
4 EPS growth rate for each company. The mean/median of analysts'  
5 projected EPS growth rates for the Electric and Hevert Proxy Groups  
6 are 4.9%/4.7% and 5.4%/5.4%, respectively.<sup>28</sup>

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

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

11 The historical growth rate indicators for my Electric Proxy Group  
12 imply a baseline growth rate of 4.3%. The average of the projected  
13 EPS, DPS, and BVPS growth rates from *Value Line* is 5.1%, and  
14 *Value Line's* projected sustainable growth rate is 3.6%. The  
15 projected EPS growth rates of Wall Street analysts for the Electric  
16 Proxy Group are 4.9% and 4.7% as measured by the mean and  
17 median growth rates. The overall range for the projected growth-rate  
18 indicators (ignoring historical growth) is 3.6% to 5.1%. Giving primary  
19 weight to the projected EPS growth rate of Wall Street analysts, I  
20 believe that the appropriate projected growth rate is 5.0%. This

---

<sup>28</sup> 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.

1 growth rate figure is in the upper end of the range of historic and  
2 projected growth rates for the Electric Proxy Group.

3 For the Hevert Proxy Group, the historical growth rate indicators  
4 suggest a growth rate of 4.8%. The average of the projected EPS,  
5 DPS, and BVPS growth rates from *Value Line* is 5.1%, and *Value*  
6 *Line's* projected sustainable growth rate is 3.4%. The projected EPS  
7 growth rates of Wall Street analysts are 5.4% as measured by both  
8 the mean and median growth rates. The overall range for the  
9 projected growth rate indicators is 3.4% to 5.4%. Giving primary  
10 weight to the projected EPS growth rate of Wall Street analysts, I  
11 believe that the appropriate projected growth rate is 5.4%. This  
12 growth rate figure is in the upper end of the range of historic and  
13 projected growth rates for the Hevert Proxy Group.

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

17 A. My DCF-derived equity cost rates for the groups are summarized on  
18 page 1 of Exhibit JRW-7 and in Table 5 below.

	Dividend Yield	1 + ½ Growth Adjustment	DCF Growth Rate	Equity Cost Rate
Electric Proxy Group	3.15%	1.02500	5.00%	8.25%
Hevert Proxy Group	2.90%	1.02700	5.40%	8.40%

1 The result for the Electric Proxy Group is the 3.15% dividend yield,  
2 times the one and one-half growth adjustment factor of 1.02500, plus  
3 the DCF growth rate of 5.00%, which results in an equity cost rate of  
4 8.25%. The result for the Hevert Proxy Group is 8.40%, which  
5 includes a dividend yield of 2.90%, a growth adjustment factor of  
6 1.0270, and a DCF growth rate of 5.40%.

### 7 C. Capital Asset Pricing Model

8 Q. PLEASE DISCUSS THE CAPM.

9     A.     The CAPM is a risk premium approach to gauging a firm's cost of  
10         equity capital. According to the risk premium approach, the cost of  
11         equity is the sum of the interest rate on a risk-free bond ( $R_f$ ) and a  
12         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



1           unsystematic risk, and market or systematic risk, which is measured  
2           by a firm's beta. The only risk that investors receive a return for  
3           bearing is systematic risk.

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

$$6 \qquad K = (R_f) + \beta * [E(R_m) - (R_f)]$$

7           Where:

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

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

1 the most difficult input to measure is the expected equity or market  
2 risk premium ( $E(R_m) - (R_f)$ ). I will discuss each of these inputs below.

3 **Q. PLEASE DISCUSS EXHIBIT JRW-8.**

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

7 **Q. PLEASE DISCUSS THE RISK-FREE INTEREST RATE.**

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

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

14 A. As shown on page 2 of Exhibit JRW-8, the yield on 30-year U.S.  
15 Treasury bonds has been in the 2.0% to 4.0% range over the 2013–  
16 2020 time period. The current 30-year Treasury yield is near the  
17 bottom of this range. Given the recent range of yields, I have chosen  
18 to use the top end of the range as my risk-free interest rate.  
19 Therefore, I am using 3.75% as the risk-free rate, or  $R_f$ , in my CAPM.

1 This is equal to the normalized risk-free interest rate used by the  
2 investment advisory firm Duff & Phelps.<sup>29</sup>

3 **Q. DOES YOUR 3.75% RISK-FREE INTEREST RATE TAKE INTO**  
4 **CONSIDERATION FORECASTS OF HIGHER INTEREST RATES?**

5 A. No, it does not. As I stated before, forecasts of higher interest rates  
6 have been notoriously wrong for a decade. My 3.75% risk-free  
7 interest rate takes into account the range of interest rates in the past  
8 and effectively synchronizes the risk-free rate with the market risk  
9 premium. The risk-free rate and the market risk premium are  
10 interrelated in that the market risk premium is developed in relation  
11 to the risk-free rate. As discussed below, my market risk premium is  
12 based on the results of many studies and surveys that have been  
13 published over time. Therefore, my risk-free interest rate of 3.75% is  
14 effectively a normalized risk-free rate of interest.

15 **Q. WHAT BETAS ARE YOU EMPLOYING IN YOUR CAPM?**

16 A. Beta ( $\beta$ ) is a measure of the systematic risk of a stock. The market,  
17 usually taken to be the S&P 500, has a beta of 1.0. The beta of a  
18 stock with the same price movement as the market also has a beta  
19 of 1.0. A stock with price movement greater than that of the market,  
20 such as a technology stock, is riskier than the market and has a beta  
21 greater than 1.0. A stock with below average price movement, such

---

<sup>29</sup> <https://www.duffandphelps.com/insights/publications/valuation-insights/valuation-insights-first-quarter-2019/us-equity-risk-premium-recommendation>.

1 as that of a regulated public utility, is less risky than the market and  
2 has a beta less than 1.0. Estimating a stock's beta involves running  
3 a linear regression of a stock's return on the market return.

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

9 Several online investment information services, such as Yahoo and  
10 Reuters, provide estimates of stock betas. Usually these services  
11 report different betas for the same stock. The differences are usually  
12 due to: (1) the time period over which  $\beta$  is measured; and (2) any  
13 adjustments that are made to reflect the fact that betas tend to  
14 regress to 1.0 over time. In estimating an equity cost rate for the  
15 proxy groups, I am using the betas for the companies as provided in  
16 the *Value Line Investment Survey*. As shown on page 3 of Exhibit  
17 JRW-8, the median betas for the companies in both the Electric and  
18 Hevert Proxy Groups are 0.55.

19 **Q. PLEASE DISCUSS THE MARKET RISK PREMIUM.**

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

1 difference in the expected total return between investing in equities  
2 and investing in “safe” fixed-income assets, such as long-term  
3 government bonds. However, while the market risk premium is easy  
4 to define conceptually, it is difficult to measure because it requires  
5 an estimate of the expected return on the market -  $E(R_m)$ . As is  
6 discussed below, there are different ways to measure  $E(R_m)$ , and  
7 studies have come up with significantly different magnitudes for  
8  $E(R_m)$ . As Merton Miller, the 1990 Nobel Prize winner in economics  
9 indicated,  $E(R_m)$  is very difficult to measure and is one of the great  
10 mysteries in finance.<sup>30</sup>

11 **Q. PLEASE DISCUSS THE ALTERNATIVE APPROACHES TO**  
12 **ESTIMATING THE MARKET RISK PREMIUM.**

13 A. Page 4 of Exhibit JRW-8 highlights the primary approaches to, and  
14 issues in, estimating the expected market risk premium. The  
15 traditional way to measure the market risk premium was to use the  
16 difference between historical average stock and bond returns. In this  
17 case, historical stock and bond returns, also called *ex post* returns,  
18 were used as the measures of the market’s expected return (known  
19 as the *ex ante* or forward-looking expected return). This type of  
20 historical evaluation of stock and bond returns is often called the  
21 “Ibbotson approach” after Professor Roger Ibbotson, who

---

<sup>30</sup> Merton Miller, “The History of Finance: An Eyewitness Account,” *Journal of Applied Corporate Finance*, 2000, p. 3.

1 popularized this method of using historical financial market returns  
2 as measures of expected returns. However, this historical evaluation  
3 of returns can be a problem because: (1) *ex post* returns are not the  
4 same as *ex ante* expectations; (2) market risk premiums can change  
5 over time, increasing when investors become more risk-averse and  
6 decreasing when investors become less risk-averse; and (3) market  
7 conditions can change such that *ex post* historical returns are poor  
8 estimates of *ex ante* expectations.

9 The use of historical returns as market expectations has been  
10 criticized in numerous academic studies as discussed later in my  
11 testimony. The general theme of these studies is that the large equity  
12 risk premium discovered in historical stock and bond returns cannot  
13 be justified by the fundamental data. These studies, which fall under  
14 the category "*Ex Ante* Models and Market Data," compute *ex ante*  
15 expected returns using market data to arrive at an expected equity  
16 risk premium. These studies have also been called "Puzzle  
17 Research" after the famous study by Mehra and Prescott in which  
18 the authors first questioned the magnitude of historical equity risk  
19 premiums relative to fundamentals.<sup>31</sup>

---

<sup>31</sup> Rajnish Mehra & Edward C. Prescott, "The Equity Premium: A Puzzle," *Journal of Monetary Economics*, 145 (1985).

1 In addition, there are a number of surveys of financial professionals  
2 regarding the market risk premium, as well as several published  
3 surveys of academics on the equity risk premium. *CFO Magazine*  
4 conducts a quarterly survey of CFOs, which includes questions  
5 regarding their views on the current expected returns on stocks and  
6 bonds. Usually, over 200 CFOs participate in the survey.<sup>32</sup> Questions  
7 regarding expected stock and bond returns are also included in the  
8 Federal Reserve Bank of Philadelphia's annual survey of financial  
9 forecasters, which is published as the *Survey of Professional*  
10 *Forecasters*.<sup>33</sup> This survey of professional economists has been  
11 published for almost 50 years. In addition, Pablo Fernandez  
12 conducts annual surveys of financial analysts and companies  
13 regarding the equity risk premiums used in their investment and  
14 financial decision-making.<sup>34</sup>

15 **Q. PLEASE PROVIDE A SUMMARY OF THE MARKET RISK**  
16 **PREMIUM STUDIES.**

---

<sup>32</sup> DUKE/CFO Magazine Global Business Outlook Survey (<https://www.cfosurvey.org>).

<sup>33</sup> 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.

<sup>34</sup> 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](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3358901).

1 A. Derrig and Orr, Fernandez, and Song completed the most  
2 comprehensive reviews of the research on the market risk  
3 premium.<sup>35</sup> Derrig and Orr's study evaluated the various approaches  
4 to estimating market risk premiums, discussed the issues with the  
5 alternative approaches, and summarized the findings of the  
6 published research on the market risk premium. Fernandez  
7 examined four alternative measures of the market risk premium –  
8 historical, expected, required, and implied. He also reviewed the  
9 major studies of the market risk premium and presented the  
10 summary market risk premium results. Song provided an annotated  
11 bibliography and highlighted the alternative approaches to estimating  
12 the market risk premium.

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

---

<sup>35</sup> 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).



1           Blocks approach is a hybrid approach employing elements of both  
2           historical and *ex ante* models.

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

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

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

14   A.     The studies cited on page 5 of Exhibit JRW-8 include every market  
15          risk premium study and survey I could identify that was published  
16          over the past 15 years and that provided a market risk premium  
17          estimate. Many of these studies were published prior to the financial  
18          crisis that began in 2008. In addition, some of these studies were  
19          published in the early 2000s at the market peak. It should be noted  
20          that many of these studies (as indicated) used data over long periods  
21          of time (as long as 50 years of data) and so were not estimating a  
22          market risk premium as of a specific point in time (e.g., the year

1 2001). To assess the effect of the earlier studies on the market risk  
2 premium, I have reconstructed page 5 of Exhibit JRW-8 on page 6  
3 of Exhibit JRW-8; however, I have eliminated all studies dated before  
4 January 2, 2010. The median market risk premium estimate for this  
5 subset of studies is 5.13%.

6 **Q. PLEASE SUMMARIZE THE MARKET RISK PREMIUM STUDIES**  
7 **AND SURVEYS.**

8 A. As noted above, there are three approaches to estimating the market  
9 risk premium – historic stock and bond returns, ex ante or expected  
10 returns models, and surveys. The studies on page 6 of Exhibit JRW-  
11 8 can be summarized in the following manners:

12 Historic Stock and Bond Returns - Historic stock and bond returns  
13 suggest a market risk premium in the 4.40% to 6.43% range,  
14 depending on whether one uses arithmetic or geometric mean  
15 returns.

16 Ex Ante Models - Market risk premium studies that use expected or  
17 ex ante return models indicate a market risk premium in the range of  
18 4.29% to 6.00%.

19 Surveys - Market risk premiums developed from surveys of analysts,  
20 companies, financial professionals, and academics are lower, with a  
21 range from 1.85% to 5.70%.

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

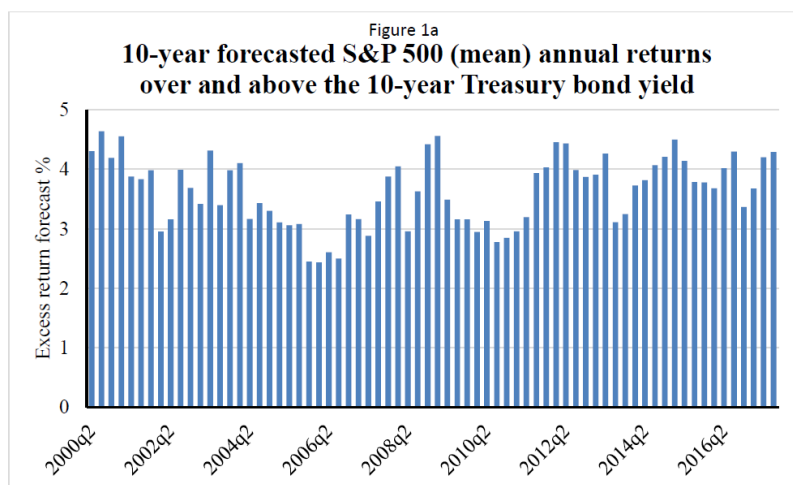
4 A. I will highlight several studies/surveys.

5 *CFO Magazine* conducts a quarterly survey of CFOs, which includes  
6 questions regarding their views on the current expected returns on  
7 stocks and bonds. In the December 2019 CFO survey conducted by  
8 *CFO Magazine* and Duke University, which included approximately  
9 400 responses, the expected 10-year market risk premium was  
10 4.99% (with an expected S&P 500 stock return of 6.81% and a  
11 current 10-year Treasury yield of 1.82%).<sup>36</sup> Figure 4, below, shows  
12 the market risk premium associated with the CFO Survey, which has  
13 been in the 4.0% range in recent years.

---

<sup>36</sup> DUKE/CFO Magazine Global Business Outlook Survey, at 38, (December),  
<https://www.cfosurvey.org/wp-content/uploads/2019/12/2019-Q4-US-Toplines.pdf>.

**Figure 4**  
**Market Risk Premium**  
**CFO Survey**



Source:

[https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3151162](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3151162)

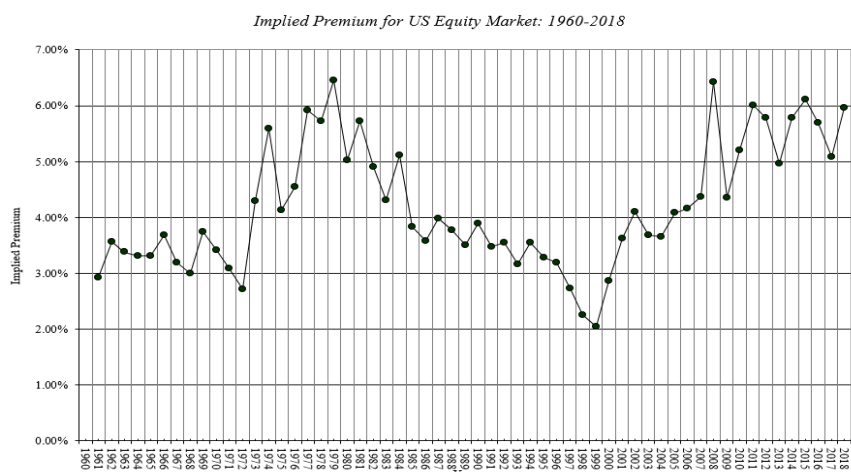
1 Pablo Fernandez conducts annual surveys of financial analysts and  
 2 companies regarding the equity risk premiums used in their  
 3 investment and financial decision-making.<sup>37</sup> His survey results are  
 4 included on pages 5 and 6 of Exhibit JRW-8. The results of his 2019  
 5 survey of academics, financial analysts, and companies, which  
 6 included 4,000 responses, indicated a mean market risk premium  
 7 employed by U.S. analysts and companies of 5.6%.<sup>38</sup> His estimated  
 8 market risk premium for the U.S. has been in the 5.00%-5.60% range  
 9 in recent years.

<sup>37</sup> 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](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3358901).

<sup>38</sup> *Ibid.* p. 3.

Professor Aswath Damodaran of New York University, a leading expert on valuation and the market risk premium, provides a monthly updated market risk premium based on projected S&P 500 EPS and stock price level and long-term interest rates. His estimated market risk premium, shown graphically in Figure 5, below, for the past 20 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 market risk premiums to be used in calculating the cost of capital data. Its recommendations over the 2008-2019 time periods are shown on page 7 of Exhibit JRW-8. Duff & Phelps' recommended market risk premium has been in the 5.0% to 6.0% range over the past decade.

1 Most recently, in the third quarter of 2019, Duff & Phelps increased  
2 its recommended market risk premium from 5.0% to 5.50%.<sup>39</sup>

3 KPMG is one of the largest public accounting firms in the world. Its  
4 recommended market risk premium over the 2013-2019 time period  
5 is shown in Panel A of page 8 of Exhibit JRW-8. KPMG's  
6 recommended market risk premium has been in the 5.50% to 6.50%  
7 range over this time period. In the third quarter of 2019, KPMG  
8 increased its estimated market risk premium from 5.50% to 5.75%.<sup>40</sup>

9 Finally, the website *market-risk-premia.com* provides risk-free  
10 interest rates, implied market risk premiums, and overall cost of  
11 capital for 36 countries around the world. These parameters for the  
12 U.S. over the 2012-2019 time period are shown in Panel B of page  
13 8 of Exhibit JRW-8. As of November 30, 2019, *market-risk-*  
14 *premia.com* estimated an implied cost of capital for the U.S. of  
15 5.78%, consisting of a risk-free rate of 1.78% and an implied market  
16 risk premium of 4.00%.<sup>41</sup>

---

<sup>39</sup> 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>.

<sup>40</sup> KPMG, "Equity Market Risk Premium Research Summary," (September, 2019), <https://assets.kpmg/content/dam/kpmg/nl/pdf/2019/advisory/equity-market-risk-premium-research-summary-300919.pdf>

<sup>41</sup> Market-Risk-Premia.com, "Implied Market-risk-premia (market risk premium): USA," <http://www.market-risk-premia.com/us.html>.

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

3 A. The studies on page 6 of Exhibit JRW-8, and more importantly the  
 4 more recent and relevant studies just cited, suggest that the  
 5 appropriate market risk premium in the U.S. is in the 4.0% to 6.0%  
 6 range. I will use an expected market risk premium of 5.75%, which is  
 7 in the upper end of the range, as the market risk premium. I gave  
 8 most weight to the market risk premium estimates of the KPMG, CFO  
 9 Survey, Duff & Phelps, the Fernandez survey, and Damodaran. This  
 10 is a conservatively high estimate of the market risk premium  
 11 considering the many studies and surveys of the market risk  
 12 premium.

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

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

**Table 6**  
**CAPM-Derived Equity Cost Rate/ROE**

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

	Risk-Free Rate	Beta	Equity Risk Premium	Equity Cost Rate
<b>Electric Proxy Group</b>	<b>3.75%</b>	<b>0.55</b>	<b>5.75%</b>	<b>7.3%</b>
<b>Hevert Proxy Group</b>	<b>3.75%</b>	<b>0.55</b>	<b>5.75%</b>	<b>7.2%</b>

1 For the both the Electric and Hevert Proxy Groups, the risk-free rate  
2 of 3.75% plus the product of the beta of 0.55 times the equity risk  
3 premium of 5.75% results in a 6.9% equity cost rate.

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

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

10 **D. Equity Cost Rate Summary**

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

13 A. My DCF analyses for the Electric and Hevert Proxy Groups indicate  
14 equity cost rates of 8.25% and 8.40%, respectively. The CAPM  
15 equity cost rates for both groups are 6.90%. Table 7, below, shows  
16 these results.

**Table 7**  
**ROEs Derived from DCF and CAPM Models**

	<b>DCF</b>	<b>CAPM</b>
<b>Electric Proxy Group</b>	<b>8.25%</b>	<b>6.90%</b>
<b>Hevert Proxy Group</b>	<b>8.40%</b>	<b>6.90%</b>



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

3    A.     Given these results, I conclude that the appropriate equity cost rate  
4           for companies in the Electric and Hevert Proxy Groups is in the  
5           6.90% to 8.40% range.

6    **Q.     WHAT EQUITY COST RATE ARE YOU RECOMMENDING FOR**  
7           **DEC?**

8    A.     Given these results, I am recommending an equity cost rate or ROE  
9           for DEC of 8.40%. I believe that this equity cost rate accurately  
10          reflects the market cost of equity capital currently. As I previously  
11          noted, capital costs in the U.S. remain low, with low inflation and  
12          interest rates, very modest economic growth, and the stock market  
13          at an all-time high. I believe that this range accurately reflects current  
14          capital market data. However, given that I am recommending a  
15          capital structure with a lower common equity ratio and higher  
16          financial risk than proposed by the Company, as a primary ROE for  
17          DEC, I am recommending 9.0%. I recognize that this figure is below  
18          the authorized ROEs for electric utility companies nationally.  
19          Therefore, as a primary ROE for DEC, I am recommending 9.0%.  
20          This recommendation gives weight to the higher authorized ROEs  
21          for electric utility companies.

1 Q. PLEASE INDICATE WHY YOUR EQUITY COST RATE  
2 RECOMMENDATIONS OF 9.0%/8.40% ARE APPROPRIATE FOR  
3 DEC.

4 A. There are a number of reasons why an equity cost rate of  
5 9.0%/8.40% is appropriate and fair for the Company in this case:

6 1. DEC's investment risk, as indicated by its S&P and  
7 Moody's credit ratings of A- and A1, is below the averages of the  
8 Electric and Hevert Proxy Groups;

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

14 3. As shown in Exhibit JRW-5, the electric utility industry  
15 is among the lowest risk industries in the U.S. as measured by beta.  
16 Most notably, the betas for electric utilities have been declining in  
17 recent years, which indicates the risk of the industry has declined.  
18 Overall, the cost of equity capital for this industry is the lowest in the  
19 U.S., according to the CAPM;

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

1                   5.       As shown in Figure 3, the authorized ROEs for electric  
2                   utility and gas distribution companies have declined in recent years.  
3                   On an annual basis, these authorized ROEs for electric utilities have  
4                   declined from an average of 10.01% in 2012, 9.8% in 2013, 9.76%  
5                   in 2014, 9.58% in 2015, 9.60% in 2016, 9.68% in 2017, 9.56% in  
6                   2018, and 9.64% in of 2019, according to Regulatory Research  
7                   Associates.<sup>42</sup> In my opinion, these authorized ROEs have lagged  
8                   behind capital market cost rates, or in other words, authorized ROEs  
9                   have been slow to reflect low capital market cost rates. However, the  
10                  trend has been towards lower ROEs, and the norm now is below ten  
11                  percent. Hence, I believe that my recommended ROE reflects the  
12                  low capital cost rates in today's markets, and these low capital cost  
13                  rates are finally being recognized by state utility commissions.

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

16       A.     Yes, I do. As previously noted, according to the *Hope* and *Bluefield*  
17                  decisions, returns on capital should be: (1) comparable to returns  
18                  investors expect to earn on other investments of similar risk; (2)  
19                  sufficient to assure confidence in the company's financial integrity;  
20                  and (3) adequate to maintain and support the company's credit and  
21                  to attract capital.

---

<sup>42</sup> S&P Global Market Intelligence, RRA *Regulatory Focus*, 2019.

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

4 A. In an article published by Moody's on utility ROEs and credit quality,  
5 Moody's recognizes that authorized ROEs for electric and gas  
6 companies are declining due to lower interest rates. The article  
7 explains:<sup>43</sup>

8 The credit profiles of US regulated utilities will  
9 remain intact over the next few years despite our  
10 expectation that regulators will continue to trim the  
11 sector's profitability by lowering its authorized  
12 returns on equity (ROE). Persistently low interest  
13 rates and a comprehensive suite of cost recovery  
14 mechanisms ensure a low business risk profile for  
15 utilities, prompting regulators to scrutinize their  
16 profitability, which is defined as the ratio of net  
17 income to book equity. We view cash flow measures  
18 as a more important rating driver than authorized  
19 ROEs, and we note that regulators can lower  
20 authorized ROEs without hurting cash flow, for  
21 instance by targeting depreciation, or through  
22 special rate structures.

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

---

<sup>43</sup> Moody's Investors Service, "Lower Authorized Equity Returns Will Not Hurt Near-Term Credit Profiles," March 10, 2015.

1 With respect to authorized ROEs, Moody's recognizes that utilities  
2 and regulatory commissions are having trouble justifying higher  
3 ROEs in the face of lower interest rates and cost recovery  
4 mechanisms:<sup>44</sup>

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

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

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

21 A. Moody's also highlights in the article that utilities are raising about  
22 \$50 billion a year in debt capital, despite the lower ROEs.

---

<sup>44</sup> *Id.*

1                    **VI. CRITIQUE OF DEC'S RATE OF RETURN TESTIMONY**

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

4    A. The Company has proposed a capital structure of 47.00% long-term  
5                    debt and 53.00% common equity and a long-term debt cost rate of  
6                    4.51%. Mr. Hevert has recommended a common equity cost rate of  
7                    10.50%. The Company's overall proposed rate of return is 7.83%.

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

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

11                    Capital Structure – The Company has proposed a capital structure  
12                    consisting of 47.00% long-term debt and 53.00% common equity.  
13                    The Company's proposed capital structure has a higher common  
14                    equity ratio than the average of the Electric and Hevert Proxy  
15                    Groups. In my primary rate of return recommendation, I am  
16                    recommending adjusting DEC's proposed capital structure to use a  
17                    common equity ratio of 50 percent, as that is more in line with the  
18                    capital structures of the utilities in the proxy group as well as DEC's  
19                    parent, Duke Energy. In my alternative rate of return  
20                    recommendation, I am using DEC's proposed capital structure, but I  
21                    then employ a lower ROE to reflect the high common equity ratio and  
22                    lower financial risk of the Company's proposed capitalization.

1        Capital Market Conditions – Mr. Hevert’s analyses and ROE results  
2        and recommendations reflect the assumption of higher interest rates  
3        and capital costs. However, I show that despite the Federal  
4        Reserve’s moves to increase the federal funds rate over the 2015-  
5        18 time period, interest rates and capital costs remained at low  
6        levels. In 2019, interest rates fell dramatically with moderate  
7        economic growth and low inflation. The Federal Reserve cut the  
8        federal fund rate three times (July, September, and October) and the  
9        30-year yield traded at all-time low levels.

10       The Company’s ROE Analysis is Out-of-Date - The Company’s ROE  
11       study was prepared in June, 2019, about eight months ago. Since  
12       that time, the Federal Reserve has cut the federal funds rate three  
13       times and the 30-year Treasury rate has fallen over seventy basis  
14       points. Capital costs are much lower now not only than when the  
15       Company’s ROE study was prepared, but also when it filed its  
16       request to increase rates.

17       DEC’s Investment Risk is Below the Averages of the Two Proxy  
18       Groups – Mr. Hevert cites the Company’s capital expenditures and  
19       North Carolina’s regulatory environment to imply that DEC is riskier  
20       than his proxy group. However, his assessment of DEC’s risk is  
21       erroneous. The assessment of capital expenditures is part of the  
22       credit rating process, and DEC’s S&P and Moody’s credit rating

1 suggest that the Company's investment risk is below the averages  
2 of the proxy groups.

3 Disconnect Between Mr. Hevert's Equity Cost Rate Studies and his  
4 10.50% ROE Recommendation – There is a disconnect between Mr.  
5 Hevert's equity cost rate results and his 10.50% ROE  
6 recommendation. Simply stated, the vast majority of his equity cost  
7 rate results point to a lower ROE. In fact, the only results that point  
8 to an ROE as high as 10.50% are some of his CAPM/ECAPM results,  
9 which as I explain later in my testimony are seriously flawed. As a  
10 result, Mr. Hevert's ROE recommendation is based on: (1) the results  
11 of only one model (the CAPM); and, even more narrowly, (2) and  
12 primarily from *Value Line* data. Otherwise, Mr. Hevert provides no  
13 other equity cost rate studies that support his 10.50% ROE  
14 recommendation.

15 DCF Equity Cost Rate - The DCF Equity Cost Rate is estimated by  
16 summing the stock's dividend yield and investors' expected long-run  
17 growth rate in dividends paid per share. There are several errors  
18 regarding Mr. Hevert's DCF analyses: (1) he has given very little  
19 weight to his constant-growth DCF results; (2) He has claimed that  
20 the DCF results underestimate the market-determined cost of equity  
21 capital due to high utility stock valuations and low dividend yields;  
22 and (3) he has relied exclusively on the overly optimistic and



1 upwardly biased EPS growth-rate forecasts of Wall Street analysts  
2 and *Value Line*.

3 CAPM Approach - The CAPM approach requires an estimate of the  
4 risk-free interest rate, the beta, and the market or equity risk  
5 premium. There are two primary issues with Mr. Hevert's CAPM  
6 analyses: (1) he has Mr. has employed an ad hoc version of the  
7 CAPM, ECAPM, which makes inappropriate adjustments to the risk-  
8 free rate and the market risk premium and is an untested model in  
9 academic and profession research; and (2) his market risk premiums  
10 of 12.25% and 12.15% are exaggerated and do not reflect current  
11 market fundamentals. Mr. Hevert has employed analysts' three-to-  
12 five-year growth-rate projections for EPS to compute an expected  
13 market return and market risk premium. These EPS growth-rate  
14 projections and the resulting expected market returns and market  
15 risk premiums include highly unrealistic assumptions regarding  
16 future economic and earnings growth and stock returns.

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

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

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

20 Other Issues - Mr. Hevert also considers several other factors in  
21 arriving at his 10.50% ROE recommendation. Mr. Hevert has cited  
22 North Carolina's REPS, the Company's high level of capital

1 expenditures, environmental regulations, coal-fired and nuclear  
2 generation. However, these are risk factors considered in the credit-  
3 rating process used by major rating agencies. As I noted above,  
4 DEC's investment risk as measured by S&P and Moody's is below  
5 the average of the proxy groups. Second, Mr. Hevert also considers  
6 flotation costs in making his ROE recommendation of 10.50%.  
7 However, he has not identified any flotation costs for DEC.

8 North Carolina Economic Conditions – Mr. Hevert evaluates a  
9 number of factors such as employment and income levels and comes  
10 to the conclusion that DEC's proposed ROE of 10.50% is fair and  
11 reasonable to DEC, its shareholders, and its customers in light of the  
12 effect of those changing economic conditions. While I agree  
13 economic conditions have improved in North Carolina, the  
14 improvements do not necessarily justify such a high rate of return  
15 and ROE. Specifically, I highlight the following: (1) DEC's ROE  
16 request of 10.50% is almost 100 basis points above the average  
17 authorized ROEs for electric utilities over the 2018-19 time period;  
18 (2) whereas the unemployment rates in North Carolina and DEC's  
19 service territory have fallen by two-thirds since their peaks in the  
20 2009-2010 period, they are both above the national average of  
21 3.90%; and (3) whereas North Carolina's residential electric rates are  
22 below the national average, North Carolina's median household  
23 income is more than 10% below the U.S. norm.

1 Capital market conditions, the out-of-date ROE study, DEC's  
2 proposed capital structure, and the investment risk of DEC were  
3 previously discussed. The other issues are addressed below.

4 **A. The Disconnect Between Mr. Hevert's Equity Cost Rate**  
5 **Results and His 10.50% ROE Recommendation**

6 **Q. PLEASE REVIEW MR. HEVERT'S EQUITY COST RATE**  
7 **RESULTS AND HIS 10.50% ROE RECOMMENDATION.**

8 A. Page 1 of Exhibit JRW-9 shows Mr. Hevert's equity cost rate results  
9 using the DCF, CAPM, and BYRP approaches. There appears to be  
10 a disconnect between these results and his 10.50% ROE  
11 recommendation. First, it is very difficult to see exactly how he gets  
12 to his 10.50% ROE recommendation. He provides no details on how  
13 he weighted his equity cost rate results to get to 10.50%.

14 Second, the vast majority of his equity cost rate results point to a  
15 lower ROE. The average of his DCF results is 8.97%, to which he  
16 clearly gave no weight. His BYRP results, which are inflated because  
17 he has used projected interest rates, average 9.95%. His CAPM  
18 results, calculated using data from Bloomberg and *Value Line*, range  
19 from 8.73% to 9.81%. These results clearly do not support a ROE of  
20 10.50%.

1 Finally, the only results that point to a ROE as high as 10.50% are  
2 his ECAPM results using *Value Line* betas. As a result, Mr. Hevert's  
3 ROE recommendation is based on: (1) the results of only one ad hoc  
4 CAPM model (the ECAPM); and, even more narrowly, (2) only one  
5 source of financial information for betas (*Value Line*). In addition, as  
6 discussed below, there are a number of empirical issues with the  
7 *Value Line* projected EPS growth rates which result in an overstated  
8 expected market return and market risk premium. Otherwise, Mr.  
9 Hevert provides no other credible equity cost rate studies that  
10 support his 10.50% ROE recommendation. Therefore, his ROE  
11 recommendation is based on not only one model (ECAPM), but also  
12 on only one information source (*Value Line*). There are obvious risks  
13 to relying on only one approach and information source to estimate  
14 the cost of equity capital.

15 **B. DCF Approach**

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

17 A. On pages 74-83 of his testimony and in Exhibit No. RBH-1, Mr.  
18 Hevert develops an equity cost rate by applying the DCF model to  
19 the Hevert Proxy Group. Mr. Hevert's DCF results are summarized  
20 on page 2 of my Exhibit JRW-9. He uses constant-growth and  
21 multistage growth DCF models. Mr. Hevert uses three dividend-yield  
22 measures (30, 90, and 180 days) in his DCF models. In his constant-

1 growth and quarterly DCF models, Mr. Hevert has relied on the  
2 forecasted EPS growth rates of Zacks, IBES, and *Value Line*. For  
3 each model, he reports Mean Low, Mean and Mean High results.

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

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

9 **1. The Low Weight Given to the DCF Results**

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

13 A. Apparently, very little, if any. The average of his mean constant-  
14 growth and multi-stage DCF equity cost rates is only 8.97%. Had he  
15 given these results any weight, he would have arrived at a much  
16 lower recommendation for his estimated cost of equity.

17 **2. The DCF Model Understates the Cost of Equity Capital**

18 **Q. PLEASE EXPLAIN MR. HEVERT'S CLAIM THAT THE DCF MODEL**  
19 **UNDERSTATES THE COST OF EQUITY CAPITAL.**

20 A. At pages 5-11 of his testimony, Mr. Hevert expresses concern with  
21 the constant-growth DCF model results in light of current capital

1 market conditions, which include high utility stock valuations and low  
2 dividend yields. However, Mr. Hevert's arguments on this issue are  
3 without merit for the following reasons: (1) he is saying that utility  
4 stocks are overvalued, and their stock prices will decline in the future  
5 (and therefore their dividend yield will increase). Hence, Mr. Hevert  
6 presumes that he knows more than investors in the stock market. If  
7 he believes that utility stock prices will decline in the future, he should  
8 be recommending a negative expected return because a decline in  
9 utility stock prices would produce negative stock returns in the future;  
10 (2) the DCF approach directly measures the cost of equity because  
11 it uses dividends, stock prices, and expected growth rates; (3) the  
12 CAPM is an indirect method of measuring the cost of equity with the  
13 only company-specific input being beta. In addition, it is highly  
14 dependent on the market risk premium which, as discussed above,  
15 is one of the great mysteries in finance; and (4) as discussed below,  
16 Mr. Hevert's CAPM result is grossly inflated due to its unrealistic  
17 assumptions on future earnings, economic growth, and future stock  
18 returns.

19 **Q. ARE THERE OTHER REASONS WHY UTILITY STOCK STOCKS**  
20 **HAVE PERFORMED SO WELL AND HAVE RELATIVELY HIGH**  
21 **VALUATIONS?**

22 A. Yes. As discussed in a Moody's article, utilities have achieved higher  
23 market valuations due to cost recovery mechanisms that have

1 reduced the risk of the utility industry, which have led to higher  
2 valuation levels.

3 As utilities increasingly secure more up-front  
4 assurance for cost recovery in their rate  
5 proceedings, we think regulators will increasingly  
6 view the sector as less risky. The combination of low  
7 capital costs, high equity market valuation multiples  
8 (which are better than or on par with the broader  
9 market despite the regulated utilities' low risk  
10 profile), and a transparent assurance of cost  
11 recovery tend to support the case for lower  
12 authorized returns, although because utilities will  
13 argue they should rise, or at least stay unchanged.<sup>45</sup>

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

18 **3. Wall Street Analysts' EPS Growth Rate Forecasts**

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

22 **A.** It seems highly unlikely that investors today would rely exclusively  
23 on the EPS growth rate forecasts of Wall Street analysts and ignore  
24 other growth rate measure in arriving at their expected growth rates

---

<sup>45</sup> Moody's Investors Service, "Lower Authorized Equity Returns Will Not Hurt Near-Term Credit Profiles," March 10, 2015, p. 3.



1 for equity investments. As I previously stated, the appropriate growth  
2 rate in the DCF model is the dividend growth rate, not the earnings  
3 growth rate. Hence, consideration must be given to other indicators  
4 of growth, including historical prospective dividend growth, internal  
5 growth, as well as projected earnings growth.

6 Finally, and most significantly, it is well-known that the long-term EPS  
7 growth rate forecasts of Wall Street securities analysts are overly  
8 optimistic and upwardly biased. In addition, as discussed above, the  
9 projected EPS growth rate forecasts have been shown to be overly-  
10 optimistic and upwardly biased.

11 Hence, using these growth rates as a DCF growth rate produces an  
12 overstated equity cost rate. A 2007 study by Easton and Sommers  
13 found that optimism in analysts' earnings growth rate forecasts leads  
14 to an upward bias in estimates of the cost of equity capital of almost  
15 3.0 percentage points.<sup>46</sup>

16 **Q. ON PAGES 77-78 OF HIS TESTIMONY, MR. HEVERT CITES NINE**  
17 **DIFFERENT STUDIES TO SUPPORT HIS USE OF ANALYSTS'**  
18 **EPS GROWTH RATE FORECASTS. PLEASE DISCUSS THESE**  
19 **STUDIES.**

---

<sup>46</sup> 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.

1 A. The studies Mr. Hevert cites to support his exclusive use of analysts'  
2 EPS growth rate forecasts are all at least 20 years old. There have  
3 been many research studies on this topic over the past 20 years. I  
4 reviewed these studies earlier in my testimony. The conclusion from  
5 the more recent studies is universal – analysts' three-to-five-year  
6 EPS growth rate forecasts are overly optimistic and upwardly biased.

7 **C. CAPM Approach**

8 **Q. PLEASE DISCUSS MR. HEVERT'S CAPM.**

9 A. On pages 83-91 of his testimony and in Exhibit Nos. RBH-2-RBH-4,  
10 Mr. Hevert develops an equity cost rate by applying the CAPM model  
11 to the companies in his proxy group. The CAPM approach requires  
12 an estimate of the risk-free interest rate, beta, and the market risk  
13 premium. Mr. Hevert uses two different measures of the 30-Year  
14 Treasury bond yield: (a) current yield of 2.63% and a near-term  
15 projected yield of 2.70%; (b) two different betas (an average  
16 Bloomberg beta of 0.498 and an average *Value Line* beta of 0.58);  
17 and (c) two market risk premium measures – a Bloomberg, DCF-  
18 derived market risk premium of 12.25% and a *Value Line* DCF-  
19 derived market risk premium of 12.15%. Based on these figures, he  
20 finds a CAPM equity cost rate range from 8.73% to 9.81%. Mr.  
21 Hevert also employs an ad hoc version of the CAPM, the ECAPM,  
22 which makes inappropriate adjustments to the risk-free rate and the

1 market risk premium and is an untested model in academic and  
2 profession research. His ECAPM results range from 10.21% to  
3 11.10%. Mr. Hevert's CAPM/ECAPM results are summarized on  
4 page 2 of Exhibit JRW-9.

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

6 A. As explained further below, there are two issues with Mr. Hevert'  
7 CAPM analyses: (1) Mr. Hevert has employed an ad hoc version of  
8 the CAPM, the ECAPM; and (2) Mr. Hevert's market risk premiums  
9 of 12.25% and 12.15% include highly unrealistic assumptions  
10 regarding future economic and earnings growth and stock returns.

11 **1. Market Risk Premiums**

12 **Q. PLEASE ASSESS MR. HEVERT'S MARKET RISK PREMIUMS**  
13 **DERIVED FROM APPLYING THE DCF MODEL TO THE S&P 500**  
14 **AND VALUE LINE INVESTMENT SURVEY.**

15 A. For his Bloomberg and *Value Line* market risk premiums, Mr. Hevert  
16 computes market risk premiums of 12.25% and 12.15%,  
17 respectively, by: (1) calculating an expected market return by  
18 applying the DCF model to the S&P 500; and then (2) subtracting the  
19 current 30-year Treasury bond yield of 2.63% from his estimate of  
20 the expected market return. Mr. Hevert also uses (1) a dividend yield  
21 of 2.20% and an expected DCF growth rate of 12.68% for Bloomberg  
22 and (2) a dividend yield of 2.08% and an expected DCF growth rate

1 of 12.70% for *Value Line*. The resulting expected annual S&P 500  
2 stock market returns using this approach are 14.78% (using  
3 Bloomberg three- to five-year EPS growth rate estimates) and  
4 14.88% (using *Value Line* three- to five-year EPS growth rate  
5 estimates). These results are not realistic in today's market.

6 **Q. ARE MR. HEVERT'S MARKET RISK PREMIUMS OF 12.25% AND**  
7 **12.15% REFLECTIVE OF THE MARKET RISK PREMIUMS**  
8 **FOUND IN STUDIES AND SURVEYS OF THE MARKET RISK**  
9 **PREMIUM?**

10 A. No. These are well in excess of market risk premiums: (1) found in  
11 studies of the market risk premium by leading academic scholars; (2)  
12 produced by analyses of historic stock and bond returns; and (3)  
13 found in surveys of financial professionals. Page 5 of Exhibit JRW-8  
14 provides the results of over 30 market risk premium studies from the  
15 past 15 years. Historic stock and bond returns suggest a market risk  
16 premium in the 4.5% to 7.0% range, depending on whether one uses  
17 arithmetic or geometric mean returns. There have been many  
18 studies using expected return (also called *ex ante*) models, and their  
19 market risk premium results vary from as low as 2.0% to as high as  
20 7.31%. Finally, the market risk premiums developed from surveys of  
21 analysts, companies, financial professionals, and academics  
22 suggest lower market risk premiums, in a range of from 1.91% to  
23 5.70%. The bottom line is that there is no support in historic return

1 data, surveys, academic studies, or reports for investment firms for  
2 market risk premiums as high as those used by Mr. Hevert.

3 **Q. PLEASE AGAIN ADDRESS THE ISSUES WITH ANALYSTS' EPS**  
4 **GROWTH RATE FORECASTS.**

5 A. The key point is that Mr. Hevert's CAPM market risk premium  
6 methodology is based entirely on the concept that analyst projections  
7 of companies' three-to-five EPS growth rates reflect investors'  
8 expected *long-term* EPS growth for those companies. However, this  
9 seems highly unrealistic given the research on these projections. As  
10 previously noted, numerous studies have shown that the long-term  
11 EPS growth rate forecasts of Wall Street securities analysts are  
12 overly optimistic and upwardly biased.<sup>47</sup> Moreover, a 2011 study  
13 showed that analysts' forecasts of EPS growth over the next three-  
14 to-five years earnings are no more accurate than their forecasts of  
15 the next single year's EPS growth.<sup>48</sup> The overly-optimistic inaccuracy

---

<sup>47</sup> 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.

<sup>48</sup> 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.

1 of analysts' growth rate forecasts leads to an upward bias in equity  
2 cost estimates that has been estimated at about 300 basis points.<sup>49</sup>

3 **Q. HAVE CHANGES IN REGULATIONS IMPACTED THE UPWARD**  
4 **BIAS IN WALL STREET ANALYSTS' THREE-TO-FIVE YEAR EPS**  
5 **GROWTH RATE FORECASTS?**

6 A. No. A number of the studies I have cited here demonstrate that the  
7 upward bias has continued despite changes in regulations and  
8 reporting requirements over the past two decades. This observation  
9 is highlighted by a 2010 McKinsey study entitled "Equity Analysts:  
10 Still Too Bullish," which involved a study of the accuracy of analysts'  
11 long-term EPS growth rate forecasts. The authors conclude that after  
12 a decade of stricter regulation, analysts' long-term earnings  
13 forecasts continue to be excessively optimistic. They made the  
14 following observation:<sup>50</sup>

15 Alas, a recently completed update of our work only  
16 reinforces this view—despite a series of rules and  
17 regulations, dating to the last decade, that were  
18 intended to improve the quality of the analysts' long-  
19 term earnings forecasts, restore investor confidence  
20 in them, and prevent conflicts of interest. For  
21 executives, many of whom go to great lengths to  
22 satisfy Wall Street's expectations in their financial  
23 reporting and long-term strategic moves, this is a  
24 cautionary tale worth remembering. This pattern  
25 confirms our earlier findings that analysts typically

---

<sup>49</sup> 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).

<sup>50</sup> Marc H. Goedhart, Rishi Raj, and Abhishek Saxena, "Equity Analysts, Still Too Bullish," *McKinsey on Finance*, pp. 14-17, (Spring 2010) (emphasis added).

1 lag behind events in revising their forecasts to reflect  
2 new economic conditions. When economic growth  
3 accelerates, the size of the forecast error declines;  
4 when economic growth slows, it increases. So as  
5 economic growth cycles up and down, the actual  
6 earnings S&P 500 companies report occasionally  
7 coincide with the analysts' forecasts, as they did, for  
8 example, in 1988, from 1994 to 1997, and from 2003  
9 to 2006. *Moreover, analysts have been persistently*  
10 *overoptimistic for the past 25 years, with estimates*  
11 *ranging from 10 to 12 percent a year, compared with*  
12 *actual earnings growth of 6 percent. Over this time*  
13 *frame, actual earnings growth surpassed forecasts*  
14 *in only two instances, both during the earnings*  
15 *recovery following a recession. On average,*  
16 *analysts' forecasts have been almost 100 percent*  
17 *too high.*

18 This is the same observation made in a *Bloomberg*  
19 *Businessweek* article.<sup>51</sup> The author concluded:

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

24 **Q. IS THERE OTHER EVIDENCE THAT INDICATES THAT MR.**  
25 **HEVERT'S MARKET RISK PREMIUMS COMPUTED USING S&P**  
26 **500 EPS GROWTH RATE ARE EXCESSIVE?**

27 A. Beyond my previous discussion of the upwardly biased nature of  
28 analysts' projected EPS growth rates, the fact is that long-term EPS  
29 growth rates of 12.68% and 12.70% are inconsistent with both

---

<sup>51</sup> 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>.

1 historic and projected economic and earnings growth in the U.S for  
2 several reasons: (1) long-term EPS and economic growth is about  
3 one-half of Mr. Hevert's projected EPS growth rates of 12.68% and  
4 12.70%; (2) as discussed below, long-term EPS and Gross Domestic  
5 Product (GDP) growth are directly linked; and (3) more recent trends  
6 in GDP growth, as well as projections of GDP growth, suggest slower  
7 economic and earnings growth in the future.

8 Long-Term Historic EPS and GDP Growth have been in the 6%-7%  
9 Range - I performed a study of the growth in nominal GDP, S&P 500  
10 stock price appreciation, and S&P 500 EPS and DPS growth since  
11 1960. The results are provided on page 1 of Exhibit JRW-10, and a  
12 summary is shown in Table 8, below.

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

<b>Nominal GDP</b>	<b>6.46</b>
<b>S&amp;P 500 Stock Price</b>	<b>6.71</b>
<b>S&amp;P 500 EPS</b>	<b>6.89</b>
<b><u>S&amp;P 500 DPS</u></b>	<b><u>5.85</u></b>
<b>Average</b>	<b>6.48</b>

13 The results show that the historical long-run growth rates for GDP,  
14 S&P EPS, and S&P DPS are in the 6% to 7% range. By comparison,  
15 Mr. Hevert's long-run growth rate projections of 12.68% and 12.70%  
16 are at best overstated. For Mr. Hevert's estimates to come to fruition,



1 companies in the U.S. would be expected to: (1) increase their  
2 growth rate of EPS by 100% in the future, and (2) maintain that  
3 growth indefinitely in an economy that is expected to grow at about  
4 one-third of his projected growth rates.

5 There is a Direct Link Between Long-Term EPS and GDP Growth -

6 The results in Exhibit JRW-10 and Table 8 show that historically  
7 there has been a close link between long-term EPS and GDP growth  
8 rates. Brad Cornell of the California Institute of Technology published  
9 a study on GDP growth, earnings growth, and equity returns. He  
10 found that long-term EPS growth in the U.S. is directly related to GDP  
11 growth, with GDP growth providing an upward limit on EPS growth.  
12 In addition, he found that long-term stock returns are determined by  
13 long-term earnings growth. He concluded with the following  
14 observations:<sup>52</sup>

15 The long-run performance of equity investments is  
16 fundamentally linked to growth in earnings. Earnings  
17 growth, in turn, depends on growth in real GDP. This  
18 article demonstrates that both theoretical research  
19 and empirical research in development economics  
20 suggest relatively strict limits on future growth. In  
21 particular, real GDP growth in excess of 3 percent in  
22 the long run is highly unlikely in the developed world.  
23 In light of ongoing dilution in earnings per share, this  
24 finding implies that investors should anticipate real

---

<sup>52</sup> Bradford Cornell, "Economic Growth and Equity Investing," *Financial Analysts Journal* (January- February 2010), p. 63.

1 returns on U.S. common stocks to average no more  
2 than about 4–5 percent in real terms.

3 The Trend and Projections Indicate Slower GDP Growth in the  
4 Future - The components of nominal GDP growth are real GDP  
5 growth and inflation. Page 3 of Exhibit JRW-10 shows annual real  
6 GDP growth rate over the 1961 to 2018 time period. Real GDP  
7 growth has gradually declined from the 5.0% to 6.0% range in the  
8 1960s to the 2.0% to 3.0% range during the most recent five-year  
9 period. The second component of nominal GDP growth is inflation.  
10 Page 4 of Exhibit JRW-10 shows inflation as measured by the annual  
11 growth rate in the Consumer Price Index (CPI) over the 1961 to 2018  
12 time period. The large increase in prices from the late 1960s to the  
13 early 1980s is readily evident. Equally evident is the rapid decline in  
14 inflation during the 1980s as inflation declined from above 10% to  
15 about 4%. Since that time, inflation has gradually declined and has  
16 been in the 2.0% range or below over the past five years.

17 The graphs on pages 2, 3, and 4 of Exhibit JRW-10 provide clear  
18 evidence of the decline, in recent decades, in nominal GDP as well  
19 as its components, real GDP and inflation. To gauge the magnitude  
20 of the decline in nominal GDP growth, Table 5, below, provides the  
21 compounded GDP growth rates for 10-, 20-, 30-, 40- and 50- years.<sup>53</sup>

---

<sup>53</sup> Table 5 is also included as Page 5 of Exhibit JRW-10.

1       Whereas the 50-year compounded GDP growth rate is 6.63%, there  
 2       has been a monotonic and significant decline in nominal GDP growth  
 3       over subsequent 10-year intervals. These figures strongly suggest that  
 4       nominal GDP growth in recent decades has slowed and that a figure  
 5       in the range of 4.0% to 5.0% is more appropriate today for the U.S.  
 6       economy.

**Table 9**  
**Historical Nominal GDP Growth Rates**

<b>10-Year Average</b>		<b>3.37%</b>
<b>20-Year Average</b>		<b>4.17%</b>
<b>30-Year Average</b>		<b>4.65%</b>
<b>40-Year Average</b>		<b>5.56%</b>
<b>50-Year Average</b>		<b>6.36%</b>

7       Long-Term GDP Projections also Indicate Slower GDP Growth in the  
 8       Future - A lower range is also consistent with long-term GDP  
 9       forecasts. There are several forecasts of annual GDP growth that are  
 10      available from economists and government agencies. These are  
 11      listed in Panel B of on page 5 of Exhibit JRW-10. The mean 10-year  
 12      nominal GDP growth forecast (as of March 2019) by economists in  
 13      the recent *Survey of Financial Forecasters* is 4.25%.<sup>54</sup> The Energy  
 14      Information Administration (EIA), in its projections used in preparing  
 15      *Annual Energy Outlook*, forecasts long-term GDP growth of 4.20%

---

<sup>54</sup> <https://www.philadelphiafed.org/research-and-data/real-time-center/survey-of-professional-forecasters/>

1 for the period 2018-2050.<sup>55</sup> The Congressional Budget Office (CBO),  
2 in its forecasts for the period 2019 to 2049, projects a nominal GDP  
3 growth rate of 4.40%.<sup>56</sup> Finally, the Social Security Administration  
4 (SSA), in its Annual OASDI Report, provides a projection of nominal  
5 GDP from 2018-2095.<sup>57</sup> SSA's projected growth GDP growth rate  
6 over this period is 4.35%. Overall, these forecasts suggest long-term  
7 GDP growth rate in the 4.0% - 4.4% range. The trends and  
8 projections indicating slower GDP growth make Mr. Hevert's market  
9 risk premiums computed using analysts' projected EPS growth rates  
10 look even more unrealistic. Simply stated, Mr. Hevert's projected  
11 EPS growth rates of 12.68% and 12.70% are almost three times  
12 projected GDP growth.

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

15 A. As addressed in a study by the consulting firm McKinsey & Co., two  
16 factors drive real GDP growth over time: (a) the number of workers  
17 in the economy (employment); and (2) the productivity of those

---

<sup>55</sup> U.S. Energy Information Administration, *Annual Energy Outlook 2019*, Table: Macroeconomic Indicators, <https://www.eia.gov/outlooks/aeo/pdf/appa.pdf>.

<sup>56</sup> Congressional Budget Office, *The 2019 Long-Term Budget Outlook*, June 15, 2019 <https://www.eia.gov/outlooks/aeo/pdf/appa.pdf>.

<sup>57</sup> Social Security Administration, *2019 Annual Report of the Board of Trustees of the Old-Age, Survivors, and Disability Insurance (OASDI) Program*, Table VI.G4, p. 211 (June 15, 2019), [https://www.ssa.gov/oact/TR/2019/VI\\_G2\\_OASDHI\\_GDP.html#200732](https://www.ssa.gov/oact/TR/2019/VI_G2_OASDHI_GDP.html#200732). The 4.35% represents the compounded growth rate in projected GDP from \$21,485 trillion in 2019 to \$546,311 trillion in 2095.

1 workers (usually defined as output per hour).<sup>58</sup> According to  
2 McKinsey, real GDP growth over the past 50 years was driven by  
3 population and productivity growth, which grew at compound annual  
4 rates of 1.7% and 1.8%, respectively.

5 However, global economic growth is projected to slow significantly in  
6 the years to come. The primary factor leading to the decline is slow  
7 growth in employment (working-age population), which results from  
8 slower population growth and longer life expectancy. McKinsey  
9 estimates that employment growth will slow to 0.3% over the next 50  
10 years. The study concludes that even if productivity remains at the  
11 rapid rate of the past 50 years of 1.8%, real GDP growth will fall by  
12 40% to 2.1%.

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

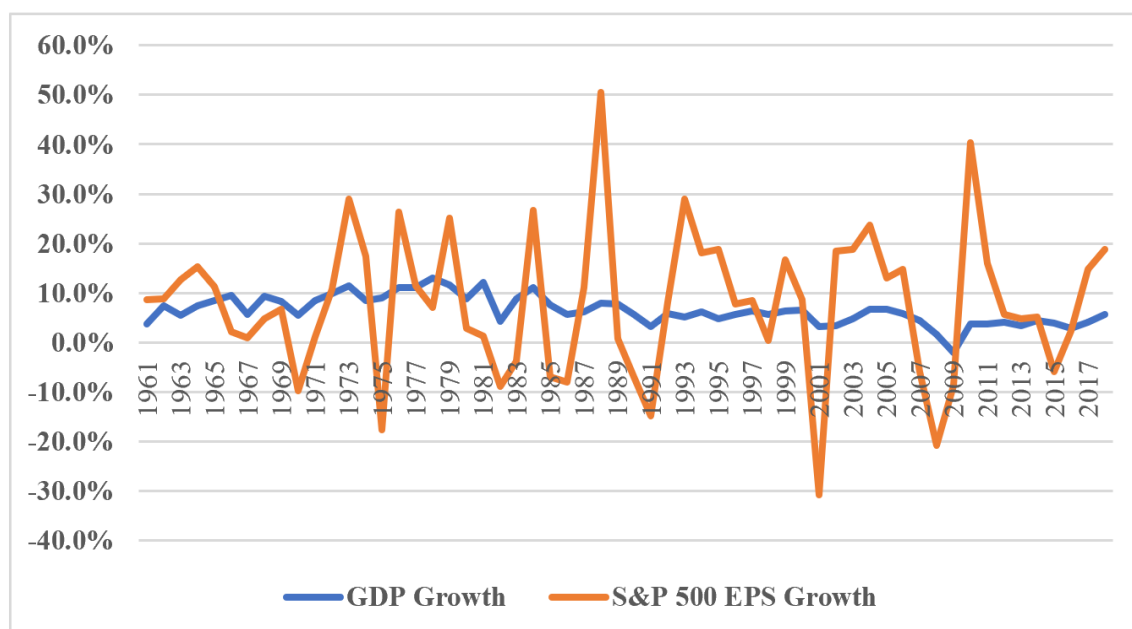
15 A. Figure 6 shows the average annual growth rates for GDP and the  
16 S&P 500 EPS since 1960. The one very apparent difference between  
17 the two is that the S&P 500 EPS growth rates are much more volatile  
18 than the GDP growth rates, when compared using the relatively  
19 short, and somewhat arbitrary, annual conventions used in these

---

<sup>58</sup> McKinsey & Co., "Can Long-Term Growth be Saved?", McKinsey Global Institute, (Jan. 2015).

- 1 data.<sup>59</sup> Volatility aside, however, it is clear that over the medium to  
 2 long run, S&P 500 EPS growth does not outpace GDP growth.

**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/>

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

<sup>59</sup> 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.

1        Corporate Profits are Constrained by GDP – Milton Friedman, the  
2        noted economist, warned investors and others not to expect  
3        corporate profit growth to sustainably exceed GDP growth, stating,  
4        “Beware of predictions that earnings can grow faster than the  
5        economy for long periods. When earnings are exceptionally high,  
6        they don’t just keep booming.”<sup>60</sup> Friedman also noted in the *Fortune*  
7        interview that profits must move back down to their traditional share  
8        of GDP. In Table 10, below, I show that currently the aggregate net  
9        income levels for the S&P 500 companies, using 2018 figures,  
10       represent 6.73% of nominal GDP.

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

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

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>.

11       Short-Term Factors Impact S&P 500 EPS – The growth rates in the  
12       S&P 500 EPS and GDP can diverge on a year-to-year basis due to  
13       short-term factors that impact S&P 500 EPS in a much greater way  
14       than GDP. As shown above, S&P EPS growth rates are much more

<sup>60</sup> 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/>.

1 volatile than GDP growth rates. The EPS growth for the S&P 500  
2 companies has been influenced by low labor costs and interest rates,  
3 commodity prices, the recovery of different sectors such as the  
4 energy and financial sectors, the cut in corporate tax rates, etc.  
5 These short-term factors can make it appear that there is a  
6 disconnect between the economy and corporate profits.

7 The Differences Between the S&P 500 EPS and GDP – In the last  
8 two years, as the EPS for the S&P 500 has grown at a faster rate  
9 than U.S. nominal GDP, some have pointed to the differences  
10 between the S&P 500 and GDP.<sup>61</sup> These differences include: (a)  
11 corporate profits are about 2/3 manufacturing driven, while GDP is  
12 2/3 services driven; (b) consumer discretionary spending accounts  
13 for a smaller share of S&P 500 profits (15%) than of GDP (23%); (c)  
14 corporate profits are more international-trade driven, while exports  
15 minus imports tend to be a drag on GDP; and (d) S&P 500 EPS is  
16 impacted, not just by corporate profits, but also by share buybacks  
17 on the positive side (fewer shares boost EPS) and by share dilution  
18 on the negative side (new shares dilute EPS). While these  
19 differences may seem significant, it must be remembered that the

---

<sup>61</sup> 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](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/>.



1 Income Approach to measure GDP includes corporate profits (in  
2 addition to employee compensation and taxes on production and  
3 imports) and therefore effectively accounts for the first three  
4 factors.<sup>62</sup>

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

8 **Q. PLEASE PROVIDE ADDITIONAL EVIDENCE ON HOW**  
9 **UNREALISTIC THE S&P 500 EPS GROWTH RATES ARE THAT**  
10 **MR. HEVERT USES TO COMPUTE HIS MARKET RISK**  
11 **PREMIUMS.**

12 A. Beyond my previous discussion, I have performed the following  
13 analysis of S&P 500 EPS and GDP growth in Table 11 below.  
14 Specifically, I started with the 2018 aggregate net income for the S&P  
15 500 companies and 2018 nominal GDP for the U.S. As shown in  
16 Table 9, the aggregate profit for the S&P 500 companies represented  
17 6.73% of nominal GDP in 2018. In Table 7, I then projected the  
18 aggregate net income level for the S&P 500 companies and GDP as  
19 of the year 2050. For the growth rate for the S&P 500 companies, I  
20 used the average of Mr. Hevert's Bloomberg and *Value Line* growth

---

<sup>62</sup> 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.

1 rates, 12.68% and 12.70%, which is 12.69%. As a growth rate for  
 2 nominal GDP, I used the average of the long-term projected GDP  
 3 growth rates from CBO, SSA, and EIA (4.0%, 4.4%, and 4.3%),  
 4 which is 4.23%. The projected 2050 level for the aggregate net  
 5 income level for the S&P 500 companies is \$64.3 trillion. However,  
 6 over the same period GDP only grows to \$78.7 trillion. As such, if the  
 7 aggregate net income for the S&P 500 grows in accordance with the  
 8 growth rates used by Mr. Hevert, and if nominal GDP grows at rates  
 9 projected by major government agencies, the net income of the S&P  
 10 500 companies will represent growth from 6.73% of GDP in 2018 to  
 11 81.71% of GDP in 2050. Obviously, it is implausible for the net  
 12 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	1,406,400.0	12.69%	32	64,334,063.3
2018 Nominal U.S. GDP	20,891,000.0	4.23%	32	78,735,624.7
Net Income/GDP (%)	6.73%			81.71%

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 - 12.68% and 12.70%;

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%).

1     **Q.     PLEASE PROVIDE A SUMMARY ANALYSIS ON GDP AND S&P**  
2           **500 EPS GROWTH RATES.**

3     A.     As noted above, the long-term link between corporate profits and  
4           GDP is inevitable. The short-term differences in growth between the  
5           two has been highlighted by some notable market observers,  
6           including Warren Buffett, who indicated that corporate profits as a  
7           share of GDP tend to go far higher after periods where they are  
8           depressed, and then drop sharply after they have been hovering at  
9           historically high levels. In a famous 1999 *Fortune* article, Mr. Buffet  
10          made the following observation:<sup>63</sup>

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

---

<sup>63</sup> Carol Loomis, "Mr. Buffet on the Stock Market," *Fortune*, (Nov. 22, 1999), [https://money.cnn.com/magazines/fortune/fortune\\_archive/1999/11/22/269071/](https://money.cnn.com/magazines/fortune/fortune_archive/1999/11/22/269071/).

1 In sum, Mr. Hevert's long-term S&P 500 EPS growth rates of 12.68%  
2 and 12.70% are grossly overstated and have no basis in economic  
3 reality. In the end, the big question remains as to whether corporate  
4 profits can grow faster than GDP. Jeremy Siegel, the renowned  
5 finance professor at the Wharton School of the University of  
6 Pennsylvania, believes that going forward, earnings per share can  
7 grow about half a point faster than nominal GDP, or about 5.0%, due  
8 to the big gains in the technology sector. But he also believes that  
9 sustained EPS growth matching analysts' near-term projections is  
10 absurd: "The idea of 8% or 10% or 12% growth is ridiculous. It will  
11 not happen."<sup>64</sup>

12 **Q. PLEASE PROVIDE ADDITIONAL INSIGHTS INTO THE CAPM**  
13 **RESULTS.**

14 A. There are several additional issues with the *Value Line* results.  
15 Simply put, the 14.78% and 14.88% expected stock market returns  
16 (Mr. Hevert's Exhibit RBH-2 at pages 1 and 8) are simply excessive.  
17 The compounded annual return in the U.S. stock market is about  
18 10% (9.49% between 1928-2018 according to Damodaran).<sup>65</sup> Mr.  
19 Hevert's *Value Line* CAPM results assume that return on the U.S.  
20 stock market will be almost 50% higher in the future than it has been

---

<sup>64</sup> 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/>.

<sup>65</sup> <http://pages.stern.nyu.edu/~adamodar/>

1 in the past! The extremely high expected stock market returns, and  
2 their resulting market risk premiums and equity cost rate results, are  
3 directly related to the 12.69% and 12.70% expected EPS growth  
4 rates. Simply put, these projected growth rates do not reflect  
5 economic reality. As noted above, it assumes that S&P 500  
6 companies can grow their earnings in the future at a rate that is triple  
7 the expected GDP growth rate.

## 8 2. ECAPM

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

10 A. Mr. Hevert has employed a variation of the CAPM which he calls the  
11 "ECAPM". The ECAPM, as popularized by rate of return consultant  
12 Dr. Roger Morin, attempts to model the well-known finding of tests of  
13 the CAPM that have indicated the Security Market Line ("SML") is  
14 not as steep as predicted by the CAPM.<sup>66</sup> As such, the ECAPM is  
15 nothing more than an ad hoc version of the CAPM and has not been  
16 theoretically or empirically validated in refereed journals. The  
17 ECAPM uses weighting to adjust the risk-free rate and market risk  
18 premium in applying the ECAPM. Mr. Hevert uses 0.25 and 0.75  
19 factors in his ECAPM.

---

<sup>66</sup> In Modern Capital Market theory, the SML is the relationship between the expected return on common stocks and beta.

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

7 **D. Bond Yield Risk Premium Approach**

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

9 A. On pages 92-96 of his testimony and in Exhibit No. RBH-5, Mr. Hevert  
10 develops an equity cost rate using his BYRP approach. Mr. Hevert  
11 develops an equity cost rate by: (1) regressing the average quarterly  
12 authorized returns on equity for electric utility companies from the  
13 January 1, 1992, to May 23, 2019, time period on the 30-year  
14 Treasury Yield; and (2) adding the appropriate risk premium  
15 established in step (1) to three different 30-year Treasury yields: (a)  
16 the current yield of 2.63%; (b) a near-term projected yield of 2.70%;  
17 and (c) a long-term projected yield of 3.70%. Mr. Hevert's risk  
18 premium results are provided on Exhibit JRW-9. He reports BYRP  
19 equity cost rates ranging from 9.90% to 10.06%.

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

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

1           **1.           Base Yields**

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

4       A.     Mr. Hevert has used current, near-term projected, and long-term  
5           projected risk-free rates of 2.63%, 2.70%, and 3.70% in his BYRP  
6           analyses. The actual yield on 30-year Treasury bonds has been in the  
7           2.30% range in recent months. As such, Mr. Hevert's current, near-  
8           term projected, and long-term projected risk-free rates are 33, 40,  
9           and 140 basis points, respectively, above the current yield on long-  
10          term Treasury bonds. These current and forecasted yields are  
11          excessive for two reasons. First, as discussed previously, economists  
12          have been predicting that interest rates are going up for a decade, and  
13          yet they are almost always wrong. Obviously, investors are well aware  
14          of the consistently wrong forecasts of higher interest rates, and  
15          therefore are likely to place little weight on such forecasts. Second,  
16          investors would not be buying long-term Treasury bonds at their  
17          current yields if they expected interest rates to suddenly increase. If  
18          interest rates do increase, the prices of the bonds investors bought at  
19          today's yields go down, thereby producing a negative return.

20           **2.           Risk Premium**

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

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

9 In addition, Mr. Hevert's BYRP approach is a gauge of *commission*  
10 behavior and not *investor* behavior. Capital costs are determined in  
11 the marketplace through the financial decisions of investors and are  
12 reflected in such fundamental factors as dividend yields, expected  
13 growth rates, interest rates, and investors' assessment of the risk  
14 and expected return of different investments. Regulatory  
15 commissions evaluate capital market data in setting authorized  
16 ROEs, but also consider other utility- and rate case-specific  
17 information in setting ROEs. As such, Mr. Hevert's approach and  
18 results reflect factors such as capital structure, credit ratings and  
19 other risk measures, service territory, capital expenditures, energy  
20 supply issues, rate design, investment and expense trackers, and  
21 other factors used by utility commissions in determining an  
22 appropriate ROE in addition to capital costs. This may especially be



1 true when the authorized ROE data includes the results of rate cases  
2 that are settled and not fully litigated.

3 Finally, Mr. Hevert's methodology produces an inflated required rate  
4 of return because utilities have been selling at market-to-book ratios  
5 well in excess of 1.0 for many years. This indicates that the  
6 authorized and earned rates of return on equity have been greater  
7 than the return that investors require. The relationship between ROE,  
8 the equity cost rate, and market-to-book ratios was explained earlier  
9 in this testimony. In short, a market-to-book ratio above 1.0 indicates  
10 a company's ROE is above its equity cost rate. Therefore, the risk  
11 premium produced from the study is overstated as a measure of  
12 investor return requirements and produces an inflated equity cost  
13 rate.

14 **E. Expected Earnings Approach**

15 **Q. PLEASE REVIEW MR. HEVERT'S EXPECTED EARNINGS**  
16 **APPROACH.**

17 A. On pages 96-7 of his testimony and in Exhibit RBH-6, Mr. Hevert  
18 develops an equity cost rate using his Expected Earnings approach,  
19 which he uses for comparison purposes. Mr. Hevert's approach  
20 involves using *Value Line's* projected ROE for the years 2022-24 for  
21 his proxy group and then adjusting this ROE to account for the fact

1 the *Value Line* uses year-end equity in computing ROE. Mr. Hevert  
2 reports Expected Earnings results of 10.44% and 10.54%.

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

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

8 The Expected Earnings Approach Does Not Measure the Market  
9 Cost of Equity Capital – First and foremost, this accounting-based  
10 methodology does not measure investor return requirements. As  
11 indicated by Professor Roger Morin, a long-term utility rate of return  
12 consultant, “More simply, the Comparable (Expected) Earnings  
13 standard ignores capital markets. If interest rates go up 2% for  
14 example, investor requirements and the cost of equity should  
15 increase commensurably, but if regulation is based on accounting  
16 returns, no immediate change in equity cost results.”<sup>67</sup> As such,  
17 this method does not measure the market cost of equity because  
18 there is no way to assess whether the earnings are greater than or  
19 less than the earnings investors require, and therefore this approach  
20 does not measure the market cost of equity capital.

---

<sup>67</sup> Roger Morin, *New Regulatory Finance* (2006), p. 293.

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

12       Changes in ROE Ratios do not Track Capital Market Conditions - As  
13       also indicated by Morin, "The denominator of accounting return, book  
14       equity, is a historical cost-based concept, which is insensitive to  
15       changes in investor return requirements. Only stock market price is  
16       sensitive to a change in investor requirements. Investors can only  
17       purchase new shares of common stock at current market prices  
18       and not at book value."<sup>68</sup>

19       The Expected Earnings Approach is Circular - The proxies' ROEs  
20       ratios are not determined by competitive market forces, but instead

---

<sup>68</sup> *Id.*

1 are largely the result of federal and state rate regulation, including  
2 the present proceeding.

3 The Proxies' ROEs Reflect Earnings on Business Activities that are  
4 not Representative of DEC's Rate-Regulated Utility Activities - The  
5 numerators of the proxy companies' ROEs include earnings from  
6 business activities that are riskier and produce more projected  
7 earnings per dollar of book investment than does regulated electric  
8 utility service. These include earnings from: (1) unregulated  
9 businesses, including merchant generation; (2) electric generation;  
10 and (3) international operations.

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

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

18 **F. Other Issues**

19 **1. Other DEC Risk Factors**

20 **Q. PLEASE ADDRESS MR. HEVERT'S CONSIDERATION OF**  
21 **OTHER UNIQUE RISK FACTORS FACED BY DEC.**

1 A. Mr. Hevert has a number of risk factors he considered in arriving at  
2 his 10.50% ROE recommendation. These include North Carolina's  
3 REPS, the Company's high level of capital expenditures,  
4 environmental regulations, and its coal-fired and nuclear generation.  
5 However, these are risk factors already considered in the credit-  
6 rating process used by major rating agencies. In addition, as I noted  
7 above, DEC's S&P and Moody's credit ratings of A- and A1 suggest  
8 that the Company's investment risk is below the average of the proxy  
9 groups.

10 **2. Flotation Costs**

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

13 A. Mr. Hevert argues that a flotation cost adjustment is appropriate for  
14 DEC and he has considered flotation costs in arriving at his 10.50%  
15 ROE recommendation.

16 First and foremost, Mr. Hevert has not identified any flotation cost for  
17 DEC. Therefore, he is asking for higher revenues in the form of a  
18 higher ROE for expenses that he has not identified.

1 Second, in North Carolina flotation costs cannot be recovered unless  
2 the Company is expected to issue common stock.<sup>69</sup>

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

7 (1) If an equity flotation cost adjustment is similar to a debt  
8 flotation cost adjustment, the fact that the market-to-book  
9 ratios for electric utility companies are over 1.95X actually  
10 suggests that there should be a flotation cost reduction (and  
11 not an increase) to the equity cost rate. This is because when  
12 (a) a bond is issued at a price in excess of face or book value,  
13 and (b) the difference between market price and the book  
14 value is greater than the flotation or issuance costs, the cost

---

<sup>69</sup> 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.

1 of that debt is lower than the coupon rate of the debt. The  
2 amount by which market values of electric utility companies  
3 are in excess of book values is much greater than flotation  
4 costs. Hence, if common stock flotation costs were exactly like  
5 bond flotation costs, and one was making an explicit flotation  
6 cost adjustment to the cost of common equity, the adjustment  
7 would be downward;

8 (2) If a flotation cost adjustment is needed to prevent  
9 dilution of existing stockholders' investment, then the  
10 reduction of the book value of stockholder investment  
11 associated with flotation costs can occur only when a  
12 company's stock is selling at a market price at/or below its  
13 book value. As noted above, electric utility companies are  
14 selling at market prices well in excess of book value. Hence,  
15 when new shares are sold, existing shareholders realize an  
16 increase in the book value per share of their investment, not  
17 a decrease;

18 (3) Flotation costs consist primarily of the underwriting  
19 spread or fee and not out-of-pocket expenses. On a per-share  
20 basis, the underwriting spread is the difference between the  
21 price the investment banker receives from investors and the  
22 price the investment banker pays to the company. Therefore,

1           these are not expenses that must be recovered through the  
2           regulatory process. Furthermore, the underwriting spread is  
3           known to the investors who are buying the new issue of stock,  
4           and who are well aware of the difference between the price  
5           they are paying to buy the stock and the price that the  
6           Company is receiving. The offering price they pay is what  
7           matters when investors decide to buy a stock based on its  
8           expected return and risk prospects. Therefore, the company  
9           is not entitled to an adjustment to the allowed return to  
10          account for those costs; and

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



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

3 **VII. NORTH CAROLINA ECONOMIC CONDITIONS AND**  
4 **DEC'S RATE OF RETURN RECOMMENDATION**

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

7 A. Mr. Hevert has acknowledged that the North Carolina Utilities  
8 Commission must balance the interests of investors and customers  
9 in setting the ROE. In addition, Mr. Hevert notes that the  
10 Commission's task is to set rates as low as possible consistent with  
11 the dictates of the United States and North Carolina Constitutions.<sup>70</sup>  
12 On this issue, the ROE should be the minimum amount needed to  
13 meet the *Hope* and *Bluefield* standards. Finally, Mr. Hevert also  
14 highlights that the North Carolina Supreme Court has indicated that  
15 in retail utility service rate cases, the Commission must make  
16 findings of fact regarding the impact of changing economic  
17 conditions on customers when determining the proper ROE for a  
18 public utility.<sup>71</sup>

---

<sup>70</sup> 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.")

<sup>71</sup> *State of North Carolina ex rel. Utilities Commission v. Cooper*, 758 S.E.2d 635, 642 (2014) (Cooper II).

1 With respect to this latter mandate, Mr. Hevert evaluates a number  
2 of factors such as employment and income levels and, based on his  
3 review of the data, comes to the conclusion that DEC's proposed  
4 ROE of 10.50 percent is fair and reasonable to DEC, its  
5 shareholders, and its customers in light of the effect of those  
6 changing economic conditions.<sup>72</sup>

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

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

13 **Q. DO YOU AGREE WITH MR. HEVERT'S CONCLUSION THAT THE**  
14 **IMPROVEMENT IN ECONOMIC CONDITIONS IN NORTH**  
15 **CAROLINA AND THE COMPANY'S SERVICE TERRITORY**  
16 **JUSTIFY THE COMPANY'S PROPOSED RATE OF RETURN**  
17 **INCLUDING A 10.50% ROE?**

18 A. No. Whereas economic conditions have improved in North Carolina,  
19 it does not necessarily justify such a high rate of return and ROE. I  
20 have three observations on Mr. Hevert's assessment of the

---

<sup>72</sup> Hevert Testimony, pp. 53-62.

1 economic conditions in North Carolina and DEC's service territory  
2 and its requested ROE:

3 (1) DEC's ROE request of 10.50% is almost 100 basis  
4 points above the average authorized ROEs for electric utilities over  
5 the 2018-19 time period;

6 (2) whereas the unemployment rates in North Carolina  
7 and DEC's service territory have fallen by two-thirds since their  
8 peaks in the 2009-2010 period, they are both above the national  
9 average of 3.90%; and

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

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

16 A. The lower level of household income in the state and the higher level  
17 of unemployment in DEC's service territory (relative to the national  
18 average) suggest that affordability can be an issue for an essential  
19 utility service such as electricity. Certainly, it does not justify an  
20 authorized ROE that is almost 100 basis points above the national  
21 average. And DEC's overall rate of return request has a significant  
22 impact on its overall requested increase in revenues.

- 1    **Q       DOES THIS CONCLUDE YOUR TESTIMONY?**
- 2    A.       Yes, it does.

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

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

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

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

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

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

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

**J. Randall Woolridge****Office Address**

302 Business Building  
The Pennsylvania State University  
University Park, PA 16802  
814-865-1160

**Home Address**

120 Haymaker Circle  
State College, PA 16801  
814-238-9428

**Academic Experience**

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

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

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

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

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

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

**Education**

**Doctor of Philosophy in Business Administration**, the University of Iowa. Major field: Finance.

**Master of Business Administration**, the Pennsylvania State University.

**Bachelor of Arts**, the University of North Carolina. Major field: Economics.

**Books**

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

Patrick Cusatis, Gary Gray, and J. Randall Woolridge, *The StreetSmart Guide to Valuing a Stock* (2<sup>nd</sup> 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*.



Exhibit JRW-1

Duke Energy Carolinas, LLC  
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%	4.51%	2.26%
Common Equity	<u>50.00%</u>	<u>9.00%</u>	<u>4.50%</u>
Total Capitalization	100.00%		6.76%

\* 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	47.00%	4.51%	2.12%
Common Equity	<u>53.00%</u>	<u>8.40%</u>	<u>4.45%</u>
Total Capitalization	100.00%		6.57%

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





Exhibit JRW-2  
Duke Energy Carolinas, LLC

Panel A  
Electric Proxy Group

Company	Operating Revenue (\$mil)	Percent Reg Elec Revenue	Percent Reg Gas Revenue	Net Plant (\$mil)	Market Cap (\$mil)	S&P Issuer Credit Rating	Moody's Long Term Rating	Pre-Tax Interest Coverage	Primary Service Area	Common Equity Ratio	Return on Equity	Market to Book Ratio	Market to Book Ratio
ALLETE, Inc. (NYSE-ALE)	\$1,498.6	71%	0%	\$3,904.4	\$3,993.8	BBB+	Baa1	3.34	MN, WI	59.2%	8.2%	1.85	1.85
Alliant Energy Corporation (NYSE-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	2.13
Ameren Corporation (NYSE-AEE)	\$6,291.0	85%	15%	\$22,810.0	\$16,366.8	BBB+	Baa1	3.64	IL,MO	46.2%	10.9%	2.11	2.11
American Electric Power Co. (NYSE-AEP)	\$16,195.7	88%	0%	\$55,099.1	\$37,379.9	A-	Baa1	2.99	10 States	42.7%	10.3%	1.96	1.96
Avangrid (NYSE-AVG)	\$6,291.0	56%	23%	\$22,810.0	\$16,366.8	BBB+	Baa1	3.53	NY,CT,ME	70.8%	3.9%	1.06	1.06
Avista Corp (NYSE-AVA)	\$1,396.9	64%	22%	\$4,648.9	\$2,881.1	BBB	Baa2	2.61	WA,OR,AK,ID	45.7%	7.80%	1.62	2.91
CMS Energy Corporation (NYSE-CMS)	\$6,873.0	66%	28%	\$18,126.0	\$13,966.2	BBB+	Baa1	2.67	MI	28.9%	14.2%	2.91	1.52
Consolidated Edison, Inc. (NYSE-ED)	\$12,337.0	70%	19%	\$41,749.0	\$35,673.3	BBB+	A3	3.03	NY,PA	44.8%	8.6%	1.52	1.45
Dominion Energy, Inc. (NYSE-D)	\$13,366.0	70%	15%	\$54,560.0	\$51,000.1	BBB+	NA	3.10	VA,NC,SC,OH,WV,UT	38.5%	12.31%	2.31	1.43
Duke Energy Corporation (NYSE-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	1.86
Edison International (NYSE-EIX)	\$12,657.0	100%	0%	\$41,348.0	\$18,107.4	BBB	Baa3	(0.48)	CA	45.1%	-2.4%	1.43	1.87
Energy Corporation (NYSE-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	1.40
Eversource Energy (NYSE-EVRG)	\$4,275.9	100%	0%	\$18,782.5	\$14,840.0	A-	Baa1	3.11	KS,MO	54.2%	7.9%	1.49	2.77
Eversource Energy (NYSE-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	1.88
Exelon Corporation (NYSE-EXC)	\$11,009.5	56%	5%	\$31,974.4	\$46,448.0	BBB+	Baa2	2.44	PA,NJ,IL,MD,DC,DE	47.8%	6.4%	1.40	3.60
FirstEnergy Corporation (NYSE-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	2.82
Hawaiian Electric Industries (NYSE-HE)	\$2,860.8	89%	0%	\$4,830.1	\$4,060.1	BBB-	NA	3.87	HI	51.2%	9.6%	1.88	2.22
IDACORP, Inc. (NYSE-IDA)	\$1,370.8	100%	0%	\$4,395.7	\$8,562.5	BBB	Baa1	3.85	ID	56.4%	9.8%	3.60	1.54
MGE Energy, Inc. (NYSE-MGEE)	\$559.8	72%	28%	\$1,509.4	\$2,303.7	AA-	Aa2	7.69	WI	61.5%	10.6%	2.82	1.97
NextEra Energy, Inc. (NYSE-NEE)	\$16,727.0	71%	0%	\$70,334.0	\$83,224.6	A-	Baa1	5.87	FL	49.8%	17.3%	2.22	3.04
NorthWestern Corporation (NYSE-NWE)	\$1,192.0	77%	23%	\$4,521.3	\$2,991.2	BBB	NA	2.94	MT,SD,NE	47.8%	10.5%	1.54	1.92
OGE Energy Corp. (NYSE-OGE)	\$2,270.3	100%	0%	\$8,643.8	\$7,899.1	BBB+	Baa1	4.19	OK,AR	56.0%	10.8%	1.97	1.71
Pinnacle West Capital Corp. (NYSE-PNW)	\$3,691.2	95%	0%	\$14,029.6	\$16,260.8	A-	A3	4.04	AZ	50.6%	10.1%	3.04	1.75
Portland General Electric Company (NYSE-POR)	\$1,991.0	100%	0%	\$6,887.0	\$4,287.2	BBB+	A3	2.85	OR	50.3%	8.6%	1.71	1.63
PNM Resources, Inc. (NYSE-PNM)	\$1,436.6	100%	0%	\$5,234.6	\$3,360.4	BBB+	Baa3	1.73	NM,TX	37.6%	5.8%	1.92	1.67
PPL Corporation (NYSE-PPL)	\$7,785.0	94%	4%	\$34,458.0	\$20,457.2	A-	Baa2	3.37	PA,KY	34.6%	16.3%	1.75	2.30
Sempra Energy (NYSE-SRE)	\$1,991.0	56%	44%	\$6,887.0	\$31,467.5	BBB+	Baa1	2.02	CA,TX	43.1%	6.5%	1.63	2.13
Southern Company (NYSE-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	2.02
WEC Energy Group (NYSE-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	1.88
Xcel Energy Inc. (NYSE-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	\$7,851.8	81%	11%	\$26,964.6	\$21,986.1	BBB+	Baa1	3.14		46.0%	9.6%	2.00	
Median	\$6,582.0	85%	6%	\$22,405.5	\$16,407.4	BBB+	Baa1	3.10		45.5%	9.7%	1.87	

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

Panel B  
Hewitt Proxy Group

Company	Operating Revenue (\$mil)	Percent Reg Elec Revenue	Percent Reg Gas Revenue	Net Plant (\$mil)	Market Cap (\$mil)	S&P Issuer Credit Rating	Moody's Long Term Rating	Pre-Tax Interest Coverage	Primary Service Area	Common Equity Ratio	Return on Equity	Market to Book Ratio	Market to Book Ratio
ALLETE, Inc. (NYSE-ALE)	\$1,498.6	71%	0%	\$3,904.4	\$3,993.8	BBB+	Baa1	3.34	MN, WI	59.2%	8.2%	1.85	1.85
Alliant Energy Corporation (NYSE-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	2.13
Ameren Corporation (NYSE-AEE)	\$6,291.0	85%	15%	\$22,810.0	\$16,366.8	BBB+	Baa1	3.64	IL,MO	46.2%	10.9%	2.11	2.11
American Electric Power Co. (NYSE-AEP)	\$16,195.7	88%	0%	\$55,099.1	\$37,379.9	A-	NA	2.99	10 States	42.7%	10.3%	1.96	1.96
Avangrid (NYSE-AVG)	\$6,291.0	56%	23%	\$22,810.0	\$16,366.8	BBB+	Baa1	3.53	NY,CT,ME	70.8%	3.9%	1.06	1.06
CMS Energy Corporation (NYSE-CMS)	\$6,873.0	66%	28%	\$18,126.0	\$13,966.2	BBB+	NA	2.67	MI	28.9%	14.2%	2.91	1.52
DTE Energy Company (NYSE-DTE)	\$14,212.0	37%	39%	\$21,650.0	\$20,066.4	BBB+	Baa1	3.15	MI	42.9%	10.8%	1.87	
Eversource Energy (NYSE-EVRG)	\$4,275.9	100%	0%	\$18,782.5	\$14,840.0	A-	Baa1	3.11	KS,MO	54.2%	7.9%	1.49	2.77
Hawaiian Electric Industries (NYSE-HE)	\$2,860.8	89%	0%	\$4,830.1	\$4,060.1	BBB-	NA	3.87	HI	51.2%	9.6%	1.88	2.22
NextEra Energy, Inc. (NYSE-NEE)	\$16,727.0	71%	0%	\$70,334.0	\$83,224.6	A-	Baa1	5.87	FL	49.8%	17.3%	2.22	3.04
NorthWestern Corporation (NYSE-NWE)	\$1,192.0	77%	23%	\$4,521.3	\$2,991.2	BBB	NA	2.94	MT,SD,NE	47.8%	10.5%	1.54	1.92
OGE Energy Corp. (NYSE-OGE)	\$2,270.3	100%	0%	\$8,643.8	\$7,899.1	BBB+	NA	4.19	OK,AR	56.0%	10.8%	1.97	1.71
Otter Tail Corporation (NYSE-OTR)	\$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)	\$3,691.2	95%	0%	\$14,029.6	\$16,260.8	A-	A3	4.04	AZ	50.6%	10.1%	3.04	1.75
Portland General Electric Company (NYSE-POR)	\$1,991.0	100%	0%	\$6,887.0	\$4,287.2	BBB+	A3	2.85	OR	50.3%	8.6%	1.71	1.63
PNM Resources, Inc. (NYSE-PNM)	\$1,436.6	100%	0%	\$5,234.6	\$3,360.4	BBB+	Baa3	1.73	NM,TX	37.6%	5.8%	1.92	1.67
Southern Company (NYSE-SO)	\$23,495.0	65%	14%	\$80,797.0	\$48,493.6	A-	NA	2.49	GA,FL,NJ,IL,VA,TN,MS	38.3%	8.4%	1.67	1.95
WEC Energy Group (NYSE-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	1.88
Xcel Energy Inc. (NYSE-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	\$6,998.4	78%	11%	\$22,707.8	\$18,643.1	BBB+	Baa1	3.42		48.0%	9.7%	2.03	
Median	\$4,275.9	84%	0%	\$18,126.0	\$14,840.0	BBB+	Baa1	3.31		47.8%	10.3%	1.96	

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

## Exhibit JRW-2

## Duke Energy Carolinas, LLC

## 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	90	95
Ameren Corporation (NYSE-AEE)	0.55	A	2	85	95
American Electric Power Co. (NYSE-AEP)	0.55	A+	1	85	100
Avangrid (NYSE-AVG)	0.40	B++	2	NMF	95
Avista Corp (NYSE-AVA)	0.60	A	2	65	90
CMS Energy Corporation (NYSE-CMS)	0.50	B++	2	85	100
Consolidated Edison, Inc. (NYSE-ED)	0.45	A+	1	100	100
Dominion Energy Inc. (NYSE-D)	0.55	B++	2	60	100
Duke Energy Corporation (NYSE-DUK)	0.50	A	2	90	100
Edison International (NYSE-EIX)	0.55	B+	3	10	85
Energys Corporation (NYSE-ETR)	0.60	B++	2	60	95
Eversource Energy (NYSE-EVRG)	NMF	B++	2	NMF	NMF
Eversource Energy (NYSE-ES)	0.55	A	1	95	100
Exelon Corporation (NYSE-EXC)	0.65	B++	2	60	95
FirstEnergy Corporation (NYSE-FE)	0.65	B++	2	40	90
Hawaiian Electric Industries (NYSE-HE)	0.55	A	2	60	100
IDACORP, Inc. (NYSE-IDA)	0.55	A	2	95	100
MGE Energy, Inc. (NYSE-MGEE)	0.55	A	1	95	85
NextEra Energy, Inc. (NYSE-NEE)	0.55	A+	1	70	100
NorthWestern Corporation (NYSE-NWE)	0.60	B++	2	85	100
OGE Energy Corp. (NYSE-OGE)	0.75	A	2	80	95
Pinnacle West Capital Corp. (NYSE-PNW)	0.50	A+	1	95	100
PNM Resources, Inc. (NYSE-PNM)	0.60	B+	3	75	85
Portland General Electric Company (NYSE-POR)	0.55	B++	2	85	95
PPL Corporation (NYSE-PPL)	0.70	B++	2	70	95
Sempra Energy (NYSE-SRE)	0.70	A	2	70	95
Southern Company (NYSE-SO)	0.50	A	2	85	100
WEC Energy Group (NYSE-WEC)	0.50	A+	1	90	95
Xcel Energy Inc. (NYSE-XEL)	0.50	A+	1	100	100
Mean	0.57	A	1.8	77	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	90	95
Ameren Corporation (NYSE-AEE)	0.55	A	2	85	95
American Electric Power Co. (NYSE-AEP)	0.55	A+	1	85	100
Avangrid (NYSE-AVG)	0.40	B++	2	NMF	95
CMS Energy Corporation (NYSE-CMS)	0.50	B++	2	85	100
DTE Energy Company (NYSE-DTE)	0.55	B++	2	85	100
Eversource Energy (NYSE-EVRG)	NMF	B++	2	NMF	NMF
Hawaiian Electric Industries (NYSE-HE)	0.55	A	2	60	100
NextEra Energy, Inc. (NYSE-NEE)	0.55	A+	1	70	100
NorthWestern Corporation (NYSE-NWE)	0.60	B++	2	85	100
OGE Energy Corp. (NYSE-OGE)	0.80	A	2	80	95
Otter Tail Corporation (NDQ-OTTR)	0.70	A	2	65	90
Pinnacle West Capital Corp. (NYSE-PNW)	0.50	A+	1	95	100
PNM Resources, Inc. (NYSE-PNM)	0.60	B+	3	75	85
Portland General Electric Company (NYSE-POR)	0.55	B++	2	85	95
Southern Company (NYSE-SO)	0.50	A	2	85	100
WEC Energy Group (NYSE-WEC)	0.50	A+	1	90	95
Xcel Energy Inc. (NYSE-XEL)	0.50	A+	1	100	100
Mean	0.56	A	1.8	83	97

Data Source: Value Line Investment Survey, 2019

### *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*.



Exhibit JRW-3

**Duke Energy Carolinas, LLC**  
**Capital Structure Ratios and Debt Cost Rate**

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

	Percent of Total	Cost
Long-Term Debt	47.00%	4.51%
Common Equity	<u>53.00%</u>	
Total Capital	100.00%	

**Panel B - Duke Energy Carolinas, LLC and Duke Energy Corporation Capital Structure Ratios**

Duke Energy Carolinas, LLC Ratios	
Short-Term Debt	4.2%
Long-Term Debt	44.6%
Common Equity	<u>51.2%</u>
Total Capital	100.0%

Duke Energy Corporation Ratios	
Short-Term Debt	6.0%
Long-Term Debt	50.6%
Common Equity	43.4%
Total Capital	100.0%

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

	DEC Proposed	Adjustment	Staff Proposed	Cost
Long-Term Debt	47.00%	1.063830	50.00%	4.51%
Common Equity	<u>53.00%</u>	0.943396	<u>50.00%</u>	
Total Capital	100.00%		100.00%	

**Duke Energy Carolinas, LLC and Duke Energy Corporation Capital Structure Ratios  
Quarterly - 2017-2019**

	<i>2017 FQ4</i>	<i>2018 FQ1</i>	<i>2018 FQ2</i>	<i>2018 FQ3</i>	<i>2018 FQ4</i>	<i>2019 FQ1</i>	<i>2019 FQ2</i>	<i>2019 FQ3</i>	
Duke Energy Carolinas, LLC	12/31/2017	3/31/2018	6/30/2018	9/30/2018	12/31/2018	3/31/2019	6/30/2019	9/30/2019	Average
Short-Term Debt	6.1%	3.8%	5.5%	5.8%	1.9%	3.2%	5.2%	2.1%	4.2%
Long-Term Debt	41.3%	44.6%	44.1%	43.5%	47.4%	46.0%	43.5%	46.1%	44.6%
Common Equity	52.7%	51.6%	50.4%	50.8%	50.7%	50.8%	51.3%	51.8%	51.2%
Total Capital	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	<i>2017 FQ4</i>	<i>2018 FQ1</i>	<i>2018 FQ2</i>	<i>2018 FQ3</i>	<i>2018 FQ4</i>	<i>2019 FQ1</i>	<i>2019 FQ2</i>	<i>2019 FQ3</i>	
Duke Energy Corporation	12/31/2017	3/31/2018	6/30/2018	9/30/2018	12/31/2018	3/31/2019	6/30/2019	9/30/2019	Average
Short-Term Debt	5.6%	7.1%	6.3%	6.4%	6.6%	5.2%	6.1%	5.1%	6.0%
Long-Term Debt	51.0%	50.2%	50.6%	50.6%	49.9%	51.1%	50.8%	50.5%	50.6%
Common Equity	43.4%	42.8%	43.1%	43.1%	43.5%	43.7%	43.1%	44.4%	43.4%
Total Capital	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: S&P Global Market Intelligence





DOCKET NO. E-7, SUB 1214

Exhibit JRW-4

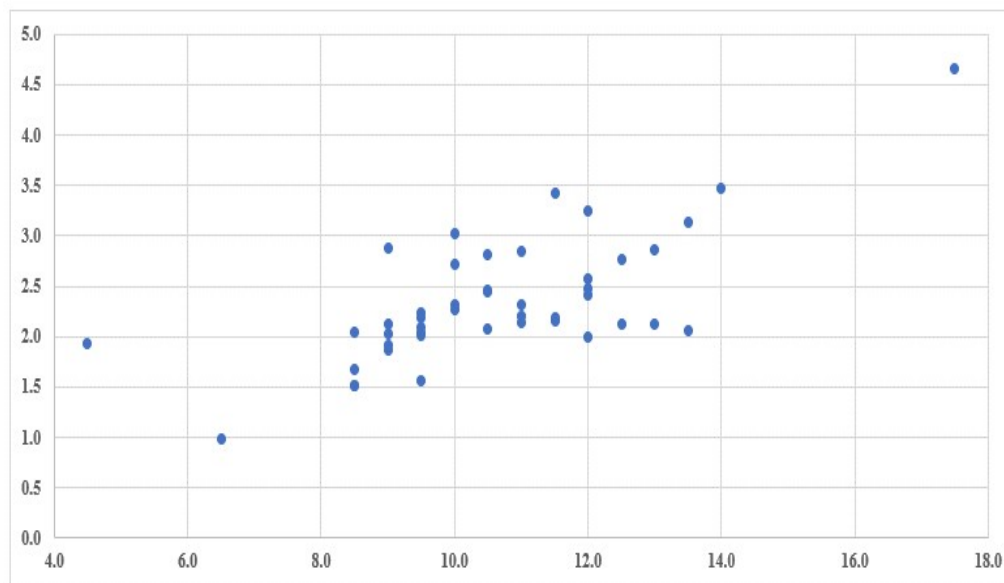
The Relationship Between Expected ROE and Market-to-Book Ratios

Page 1 of 1

**Exhibit JRW-4**

**Electric Utilities and Gas Distribution Companies**

**Market-to-Book**



**Expected Return on Equity**

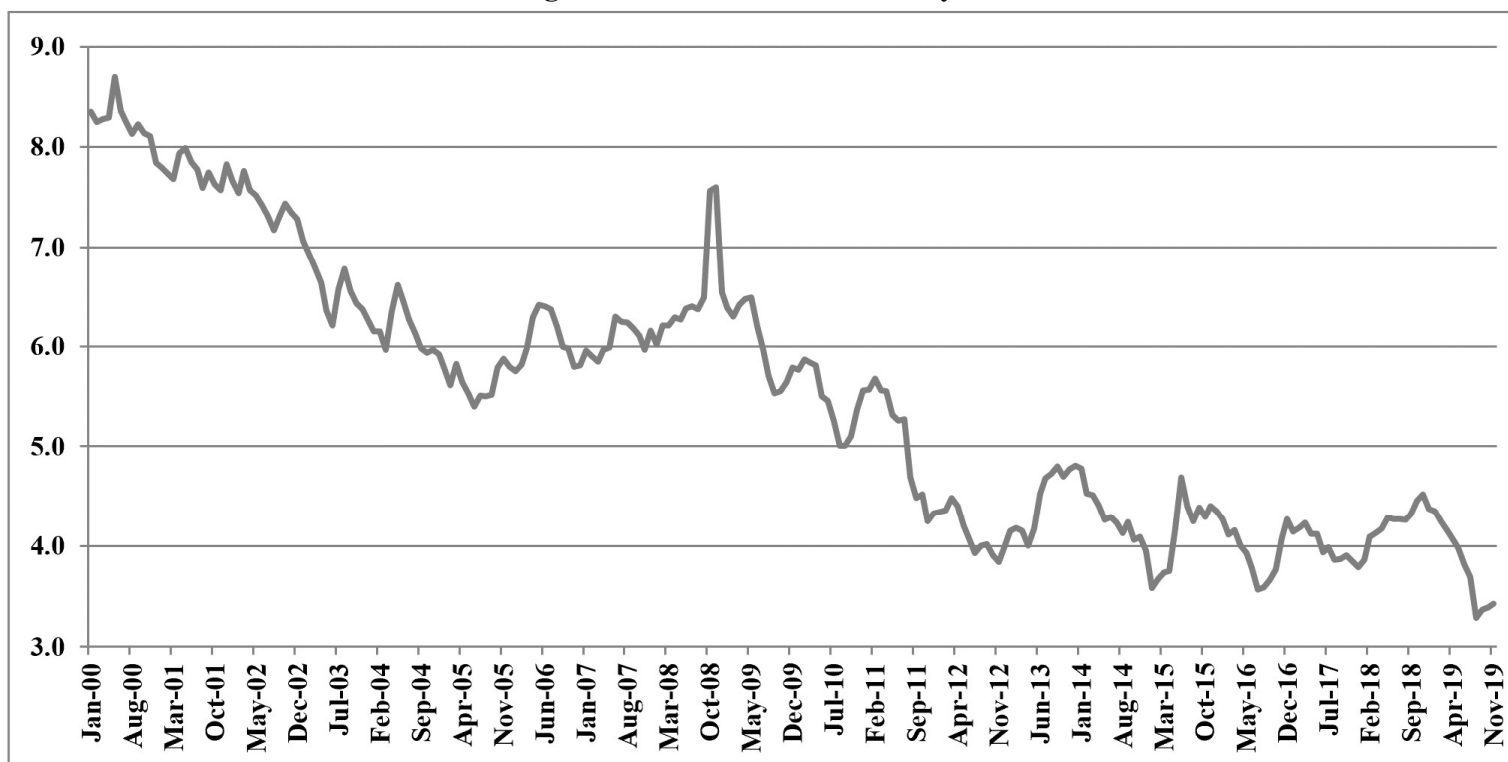
**R-Square = .50, N=43**

Source: *Value Line Investment Survey*, 2019.



DOCKET NO. E-7, SUB 1214  
Exhibit JRW-5  
Public Utility Capital Cost Indicators  
Page 1 of 4

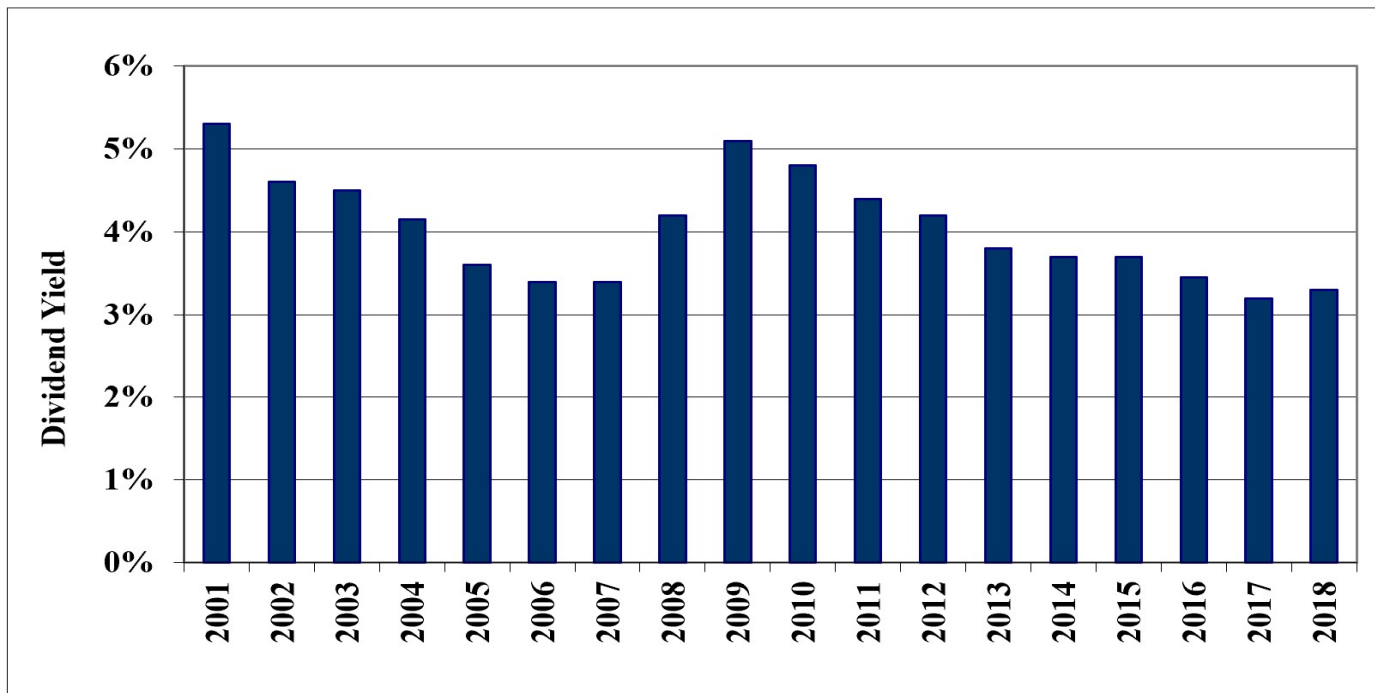
Exhibit JRW-5  
Long-Term 'A' Rated Public Utility Bonds



Data Source: Mergent Bond Record

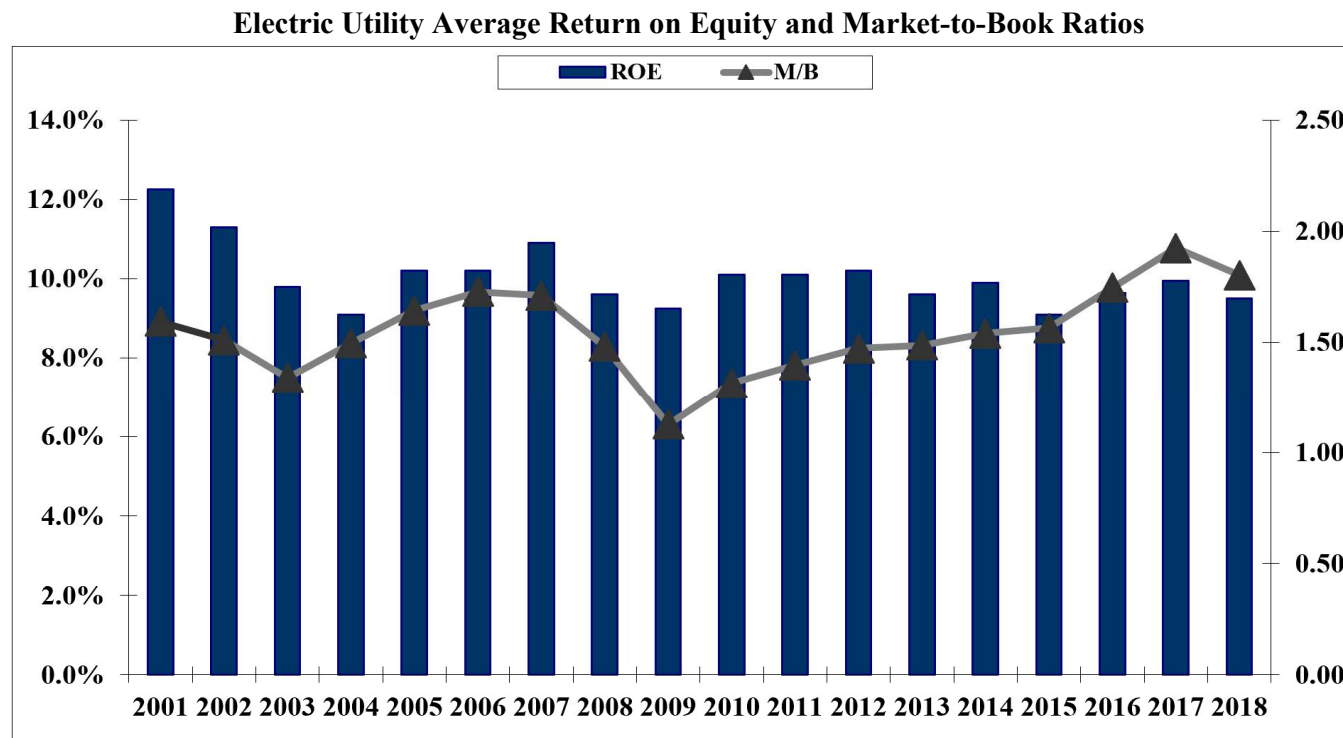
Exhibit JRW-5

Electric Utility Average Dividend Yield



Data Source: *Value Line Investment Survey*.

Exhibit JRW-5



Data Source: *Value Line Investment Survey.*

Exhibit JRW-5  
Industry Average Betas\*  
Value Line Investment Survey Betas\*\*  
20-Jan-20

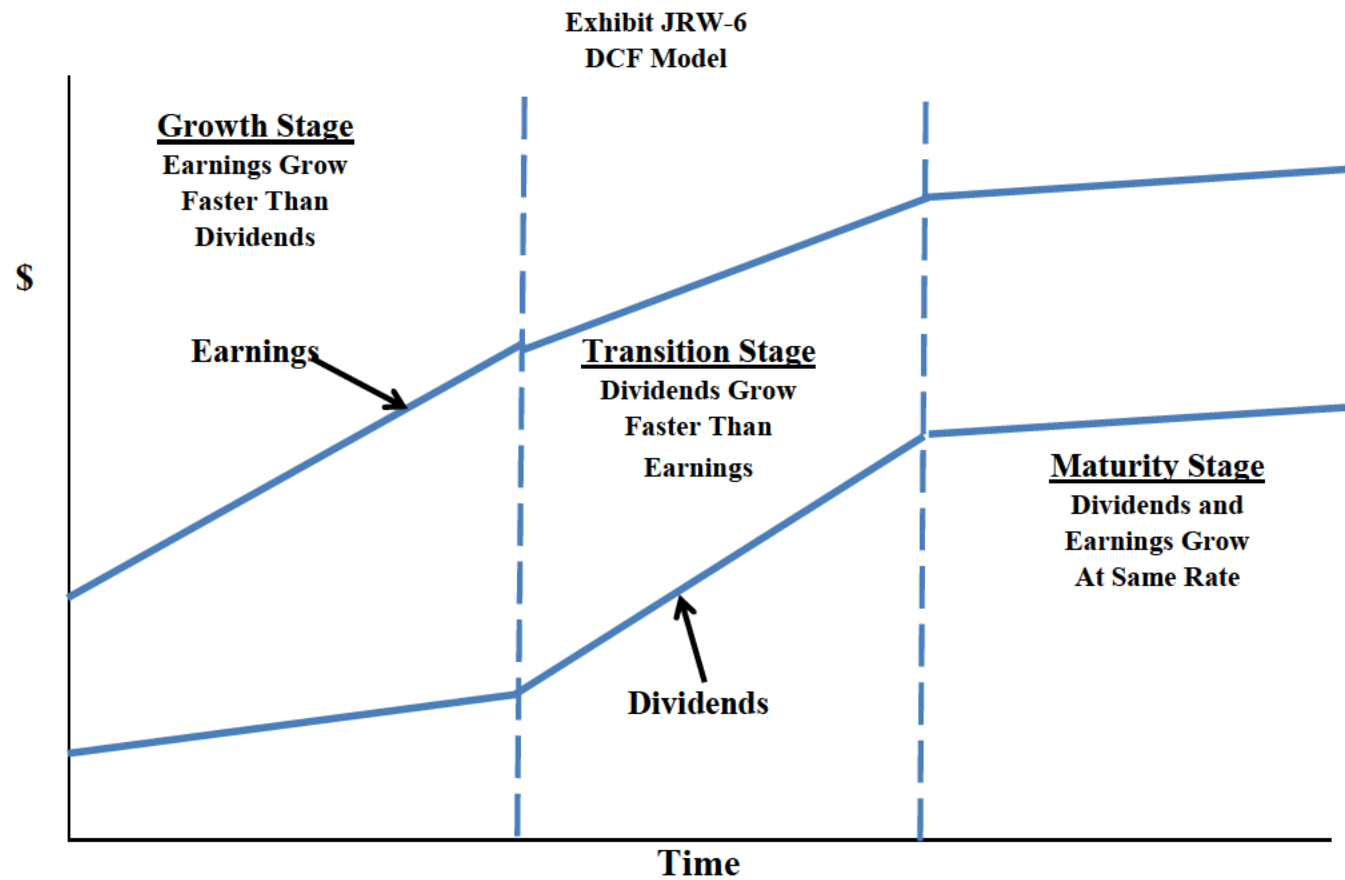
Rank	Industry	Beta	Rank	Industry	Beta	Rank	Industry	Beta
1	Petroleum (Producing)	1.81	34	Precision Instrument	1.18	67	Cable TV	1.05
2	Natural Gas (Div.)	1.77	35	Apparel	1.18	68	Funeral Services	1.04
3	Oilfield Svcs/Equip.	1.74	36	Paper/Forest Products	1.18	69	IT Services	1.04
4	Metals & Mining (Div.)	1.58	37	Advertising	1.16	70	Foreign Electronics	1.02
5	Steel	1.58	38	Homebuilding	1.16	71	Retail (Softlines)	1.02
6	Maritime	1.45	39	Retail Building Supply	1.16	72	Pharmacy Services	1.02
7	Metal Fabricating	1.44	40	Bank (Midwest)	1.16	73	Med Supp Non-Invasive	1.00
8	Oil/Gas Distribution	1.43	41	Internet	1.15	74	Healthcare Information	1.00
9	Chemical (Specialty)	1.39	42	Newspaper	1.15	75	Information Services	0.98
10	Petroleum (Integrated)	1.36	43	Entertainment	1.15	76	Retail Store	0.98
11	Chemical (Basic)	1.34	44	Computer Software	1.15	77	Med Supp Invasive	0.98
12	Chemical (Diversified)	1.33	45	Public/Private Equity	1.14	78	Educational Services	0.96
13	Engineering & Const	1.32	46	Drug	1.14	79	Investment Co.(Foreign)	0.94
14	Heavy Truck & Equip	1.31	47	Human Resources	1.14	80	Environmental	0.94
15	Hotel/Gaming	1.31	48	Telecom. Equipment	1.14	81	Thrift	0.93
16	Pipeline MLPs	1.29	49	Shoe	1.14	82	Reinsurance	0.93
17	Auto Parts	1.29	50	Power	1.14	83	Insurance (Prop/Cas.)	0.89
18	Office Equip/Supplies	1.29	51	Retail Automotive	1.14	84	Restaurant	0.88
19	Building Materials	1.28	52	Diversified Co.	1.13	85	Household Products	0.87
20	Electronics	1.28	53	Financial Svcs. (Div.)	1.13	86	Investment Co.	0.86
21	Computers/Peripherals	1.27	54	Packaging & Container	1.13	87	Beverage	0.84
22	Railroad	1.23	55	Bank	1.13	88	R.E.I.T.	0.84
23	Semiconductor	1.23	56	Wireless Networking	1.13	89	Tobacco	0.83
24	Semiconductor Equip	1.23	57	Furn/Home Furnishings	1.12	90	Food Processing	0.80
25	Machinery	1.22	58	Publishing	1.09	91	Retail/Wholesale Food	0.80
26	Electrical Equipment	1.21	59	Telecom. Utility	1.09	92	Water Utility	0.68
27	Air Transport	1.21	60	Medical Services	1.09	93	Natural Gas Utility	0.67
28	E-Commerce	1.20	61	Entertainment Tech	1.08	94	Precious Metals	0.64
29	Insurance (Life)	1.20	62	Industrial Services	1.07	95	Electric Util. (Central)	0.61
30	Automotive	1.20	63	Telecom. Services	1.06	96	Electric Utility (West)	0.59
31	Biotechnology	1.19	64	Toiletries/Cosmetics	1.06	97	Electric Utility (East)	0.56
32	Retail (Hardlines)	1.19	65	Recreation	1.06			
33	Trucking	1.19	66	Aerospace/Defense	1.05		Mean	1.12

\* Industry averages for 97 industries using Value Line's database of 1,706 companies - Updated 1-20-20.

\*\* Value Line computes betas using monthly returns regressed against the New York Stock Exchange Index for five years.

These betas are then adjusted as follows: VL Beta =  $\{(2/3) * \text{Regressed Beta}\} + \{(1/3) * (1.0)\}$  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.









**Exhibit JRW-7**

**Duke Energy Carolinas, LLC  
Discounted Cash Flow Analysis**

**Panel A  
Electric Proxy Group**

<b>Dividend Yield*</b>	<b>3.15%</b>
<b>Adjustment Factor</b>	<b><u>1.025</u></b>
<b>Adjusted Dividend Yield</b>	<b>3.23%</b>
<b>Growth Rate**</b>	<b><u>5.00%</u></b>
<b>Equity Cost Rate</b>	<b>8.25%</b>

\* 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**

<b>Dividend Yield*</b>	<b>2.90%</b>
<b>Adjustment Factor</b>	<b><u>1.027</u></b>
<b>Adjusted Dividend Yield</b>	<b>2.98%</b>
<b>Growth Rate**</b>	<b><u>5.40%</u></b>
<b>Equity Cost Rate</b>	<b>8.40%</b>

\* Page 2 of Exhibit JRW-7

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

Exhibit JRW-7

Duke Energy Carolinas, LLC  
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	2.9%	2.8%	2.8%
Alliant Energy Corporation (NYSE-LNT)	\$1.42	2.6%	2.7%	2.8%
Ameren Corporation (NYSE-AEE)	\$1.98	2.6%	2.6%	2.6%
American Electric Power Co. (NYSE-AEP)	\$2.80	3.0%	3.0%	3.1%
Avangrid (NYSE-AVG)	\$1.76	3.5%	3.5%	3.5%
Avista Corporation (NYSE-AVA)	\$1.55	3.3%	3.3%	3.4%
CMS Energy Corporation (NYSE-CMS)	\$1.53	2.5%	2.5%	2.5%
Consolidated Edison, Inc. (NYSE-ED)	\$2.96	3.4%	3.3%	3.3%
Dominion Resources, Inc. (NYSE-D)	\$3.67	4.5%	4.5%	4.7%
Duke Energy Corporation (NYSE-DUK)	\$3.78	4.2%	4.1%	4.2%
Edison International (NYSE-EIX)	\$2.55	3.5%	3.6%	3.7%
Entergy Corporation (NYSE-ETR)	\$3.72	3.1%	3.2%	3.4%
Evergy, Inc. (NYSE-EVRG)	\$2.02	3.2%	3.2%	3.2%
Eversource Energy (NYSE-ES)	\$2.14	2.6%	2.6%	2.7%
Exelon Corp. (NYSE-EXC)	\$1.45	3.2%	3.2%	3.1%
FirstEnergy Corporation (NYSE-FE)	\$1.56	3.2%	3.3%	3.4%
Hawaiian Electric Industries (NYSE-HE)	\$1.28	2.8%	2.9%	2.9%
IDACORP, Inc. (NYSE-IDA)	\$2.68	2.5%	2.5%	2.5%
MGE Energy, Inc. (NYSE-MGEE)	\$1.41	1.8%	1.8%	1.9%
NextEra Energy Inc. (NYSE-NEE)	\$5.00	2.1%	2.1%	2.3%
NorthWestern Corporation (NYSE-NWE)	\$2.30	3.2%	3.2%	3.2%
OGE Energy Corp. (NYSE-OGE)	\$1.55	3.6%	3.6%	3.6%
Pinnacle West Capital Corp. (NYSE-PNW)	\$3.13	3.6%	3.4%	3.4%
Portland General Electric Company (NYSE-POR)	\$1.54	2.8%	2.8%	2.8%
PNM Resources, Inc. (NYSE-PNM)	\$1.23	2.5%	2.4%	2.5%
PPL Corporation (NYSE-PPL)	\$1.65	4.7%	5.0%	5.2%
SEMPRA Energy (NYSE-SRE)	\$3.87	2.6%	2.6%	2.7%
Southern Company (NYSE-SO)	\$2.48	4.0%	4.0%	4.2%
WEC Energy Group (NYSE-WEC)	\$2.53	2.8%	2.8%	2.9%
Xcel Energy Inc. (NYSE-XEL)	\$1.62	2.6%	2.6%	2.6%
Mean		3.1%	3.1%	3.2%
Median		3.1%	3.1%	3.1%

Data Sources: <http://quote.yahoo.com>, January, 2020

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	2.9%	2.8%	2.8%
Alliant Energy Corporation (NYSE-LNT)	\$1.42	2.6%	2.7%	2.8%
Ameren Corporation (NYSE-AEE)	\$1.98	2.6%	2.6%	2.6%
American Electric Power Co. (NYSE-AEP)	\$2.80	3.0%	3.0%	3.1%
Avangrid (NYSE-AVG)	\$1.76	3.5%	3.5%	3.5%
CMS Energy Corporation (NYSE-CMS)	\$1.53	2.5%	2.5%	2.5%
DTE Energy Company (NYSE-DTE)	\$4.05	3.2%	3.2%	3.2%
Evergy, Inc. (NYSE-EVRG)	\$2.02	3.2%	3.2%	3.2%
Hawaiian Electric Industries (NYSE-HE)	\$1.28	2.8%	2.9%	2.9%
NextEra Energy Inc. (NYSE-NEE)	\$5.00	2.1%	2.1%	2.3%
NorthWestern Corporation (NYSE-NWE)	\$2.30	3.2%	3.2%	3.2%
OGE Energy Corp. (NYSE-OGE)	\$1.55	3.6%	3.6%	3.6%
Otter Tail Corporation (NYSE-OTTR)	\$1.40	2.8%	2.7%	2.7%
Pinnacle West Capital Corp. (NYSE-PNW)	\$3.13	3.6%	3.4%	3.4%
Portland General Electric Company (NYSE-POR)	\$1.54	2.8%	2.8%	2.8%
PNM Resources, Inc. (NYSE-PNM)	\$1.23	2.5%	2.4%	2.5%
Southern Company (NYSE-SO)	\$2.48	4.0%	4.0%	4.2%
WEC Energy Group (NYSE-WEC)	\$2.53	2.8%	2.8%	2.9%
Xcel Energy Inc. (NYSE-XEL)	\$1.62	2.6%	2.6%	2.6%
Mean		3.0%	2.9%	3.0%
Median		2.8%	2.8%	2.9%

Data Sources: <http://quote.yahoo.com>, January, 2020

Exhibit JRW-7

Duke Energy Carolinas, LLC  
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)						
Avista Corp (NYSE-AVA)	5.5	8.5	4.0	5.0	4.5	4.5
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
Dominion Energy Inc. (NYSE-D)	3.0	7.5	4.5	3.5	7.5	6.5
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
Energy Corporation (NYSE-ETR)	0.5	3.0	1.0	-0.5	1.0	-2.5
Eversource Energy (NYSE-ES)	8.0	9.5	6.5	7.0	8.0	5.0
Exelon Corporation (NYSE-EXC)	-5.5	-3.5	7.0	-3.5	-7.0	4.5
FirstEnergy Corporation (NYSE-FE)	-7.0	-2.5	-8.0	-2.5	-5.0	-17.5
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	3.4	5.4	3.9	3.0	5.2	3.3
Median	4.0	4.5	4.0	4.0	5.0	4.5
Average of Median Figures =				4.3		

Data Source: Value Line Investment Survey.

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)						
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
Eversource Energy (NYSE-ES)						
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)	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	5.0	5.8	4.5	5.5	6.2	4.8
Median	4.5	4.5	4.0	5.0	6.3	4.5
Average of Median Figures =				4.8		

Data Source: Value Line Investment Survey.

Exhibit JRW-7

Duke Energy Carolinas, LLC  
DCF Equity Cost Growth Rate Measures  
Value Line Projected Growth Rates

Panel A  
Electric Proxy Group

Company	Value Line			Value Line		
	Projected Growth			Sustainable Growth		
	Est'd. '16-'18 to '22-'24			Return on Equity	Retention Rate	Internal Growth
	Earnings	Dividends	Book Value			
ALLETE, Inc. (NYSE-ALE)	5.0	5.0	3.0	9.0%	34.0%	3.1%
Alliant Energy Corporation (NYSE-LNT)	6.5	5.5	7.5	10.0%	38.0%	3.8%
Ameren Corporation (NYSE-AEE)	6.5	4.5	5.5	10.5%	44.0%	4.6%
American Electric Power Co. (NYSE-AEP)	4.0	5.5	4.5	10.5%	32.0%	3.4%
Avangrid (NYSE-AVG)	8.5	3.0	1.0	5.5%	30.0%	1.7%
Avista Corp (NYSE-AVA)	3.5	3.5	3.5	8.0%	32.0%	2.6%
CMS Energy Corporation (NYSE-CMS)	7.0	7.0	7.0	13.5%	38.0%	5.1%
Consolidated Edison, Inc. (NYSE-ED)	3.0	3.5	3.5	8.5%	33.0%	2.8%
Dominion Energy Inc. (NYSE-D)	6.5	5.0	7.0	13.0%	21.0%	2.7%
Duke Energy Corporation (NYSE-DUK)	6.0	2.5	2.5	8.5%	30.0%	2.6%
Edison International (NYSE-EIX)	NMF	4.5	5.5	11.0%	41.0%	4.5%
Entergy Corporation (NYSE-ETR)	2.0	3.5	4.5	11.5%	36.0%	4.1%
Evergy (NYSE-EVRG)	NMF	NMF	NMF	8.5%	35.0%	3.0%
Eversource Energy (NYSE-ES)	5.5	5.5	4.5	9.0%	38.0%	3.4%
Exelon Corporation (NYSE-EXC)	9.0	5.5	5.0	9.0%	52.0%	4.7%
FirstEnergy Corporation (NYSE-FE)	6.5	3.5	7.0	16.0%	36.0%	5.8%
Hawaiian Electric Industries (NYSE-HE)	2.5	3.0	3.5	9.0%	32.0%	2.9%
IDACORP, Inc. (NYSE-IDA)	3.5	7.0	4.0	9.5%	37.0%	3.5%
MGE Energy, Inc. (NYSE-MGEE)	6.0	5.0	5.0	10.5%	46.0%	4.8%
Nextera Energy, Inc. (NYSE-NEE)	10.5	10.0	7.5	12.5%	40.0%	5.0%
NorthWestern Corporation (NYSE-NWE)	2.0	4.5	3.5	9.0%	31.0%	2.8%
OGE Energy Corp. (NYSE-OGE)	6.5	6.5	4.0	11.5%	33.0%	3.8%
Pinnacle West Capital Corp. (NYSE-PNW)	4.0	6.0	3.5	10.0%	32.0%	3.2%
PNM Resources, Inc. (NYSE-PNM)	7.0	7.0	5.0	9.0%	42.0%	3.8%
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	5.5	13.0%	36.0%	4.7%
Sempra Energy (NYSE-SRE)	11.0	8.0	6.5	11.5%	42.0%	4.8%
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	5.5	10.5%	36.0%	3.8%
Mean	5.5	5.1	4.7	10.4%	35.7%	3.7%
Median	5.8	5.0	4.5	10.3%	35.5%	3.6%
Average of Median Figures =		5.1			Median =	3.6%

\* '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.

Panel B  
Hevert Proxy Group

Company	Value Line			Value Line		
	Projected Growth			Sustainable Growth		
	Est'd. '16-'18 to '22-'24			Return on Equity	Retention Rate	Internal Growth
	Earnings	Dividends	Book Value			
ALLETE, Inc. (NYSE-ALE)	5.0	5.0	3.0	9.0%	34.0%	3.1%
Alliant Energy Corporation (NYSE-LNT)	6.5	5.5	7.5	10.0%	38.0%	3.8%
Ameren Corporation (NYSE-AEE)	6.5	4.5	5.5	10.5%	44.0%	4.6%
American Electric Power Co. (NYSE-AEP)	4.0	5.5	4.5	10.5%	32.0%	3.4%
Avangrid (NYSE-AVG)	8.5	3.0	1.0	5.5%	30.0%	1.7%
CMS Energy Corporation (NYSE-CMS)	7.0	7.0	7.0	13.5%	38.0%	5.1%
DTE Energy Company (NYSE-DTE)	4.5	7.0	6.0	9.5%	33.0%	3.1%
Evergy (NYSE-EVRG)	NMF	NMF	NMF	8.5%	35.0%	3.0%
Hawaiian Electric Industries (NYSE-HE)	2.5	3.0	3.5	9.0%	32.0%	2.9%
Nextera Energy, Inc. (NYSE-NEE)	10.5	10.0	7.5	12.5%	40.0%	5.0%
NorthWestern Corporation (NYSE-NWE)	2.0	4.5	3.5	9.0%	31.0%	2.8%
OGE Energy Corp. (NYSE-OGE)	6.5	6.5	4.0	11.5%	33.0%	3.8%
Otter Tail Corporation (NDQ-OTTR)	5.0	4.0	4.5	11.0%	34.0%	3.7%
Pinnacle West Capital Corp. (NYSE-PNW)	4.0	6.0	3.5	10.0%	32.0%	3.2%
PNM Resources, Inc. (NYSE-PNM)	7.0	7.0	5.0	9.0%	42.0%	3.8%
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	5.5	10.5%	36.0%	3.8%
Mean	5.5	5.6	4.5	10.2%	34.6%	3.5%
Median	5.3	5.8	4.3	10.0%	34.0%	3.4%
Average of Median Figures =		5.1			Median =	3.4%

\* '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.

Exhibit JRW-7

Duke Energy Carolinas, LLC  
DCF Equity Cost Growth Rate Measures  
Analysts Projected EPS Growth Rate Estimates

Panel A  
Electric Proxy Group

Company	Yahoo	Zacks	Mean
ALLETE, Inc. (NYSE-ALE)	7.0%	7.2%	7.1%
Alliant Energy Corporation (NYSE-LNT)	5.4%	5.5%	5.4%
Ameren Corporation (NYSE-AEE)	6.1%	5.7%	5.9%
American Electric Power Co. (NYSE-AEP)	4.6%	6.2%	5.4%
Avangrid (NYSE-AVG)	3.5%	3.4%	3.4%
Avista Corp (NYSE-AVA)	6.2%	7.4%	6.8%
CMS Energy Corporation (NYSE-CMS)	7.5%	6.4%	7.0%
Consolidated Edison, Inc. (NYSE-ED)	2.4%	2.0%	2.2%
Dominion Energy Inc. (NYSE-D)	4.4%	4.8%	4.6%
Duke Energy Corporation (NYSE-DUK)	4.4%	4.8%	4.6%
Edison International (NYSE-EIX)	3.9%	5.4%	4.7%
Entergy Corporation (NYSE-ETR)	-1.5%	7.0%	
Eversource Energy (NYSE-ES)	5.5%	5.6%	5.5%
Exelon Corporation (NYSE-EXC)	0.5%	4.2%	2.3%
FirstEnergy Corporation (NYSE-FE)	-6.6%	6.0%	
Hawaiian Electric Industries (NYSE-HE)	3.4%	4.2%	3.8%
IDACORP, Inc. (NYSE-IDA)	2.5%	3.9%	3.2%
MGE Energy, Inc. (NYSE-MGEE)	4.0%	N/A	4.0%
Nextera Energy, Inc. (NYSE-NEE)	8.0%	8.0%	8.0%
NorthWestern Corporation (NYSE-NWE)	3.2%	2.8%	3.0%
OGE Energy Corp. (NYSE-OGE)	3.5%	4.3%	3.9%
Pinnacle West Capital Corp. (NYSE-PNW)	4.1%	4.9%	4.5%
PNM Resources, Inc. (NYSE-PNM)	6.3%	5.4%	5.8%
Portland General Electric Company (NYSE-POR)	4.8%	4.8%	4.8%
PPL Corporation (NYSE-PPL)	0.5%	N/A	0.5%
Sempra Energy (NYSE-SRE)	10.1%	7.7%	8.9%
Southern Company (NYSE-SO)	1.5%	4.5%	3.0%
WEC Energy Group (NYSE-WEC)	6.1%	6.1%	6.1%
Xcel Energy Inc. (NYSE-XEL)	6.1%	5.4%	5.8%
Mean	4.1%	5.4%	4.9%
Median	4.4%	5.4%	4.7%

Data Sources: www.reuters.com, www.zacks.com, <http://quote.yahoo.com>, January, 2020

\* Entergy and FirstEnergy were excluded from the DCF analysis due to negative projected EPS growth rates

Panel B  
Hevert Proxy Group

Company	Yahoo	Zacks	Mean
ALLETE, Inc. (NYSE-ALE)	7.0%	7.2%	7.1%
Alliant Energy Corporation (NYSE-LNT)	5.4%	5.5%	5.4%
Ameren Corporation (NYSE-AEE)	6.1%	5.7%	5.9%
American Electric Power Co. (NYSE-AEP)	4.6%	6.2%	5.4%
Avangrid (NYSE-AVG)	3.5%	3.4%	3.4%
CMS Energy Corporation (NYSE-CMS)	7.5%	6.4%	7.0%
DTE Energy Company (NYSE-DTE)	4.8%	6.0%	5.4%
Eversource Energy (NYSE-ES)	6.7%	6.6%	6.6%
Hawaiian Electric Industries (NYSE-HE)	3.4%	4.2%	3.8%
Nextera Energy, Inc. (NYSE-NEE)	8.0%	8.0%	8.0%
NorthWestern Corporation (NYSE-NWE)	3.2%	2.8%	3.0%
OGE Energy Corp. (NYSE-OGE)	3.5%	4.3%	3.9%
Otter Tail Corporation (NDQ-OTTR)	9.0%	7.0%	8.0%
Pinnacle West Capital Corp. (NYSE-PNW)	4.1%	4.9%	4.5%
PNM Resources, Inc. (NYSE-PNM)	6.3%	5.4%	5.8%
Portland General Electric Company (NYSE-POR)	4.8%	4.8%	4.8%
Southern Company (NYSE-SO)	1.5%	4.5%	3.0%
WEC Energy Group (NYSE-WEC)	6.1%	6.1%	6.1%
Xcel Energy Inc. (NYSE-XEL)	6.1%	5.4%	5.8%
Mean	5.3%	5.5%	5.4%
Median	5.4%	5.5%	5.4%

Exhibit JRW-7

Duke Energy Carolinas, LLC  
 DCF Growth Rate Indicators

Electric and Hevert Proxy Groups

Growth Rate Indicator	Electric Proxy Group	Hevert Proxy Group
Historic <i>Value Line</i> Growth in EPS, DPS, and BVPS	4.3%	4.8%
Projected <i>Value Line</i> Growth in EPS, DPS, and BVPS	5.1%	5.1%
Sustainable Growth ROE * Retention Rate	3.6%	3.4%
Projected EPS Growth from Yahoo, Zacks, and Reuters - Mean/Median	4.9%/4.7%	5.4%/5.4%





**Exhibit JRW-8**

**Duke Energy Carolinas, LLC  
Capital Asset Pricing Model**

**Panel A  
Electric Proxy Group**

<b>Risk-Free Interest Rate</b>	<b>3.75%</b>
<b>Beta*</b>	<b>0.55</b>
<b><u>Ex Ante Equity Risk Premium**</u></b>	<b><u>5.75%</u></b>
<b>CAPM Cost of Equity</b>	<b>6.9%</b>

\* See page 3 of Exhibit JRW-8

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

**Panel B  
Hevert Proxy Group**

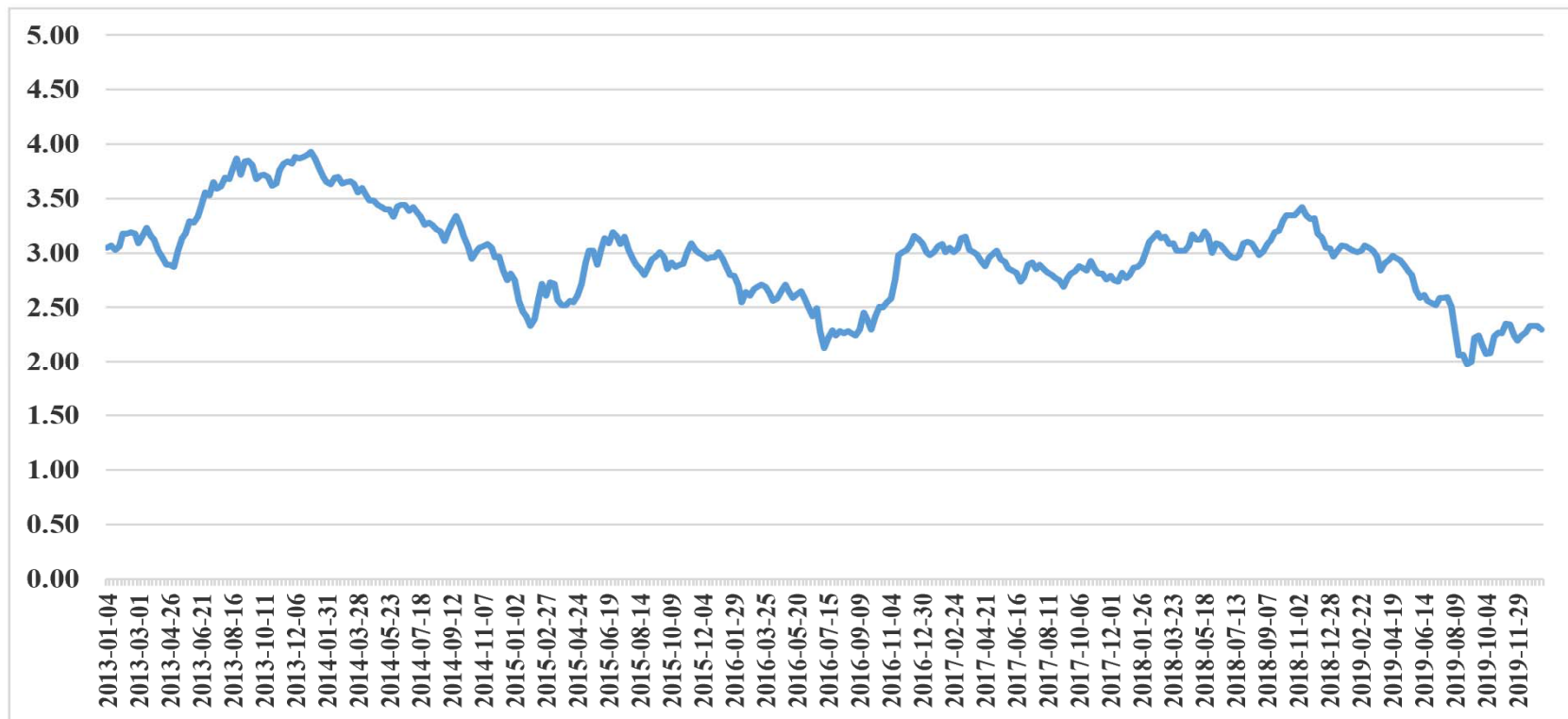
<b>Risk-Free Interest Rate</b>	<b>3.75%</b>
<b>Beta*</b>	<b>0.55</b>
<b><u>Ex Ante Equity Risk Premium**</u></b>	<b><u>5.75%</u></b>
<b>CAPM Cost of Equity</b>	<b>6.9%</b>

\* See page 3 of Exhibit JRW-8

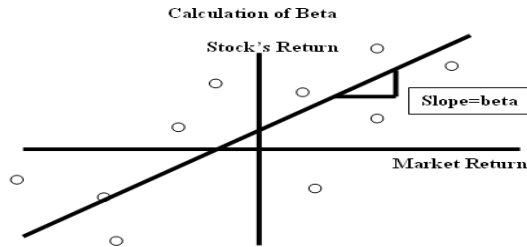
\*\* See pages 5 and 6 of Exhibit JRW-8

Exhibit JRW-8

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



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



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)	0.55
American Electric Power Co. (NYSE-AEP)	0.55
Avangrid (NYSE-AVG)	0.40
Avista Corp (NYSE-AVA)	0.60
CMS Energy Corporation (NYSE-CMS)	0.50
Consolidated Edison, Inc. (NYSE-ED)	0.45
Dominion Energy Inc. (NYSE-D)	0.55
Duke Energy Corporation (NYSE-DUK)	0.50
Edison International (NYSE-EIX)	0.55
Entergy Corporation (NYSE-ETR)	0.60
Evergy (NYSE:EVRG)	NMF
Eversource Energy (NYSE-ES)	0.55
Exelon Corporation (NYSE-EXC)	0.65
FirstEnergy Corporation (NYSE-FE)	0.65
Hawaiian Electric Industries (NYSE-HE)	0.55
IDACORP, Inc. (NYSE-IDA)	0.55
MGE Energy, Inc. (NYSE-MGEE)	0.55
NextEra Energy, Inc. (NYSE-NEE)	0.55
NorthWestern Corporation (NYSE-NWE)	0.60
OGE Energy Corp. (NYSE-OGE)	0.75
Pinnacle West Capital Corp. (NYSE-PNW)	0.50
PNM Resources, Inc. (NYSE-PNM)	0.60
Portland General Electric Company (NYSE-POR)	0.55
PPL Corporation (NYSE-PPL)	0.70
Sempra Energy (NYSE-SRE)	0.70
Southern Company (NYSE-SO)	0.50
WEC Energy Group (NYSE-WEC)	0.50
Xcel Energy Inc. (NYSE-XEL)	0.50
Mean	0.58
Median	0.55

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)	0.55
American Electric Power Co. (NYSE-AEP)	0.55
Avangrid (NYSE-AVG)	0.40
CMS Energy Corporation (NYSE-CMS)	0.50
DTE Energy Company (NYSE-DTE)	0.55
Evergy (NYSE:EVRG)	NMF
Hawaiian Electric Industries (NYSE-HE)	0.55
NextEra Energy, Inc. (NYSE-NEE)	0.55
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)	0.50
PNM Resources, Inc. (NYSE-PNM)	0.60
Portland General Electric Company (NYSE-POR)	0.55
Southern Company (NYSE-SO)	0.50
WEC Energy Group (NYSE-WEC)	0.50
Xcel Energy Inc. (NYSE-XEL)	0.50
Mean	0.56
Median	0.55

Data Source Value Line Investment Survey , 2019.

**Exhibit JRW-8**  
**Risk Premium Approaches**

	<b>Historical Ex Post Returns</b>	<b>Surveys</b>	<b>Expected Return Models and Market Data</b>
<b>Means of Assessing The Market Risk Premium</b>	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
<b>Problems/Debated Issues</b>	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).

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%	
	Damodaran	2020	1928-2019	Historical Stock Returns - Bond Returns	Geometric				4.40%	
					Arithmetic				6.43%	
	Dimson, Marsh, Staunton _Credit Suisse Repo	2019	1900-2018	Historical Stock Returns - Bond Returns	Geometric				4.83%	
					Arithmetic				5.50%	
	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%	
Ex Ante Models (Puzzle Research)	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%
	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%	
Surveys	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%	
Building Block	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					5.75%	
	Damodaran - I-1-20	2020	Projection	Fundamentals - Implied from FCF to Equity Model (Trailing 12 month, with adjusted payout)					4.79%	
	Social Security									
	Office of Chief Actuary									
Building Block	John Campbell	2001	1900-1995	Historical & Projections (D/P & Earnings Growth)	Arithmetic	3.00%	4.00%	3.50%	3.50%	
			1860-2000		Geometric	1.50%	2.50%	2.00%	2.00%	
	Peter Diamond	2001	Projected for 75 Years	Fundamentals (D/P, GDP Growth)		3.00%	4.80%	3.90%	3.90%	
	John Shoven	2001	Projected for 75 Years	Fundamentals (D/P, P/E, GDP Growth)		3.00%	3.50%	3.25%	3.25%	
	Median									4.29%
	New York Fed	2015	Five-Year	Survey of Wall Street Firms					5.70%	
	Survey of Financial Forecasters	2019	10-Year Projection	About 20 Financial Forecasters					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%	
Building Block	Median									5.37%
	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%

Exhibit JRW-8

Capital Asset Pricing Model  
Market Risk Premium

Summary of 2010-20 Equity Risk Premium Studies

Category	Study Authors	Publication Date	Time Period Of Study	Methodology	Return Measure	Range Low	Range High	Midpoint of Range	Mean	Average
Historical Risk Premium	Ibbotson	2016	1928-2015	Historical Stock Returns - Bond Returns	Arithmetic				6.00%	
					Geometric				4.40%	
	Damodaran	2020	1928-2019	Historical Stock Returns - Bond Returns	Arithmetic				6.43%	
					Geometric				4.83%	
	Dimson, Marsh, Staunton _Credit Suisse Report	2019	1900-2018	Historical Stock Returns - Bond Returns	Arithmetic				5.50%	
	Median				Geometric					5.43%
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					5.75%	
	Damodaran - 1-1-20	2020	Projection	Fundamentals - Implied from FCF to Equity Model (Trailing 12 month, with adjusted payout)					4.79%	
	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 Forecasters					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%
<b>Mean</b>										<b>4.95%</b>
<b>Median</b>										<b>5.13%</b>

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](http://www.duffandphelps.com/CostofCapital)

Date	Risk-free Rate ( $R_f$ )	$R_f$ (%)	Duff & Phelps Recommended ERP (%)	What Changed
<b>Current Guidance: December 31, 2018 – UNTIL FURTHER NOTICE</b>	<b>Normalized 20-year U.S. Treasury yield</b>	<b>3.50</b>	<b>5.50</b>	<b>ERP</b>
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>

**Panel A**  
**KPMG Equity Risk Premium Recommendation**

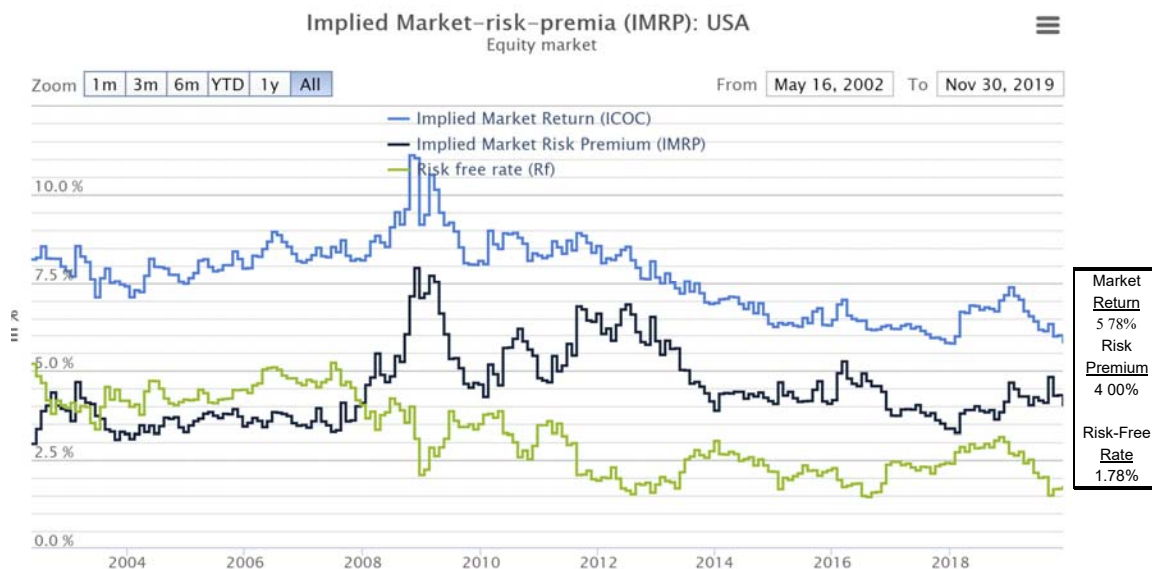
Appendix  
Historic MRP estimates

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**  
**30-Nov-19**



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





DOCKET NO. E-7, SUB 1214

Exhibit JRW-9

**Duke Energy Carolinas, LLC Recommended Cost of Capital**

Page 1 of 2

Capital Source	Capitalization Ratios*	Cost Rate	Weighted Cost Rate
Long-Term Debt	47.00%	4.51%	2.12%
Common Equity	<u>53.00%</u>	<u>10.50%</u>	<u>5.57%</u>
Total Capitalization	100.00%		7.68%

**Panel A**  
**Mr. Hevert's DCF Results**

	<b>Mean</b>	<b>Mean High</b>
30-Day Average	8.86%	9.73%
90-Day Average	8.95%	9.82%
180-Day Average	9.09%	9.96%

**Panel B**  
**Mr. Hevert's CAPM Results**

<b>CAPM</b>	<b>Bloomberg Derived Market Risk Premium</b>	<b>Value Line Derived Market Risk Premium</b>
<i>Average Bloomberg Beta Coefficient</i>		
Current 30-Year Treasury (2.63%)	8.73%	8.68%
Near Term Projected 30-Year Treasury (2.70%)	8.80%	8.75%
<i>Average Value Line Beta Coefficient</i>		
Current 30-Year Treasury (2.63%)	9.74%	9.69%
Near Term Projected 30-Year Treasury (2.70%)	9.81%	9.75%
<b>Empirical CAPM</b>	<b>Bloomberg Derived Market Risk Premium</b>	<b>Value Line Derived Market Risk Premium</b>
<i>Average Bloomberg Beta Coefficient</i>		
Current 30-Year Treasury (2.63%)	10.27%	10.21%
Near Term Projected 30-Year Treasury (2.70%)	10.34%	10.28%
<i>Average Value Line Beta Coefficient</i>		
Current 30-Year Treasury (2.63%)	11.03%	10.96%
Near Term Projected 30-Year Treasury (2.70%)	11.10%	11.03%
<b>Bond Yield Plus Risk Premium Approach</b>		
Current 30-Year Treasury (2.63%)	9.90%	
Near Term Projected 30-Year Treasury (2.70%)	9.90%	
Long-Term Projected 30-Year Treasury (3.70%)	10.06%	



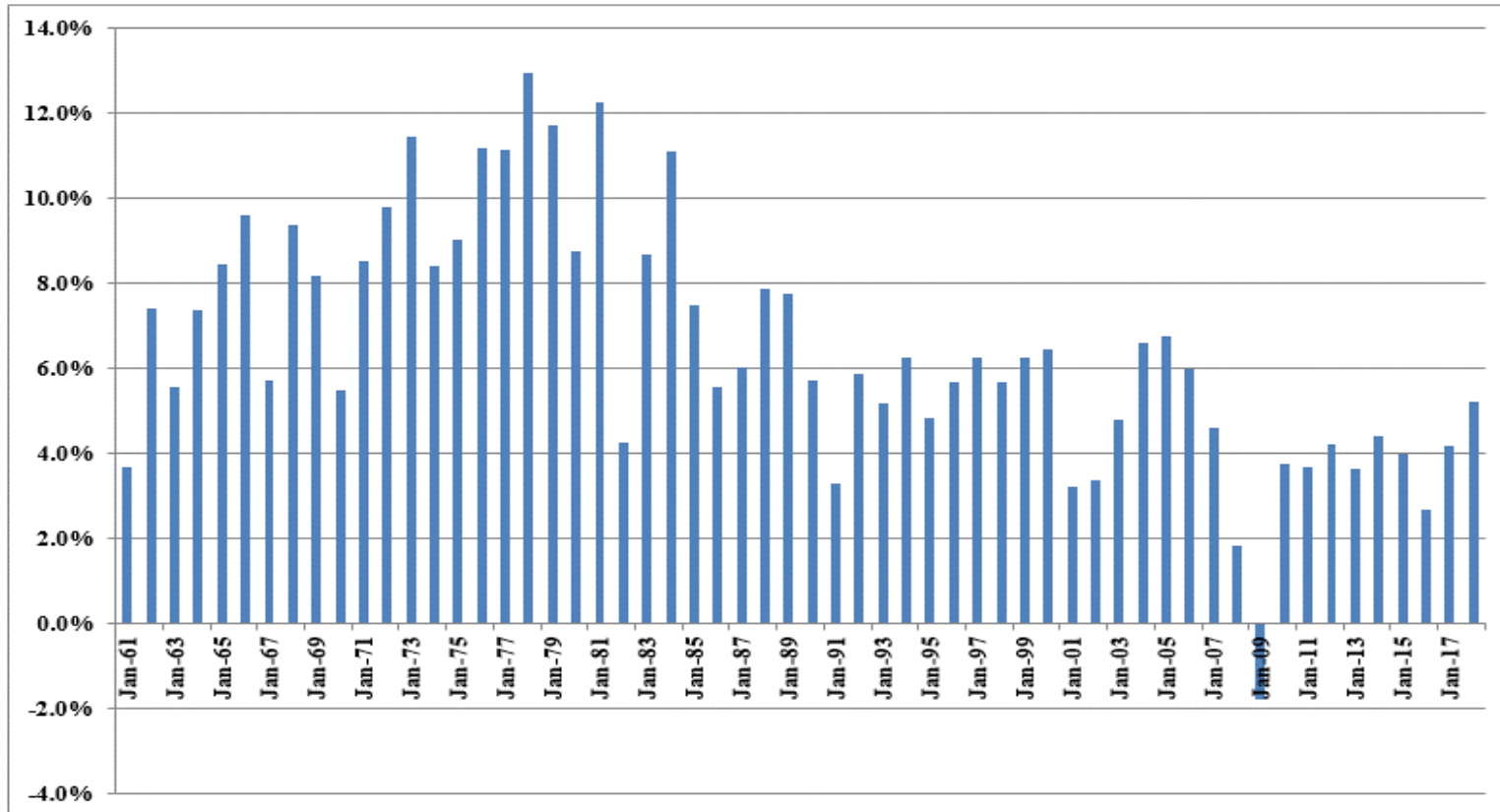
**Growth Rates**  
**GDP, S&P 500 Price, EPS, and DPS**

		GDP	S&P 500	S&P 500 EPS	S&P 500 DPS	
1	1960	542 38	58 11	3 10	1 98	
2	1961	562 21	71 55	3 37	2 04	
3	1962	603 92	63 10	3 67	2 15	
4	1963	637 45	75 02	4 13	2 35	
5	1964	684 46	84 75	4 76	2 58	
6	1965	742 29	92 43	5 30	2 83	
7	1966	813 41	80 33	5 41	2 88	
8	1967	859 96	96 47	5 46	2 98	
9	1968	940 65	103 86	5 72	3 04	
10	1969	1017 62	92 06	6 10	3 24	
11	1970	1073 30	92 15	5 51	3 19	
12	1971	1164 85	102 09	5 57	3 16	
13	1972	1279 11	118 05	6 17	3 19	
14	1973	1425 38	97 55	7 96	3 61	
15	1974	1545 24	68 56	9 35	3 72	
16	1975	1684 90	90 19	7 71	3 73	
17	1976	1873 41	107 46	9 75	4 22	
18	1977	2081 83	95 10	10 87	4 86	
19	1978	2351 60	96 11	11 64	5 18	
20	1979	2627 33	107 94	14 55	5 97	
21	1980	2857 31	135 76	14 99	6 44	
22	1981	3207 04	122 55	15 18	6 83	
23	1982	3343 79	140 64	13 82	6 93	
24	1983	3634 04	164 93	13 29	7 12	
25	1984	4037 61	167 24	16 84	7 83	
26	1985	4338 98	211 28	15 68	8 20	
27	1986	4579 63	242 17	14 43	8 19	
28	1987	4855 22	247 08	16 04	9 17	
29	1988	5236 44	277 72	24 12	10 22	
30	1989	5641 58	353 40	24 32	11 73	
31	1990	5963 14	330 22	22 65	12 35	
32	1991	6158 13	417 09	19 30	12 97	
33	1992	6520 33	435 71	20 87	12 64	
34	1993	6858 56	466 45	26 90	12 69	
35	1994	7287 24	459 27	31 75	13 36	
36	1995	7639 75	615 93	37 70	14 17	
37	1996	8073 12	740 74	40 63	14 89	
38	1997	8577 55	970 43	44 09	15 52	
39	1998	9062 82	1229 23	44 27	16 20	
40	1999	9630 66	1469 25	51 68	16 71	
41	2000	10252 35	1320 28	56 13	16 27	
42	2001	10581 82	1148 09	38 85	15 74	
43	2002	10936 42	879 82	46 04	16 08	
44	2003	11458 25	1111 91	54 69	17 88	
45	2004	12213 73	1211 92	67 68	19 41	
46	2005	13036 64	1248 29	76 45	22 38	
47	2006	13814 61	1418 30	87 72	25 05	
48	2007	14451 86	1468 36	82 54	27 73	
49	2008	14712 85	903 25	65 39	28 05	
50	2009	14448 93	1115 10	59 65	22 31	
51	2010	14992 05	1257 64	83 66	23 12	
52	2011	15542 58	1257 60	97 05	26 02	
53	2012	16197 01	1426 19	102 47	30 44	
54	2013	16784 85	1848 36	107 45	36 28	
55	2014	17521 75	2058 90	113 01	39 44	
56	2015	18219 30	2043 94	106 32	43 16	
57	2016	18707 19	2238 83	108 86	45 03	
58	2017	19485 39	2673 61	124 94	49 73	
	2018	20500 64	2506 85	148 34	53 61	Average
	Growth Rates	6.46	6.71	6.89	5.85	6.48

1 - <http://research.stlouisfed.org/fred2/series/GDPA/downloaddata>

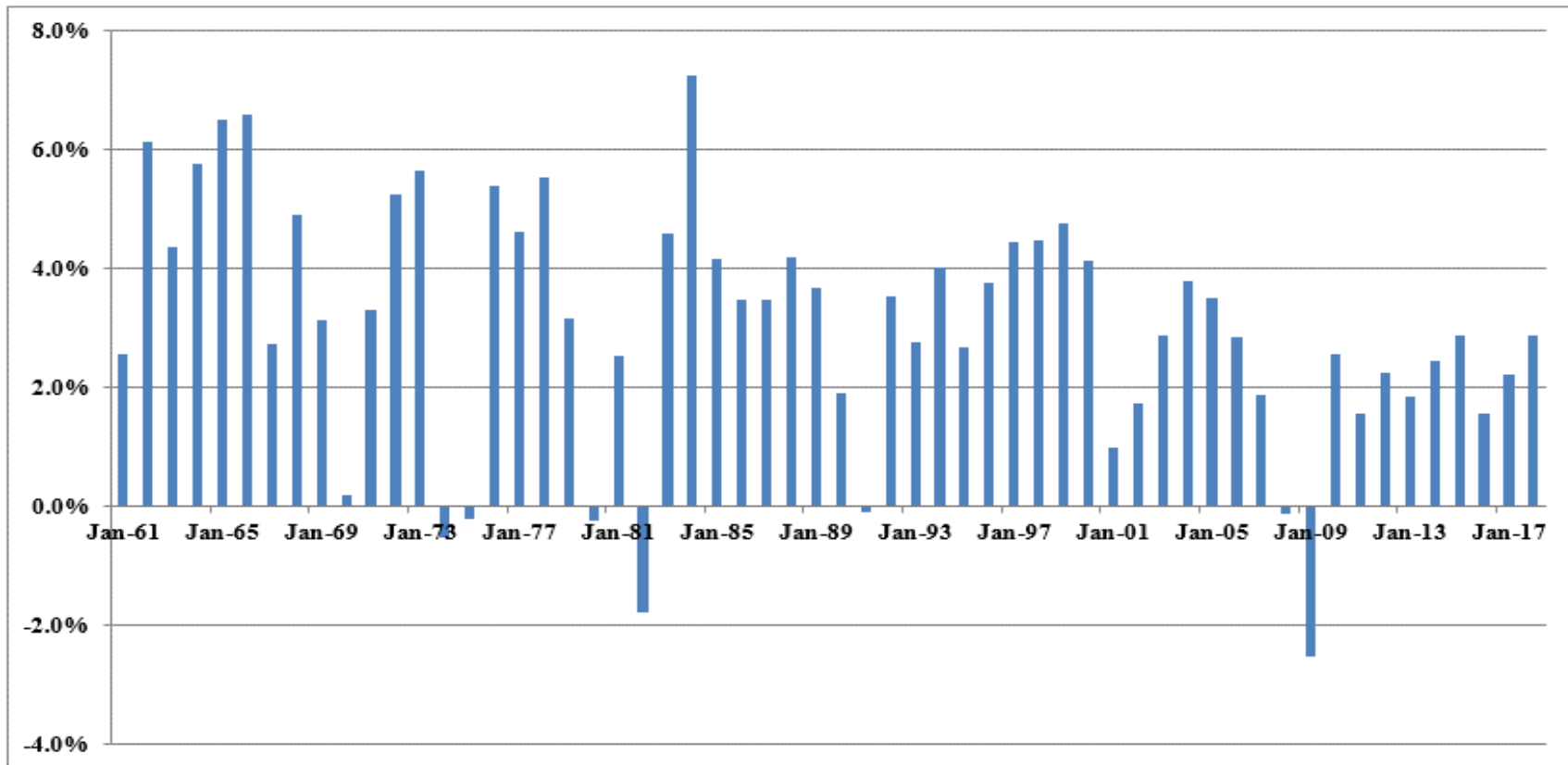
EPS and DPS - <http://pages.stern.nyu.edu/~adamodar/>

Nominal GDP Growth Rates  
Annual Growth Rates - 1961-2018



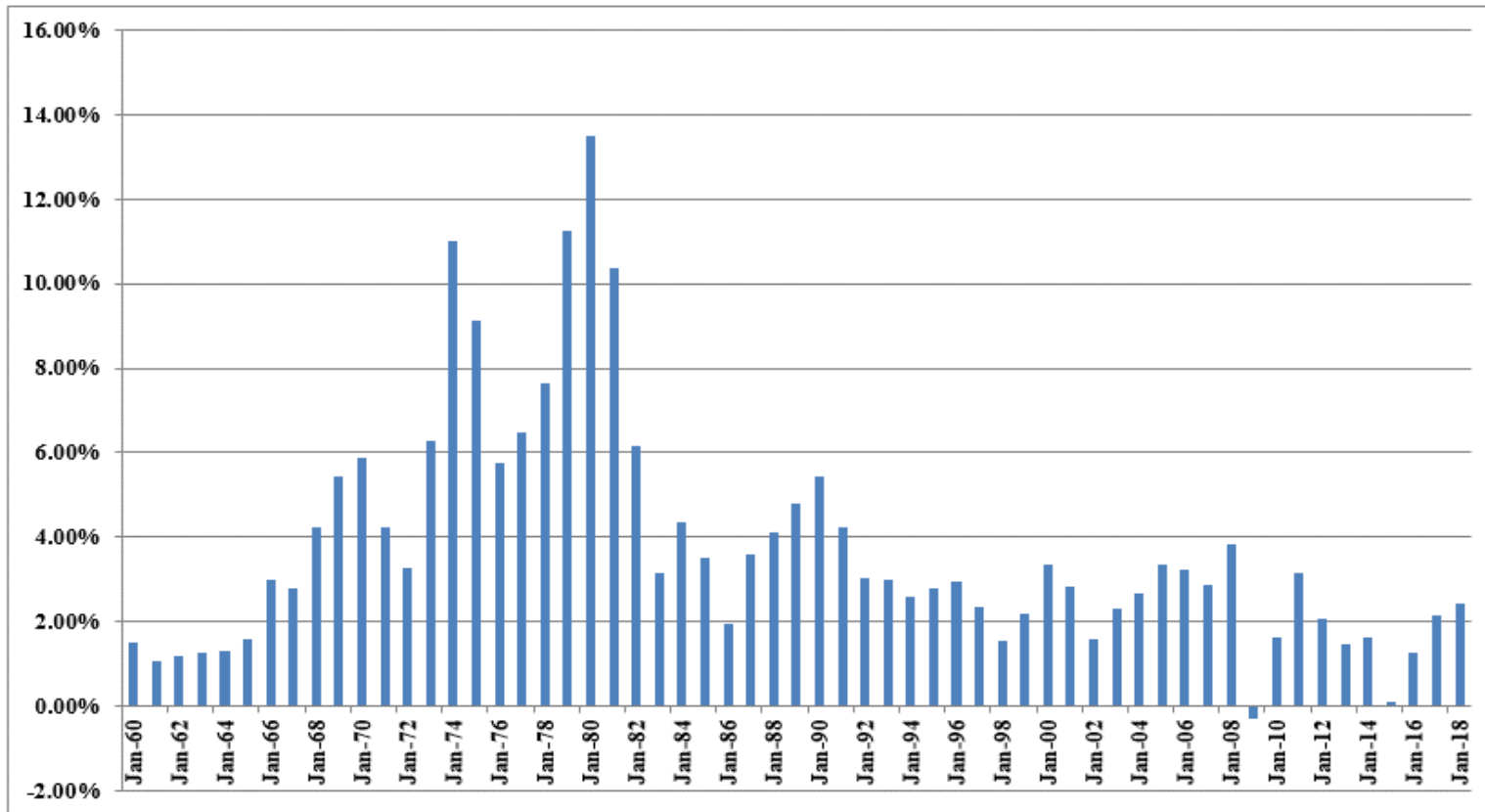
Data Sources: GDPA -<https://fred.stlouisfed.org/series/GDPA>

Annual Real GDP Growth Rates  
1961-2018



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

Annual Inflation Rates  
1961-2018



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



DOCKET NO. E-7, SUB 1214

Exhibit JRW-10

Projected Nominal GDP Growth Rates

Page 5 of 6

## 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

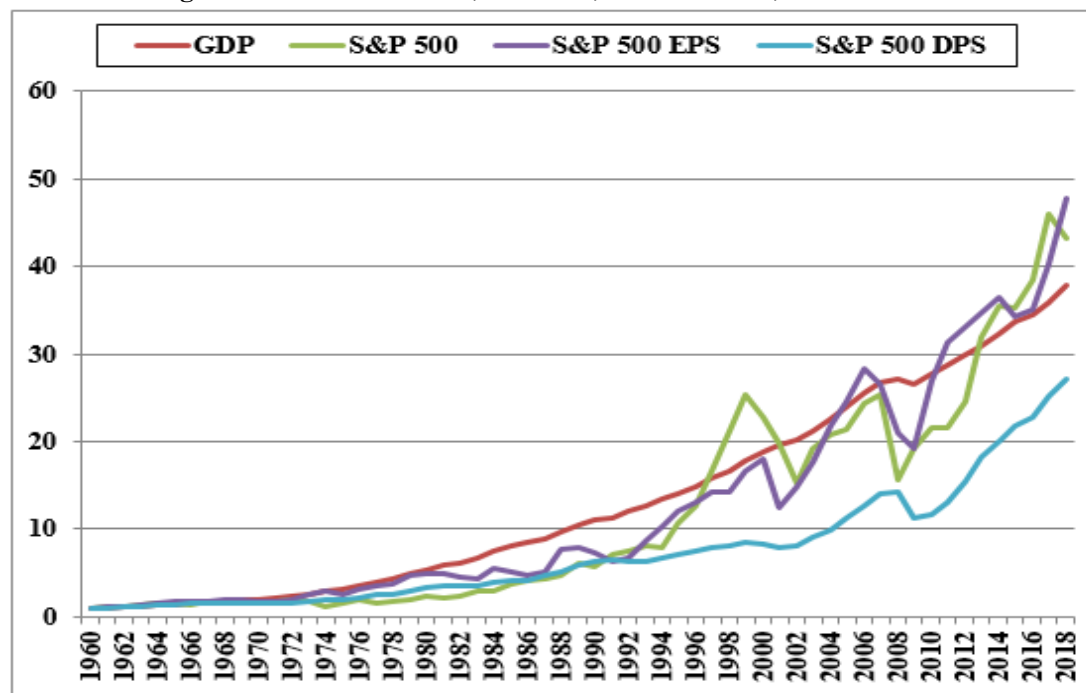
## Projected GDP Growth Rates

	Projected Nominal GDP Time Frame	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/>

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