KATHLEEN PASSIDOMO
President of the Senate

STATE OF FLORIDA
OFFICE OF PUBLIC COUNSEL

C/O THE FLORIDA LEGISLATURE
111 WEST MADISON ST.
SUITE 812
TALLAHASSEE, FLORIDA 32399-1400
850-488-9330

EMAIL: OPC_WEBSITE@LEG.STATE.FL.US
WWW.FLORIDAOPC.GOV

PAUL RENNER
Speaker of the House of Representatives

June 6, 2024

Adam J. Teitzman, Commission Clerk
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, Florida 32399-0850

Re: Docket No. 20240026 - EI

Dear Mr. Teitzman,

Please find enclosed for filing in the above referenced docket the Direct Testimony and Exhibits of J. Randall Woolridge, Ph.D.

If you have any questions or concerns; please do not hesitate to contact me. Thank you for your assistance in this matter.

Sincerely,

Walter Trierweiler
Public Counsel

/s/ Patricia A. Christensen
Patricia A. Christensen
Associate Public Counsel
Florida Bar No. 0989789

CERTIFICATE OF SERVICE
DOCKET NO. 20240026-EI

I HEREBY CERTIFY that a true and correct copy of the foregoing has been furnished by electronic mail on this 6th day of June, 2024, to the following:

Adria Harper
Carlos Marquez
Timothy Sparks
Florida Public Service Commission
Office of General Counsel
2540 Shumard Oak Blvd.
Tallahassee, FL 32399-0850
aharper@psc.state.fl.us
cmarquez@psc.state.fl.us
tsparks@psc.state.fl.us

Robert Scheffel Wright
John T. LaVia, III
Florida Retail Federation
1300 Thomaswood Drive
Tallahassee FL 32308
jlavia@gbwlegal.com
schef@gbwlegal.com

J. Jeffrey Wahlen
Malcolm N. Means
Virginia Ponder
Ausley Law Firm
P.O. Box 391
Tallahassee FL 32302
jwahlen@ausley.com
mmeans@ausley.com
vponder@ausley.com

Jon C. Moyle, Jr./Karen A. Putnal
Florida Industrial Power Users Group
Moyle Law Firm
118 North Gadsden Street
Tallahassee FL 32301
jmoyle@moylelaw.com
kputnal@moylelaw.com

L. Newton/A. George/
T. Jernigan/E. Payton
Federal Executive Agencies
139 Barnes Drive, Suite 1
Tyndall AFB FL 32403
ebony.payton.ctr@us.af.mil
thomas.jernigan.3@us.af.mil
Leslie.Newton.1@us.af.mil
Ashley.George.4@us.af.mi

Bradley Marshall
Jordan Luebkemann
Earth Justice
Florida Rising
League of United Latin American Citizens of Florida
111 S. Martin Luther King Jr. Blvd.
Tallahassee FL 32301
bmarshall@earthjustice.org
jluebkemann@earthjustice.org

Nihal Shrinath
Sierra Club
2101 Webster Street Suite 1300
Oakland CA 94612
nihal.shrinath@sierraclub.org

William C. Garner
Southern Alliance for Clean Energy
3425 Bannerman Rd. Unit 105, No. 414
Tallahassee FL 32312
bgarner@wcglawoffice.com

Sari Amiel
Sierra Club
50 F St. NW, Eighth Floor
Washington DC 20001
sari.amiel@sierraclub.org

Paula K. Brown
Tampa Electric Company
P. O. Box 111
Tampa, FL 33601-0111
regdept@tecoenergy.com

Floyd R. Self, B.C.S.
Ruth Vafek, Esq.
Berger Singerman, LLP
313 North Monroe Street, Suite 301
Tallahassee, FL 32301
fself@bergersingerman.com
rvafek@bergersingerman.com

/s/Patricia A. Christensen
Patricia A. Christensen
Associate Public Counsel
Christensen.patty@leg.state.fl.us

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Petition rate increase by Tampa Electric Company
_____/

Docket No. 20240026-EI

Filed: June 6, 2024

DIRECT TESTIMONY

OF

J. RANDALL WOOLRIDGE. PH. D.

ON BEHALF

OF

THE CITIZENS OF THE STATE OF FLORIDA

Walt Trierweiler
Public Counsel

Patricia A. Christensen
Associate Public Counsel

Octavio Simoes-Ponce
Associate Public Counsel

Office of Public Counsel
c/o The Florida Legislature
111 West Madison Street, Suite 812
Tallahassee, FL 32399-1400
(850) 488-9330

Attorneys for the Citizens
of the State of Florida

DIRECT TESTIMONY

OF

J. RANDALL WOOLRIDGE, Ph.D.

ON BEHALF OF THE CITIZENS OF

THE STATE OF FLORIDA

Docket No. 20240026-EI

I. IDENTIFICATION OF WITNESS AND PURPOSE OF TESTIMONY

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

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

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

A. I have been asked by the Florida Office of Public Counsel ("OPC") to provide an opinion as to the appropriate return on equity for Tampa Electric Company ("TECO" or "Company") and to evaluate TECO's rate of return testimony in this proceeding.

Q. HOW IS YOUR TESTIMONY ORGANIZED?

A. First, I review my cost of equity recommendation for TECO, highlight several factors that have changed since the Company's last rate case, and discuss the primary areas of contention between TECO's rate of return position and my position. Second, I provide an assessment of capital costs in today's capital markets. Third, I discuss the selection of a proxy group of electric utility companies for estimating the market cost of equity for TECO. Fourth, I discuss the relationship between a utility's capital structure and the return on equity that should be associated with that capital structure. Fifth, I provide an overview of the concept of the cost of equity capital, and then estimate the equity cost rate for TECO. Finally, I evaluate the Company's rate of return analysis and testimony.

II. OVERVIEW AND SUMMARY OF POSITIONS

A. Overview

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

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

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

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

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

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

[1] *Federal Power Commission v. Hope Natural Gas Co.*, 320 U.S. 591 (1944) ("*Hope*") and *Bluefield Water Works and Improvement Co. v. Public Service Commission of West Virginia*, 262 U.S. 679 (1923) ("*Bluefield*").

A. Summary of Positions

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

A. TECO has proposed a capital structure from investor-provided capital of 42.57% long-term debt, 3.90% short-term debt, and 54.00% common equity. The Company has recommended long-term and short-term debt cost rates of 4.53% and 3.90%. TECO Witness Dylan W. D'Ascendis has recommended a common equity cost rate of 11.50% for TECO.

Q. PLEASE SUMMARIZE TECO'S OVERALL PROPOSED RATE OF RETURN.

A. TECO's overall rate of return request is 8.27% from investor-provided capital and is summarized in Table 1.

Table 1
TECO Rate of Return Recommendation from Investor-Provided Capital

Capital Source	Capitalization Amount	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long Term Debt	$ 3,536,333	41.57%	4.53%	1.88%
Short Term Debt	376,625	4.43%	3.90%	0.17%
Common Equity	4,593,473	54.00%	11.50%	6.21%
Totals	$ 8,506,431	100.00%		8.27%

Q. WHAT ARE YOUR RECOMMENDATIONS REGARDING THE APPROPRIATE RATE OF RETURN FOR TECO?

A. I have reviewed the Company's proposed capital structure and overall cost of capital. TECO's proposed capitalization has more equity and less financial risk than the average current capitalizations of the proxy groups. The Company's proposed capital structure includes a higher common equity ratio (54.00%) than the average of the two proxy groups. Nonetheless, while I am not contesting adopting this capital structure in this testimony, I have selected a ROE that recognizes this high common equity ratio. I

am also not contesting the Company's short-term and long-term debt cost rates. To estimate an equity cost rate for the Company, I have applied the Discounted Cash Flow Model ("DCF") and the Capital Asset Pricing Model ("CAPM") to two proxy groups: (1) my group of publicly-held electric utility companies ("Electric Proxy Group"); and (2) the group developed by Mr. D'Ascendis ("D'Ascendis Proxy Group"). My analysis indicates a common equity cost rate in the range of 8.85% to 10.00% for TECO in this case. Given that I rely primarily on the DCF model and the results for the Electric Proxy Group, I believe that the appropriate ROE range for the Company is a range of 9.25%-9.75% . I am recommending a ROE of 9.50% providing that: (1) TECO's investment risk is a little below the average of the two groups; and (2) I have employed a capital structure that has more common equity and less financial risk than the average of the two proxy groups, as well as TECO's parent, Emera. Given this ROE and my proposed capital structure and debt cost rates for TECO, I am recommending an overall fair rate of return or cost of capital of 7.19% for TECO. This recommendation is summarized in Table 2 and Exhibit JRW-1.

Table 2
OPC's Rate of Return Recommendation from Investor Capital

Capital Source	Capitalization Amount	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long Term Debt	$ 3,536,333	41.57%	4.53%	1.88%
Short Term Debt	376,625	4.43%	3.90%	0.17%
Common Equity	4,593,473	54.00%	9.50%	5.13%
Totals	$ 8,506,431	100.00%		7.19%

B. Primary Rate of Return Issues in this Case

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

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

1. **TECO's Assessment of Capital Market Conditions**: Mr. D'Ascendis' analyses, ROE results, and recommendations are based on assumptions of higher interest rates and capital costs. However, despite the increase in inflation and interest rates over the past two years, there are several factors suggesting the equity cost rate for utilities have not risen significantly. To support this contention, I show that: (1) despite the higher inflation over the past two years, long-term inflation expectations are about 2.35%; (2) the yield curve is currently inverted – which suggests that investors expect yields to decline and that a recession in the next year is very likely, which would also put downward pressure on interest rates; and (3) while authorized ROEs for utilities hit all-time lows in 2020 and 2021, these ROEs did not decline nearly as much as interest rates during those years. Hence, now that interest rates have increased, authorized ROEs have not increased at the same magnitude as interest rates.

2. **Capital Structure** – As I have just noted, TECO's proposed capital structure has much more equity and less financial risk than the average capital structure of the two proxy groups as well as TECO's parent company, Emera. As a result, while I am not contesting this capital structure, I have also recommended a ROE that reflects TECO's capital structure with a relatively high common equity ratio and low financial risk.

3. **TECO's Investment Risk is a Little Below the Average of the Two Proxy Groups** TECO's issuer credit rating is BBB+ according to S&P and A3 according to Moody's.

The average S&P and Moody's ratings for the two proxy groups are BBB+ and Baa2. As such, TECO's S&P rating is equal to the average of the two proxy groups, and TECO's Moody's rating is two notches above the average of the two proxy groups. This indicates that TECO is a little less risky than the average of the two proxy groups. Mr. D'Ascendis has recognized that TECO is less risky than his proxy group.

4. **DCF Equity Cost Rate** - The DCF Equity Cost Rate is estimated by summing the stock's dividend yield and investors' expected long-run growth rate in dividends paid per share. There are two issues with Mr. D'Ascendis' DCF study: first, he gives little weight to his DCF results. His mean DCF result for his proxy group is 9.89%, yet he concludes that TECO's cost of equity is 11.50%. Second, he relies exclusively on the overly optimistic and upwardly biased growth-rate forecasts for earnings per share ("EPS") put forth by Wall Street analysts and *Value Line*.

I also have used a traditional constant-growth DCF model. In developing a growth rate for my DCF model for the proxy group, I have reviewed thirteen growth-rate measures including historic and projected growth-rate measures and have evaluated growth in dividends, book value, and earnings per share. I give primary weight to analysts' projected EPS growth rates.

5. **Risk Premium Approach**: The equity cost rate using the risk-premium model is the sum of the base interest rate yield plus a risk premium. With respect to the market-risk premium, Mr. D'Ascendis has employed six different approaches to estimate the market-risk premium. In three of his methods, he uses historical stock and bond return data. In the other three of his approaches, he bases his market-risk premium on his estimate of projected stock-market returns. As I further explain in my critique of

TECO's rate-of-return analysis later in my testimony, there are a number of empirical issues with using historical stock and bond returns to estimate an expected market risk premium. In addition, Mr. D'Ascendis' projected market returns are based on highly unrealistic assumptions about future earnings and economic growth and the resulting stock returns. First, I have conducted a study that shows Mr. D'Ascendis' estimate of the average expected stock market return of 15.60% is more than double the average annual stock return (6.87%) that investment firms are telling investors to expect over the next ten years. Second, as I demonstrate later in my testimony, the EPS growth-rate projection (14.10%) used for the S&P 500 and the resulting expected market return (15.60%) and market risk premium (11.45%) includes unrealistic assumptions regarding future economic and earnings growth and stock returns. On this point, Mr. D'Ascendis makes the assumption that the companies in the S&P 500 can grow their earnings, on average, at 14.10% annually, which is nearly triple the long-term projected growth rate of the economy as measured by Gross Domestic Product ("GDP").

6. **CAPM Approach**: The CAPM approach requires an estimate of the risk-free interest rate, the beta, and the market or equity risk premium. There are two primary issues with Mr. D'Ascendis' CAPM analyses: first, he has used a non-traditional CAPM approach, the empirical CAPM (ECAPM), as an equity-cost-rate approach. Second, and most significantly, his CAPM market-risk premium of 10.02% is developed by the same six approaches he used in his Risk-Premium approach I noted above. The market risk premium of 10.02% is larger than: what is indicated by historic stock and bond return data and what is found in the published studies and surveys of the market risk premium. In addition, I will demonstrate that the 10.02% CAPM market risk premium is based

on totally unrealistic assumptions of future economic and earnings growth and stock returns.

As I highlight in my testimony, there are three commonly used procedures for estimating a market risk premium: historic returns, surveys, and expected return models. I have used a market risk premium of 5.25%, which factors in all three approaches—historic returns, surveys, and expected return models—to estimate a market premium and that employs the results of many studies of the market risk premium. As I note, the 5.25% figure reflects the market risk premiums: (1) determined in recent academic studies by leading finance scholars; (2) employed by leading investment banks and management consulting firms; and (3) found in surveys of companies, financial forecasters, financial analysts, and corporate CFOs.

7. **Equity Cost Rate Models Applied to Non-Price Regulated Companies**: Mr. D'Ascendis also estimates an equity cost rate by applying his equity-cost-rate approaches and methodologies to a group of what he refers to as "comparable risk" non-price regulated companies. As I note in the rebuttal section of this testimony, these companies are not truly comparable to TECO and Mr. D'Ascendis' analyses are based on the same flawed approach summarized above.

8. **Other Issues**: Mr. D'Ascendis includes a flotation cost adjustment of 0.10% in his ROE analysis and recommendation. However, there is no evidence that TECO has paid flotation costs. Hence, TECO should not receive higher revenues in the form of a higher ROE for flotation costs that the Company does not incur.

III. CAPITAL MARKET CONDITIONS AND AUTHORIZED ROES

A. Capital Market Conditions

Q. PLEASE PROVIDE A SUMMARY OF THE UTILITY CAPITAL MARKET INDICATORS IN EXHIBIT JRW-2.

A. Page 1 of Exhibit JRW-2 shows the yields on Baa rated public utility bonds. These yields have gradually declined in the past decade from 7.5% to the 3.0% range. These yields bottomed out in the 3.0% range in 2020 and 2021 due to the economic fallout from the COVID-19 pandemic. These yields increased with interest rates in general in 2022, 2023, and 2024 and now are in the 5.75% range in 2024.

Page 2 of Exhibit JRW-2 shows the average dividend yield for electric utilities. These yields declined over the past decade, bottoming out at 3.1% in 2019. They have increased since that time, and the average was 3.9% as of 2023.

Page 3 of Exhibit JRW-2 provides the average earned ROEs and market-to-book ratios for electric utilities. The average earned ROE has been in the 9.0% to 10.0% range over the past five years. The average market-to-book ratio increased over the last 13 years, peaked at 2.0X in 2019, declined to the 1.75X range in 2020-2022, and declined to 1.50X in 2023.

Q. PLEASE REVIEW INTEREST RATE MOVEMENTS IN RECENT YEARS.

A. Figure 1, below, shows 30-year Treasury yields over the past 15 years (2010 to 2024). These yields were in the 3.0% range at the end of 2018. They declined to the 2.25% range in 2019 due primarily to slow economic growth and low inflation. In 2020, with the advent of the COVID-19 pandemic in February of that year, 30-year Treasury yields

declined to record low levels, dropping about 100 basis points to settle in the 1.25% range. They began their recovery in the summer of 2020 and increased to the 2.00% - 2.50% range in 2021. They increased significantly in 2022 and 2023 with the improving economy and higher inflation. In 2023, these yields increased from 3.50% to 5.00%. In 2024, these yields have since deceased and currently are in the 4.50% - 4.75% range.

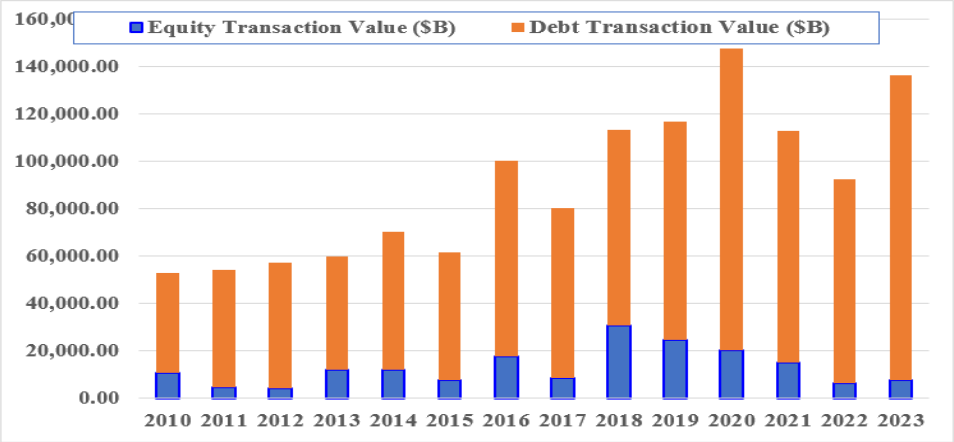
Figure 1
30-Year Treasury Yields

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

Q. DID UTILITIES TAKE ADVANTAGE OF THE RECORD LOWER BOND YIELDS IN 2020 AND 2021 TO RAISE CAPITAL?

A. Yes. Figure 2 shows the annual amounts of debt and equity capital raised by public utility companies over the past 13 years. Electric utility and gas distribution companies have taken advantage of the low interest rate and capital cost environment of recent years and raised record amounts of capital in the markets. In fact, in four of the past five years, public utilities have annually raised more than $100 billion in combined debt and equity capital.

Figure 2
Debt and Equity Capital Raised by Public Utilities
2010–2023



Data Source: S&P Global Market Intelligence, S&P Cap IQ, 2024.

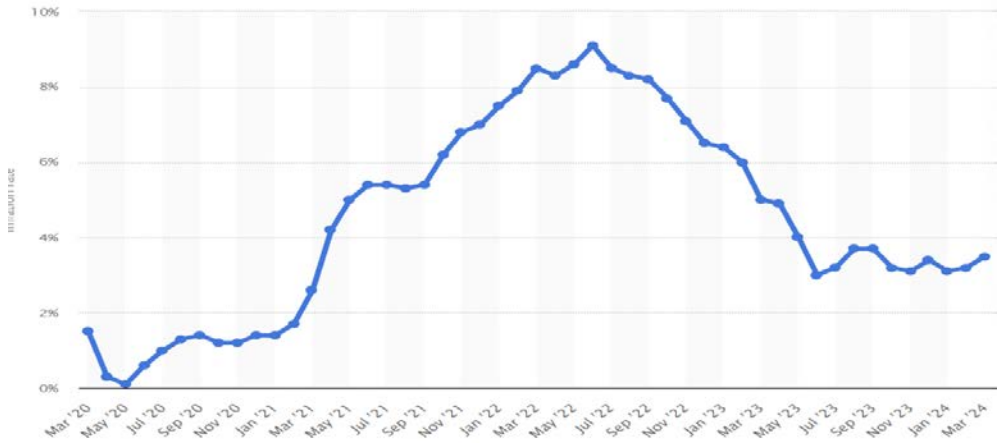
Q. PLEASE DISCUSS THE INCREASE IN INTEREST RATES SINCE THE BEGINNING OF 2022.

A. Several factors led to higher interest rates since 2022. Coming out of the pandemic, real GDP growth has increased 5.95% in 2021, 2.06% in 2022, and 3.25% in 2023, compared to a decline of -3.4% in 2020. This recovery led to greater business activity, higher levels of business and consumer spending, and large increases in housing prices. Unemployment was 6.7% in 2020 and has steadily declined to the 3.5% - 4.0% range in 2024. The recovery in the economy puts upward pressure on interest rates by increasing the demand for capital.

In addition, as reported extensively in the financial press, inflation picked up significantly in 2022, putting additional pressure on interest rates. Reported year-over-year inflation has been as high as 9.20% in 2022. Year-over-year inflation declined since that time, bottoming out at 3.10% in January of 2024 and has since increased to 3.40% in April of 2024. The high inflation reported in the past two years primarily reflects three factors: (1) the recovering and growing U.S. economy; (2) the production

shutdowns during the pandemic, which led to supply chain shortages as the global economy has recovered; and (3) the war in Ukraine, which has led to higher energy and gasoline prices worldwide.

Figure 3
Year-Over-Year Inflation Rates
2020-2024



Source: https://www.statista.com/statistics/273418/unadjusted-monthly-inflation-rate-in-the-us/

In response to the higher inflation, the Federal Reserve in 2022 increased the discount rate by 25 basis points in March, 50 basis points in May, 75 basis points in June, July, September, and November, 50 basis points in December, and 25 basis points in February, March, May, and July of 2023. Since the last rate increase, the Federal Reserve has held the discount rate steady while monitoring economic activity, with the expectation that once inflation falls to the target 2.0% range, the Federal Reserve will begin cutting the discount rate.

Investors' inflation expectations can be seen by looking at the difference between yields on ordinary Treasuries and the yields on inflation-protected Treasuries, known as TIPS. Figure 4 shows the expected inflation rate over the next five, ten, and thirty years. One can see that the expected inflation rate has declined since 2022 and is now at an expected inflation rate of 2.35% over the next five years. The expected

inflation rates over the next ten and thirty years are also in the 2.35% range. The bottom line is that the expected long-term inflation rate is around 2.35%.

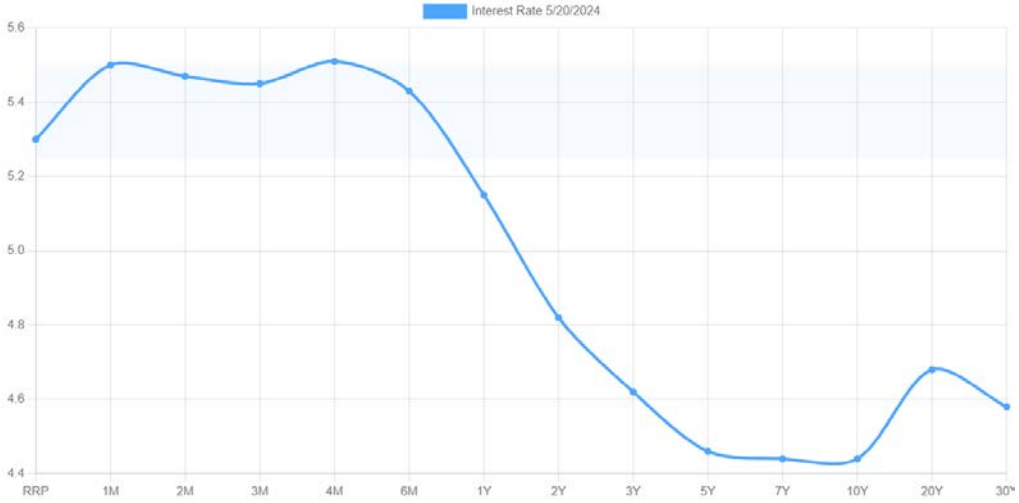
Figure 4
5-Year, 10-Year, and 30-Year Breakeven Inflation Rates

Date source: https://fred.stlouisfed.org/.

Q. DO YOU BELIEVE THAT INTEREST RATES WILL INCREASE IN 2024?

A. No. As discussed above, the current inflationary environment has pushed up interest rates over the past year. Also, as noted above, the Federal Reserve has responded with a series of discount rate increases, intended to slow the economy and cool down inflation, which would lower interest rates. Figure 5 shows the yield curve, which plots the yield-to-maturity and time-to-maturity for Treasury securities. The yield curve is usually upward sloping because investors require higher returns to commit capital for longer periods of time. Currently, the yield curve is said to be "inverted," which means that the yields on shorter-term maturity securities are higher than the yields on longer-term securities. This means that investors do not expect interest rates to remain where they are and expect that they should decline.

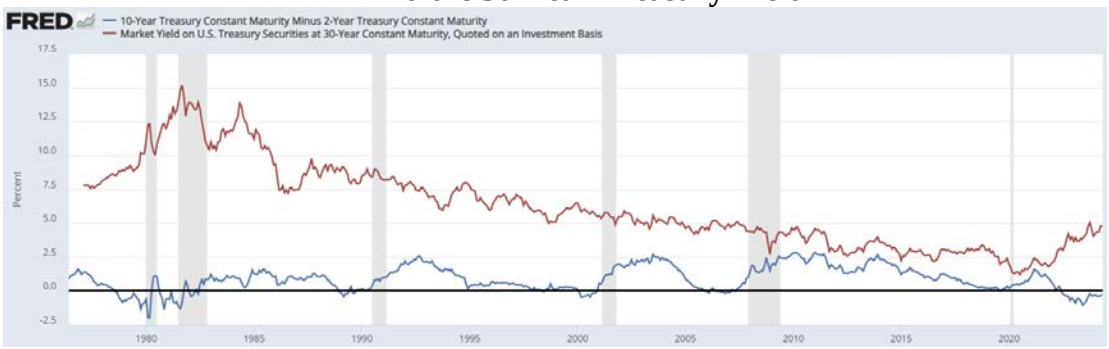
Figure 5
The Yield Curve
The Yield-to-Maturity and Time-to-Maturity for Treasury Securities



Source: https://www.ustreasuryyieldcurve.com/ - 5-20-24.

The financial press has focused on another aspect of an inverted yield curve. An inverted yield curve also is an indicator of a pending recession, which would also put downward pressure on interest rates. An inverted yield curve is usually indicated when the 2-year Treasury yield is above the 10-year Treasury yield. Figure 6 graphs two lines: (1) the 10-year Treasury yield minus the 2-year Treasury yield (blue line); and (2) the 30-year Treasury yield (red line). In Figure 6, the shaded areas are economic recessions, defined as two-straight quarters with negative GDP growth. In Figure 6, one can see that every time the yield curve inverted (2-year > 10-year) in the last 50 years, a recession followed. In addition, one can see that interest rates, as indicated by the 30-year Treasury yield in Figure 6, decline during recessions. Since the yield curve is currently inverted, a recession and lower interest rates are likely to follow.

Figure 6
Treasury 10-Year Minus 2-Year Yields
And the 30-Year Treasury Yield



Source: https://fred.stlouisfed.org/series/T10Y2Y

Q. PLEASE SUMMARIZE YOUR ASSESSMENT OF THE CURRENT CAPITAL MARKET SITUATION.

A. The U.S. economy, as measured by nominal GDP, declined 20% in the first half of 2020, rebounded significantly in 2021, and continued to rebound in 2022 and 2023. This rebound has seen big increases in consumer and business spending, lower unemployment, and higher housing prices. The rebounding economy has put pressure on prices, which has been further exacerbated by the post-COVID-19 supply chain issues and the higher energy prices brought on by the Russia-Ukraine conflict. In recent months, market participants have been focusing on economic growth, the labor market and unemployment, and inflation in anticipation of a cut in the discount rate by the Federal Reserve. Such a discount rate cut would signal that the Federal Reserve believes its target inflation rate of 2.0% is within range.

While utilities did take advantage of the low yields in 2020 and 2021 to raise record amounts of capital, the big economic issue has been reported inflation and interest rates. However, while year-over-year inflation has remained above the 2.0% target, the yields on TIPS suggest that longer-term inflationary expectations are still

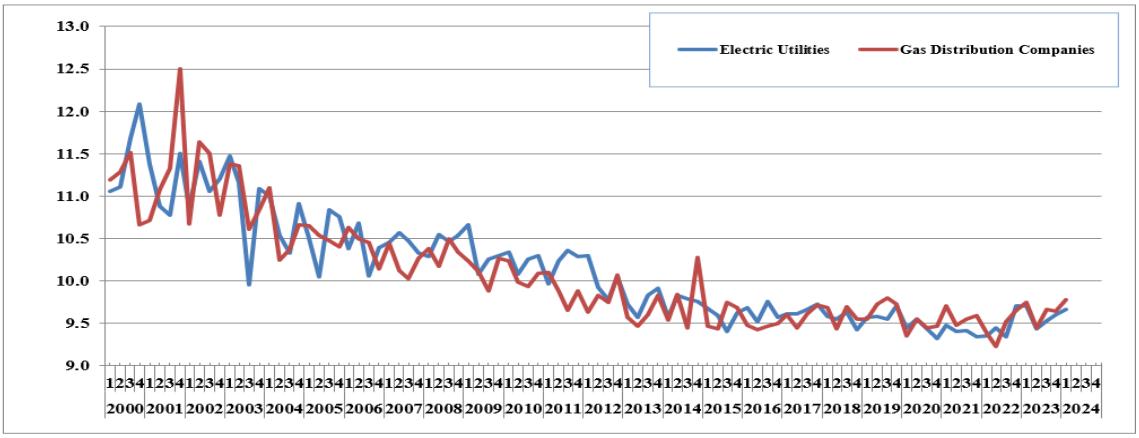
about 2.35%. In addition, as I note above, with an inverted yield curve, the prospect of a recession is likely, which would lead to lower interest rates.

B. Authorized ROEs

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

A. In 2020 and 2021, authorized ROEs for utilities hit an all-time low as the low interest rate and capital cost environment put downward pressure on authorized ROEs.[2] Figure 7 reflects the authorized ROEs for electric utility and gas distribution companies from 2000-2023. The authorized ROEs have trended downward with interest rates and capital costs in the past 15 years. The average authorized ROEs fell below 10% for electric utilities in 2012. Table 3 shows the average annual authorized ROEs for electric utility and gas distribution from 2010 to the first quarter of 2024.

Figure 7
Authorized ROEs for Electric Utilities and Gas Distribution Companies
2000-2024



Data Source: S&P Global Market Intelligence, RRA *Regulatory Focus*, 2024.

Table 3
Average Annual Authorized ROEs for Electric Utilities

[2] The data and numbers discussed in this section come from S&P Global Market Intelligence, RRA *Regulatory Focus*, 2024.

and Gas Distribution Companies
2010–2024

	Electric	Gas		Electric	Gas
2010	10.37	10.15	2017	9.74	9.72
2011	10.29	9.92	2018	9.65	9.59
2012	10.17	9.94	2019	9.66	9.72
2013	10.03	9.68	2020	9.44	9.47
2014	9.91	9.78	2021	9.38	9.56
2015	9.78	9.6	2022	9.54	9.53
2016	9.77	9.54	2023	9.60	9.64
			Q1-2024	9.66	9.78

Data Source: S&P Global Market Intelligence, RRA Regulatory Focus, 2024.

Q. PLEASE REVIEW THE AUTHORIZED ROES IN FLORIDA RELATIVE TO AUTHORIZED ROES IN THE U.S.

A. In Table 4, I show the authorized ROEs for electric and gas utilities in Florida over the 2010-2024 time period. I have several observations on these ROEs:

1. Authorized ROEs in Florida have consistently been above the average authorized ROEs for electric utilities in the U.S;
2. Prior to the pandemic (2020-2021), the authorized electric ROEs in Florida were in the 10.25%-10.50% range, about 75 basis points above the national averages;
3. During the pandemic, the authorized electric ROEs in Florida declined to the 9.85%-9.95%; and
4. Since the pandemic, electric ROEs in Florida have increased and have been in the 10.10%-10.80% range.

Table 4
Florida Authorized ROEs for
Electric Utility and Gas Distribution Companies
2010-24

Company	*Parent*	*Docket*	*Service Type*	*Date*	*Decision Type*	*Rate Increase ($M)*	*ROE (%)*	*Common Equity (%)*
Duke Energy Florida LLC	DUK	D-090079-EI	Electric	3/5/2010	Settled	126.2	10.50	46.74
Florida Power & Light Co.	NEE	D-080677-EI	Electric	3/17/2010	Settled	75.5	10.00	47.00
Duke Energy Florida LLC	DUK	D-120022-EI	Electric	2/22/2012	Settled	150.0	NA	NA
Gulf Power Co.	NEE	D-110138-EI	Electric	2/27/2012	Litigated	68.1	10.25	38.50
Florida Power & Light Co.	NEE	D-120015-EI	Electric	12/13/2012	Settled	350.0	10.50	NA
Tampa Electric Company	EMA	D-130040-EI	Electric	9/11/2013	Settled	70.0	10.25	42.00
Gulf Power Co.	NEE	D-130140-EI	Electric	12/3/2013	Settled	55.0	10.25	NA
Florida Public Utilities Co.	CPK	D-140025-EI	Electric	9/15/2014	Settled	3.8	10.25	NA
Florida Power & Light Co.	NEE	D-160021-EI	Electric	11/29/2016	Settled	811.0	10.55	NA
Gulf Power Co.	NEE	D-160186-EI	Electric	4/4/2017	Settled	62.0	10.25	NA
Duke Energy Florida LLC	DUK	D-20170183-EI	Electric	10/25/2017	Settled	200.0	NA	NA
Tampa Electric Company	EMA	D-20170210-EI	Electric	11/6/2017	Settled	0.0	10.25	NA
Pivotal Utility Holdings	NEE	20170179-GU	Natural Gas	3/26/2018	Settled	15.3	10.19	48.00
Duke Energy Florida LLC	DUK	D-20180084-EI	Electric	7/10/2018	Settled	200.5	NA	NA
Duke Energy Florida LLC	DUK	D-20180149	Electric	4/2/2019	Settled	29.2	10.50	NA
Peoples Gas System	EMA	D-20200051-GU	Natural Gas	11/19/2020	Settled	58.0	9.90	54.70
Duke Energy Florida LLC	DUK	D-20210016-EI	Electric	5/4/2021	Settled	195.4	9.85	44.84
Tampa Electric Company	EMA	D-20210034-EI	Electric	10/21/2021	Settled	302.4	9.95	45.07
Florida Power & Light Co.	NEE	D-20210015-EI	Electric	10/26/2021	Settled	1,252.0	10.60	NA
Tampa Electric Company	EMA	D-20220122-EI	Electric	8/16/2022	Settled	10.0	10.20	NA
Duke Energy Florida LLC	DUK	D-20220143-EI	Electric	10/4/2022	Settled	24.4	10.10	NA
Florida Power & Light Co.	NEE	20210015 - ROE	Electric	10/4/2022	Settled	0.0	10.80	NA
Tampa Electric Company	EMA	D-20220148	Electric	12/6/2022	Settled	91.0	10.20	45.07
Florida Public Utilities Co.	CPK	D-20220067-GU	Natural Gas	1/24/2023	Litigated	17.2	10.25	45.16
Peoples Gas System	EMA	D-20230023-GU	Natural Gas	11/9/2023	Litigated	106.7	10.15	NA

Date Source: S&P Global Market Intelligence, RRA *Regulatory Focus*, 2024

Q. PLEASE REVIEW THE COMMISSION'S COST OF CAPITAL DETERMINATION IN TECO'S MOST RECENT RATE CASE.

A. On December 6, 2022, in Docket No**.** 20220148-EI**,** the Commission approved a settlement between TECO and intervening parties which included a ROE of 10.25%.

Q. DID THE HIGHER INTEREST RATES IN 2022 AND 2023 MEAN THAT AUTHORIZED ROES MUST INCREASE IN LINE WITH INTEREST RATES?

A. Not necessarily. As noted above, authorized ROEs for utilities reached record low levels in 2020 and 2021 due to the record low interest rates and capital costs. However, authorized utility ROEs never declined to the same extent that interest rates declined in these two years. Table 5 shows the average annual 30-year Treasury yields and

authorized ROEs for electric utility companies from 2018-2023. In Table 5, I have averaged the 2018-2019 (pre-COVID-19 period) figures and the 2020-2021 (COVID-19 period) figures for the Treasury yields and ROEs, and then compared the pre-COVID-19 and COVID-19 period ROEs and yields to those in 2022 and 2023 (post-COVID-19 period). A key observation from Table 5 is that authorized ROEs for electric utility companies, despite hitting record lows in the COVID-19 period, did not decline as much as interest rates. The daily 30-year Treasury yield averaged 2.85% in the pre-COVID-19 period, versus 1.81% in the COVID-19 period, a decrease of 1.04% or 104 basis points. However, the authorized ROE for electric utility companies averaged 9.63% in the pre-COVID-19 period and declined to an average of 9.41% in the COVID-19 period, a decline of -0.22%. In 2022, the average daily 30-year Treasury yield increased by 105 basis points to 3.11%, while authorized ROEs for electric utility companies increased 0.16% to 9.54%, respectively. Likewise, the average daily 30-year Treasury yield increased by 92 basis points to 4.03% in 2023, while authorized ROEs for electric utility companies only increased by 0.06% to 9.60%.

Table 5
Average Annual 30-Year Treasury Yields and Authorized ROEs
for Electric Distribution Companies
2018–2023

	2018 Average	2019 Average	2018-19 Average	2020 Average	2021 Average	2020-21 Average	2020-21 Avg. Minus 2018-19 Avg.	2022 Average	2022 Avg. Minus 2021 Avg.	2023 Average	2023 Avg. Minus 2022 Avg.
30-Year Treasury Yield	3.11%	2.58%	2.85%	1.56%	2.06%	1.81%	-1.04%	3.11%	1.05%	4.03%	0.92%
Average Electric ROE	9.60%	9.66%	9.63%	9.44%	9.38%	9.41%	-0.22%	9.54%	0.16%	9.60%	0.06%

Data Source: S&P Global Market Intelligence, RRA Regulatory Focus, 2024.

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

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

As shown on page 3 of Exhibit JRW-2, electric utility companies have been earning ROEs in the range of 9.0%-10.0% in recent years. With these ROEs, electric utility companies such as those in the proxy group have strong investment-grade credit ratings, their stocks have been selling well over book value, and they have been raising abundant amounts of capital. While my recommendation is slightly below the average authorized ROEs for electric utility companies, the Werner and Jarvis (2022) study, which is discussed below, concluded that, over the past four decades, authorized ROEs have not declined in line with capital costs over time and therefore past authorized ROEs have overstated the actual cost of equity capital.[3] Hence, the Florida Public Service Commission ("Commission") should not be concerned that my recommended ROE is slightly below the average of currently authorized ROEs. Therefore, I believe that my recommendation meets the criteria established in *Hope* and *Bluefield*.

Q. WITH RESPECT TO THIS DISCUSSION, PLEASE DISCUSS THE *WALL STREET JOURNAL* ARTICLE ON UTILITIES' AUTHORIZED ROES IN THE CURRENT ENVIRONMENT.

[3] Karl Dunkle Werner and Stephen Jarvis, "Rate of Return Regulation Revisited," Working Paper, Energy Institute, University of California at Berkeley, 2022.

A. The *Wall Street Journal* article, entitled "Utilities Have a High-Wire Act Ahead," discussed the issues utilities face today to meet the needs of their primary stakeholders – customers and investors.[4] The article also highlights current utility rate issues in the context of a recent study on rate of return regulation.[5] In the 2022 study, Werner and Jarvis evaluated the authorized ROEs in 3,500 electric and gas rate case decisions in the U.S. from 1980-2021. They compared the allowed rate of return on equity to a number of capital cost benchmarks (government and corporate bonds, CAPM equity cost rate estimates, and U.K. authorized ROEs) and focused on three questions: (1) to what extent are utilities being allowed to earn excess ROEs by their regulators?; (2) how has this ROE affected utilities' capital investment decisions?; and (3) what impact has this had on the costs paid by consumers?[6]

The authors reported the following empirical results:[7]

(1) The real (inflation-adjusted) return that regulators allow equity investors to earn has remained steady over the last 40 years, while the many different cost of capital measures have been declining;

(2) The gap between the authorized ROEs and the benchmarks suggest that regulators have been approving ROEs that are from 0.50% to 5.50% above the cost of equity estimates;

(3) One potential explanation is that utilities have become riskier. However, the authors find that utility credit ratings, on average, have not changed much over the past 40 years;

(4) An extra 1.0% of allowed ROE causes a utility's capital rate base to expand by an extra 5% on average. This supports the Averch-Johnson effect that utilities have the

[4] Jinjoo Lee, "Utilities Have a High-Wire Act Ahead," *Wall Street Journal*, October 9, 2022, p. C1, *See* Attachment A.

[5] *Id.*

[6] Karl Dunkle Werner and Stephen Jarvis, "Rate of Return Regulation Revisited," Working Paper, Energy Institute, University of California at Berkeley, 2022.

[7] *Id.* These observations are summarized on pages 34-7 of the study.

incentive to overinvest in capital projects if they are earning an outsized return on those investments;[8]

(5) Both the ROE requested by utilities and the return granted by regulators respond more quickly to rises in market measures of capital cost than to declines. The time adjustment for decreases is twice as long as for increases;

(6) Authorized ROEs tend to be approved at round numbers (1.0, 0.5, 0.25), with 10.0% being the most common authorized ROE;

(7) Overall, based on the gap, consumers may be paying $2-20 billion per year more than if authorized ROEs had fallen in line with other capital market indicators; and

(8) The authors also indicated that their results are similar to those found in a previous study by David Rode and Paul Fischback (2019).[9]

In summary, these results indicate that over the past four decades authorized ROEs have not declined in line with capital costs, so past authorized ROEs have overstated the actual cost of equity capital. Hence, the Commission should not be concerned that my recommended ROE is below other authorized ROEs.

IV. PROXY GROUP SELECTION

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

A. To develop a fair rate-of-return recommendation for the Company, I have evaluated the return requirements of investors on the common stock of a proxy group of publicly-held utility companies.

Q. WHAT PROXY GROUPS HAVE YOU USED?

A. I have used my Electric Proxy Group and Mr. D'Ascendis' proxy group.

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[8] https://en.wikipedia.org/wiki/Averch%E2%80%93Johnson_effect

[9] David C. Rode and Paul S. Fischbeck, "Regulated Equity Returns: A Puzzle." *Energy Policy*, October, 2019.

Q. PLEASE DESCRIBE YOUR PROXY GROUP OF ELECTRIC COMPANIES.

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

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

Q. PLEASE DISCUSS THE ELECTRIC PROXY GROUP.

A. The Electric Proxy Group includes 24 companies. Page 1 of Exhibit JRW3 provides a summary of financial statistics for the proxy group, showing mean operating revenues and net plant among members of the Electric Proxy Group of $10.78 billion and $41.55 billion, respectively. The group on average receives 85% of its revenues from regulated electric operations; has a BBB+ bond rating from S&P and a Baa2 rating from Moody's; has a current average common equity ratio of 40.9%; and has an average earned ROE of 9.36%.

Q. PLEASE DESCRIBE MR. D'ASCENDIS' PROXY GROUP OF ELECTRIC UTILITY COMPANIES.

A. The D'Ascendis Proxy Group consists of fourteen electric utility companies. Summary financial statistics for the proxy group are listed on Panel B of page 1 of Exhibit JRW-3. The mean operating revenues and net plant among members of the D'Ascendis Proxy Group are $10.29 billion and $40.90 billion, respectively. On average the group receives 90% of revenues from regulated electric operations; has an average BBB+ issuer credit rating from S&P and an average Baa2 long-term rating from Moody's; has a current common equity ratio of 40.1%; and has an earned return on common equity of 9.48%.

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

A. I believe that bond ratings provide a good assessment of the investment risk of a company. Page 1 of Exhibit JRW-3 also shows S&P and Moody's issuer credit ratings for the companies in the two groups. The average S&P and Moody's ratings for the two groups are BBB+ and Baa2. TECO's issuer credit rating is BBB+ according to S&P and A3 according to Moody's. As such, TECO's S&P issuer credit rating is equal to the average of the two proxy groups (BBB+ vs. BBB+), and TECO's Moody's rating is two notches above the average of the two proxy groups (A3 vs. Baa2). In my opinion, this indicates that TECO is a little less risky than the average of the two proxy groups.

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

A. On page 2 of Exhibit JRW-3, I have assessed the riskiness of the two proxy groups using five different accepted risk measures. These measures include Beta, Financial

Strength, Safety, Earnings Predictability, and Stock Price Stability. These risk measures suggest that the two proxy groups are similar in risk. The comparisons of the risk measures include beta (0.92 vs. 0.92), Financial Strength (A vs. A/B++), Safety (2.0 vs. 2.1), Earnings Predictability (89 vs. 89), and Stock Price Stability (88 vs. 91). On balance, these measures suggest that these two proxy groups are very low risk relative to the overall stock market and are similar in risk to each other.

V. CAPITAL STRUCTURE RATIOS AND DEBT COST RATES

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

A. TECO has proposed a capital structure from investor-provided capital of 42.57% long-term debt, 3.90% short-term debt, and 54.00% common equity and long-term and short-term debt cost rates of 4.53% and 3.90%.

Q. WHAT ARE THE COMMON EQUITY RATIOS IN THE CAPITALIZATIONS OF THE TWO PROXY GROUPS?

A. As shown in Exhibit JRW-3, the average common equity ratios of the Electric and D'Ascendis Proxy Groups are 40.9% and 40.1%, respectively. As such, TECO's proposed capitalization from investor-provided capital and as proposed for rate setting purposes has much more equity and much less financial risk than the average current capitalizations of the electric utility companies in the proxy groups.

Q. WHAT IS THE COMMON EQUITY RATIO OF TECO'S PARENT, EMERA?

A. According to *Value Line*, the common equity ratio as of December 31, 2023, for Emera is 41.4%. Hence, TECO's proposed capitalization also has more equity and less financial risk than the average current capitalizations of the electric utility companies in the two proxy groups.

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

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

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

A. Yes. Short-term debt, like long-term debt, has a higher claim on the assets and earnings of the company and requires timely payment of interest and repayment of principal. Thus, in comparing the common-equity ratios of the holding companies with TECO's recommendation, it is appropriate to include short-term debt when computing the

holding company common-equity ratios. Additionally, the financial risk of a company is based on total debt, which includes both short-term and long-term debt.

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

A. Moody's published an article on the use of low-cost debt financing by public utility holding companies to increase their ROEs. The summary observations included the following about how these holding companies use "leverage" and how an increase in leverage at the parent holding company can "hurt the credit profiles of its regulated subsidiaries":

> U.S. utilities use leverage at the holding-company level to invest in other businesses, make acquisitions and earn higher returns on equity. In some cases, an increase in leverage at the parent can hurt the credit profiles of its regulated subsidiaries.[10]

This financial strategy has traditionally been known as "double leverage." Noting that double leverage results in "a consolidated debt-to-capitalization ratio that is higher at the parent than at the subsidiary because of the additional debt at the parent," Moody's defined double leverage as follows:

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

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

> consolidated debt-to-capitalization ratio that is higher at the parent than at the subsidiary because of the additional debt at the parent.[11]

Moody's goes on to discuss the potential risk "down the road" to utilities of this financing corporate strategy if regulators were to ascribe the debt at the parent level to the subsidiaries or adjust the authorized return on capital:

> **"Double leverage" drives returns for some utilities but could pose risks down the road.** The use of double leverage, a long-standing practice whereby a holding company takes on debt and downstreams the proceeds to an operating subsidiary as equity, could pose risks down the road if regulators were to ascribe the debt at the parent level to the subsidiaries or adjust the authorized return on capital.[12]

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

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

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

A. Utilities satisfy their capital needs through a mix of equity and debt. Because equity capital is more expensive than debt, the issuance of debt enables a utility to raise more capital for a given commitment of dollars than it could raise with just equity. Debt is, therefore, a means of "leveraging" capital dollars. However, as the amount of debt in

[11] *Id.* at p. 5.

[12] *Id.* at p. 1.

the capital structure increases, financial risk increases and the risk of the utility, as perceived by equity investors, also increases. Significantly, for this case, the converse is also true. As the amount of debt in the capital structure decreases, the financial risk decreases. The required return on equity capital is a function of the amount of overall risk that investors perceive, including financial risk in the form of debt.

Q. CAN THE IMPACT OF A UTILTY'S AWARDED ROE BE DETERMINED WITHOUT REFERENCE TO THAT UTILITY'S CAPITAL STRUCTURE?

A. No. A high equity component can amplify the overall impact of a relatively low ROE while a low equity component can mitigate the overall impact of a relatively high ROE. For example, suppose an electric utility has an authorized ROE and common equity ratio of 10.0% and 50.0%. Financially, the same utility would be at about the same point with authorized ROE of 9.0% but with a common equity ratio of 55.0%.

Q. IS THERE ALSO A DIRECT CORRELATION BETWEEN THE AMOUNT OF EQUITY IN A COMPANY'S CAPITAL STRUCTURE AND THE REVENUE REQUIREMENTS THAT CUSTOMERS ARE CALLED ON TO BEAR?

A. Yes. Just as there is a direct correlation between the utility's authorized return on equity and the utility's revenue requirements (the higher the return, the greater the revenue requirement), there is a direct correlation between the amount of equity in the capital structure and the revenue requirements that customers are called on to bear. As the equity ratio increases, the utility's revenue requirement increases and the rates paid by customers increase. If the proportion of equity is too high, rates will be higher than

they need to be. For this reason, the utility's management should pursue a capital acquisition strategy that results in the proper balance in the capital structure.

Q. CAN A REGULATED UTILITY SAFELY TAKE ON MORE DEBT THAN A NON-REGULATED COMPANY?

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

Q. GIVEN THAT TECO HAS PROPOSED AN EQUITY RATIO THAT IS MUCH HIGHER THAN THE AVERAGE COMMON EQUITY RATIO OF OTHER ELECTRIC UTILITY COMPANIES AND THE COMMON EQUITY RATIO OF ITS PARENT COMPANY, EMERA, WHAT SHOULD THE COMMISSION DO IN THIS RATEMAKING PROCEEDING?

A. When a regulated utility's actual capital structure contains a high equity ratio, the Commission has two options. The first option is to impute a more reasonable capital structure that is comparable to the average of the proxy group used to determine the cost of equity and to reflect the imputed capital structure in revenue requirements. Otherwise, the Commission's second option is to recognize the downward impact that an unusually high equity ratio will have on the financial risk of a utility and authorize a common equity-cost rate lower than that of the proxy group.

Q. PLEASE ELABORATE ON THIS "DOWNWARD IMPACT."

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

Q. PLEASE COMMENT ON MR. D'ASCENDIS'S CAPITAL STRUCTURE STUDY FOUND IN DOCUMENT NO. 3.

A. To support the Company's proposed capital structure with a common equity ratio of 54.0%, Mr. D'Ascendis erroneously reports on the ranges of the average five-year mean common equity ratio for the proxy companies and their operating subsidiaries. Mr. D'Ascendis is in error because he reports the ranges and not the mean common equity ratios. The fact is that the mean average five-year common equity ratios for the proxy companies and their operating subsidiaries are 43.25% and 49.05%.[13] These averages clearly do not support the Company's proposed common equity ratio. In addition, I show on page 1 of Exhibit JRW-3 that the average common equity ratios for the parent holding companies in the two proxy groups as of December 31, 2023, were 40.9% (Electric) and 40.1% (D'Ascendis). Hence, Mr. D'Ascendis' study does not

[13] See pages 2 and 5 of Mr. D'Ascendis' Document No. 3.

support the Company's proposed capital structure.

Q. HOW DO YOU PLAN TO ACCOUNT FOR THE DIFFERENCE IN THE CAPITAL STRUCTURE?

A. I am not contesting the Company's proposed capital structure in this testimony, with a common equity ratio of 54.0%, and the proposed senior debt cost rates for two reasons: (1) a capitalization (with the 54.0% common equity ratio) adopted in a settlement in the Company's last rate case; and (2) as shown on page 1 of Mr. D'Ascendis' Document No. 3, a capital structure with a common equity ratio of 54.0% is consistent with how the Company has financed itself over the past three years. While I am not contesting the proposed capital structure, I have accounted for the high common equity ratio and lower financial risk of the capital structure in adopting an ROE in this case.

V. THE COST OF COMMON EQUITY CAPITAL

A. Overview

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

A. In a competitive industry, the return on a firm's common equity capital is determined through the competitive market for its goods and services. Due to the capital requirements needed to provide utility services and the economic benefit to society from avoiding duplication of these services and the construction of utility-infrastructure facilities, most public utilities are monopolies. Because of the lack of competition and

the essential nature of their services, it is not appropriate to permit monopoly utilities to set their own prices.

Thus, regulation seeks to establish prices that are fair to consumers and, at the same time, sufficient to meet the operating and capital costs of the utility (*i.e.*, provide an adequate return on capital to attract investors).

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

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

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

equal required returns, and the market value must equal the book value of the firm's securities.

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

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

> Fundamentally, the value of a company is determined by the cash flow it generates over time for its owners, and the minimum acceptable rate of return required by capital investors. This "cost of equity capital" is used to discount the expected equity cash flow, converting it to a present value. The cash flow is, in turn, produced by the interaction of a company's return on equity and the annual rate of equity growth. High return on equity (ROE) companies in low-growth markets, such as Kellogg, are prodigious generators of cash flow, while low ROE companies in high-growth markets, such as Texas Instruments, barely generate enough cash flow to finance growth.
>
> A company's ROE over time, relative to its cost of equity, also determines whether it is worth more or less than its book value. If its ROE is consistently greater than the cost of equity capital (the investor's minimum acceptable return), the business is economically profitable and its market value will exceed book value. If, however, the business

> earns an ROE consistently less than its cost of equity, it is economically unprofitable and its market value will be less than book value. [14]

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

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

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

> For a given industry, more profitable firms – those able to generate higher returns per dollar of equity – should have higher market-to-book ratios. Conversely, firms which are unable to generate returns in excess of their cost of equity [(K)] should sell for less than book value. [15]

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

To assess the relationship by industry, as suggested above, I performed a regression study between estimated ROE and market-to-book ratios of the Electric Proxy Group companies. The results are presented in Figure 8. The average R-square is 0.61.[16] This demonstrates the strong positive relationship between ROEs and market-to-book ratios

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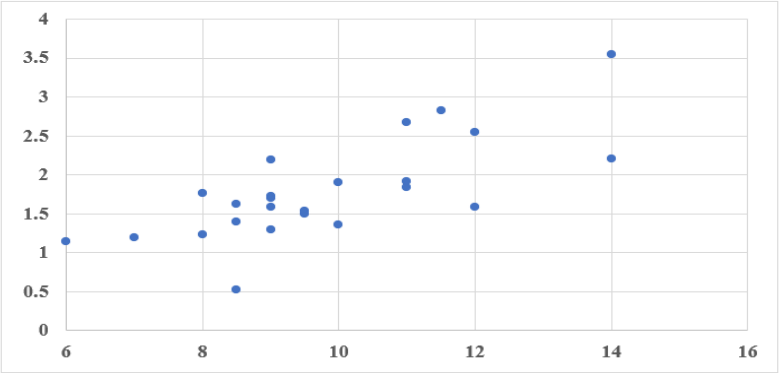
[14] James M. McTaggart, "The Ultimate Poison Pill: Closing the Value Gap," *Commentary* (Spring 1986), p. 3.

[15] Benjamin C. Esty, *Note on Value Drivers*, HARVARD BUSINESS SCHOOL BACKGROUND NOTE 297-082, April 1997.

[16] 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 0 and 1.0, with values closer to 1.0 indicating a higher relationship between two variables.

for public utilities. Given that the market-to-book ratios have been above 1.0 for a number of years, this also demonstrates that utilities have been earning ROEs above the cost of equity capital for many years.

Figure 8
The Relationship Between Expected ROE and Market-to-Book Ratios
***Value Line* Electric Utilities**



Data: *Value Line Investment Survey*, 2024
R-Square – 0.61, n=31.

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

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

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

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

Table 6 provides an assessment of investment risk for 91 industries as measured by beta, which, according to modern capital market theory, is the only relevant measure of investment risk. These betas come from the *Value Line Investment Survey*. The study shows that the investment risk of utilities is low compared to other industries.[17] The average betas for electric, gas, and water utility companies are 0.89, 0.88, and 0.82, respectively.[18] As such, the cost of equity for utilities is the lowest of all industries in the U.S., based on modern capital market theory.

[17] As I discuss in more detail below, a stock whose price movement is greater than that of the market, such as a technology stock, is riskier than the market and has a beta greater than 1.0. A stock with below-average price movement, such as that of a regulated public utility, is less risky than the market and has a beta less than 1.0.

[18] The beta for the *Value Line* electric utilities is the simple average of *Value Line*'s Electric East (0.90), Central (0.88), and West (0.91) group betas.

Table 6
Industry Average Betas*
Value Line* Investment Survey Betas*

Industry Average Betas*
Value Line Investment Survey Betas**
13-Jan-24

Rank	Industry	Beta	Rank	Industry	Beta	Rank	Industry	Beta
1	Hotel/Gaming	1.52	33	Bank	1.18	65	Railroad	1.07
2	Oilfield Svcs/Equip.	1.44	34	Heavy Truck & Equip	1.18	66	IT Services	1.05
3	Apparel	1.41	35	R.E.I.T.	1.18	67	Cable TV	1.05
4	Insurance (Life)	1.40	36	Pipeline MLPs	1.18	68	Thrift	1.04
5	Air Transport	1.39	37	Electrical Equipment	1.17	69	Information Services	1.03
6	Petroleum (Producing)	1.37	38	Med Supp Invasive	1.16	70	Retail Store	1.03
7	Petroleum (Integrated)	1.36	39	Computers/Peripherals	1.16	71	Packaging & Container	1.01
8	Office Equip/Supplies	1.36	40	Entertainment	1.16	72	Human Resources	1.00
9	Advertising	1.36	41	Computer Software	1.16	73	Investment Co.	0.99
10	Shoe	1.33	42	Chemical (Specialty)	1.15	74	Retail Building Supply	0.99
11	Metals & Mining (Div.)	1.33	43	Healthcare Information	1.15	75	Med Supp Non-Invasive	0.99
12	Public/Private Equity	1.33	44	Engineering & Const	1.15	76	Environmental	0.98
13	Homebuilding	1.30	45	Maritime	1.15	77	Educational Services	0.97
14	Building Materials	1.30	46	Automotive	1.15	78	Drug	0.94
15	Auto Parts	1.30	47	Wireless Networking	1.15	79	Telecom. Services	0.92
16	Metal Fabricating	1.28	48	Semiconductor	1.15	80	Electric Utility (West)	0.91
17	Recreation	1.28	49	Medical Services	1.14	81	Beverage	0.91
18	Steel	1.28	50	Diversified Co.	1.14	82	Trucking	0.90
19	Retail (Hardlines)	1.27	51	Chemical (Basic)	1.13	83	Electric Utility (East)	0.90
20	Natural Gas (Div.)	1.27	52	Machinery	1.13	84	Tobacco	0.89
21	Retail (Softlines)	1.26	53	E-Commerce	1.13	85	Electric Util. (Central)	0.88
22	Restaurant	1.25	54	Power	1.13	86	Natural Gas Utility	0.88
23	Furn/Home Furnishings	1.23	55	Electronics	1.12	87	Biotechnology	0.83
24	Retail Automotive	1.22	56	Toiletries/Cosmetics	1.11	88	Household Products	0.82
25	Semiconductor Equip	1.21	57	Industrial Services	1.10	89	Retail/Wholesale Food	0.82
26	Chemical (Diversified)	1.21	58	Publishing	1.09	90	Water Utility	0.82
27	Financial Svcs. (Div.)	1.20	59	Investment Co.(Foreign)	1.09	91	Food Processing	0.77
28	Internet	1.20	60	Entertainment Tech	1.08			
29	Aerospace/Defense	1.20	61	Reinsurance	1.07			
30	Oil/Gas Distribution	1.19	62	Insurance (Prop/Cas.)	1.07			
31	Paper/Forest Products	1.19	63	Telecom. Equipment	1.07			
32	Bank (Midwest)	1.18	64	Precision Instrument	1.07		Mean	1.13

* Industry averages for 92 industries using *Value Line*'s database of 1,700 companies - Updated 1-13-24.
** *Value Line* computes betas using monthly returns regressed against the New York Stock Exchange Index for five years. These betas are then adjusted as follows: *VL* Beta = [{(2/3) * Regressed Beta} + {(1/3) * (1.0)}] to account to tendency for Betas to regress toward average of 1.0. See M. Blume, "On the Assessment of Risk," *Journal of Finance*, March 1971.

Q. WHAT IS THE COST OF COMMON EQUITY CAPITAL?

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

According to valuation principles, the present value of an asset equals the discounted value of its expected future cash flows. Investors discount these expected cash flows at their required rate of return that, as noted above, reflects the time value

of money and the perceived riskiness of the expected future cash flows. As such, the cost of common equity is the rate at which investors discount expected cash flows associated with common stock ownership.

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

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

Q. HOW DID YOU ESTIMATE THE COST OF EQUITY CAPITAL FOR THE COMPANY?

A. Primarily, I rely on the DCF model to estimate the cost-of-equity capital. Given the investment-valuation process and the relative stability of the utility business, the DCF model provides the best measure of equity-cost rates for public utilities. I have also performed an analysis using the CAPM; however, I give these results less weight because I believe that risk-premium studies, of which the CAPM is one form, provide a less reliable indication of equity-cost rates for public utilities.

Q. PLEASE EXPLAIN WHY YOU BELIEVE THAT THE CAPM PROVIDES A LESS RELIABLE INDICATOR OF EQUITY COST RATES.

A. I believe that the CAPM provides a less reliable measure of a utility's equity-cost rate because it requires an estimate of the market-risk premium. As discussed below, there is a wide variation in estimates of the market-risk premium found in studies by academics and investment firms as well as in surveys of market professionals.

B. DCF Approach

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

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

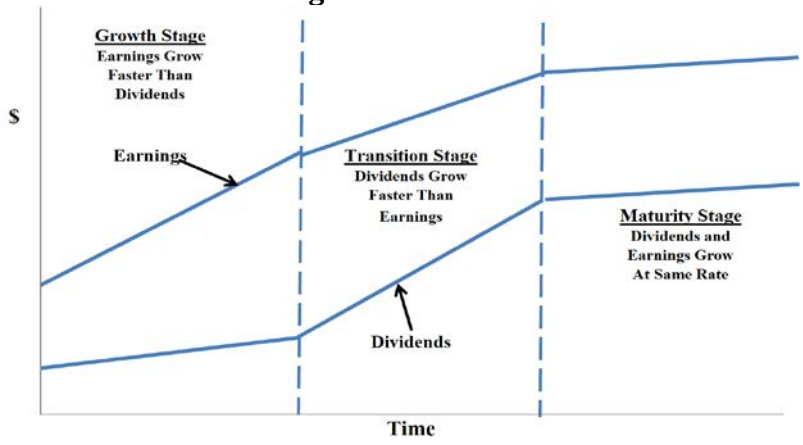
$$P = \frac{D_1}{(1+k)^1} + \frac{D_2}{(1+k)^2} + \cdots + \frac{D_n}{(1+k)^n}$$

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

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

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

Figure 9
The Three-Stage Dividend Discount Model



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

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

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

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

Q. PLEASE BRIEFLY EXPLAIN THE CONCEPT OF "PRESENT VALUE."

A. Present value is the concept that an amount of money today is worth more than that same amount in the future. In other words, money received in the future is not worth as much as an equal amount received today. Present value tells an investor how much he or she would need in today's dollars to earn a specific amount in the future.

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

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

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

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

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

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

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

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

A. One should be sensitive to several factors when using the DCF model to estimate a firm's cost of equity capital. In general, one must recognize the assumptions under

which the DCF model was developed in estimating its components (the dividend yield and the expected growth rate). The dividend yield can be measured precisely at any point in time; however, it tends to vary somewhat over time. Estimation of expected growth is considerably more difficult. One must consider recent firm performance, in conjunction with current economic developments and other information available to investors, to accurately estimate investors' expectations.

Q. WHAT DIVIDEND YIELDS HAVE YOU REVIEWED?

A. I have calculated the dividend yields for the companies in the proxy groups using the current annual dividend and the 30-day, 90-day, and 180-day average stock prices. The dividend yields for the Electric Proxy Group are provided in Panel A of page 2 of Exhibit JRW-5. For the group, the mean and median dividend yields using the 30-day, 90-day, and 180-day average stock prices range from 4.00% to 4.20%. Hence, I will use 4.10% as the dividend yield for the Electric Proxy Group. The dividend yields for the D'Ascendis Proxy Group are provided in Panel B of page 2 of Exhibit JRW-5. For the group, the mean and median dividend yields using the 30-day, 90-day, and 180-day average stock prices range from 4.20% to 4.40%. Hence, I will use 4.30% as the dividend yield for the D'Ascendis Group.

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

A. According to the traditional DCF model, the dividend yield term relates the dividend paid over the coming period to the current stock price. As indicated by Professor

Myron Gordon, who is commonly associated with the development of the DCF model for popular use, this is obtained by multiplying the expected dividend over the coming quarter by 4, and then dividing this dividend by the current stock price to determine the appropriate dividend yield for a firm that pays dividends on a quarterly basis.[19]

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

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

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

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

[19] *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).

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

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

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

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

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

A. Historical growth rates for EPS, DPS, and BVPS are readily available to investors and are presumably an important ingredient in forming expectations concerning future

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

Q. PLEASE DEFINE AND EXPLAIN THE RELEVANCE OF INTERNAL GROWTH.

A. A company's internal (or "organic") growth occurs when a business expands its own operations rather than relying on takeovers and mergers. It can come about through various means (e.g., increasing existing production capacity through investment in new capital and technology, or development and launch of new products).

Internally generated growth is a function of the percentage of earnings retained within the firm (the earnings retention rate) and the rate of return earned on those earnings (i.e., the ROE). The internal growth rate is computed as the retention rate times the ROE. Internal growth is significant in determining long-run earnings and, therefore, dividends. Investors recognize the importance of internally generated

growth and pay premiums for stocks of companies that retain earnings and earn high returns on internal investments.

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

A. Analysts' EPS forecasts for companies are collected and published by several different investment information services, including Institutional Brokers Estimate System ("I/B/E/S"), Bloomberg, FactSet, S&P Cap IQ, Zacks, First Call, and Reuters, among others. Thompson Reuters publishes analysts' EPS forecasts under different product names, including I/B/E/S, First Call, and Reuters. Bloomberg, FactSet, S&P Cap IQ, and Zacks each publish their own set of analysts' EPS forecasts for companies. These services do not reveal: (1) the analysts who are solicited for forecasts; or (2) the identity of the analysts who actually provide the EPS forecasts that are used in the compilations published by the services.

I/B/E/S, Bloomberg, FactSet, S&P Cap IQ, and First Call are fee-based services. These services usually provide detailed reports and other data in addition to analysts' EPS forecasts.

In contrast, Thomson Reuters and Zacks provide limited EPS forecast data free-of-charge on the Internet. Yahoo Finance (http://finance.yahoo.com) lists Thomson Reuters as the source of its summary EPS forecasts. Zacks (www.zacks.com) publishes its summary forecasts on its website. Zacks' estimates are also available on other websites, such as MSN.money (http://money.msn.com).

Q. ARE YOU RELYING EXCLUSIVELY ON THE EPS FORECASTS OF WALL STREET ANALYSTS IN ARRIVING AT A DCF GROWTH RATE FOR THE PROXY GROUP?

A. No. There are several issues with using the EPS growth rate forecasts of Wall Street analysts as DCF growth rates. First, the appropriate growth rate in the DCF model is the dividend growth rate, not the earnings growth rate. Nonetheless, over the very long term, dividend and earnings will have to grow at a similar growth rate. Therefore, consideration must be given to other indicators of growth, including prospective dividend growth, internal growth, as well as projected earnings growth.

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

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

[20] 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. According to random walk theory in this context, annual changes in earnings are normally distributed and are independent of each other. Therefore, the theory presumes the past movement or trend of earnings cannot be used to predict its future earnings.

biased. This has been demonstrated in a number of academic studies over the years.[21] Hence, using these growth rates as a DCF growth rate will provide an overstated equity cost rate. On this issue, a study by Peter Easton and Gregory Sommers (2007) found that optimism in analysts' growth rate forecasts leads to an upward bias in estimates of the cost of equity capital of almost 3.0 percentage points.[22]

Q. ARE ANALYSTS' PROJECTED EPS GROWTH RATES FOR ELECTRIC UTILITIES LIKEWISE OVERLY OPTIMISTIC AND UPWARDLY BIASED?

A. Yes. I have completed a study of the accuracy of analysts' EPS growth rates for electric utilities and gas distribution companies over the 1985 to 2022 time period. In the study, I used the utilities listed in the electric utilities and gas distribution companies covered by *Value Line*.

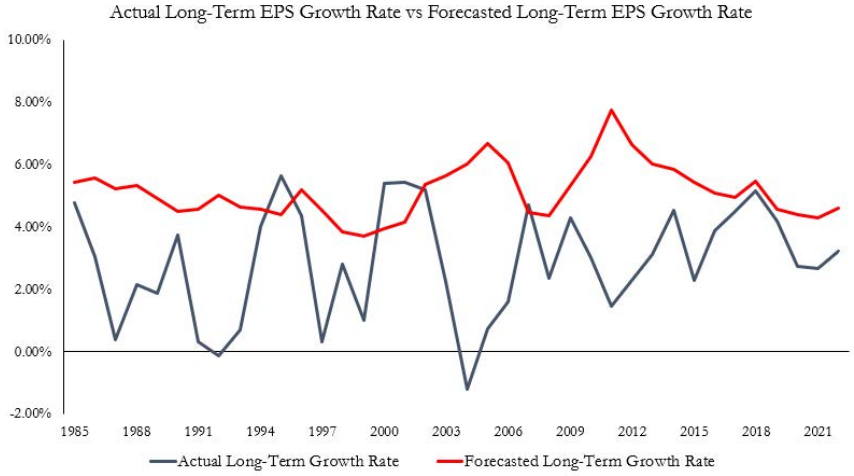
I collected the three-to-five-year projected EPS growth rate from I/B/E/S for each utility and compared that growth rate to the utility's actual subsequent three-to-five-year EPS growth rate. As shown in Figure 10, the mean forecasted EPS growth rate (depicted in the red line in Figure 10) is consistently greater than the achieved actual EPS growth rate over the time period, with the exception of short periods in

[21] 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).

[22] 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).

1996, 2001, and 2007. Over the entire period, the mean forecasted EPS growth rate is over 200 basis points above the actual EPS growth rate. As such, the projected EPS growth rates for electric utilities are overly optimistic and upwardly based.

Figure 10
Mean Forecasted vs. Actual Long-Term EPS Growth Rates
Electric Utilities and Gas Distribution Companies
1985–2022



Data Source: S&P Global Market Intelligence, Capital IQ, I/B/E/S, 2023.

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

A. Yes. A study by Andrew Szakmary, Mitchell Conover, and Carol Lancaster ("SCL") evaluated the accuracy of *Value Line*'s three-to-five-year EPS growth rate forecasts using companies in the Dow Jones Industrial Average over a 30-year time period and found these forecasted EPS growth rates to be significantly higher than the EPS growth rates that these companies subsequently achieved.[23]

SCL studied the predicted versus the projected stock returns, sales, profit margins, and earnings per share made by *Value Line* over the 1969 to 2001 time period.

[23] Szakmary, A., Conover, C., & Lancaster, C., *An Examination of* Value Line*'s Long-Term Projections*, J. BANKING & FIN., May 2008, at 820–33.

Value Line projects variables from a three-year base period (e.g., 2012 to 2014) to a future three-year projected period (e.g., 2016 to 2018). SCL used the 65 stocks included in the Dow Jones Indexes (30 Industrials, 20 Transports, and 15 Utilities). SCL found that the projected annual stock returns for the Dow Jones stocks were "incredibly over optimistic" and of no predictive value. The mean annual stock return of 20% for the Dow Jones stocks' *Value Line*'s forecasts was nearly double the realized annual stock return.

The authors also found that *Value Line*'s forecasts of earnings per share and profit margins were "strikingly over optimistic." *Value Line*'s forecasts of annual sales were higher than achieved levels, but not statistically significant. SCL concluded that the overly optimistic projected annual stock returns were attributable to *Value Line*'s upwardly biased forecasts of earnings per share and profit margins.

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

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

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

A. According to the DCF model, the equity cost rate is a function of the dividend yield and expected growth rate. Because I believe that investors are aware of the upward bias in analysts' long-term EPS growth-rate forecasts, stock prices reflect the bias. But

the DCF growth rate needs to be adjusted downward from the projected EPS growth rate to reflect the upward bias in the DCF model.

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

A. Panel A of page 3 of Exhibit JRW-5 provides the 5- and 10-year historical growth rates for EPS, DPS, and BVPS for the companies in the Electric Proxy Group, as published in the *Value Line Investment Survey*. The median historical growth measures for EPS, DPS, and BVPS for the Electric Proxy Group range from 3.5% to 5.0%, with an average of the medians of 4.3%. Panel B of page 3 of Exhibit JRW-5 provides the *Value Line* 5- and 10-year historical growth rates for EPS, DPS, and BVPS for the companies in the D'Ascendis Proxy Group. The median historical growth measures for EPS, DPS, and BVPS for the D'Ascendis Proxy Group range from 3.5% to 5.0%, with an average of the medians of 4.1%.

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

A. *Value Line's* projections of EPS, DPS, and BVPS growth for the companies in the proxy groups are shown on page 4 of Exhibit JRW-5. Due to the presence of outliers, I relied on the medians in the analysis. For the Electric Proxy Group, as shown in Panel A of page 4 of Exhibit JRW-5, the medians range from 4.0% to 6.0%, with an average of the medians of 5.0%.[24] For the D'Ascendis Proxy Group, as shown in Panel B of

[24] It should be noted that *Value Line* uses a different approach in estimating projected growth. *Value Line* does not project growth from today, but *Value Line* projects growth from a three-year base period – 2020-2022 –

page 4 of Exhibit JRW-5, the medians range from 4.3% to 6.3%, with an average of the medians of 5.3%.

Also provided on page 4 of Exhibit JRW-5 are the prospective sustainable growth rates for the companies in the proxy groups as measured by *Value Line*'s average projected retention rate and return on shareholders' equity. As noted above, sustainable growth is a significant and a primary driver of long-run earnings growth. For the Electric and D'Ascendis Proxy Groups, the median prospective sustainable growth rates are 4.1% and 3.9%, respectively.

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

A. Yahoo, Zacks, and S&P Cap IQ collect, summarize, and publish Wall Street analysts' long-term EPS growth rate forecasts for the companies in the proxy group. These forecasts are provided for the companies in the proxy groups on page 5 of Exhibit JRW-5. I have reported both the mean and median growth rates for the group. Since there is considerable overlap in analyst coverage between the two services, and not all the companies have forecasts from the different services, I have averaged the expected five-year EPS growth rates from the two services for each company to arrive at an expected EPS growth rate for each company. As shown in Panel A of page 5 of Exhibit JRW-5, the mean/median of analysts' projected EPS growth rates for the Electric Proxy Group

to a projected three-year period for the period 2026-2028. Using this approach, the three-year base period can have a significant impact on the *Value L*ine growth rate if this base period includes years with abnormally high or low earnings. Therefore, I evaluate these growth rates separately from analysts EPS growth rates.

are 5.9%/6.0%. The mean/median of analysts' projected EPS growth rates for the D'Ascendis Proxy Group, as shown in Panel B of page 5 of Exhibit JRW-5, are 6.0/6.2%.

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

A. Page 6 of Exhibit JRW-5 shows the summary DCF growth rate indicators for the proxy group.

The historical growth rate indicators for the Electric Proxy Group imply a baseline growth rate of 4.3%. The average of the projected EPS, DPS, and BVPS growth rates from *Value Line* is 5.0%, and *Value Line*'s projected sustainable growth rate is 4.1%. The mean/median projected EPS growth rates of Wall Street analysts for the Electric Proxy Group are 5.9%/6.0% (average = 5.95%) as measured by the mean and median growth rates. The overall range for the projected growth-rate indicators (ignoring historical growth) is 4.10% to 5.95%, and the average of the three projected growth rates is 5.00% (4.1%, 5.0%, and 5.95%). Giving more weight to the projected growth rates of Wall Street analysts and *Value Line*, but recognizing the upward bias nature of these forecasts, I believe that the appropriate projected growth rate is in the range of 5.00% to 5.95%. Given this range, I will use 5.50%, which is the midpoint of the range, for my DCF growth rate for the Electric Proxy Group. This growth rate figure is in the upper end of the range of historic and projected growth rates for the Electric Proxy Group.

For the D'Ascendis Proxy Group, the historical growth rate indicators suggest a growth rate of 4.10%. The average of the projected EPS, DPS, and BVPS growth rates from *Value Line* is 5.3%, and *Value Line*'s projected sustainable growth rate is 3.9%. The projected EPS growth rates of Wall Street analysts are 6.0% and 6.2% (average = 6.1%) as measured by the mean and median growth rates. The overall range for the projected growth-rate indicators (ignoring historical growth) is 3.90% to 6.10%, and the average of the three projected growth rates is 5.10% (5.3%, 3.9%, and 6.1%). Again, giving more weight to the projected EPS growth rate of Wall Street analysts but recognizing the upward bias nature of these forecasts, I believe that the appropriate DCF growth rate range is 5.10% to 6.10%. Given these figures, I will use the midpoint of this range, 5.60%, as the DCF growth rate for the D'Ascendis Proxy Group. As with the Electric Proxy Group, this growth rate figure is in the upper end of the range of historic and projected growth rates for the D'Ascendis Proxy Group.

Q. WHAT ARE THE RESULTS FROM YOUR APPLICATION OF THE DCF MODEL?

A. My DCF-derived equity cost rate for the group is summarized on page 1 of Exhibit JRW-5 and in Table 7.

Table 7
DCF-derived Equity Cost Rate/ROE

	Dividend Yield	1 + ½ Growth Adjustment	DCF Growth Rate	Equity Cost Rate
Electric Proxy Group	**4.10%**	**1.02725**	**5.50%**	**9.70%**
D'Ascendis Proxy Group	**4.30%**	**1.02800**	**5.60%**	**10.00%**

The result for the Electric Proxy Group is the 4.10% dividend yield, times the 1 + ½ growth adjustment of 1.02725, plus the DCF growth rate of 5.45%, which results in an equity cost rate of 9.70%. The result for the D'Ascendis Proxy Group is the 4.30% dividend yield, times the 1 + ½ growth adjustment of 1.02800, plus the DCF growth rate of 5.60%, which results in an equity cost rate of 10.00%.

C. Capital Asset Pricing Model ("CAPM")

Q. PLEASE DISCUSS THE CAPM.

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

$$k = R_f + RP$$

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

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

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

Where:

K represents the estimated rate of return on the stock;

$E(R_m)$ represents the expected return on the overall stock market (frequently, the 'market' refers to the S&P 500);

(R_f) represents the risk-free rate of interest;

[E(R_m) - (R_f)] represents the expected equity or market risk premium—the excess return that an investor expects to receive above the risk-free rate for investing in risky stocks; and

Beta—(ß) is a measure of the systematic risk of an asset.

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

Q. PLEASE DISCUSS EXHIBIT JRW-6.

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

Q. PLEASE DISCUSS THE RISK-FREE INTEREST RATE.

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

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

A. As shown on page 2 of Exhibit JRW-6, the yield on 30-year U.S. Treasury bonds has been in the 1.3% to 5.00% range over the 2010–2024 time period. The current 30-year Treasury yield is above the average of this range. Kroll, a division of the investment firm Duff & Phelps, recommends using a normalized risk-free interest rate.[25] Currently, Kroll is recommending a normalized risk-free interest rate of 3.50%, or, if the spot 20-year Treasury yield is above 3.50%, Kroll recommends using the spot 20-year Treasury yield.

However, it has also noted these yields are distorted currently: "We are aware of lack of liquidity issues in the U.S. Treasury market for the 20-year maturity, which is causing some distortion in the 20-year yield relative to that observed for 10- and 30-year maturities."[26] The illiquidity and resulting yield distortion has also been highlighted in the financial press.[27] As shown in Figure 5 (page 16), the yield curve is currently inverted with a yield "hump" at the 20-year mark. The current 30-year Treasury yield is in the 4.50% - 4.75% range. Given the recent range of yields, I am using 4.65% as the risk-free rate, or R_f, in my CAPM.

Q. DOES THE 4.65% RISK-FREE INTEREST RATE TAKE INTO CONSIDERATION FORECASTS OF HIGHER INTEREST RATES?

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[25] Kroll, *Cost of Capital Resource Center* (2023). https://www.kroll.com/en/insights/publications/cost-of-capital/recommended-us-equity-risk-premium-and-corresponding-risk-free-rates.

[26] *Id.*

[27] For example, see Duguid and Smith, "The market is just dead - Investors steer clear of 20-year Treasuries," *Financial Times*, July 22, 2022.

A. No. The 4.65% risk-free interest rate takes into account the range of interest rates in the past and effectively synchronizes the risk-free rate with the market risk premium. The risk-free rate and the market risk premium are interrelated in that the market risk premium is developed in relation to the risk-free rate. As discussed below, my market risk premium is based on the results of many studies and surveys that have been published over time.

Q. PLEASE DISCUSS BETAS IN THE CAPM.

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

As shown on page 3 of Exhibit JRW-6, the slope of the regression line is the stock's beta. A steeper line indicates that the stock is more sensitive to the return on the overall market. This means that the stock has a higher beta and greater-than-average market risk. A less steep line indicates a lower beta and less market risk. Several online investment information services, such as Yahoo and Reuters, provide estimates of stock betas. Usually these services report different betas for the same stock. The differences are usually due to: (1) the time period over which beta is measured; and (2)

any adjustments that are made to reflect the fact that betas tend to regress to 1.0 over time.

Q. PLEASE DISCUSS THE 2020 CHANGE IN BETAS.

A. I have traditionally used the betas as provided in the *Value Line Investment Survey*. As discussed above, the betas for utilities recently increased significantly as a result of the volatility of utility stocks during the stock market meltdown associated with the novel coronavirus in March 2020. Utility betas as measured by *Value Line* have been in the 0.55 to 0.70 range for the past 10 years. But utility stocks were much more volatile relative to the market in March and April of 2020, and this resulted in an increase of above 0.30 to the average utility beta.

Value Line defines their computation of beta in the following manner:[28]

> Beta - A relative measure of the historical sensitivity of a stock's price to overall fluctuations in the New York Stock Exchange Composite Index. A Beta of 1.50 indicates a stock tends to rise (or fall) 50% more than the New York Stock Exchange Composite Index. The ''Beta coefficient'' is derived from a regression analysis of the relationship between weekly 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. The Betas are adjusted for their long-term tendency to converge toward 1.00.

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

1. *Value Line* betas are computed using weekly returns, and the volatility of utility stocks during March 2020 was impacted by using weekly and not monthly returns.

[28] https://www.valueline.com/investment-education/glossary/b.

Yahoo Finance uses five years of monthly returns to compute betas, and Yahoo Finance's betas for utilities are lower than *Value Lin*e's.

2. *Value Line* betas are computed using the New York Stock Exchange Index as the market. While about 3,000 stocks trade on the NYSE, most technology stocks are traded on the NASDAQ or the over-the-counter market and not the NYSE. Technology stocks, which make up about 25% of the S&P 500, tend to be more volatile. If they were traded on the NYSE, they would increase the volatility of the measure of the market and thereby lower utility betas.

3. Major vendors of CAPM betas such as Merrill Lynch, *Value Line,* and Bloomberg publish adjusted betas. The so-called Blume adjustment cited by *Value Line* adjusts betas calculated using historical returns data to reflect the tendency of stock betas to regress toward 1.0 over time, which means that the betas of typical low beta stocks tend to increase toward 1.0, and the betas of typical high beta stocks tend to decrease toward 1.0.[29]

The Blume adjustment procedure is:

Regressed Beta = .67 * (Observed Beta) + 0.33

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

Regressed Beta = .67 * (0.50) + 0.33 = 0.67

Blume offered two reasons for betas to regress toward 1.0. First, he suggested it may be a by-product of management's efforts to keep the level of firm's systematic risk

[29] M. Blume, *On the Assessment of Risk*, J. OF FIN. (Mar. 1971).

close to that of the market. He also speculated that it results from management's efforts to diversify through investment projects.

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

A. In the past, I have used *Value Line* betas exclusively. However, given the discussion above, I am also using betas published by S&P Capital IQ. S&P Capital IQ computes betas over a five-year period using monthly returns and the S&P 500 as the market return. S&P Capital IQ does not use the Blume adjustment, but I have included that adjustment in my analysis. As shown on page 3 of Exhibit JRW-6, I have averaged the *Value Line* betas and my adjusted S&P Capital IQ for the proxy groups. The median betas for the Electric and D'Ascendis Proxy Groups are 0.80 and 0.80, respectively.

Q. PLEASE DISCUSS THE MARKET RISK PREMIUM.

A. The market risk premium is equal to the expected return on the stock market (e.g., the expected return on the S&P 500, $E(R_m)$ minus the risk-free rate of interest (R_f)). The market risk premium is the difference in the expected total return between investing in equities and investing in "safe" fixed-income assets, such as long-term government bonds. However, while the market risk premium is easy to define conceptually, it is difficult to measure because it requires an estimate of the expected return on the market—$E(R_m)$. As I discuss below, there are different ways to measure $E(R_m)$, and studies have come up with significantly different magnitudes for $E(R_m)$. As Merton

Miller, the 1990 Nobel Prize winner in economics, indicated, $E(R_m)$ is very difficult to measure and is one of the great mysteries in finance.[30]

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

A. Page 4 of Exhibit JRW-6 highlights the primary approaches to, and issues in, estimating the expected market risk premium. The traditional way to measure the market risk premium was to use the difference between historical average stock and bond returns. In this case, historical stock and bond returns, also called *ex post* returns, were used as the measures of the market's expected return (known as the *ex ante* or forward-looking expected return). This type of historical evaluation of stock and bond returns is often called the "Ibbotson approach" after Professor Roger Ibbotson, who popularized this method of using historical financial market returns as measures of expected returns. However, this historical evaluation of returns can be a problem because: (1) *ex post* returns are not the same as *ex ante* expectations; (2) market risk premiums can change over time, increasing when investors become more risk-averse and decreasing when investors become less risk-averse; and (3) market conditions can change such that *ex post* historical returns are poor estimates of *ex ante* expectations.

The use of historical returns as market expectations has been criticized in numerous academic studies, which I discuss later. The general theme of these studies is that the large equity risk premium discovered in historical stock and bond returns cannot be justified by the fundamental data. These studies, which fall under the

[30] Merton Miller, *The History of Finance: An Eyewitness Account*, J. APPLIED CORP. FIN., 3 (2000).

category "*ex ante* models and market data," compute *ex ante* expected returns using market data to arrive at an expected equity risk premium. These studies have also been called "puzzle research" after the famous study by Rajnish Mehra and Edward Prescott in which the authors first questioned the magnitude of historical equity risk premiums relative to fundamentals.[31]

In addition, there are a number of surveys of financial professionals regarding the market risk premium, as well as several published surveys of academics on the equity risk premium. Duke University has published a CFO Survey on a quarterly basis for over 10 years.[32] Questions regarding expected stock and bond returns are also included in the Federal Reserve Bank of Philadelphia's annual survey of financial forecasters, which is published as the *Survey of Professional Forecasters*.[33] This survey of professional economists has been published for almost 50 years. In addition, Pablo Fernandez conducts annual surveys of financial analysts and companies regarding the equity risk premiums used in their investment and financial decision making.[34]

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[31] Rajnish Mehra & Edward C. Prescott, *The Equity Premium: A Puzzle*, J. MONETARY ECON. 145 (1985).

[32] *The CFO Survey*, DUKE UNIVERSITY, https://www.richmondfed.org/cfosurvey.

[33] *Survey of Professional Forecasters*, FEDERAL RESERVE BANK OF PHILADELPHIA (Feb. 10, 2023), https://www.philadelphiafed.org/-/media/frbp/assets/surveys-and-data/survey-of-professional-forecasters/2020/spfq120.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.

[34] Pablo Fernandez, Teresa Garcia, and Pablo Acín, SURVEY: MARKET RISK PREMIUM AND RISK-FREE RATE USED FOR 80 COUNTRIES IN 2023, IESE BUSINESS SCHOOL WORKING PAPER (April 4, 2023).

Q. PLEASE HIGHLIGHT THE RESULTS OF THE ACADEMIC AND PROFESSIONAL STUDIES DISCUSSING THE MARKET RISK PREMIUM.

A. Richard Derrig and Elisha Orr, Pablo Fernandez, and Zhiyi Song completed the most comprehensive reviews of the research on the market risk premium.[35] Derrig and Orr's study evaluated the various approaches to estimating market risk premiums, discussed the issues with the alternative approaches, and summarized the findings of the published research on the market risk premium. Fernandez examined four alternative measures of the market risk premium – historical, expected, required, and implied. He also reviewed the major studies of the market risk premium and presented the summary market risk premium results. Song provided an annotated bibliography and highlighted the alternative approaches to estimating the market risk premium.

Page 5 of Exhibit JRW-6 provides a summary of the results of the market risk premium studies that I have reviewed. These include the results of: (1) the various studies of the historical risk premium: (2) *ex ante* market risk premium studies; (3) market risk premium surveys of CFOs, financial forecasters, analysts, companies, and academics; and (4) the building blocks approach to the market risk premium. There are results reported for over 30 studies, and the median market risk premium of these studies is 4.64%.

[35] *See* Richard Derrig & Elisha Orr, *Equity Risk Premium: Expectations Great and Small (Version 3.0)*, Aug. 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 (The CFA Institute Research (2007).

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

A. The studies cited on page 5 of Exhibit JRW-6 include every market risk premium study and survey I could identify that was published over the past 20 years and that provided a market risk premium estimate. Many of these studies were published prior to the financial crisis that began in 2008. In addition, some of these studies were published in the early 2000s at the market peak. It should be noted that many of these studies (as indicated) used data over long periods of time (as long as 50 years of data) and so were not estimating a market risk premium as of a specific point in time (e.g., the year 2001). To assess the effect of the earlier studies on the market risk premium, I have reconstructed page 5 of Exhibit JRW-6 on page 6 of Exhibit JRW-6; however, I have eliminated all studies dated before January 2, 2010. The median market risk premium estimate for this subset of studies is 5.23%.

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

A. As noted above, there are three approaches to estimating the market risk premium: (1) historic stock and bond returns; (2) *ex ante* or expected returns models; and (3) surveys. The studies on page 6 of Exhibit JRW-6 can be summarized in the following manner:

Historic Stock and Bond Returns: Historic stock and bond returns suggest a market risk premium in the 4.40% to 6.80% range, depending on whether one uses arithmetic or geometric mean returns.

***Ex Ante* Models**: Market risk-premium studies that use expected or *ex ante* return models indicate a market risk premium in the range of 2.61% to 6.00%.

Surveys: Market risk premiums developed from surveys of analysts, companies, financial professionals, and academics are lower, with a range from 3.40% to 5.70%.

Building Block: The mean reported market risk premiums reported in studies using the building blocks approach range from 3.00% to 5.21%.

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

A. I will highlight several studies and surveys.

First, Pablo Fernandez conducts annual surveys of financial analysts and companies regarding the equity risk premiums used in their investment and financial decision-making.[36] His survey results are included on pages 5 and 6 of Exhibits JRW-6. The results of his 2024 survey of academics, financial analysts, and companies, which included 4,000 responses, indicated a mean market risk premium employed by U.S. analysts and companies of 5.5%.[37] His estimated market risk premium for the U.S. has been in the 5.00% to 5.70% range in recent years.

Second, 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.[38] His estimated market risk premium has been in the range of 4.0% to 6.0% since 2010. As shown in Figure 11 as of May 1, 2024, Damodaran's estimate of the equity risk premium was 4.15%.[39]

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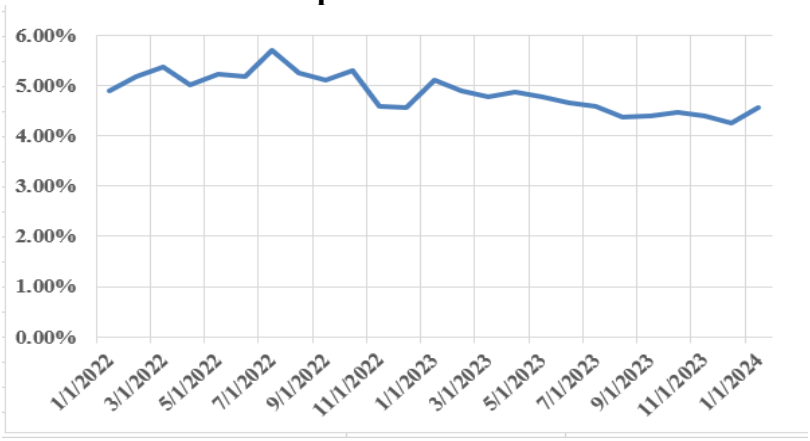
[36] Pablo Fernandez, Teresa Garcia, & Pablo Acín, *Survey: Market Risk Premium and Risk-Free Rate Used for 80 Countries in 2024, IESE Business School Working Paper* (March 2024).

[37] *Id.* at 3.

[38] Aswath Damodaran, *Damodaran Online*, N.Y. Univ https://pages.stern.nyu.edu/~adamodar/

[39] *Id.* On August 12, 2023, Professor Damodaran appeared on CNBC to discuss the equity risk premium. *See* CNBC Television, *Equity Risk Premium is Core to Understanding Long-Term Market Returns, says NYU Aswath Damodaran*, YouTube https://www.youtube.com/watch?v=VPkQ7_3Sf1E (last visited Apr. 24,

Figure 11
Damodaran Implied Market Risk Premium



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

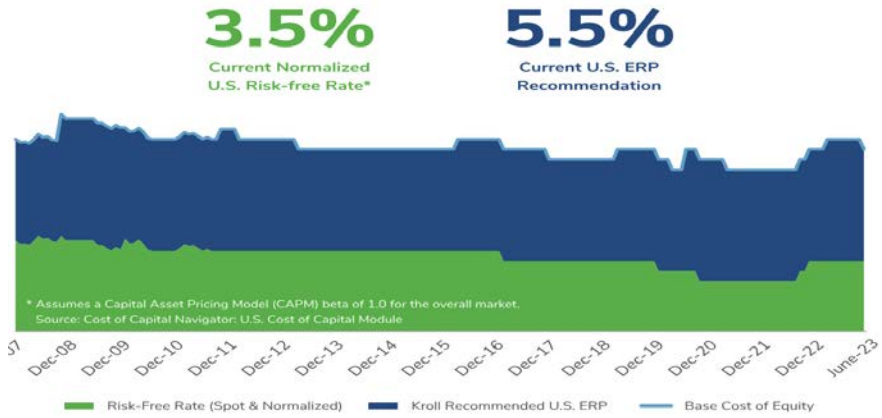
Next, as explained previously, Kroll provides recommendations for the normalized risk-free interest rate and market risk premiums to be used in calculating the cost-of-capital data. Its recommendations over the 2008 to 2023 period are shown on page 7 of Exhibit JRW-6 and are also depicted graphically in Figure 12 below. Over the past decade, Kroll's recommended normalized risk-free interest rates have been in the 2.50% to 4.50% range, and market risk premiums have been in the 5.0% to 6.0% range. In early 2020, in the wake of the emergence of COVID-19, Kroll decreased its recommended normalized risk-free interest rate from 3.0% to 2.50% and increased its market risk premium from 5.00% to 6.00%.[40] Subsequently, on December 9, 2020, Kroll reduced its recommended market risk premium to 5.50%, and on October 18, 2022, Kroll increased its market risk premium to 6.00%. Most recently, on June 8,

2024)).

[40] The following summary may be found at:https://www.kroll.com/en/insights/publications/cost-of-capital/recommended-us-equity-risk-premium-and-corresponding-risk-free-rates.

2023, Kroll again reduced its market risk premium to 5.50%. This recommendation was reaffirmed on February 8, 2024.[41]

Figure 12
Kroll
Normalized Risk-Free Rate and Market Risk Premium Recommendations
2007–2024



Source:https://www.kroll.com/en/insights/publications/cost-of-capital/recommended-us-equity-risk-premium-and-corresponding-risk-free-rates.

Fourth, Dr. David Kelly, the Chief Global Strategist at *J.P. Morgan Asset Management*, is one of the best-known market strategists on Wall Street. His annual publication and their monthly updates, the *JP Morgan Guide to the Markets*, is a must-read guide for stockbrokers and financial professionals.[42] In presenting their annual expectations for the markets, JP Morgan provides details about inputs and assumptions of expected market returns. In its 2023 update, JP Morgan details the 2023 expected long-term stock market return of 7.90%, bond yield of 3.50%, and resulting market risk premium of 4.40%.[43]

[41] *Id.*

[42] JP Morgan, *2023 Long-Term Capital Market Assumptions*, 70 (2023). (Provided in Dr. Woolridge's work papers.

[43] *Id.*

Finally, KPMG, the international accounting firm, regularly publishes an update to their market risk premium to be used in their valuation practice. KPMG's market risk premium is shown in Figure 13, which was as high as 6.75% in 2020, and was lowered to as low as 5.00% on September 30, 2021. KPMG increased its market risk premium to 6.00% on June 30, 2022, but lowered it to 5.75% on December 31, 2022, to 5.50% on March 31, 2023, to 5.25% on June 30, 2023, and to 5.00% on September 30, 2023.[44]

Figure 13
KPMG
Market Risk Premium Recommendations
2020–2023

https://indialogue.io/clients/reports/public/5d9da61986db2894649a7ef2/5d9da63386db2894649a7ef5

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

A. The studies on page 6 of Exhibit JRW-6 and, more importantly, the more timely and relevant studies cited in the previous section, suggest that the appropriate market risk premium in the U.S. is in the 4.0% to 6.0% range. In the last year, as interest rates have

[44] *KPMG Corporate Finance & Valuations NL Recommends A MRP of 5.0% as per March 31, 2024*, KMPG (Mar. 31, 2024). https://indialogue.io/clients/reports/public/5d9da61986db2894649a7ef2/5d9da63386db2894649a7ef5.

increased, estimates of the market risk premium have declined. I give most weight to the market risk-premium estimates of Kroll, KPMG, JP Morgan, Damodaran, and the Fernandez and Duke-CFO surveys. Given the recent estimates, I believe a market risk premium in the 5.00% to 5.50% range is appropriate. I use the midpoint of this range, 5.25%, as the market risk premium in my CAPM study.

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

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

Table 8

CAPM-derived Equity Cost Rate/ROE

$$K = (R_f) + ß * [E(R_m) - (R_f)]$$

	Risk-Free Rate	Beta	Equity Risk Premium	Equity Cost Rate
Electric Proxy Group	**4.65%**	**0.80**	**5.25%**	**8.85%**
D'Ascendis Proxy Group	**4.65%**	**0.80**	**5.25%**	**8.85%**

For the Proxy Group, the risk-free rate of 4.65% plus the product of the beta of 0.80 times the equity risk premium of 5.25% results in an 8.85% equity cost rate. For the D'Ascendis Proxy Group, the risk-free rate of 4.65% plus the product of the beta of 0.80 times the equity risk premium of 5.25% results in an 8.85% equity cost rate.

D. Equity Cost Rate Summary

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

A. Table 9 provides my DCF and CAPM analyses for the proxy groups.

Table 9
ROEs Derived from DCF and CAPM Models

	DCF	CAPM
Electric Proxy Group	**9.70%**	**8.85%**
D'Ascendis Proxy Group	**10.00%**	**8.85%**

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

A. My analysis indicates an equity cost rate in the range of 8.85% to 10.00% is appropriate for the Company. Given that I rely primarily on the DCF model and the results for the Electric Proxy Group, I believe that the appropriate ROE range for the Company is in the 9.25%-9.75% range. Given further that TECO's investment risk is a little below the average of the two groups, and I have employed a capital structure that has much more common equity and less financial risk than the average of the two proxy groups as well as TECO's parent, Emera, I am recommending a ROE of 9.50% for the Company.

Q. PLEASE INDICATE WHY AN EQUITY COST RATE OF 9.50% IS APPROPRIATE FOR TECO.

A. There are a few reasons why an equity cost rate of 9.50% is appropriate and fair for the Company in this case:

1. As shown in Table 6, the electric utility industry is among the lowest risk industries in the U.S. as measured by beta. As such, the cost of equity capital for this industry is amongst the lowest in the U.S., according to the CAPM.

2. The investment risk of TECO, as indicated by the Company's S&P credit ratings, is slightly below the average of the two proxy groups.

3. The authorized ROEs for electric utility companies were 9.44% in 2020, 9.38% in 2021, 9.54% in 2022, 9.60% in 2023, and 9.66% in the first quarter of 2024.[45] While interest rates have increased coming out of the pandemic, which led to record low authorized ROEs for utilities, I show that authorized ROEs for utilities never declined as much as interest rates in 2020 and 2021. In addition, as discussed on pages 21-3, the Werner and Jarvis study concluded that, over the past four decades, authorized ROEs have not declined in line with capital costs over time, so past authorized ROEs have overstated the actual cost of equity capital. Hence, the Commission should not be concerned that my recommended ROE is below other authorized ROEs.

Q. DO YOU BELIEVE THAT YOUR 9.50% ROE RECOMMENDATION MEET THE *HOPE* AND *BLUEFIELD* STANDARDS?

A. Yes, I do. As I previously noted, according to the *Hope* and *Bluefield* decisions, returns on capital should be: (1) comparable to returns investors expect to earn on other investments of similar risk; (2) sufficient to assure confidence in the company's financial integrity; and (3) adequate to maintain and support the company's credit and to attract capital. As page 3 of Exhibit JRW-2 shows, electric utility and gas distribution companies have been earning in the 8.0% to 10.0% range in recent years. While my recommendation is slightly below the average authorized ROEs for electric distribution companies, it reflects the downward trend in authorized and earned ROEs of utilities. In addition, as discussed above, the Werner and Jarvis study demonstrated that authorized ROEs over the past four decades have not declined in line with capital costs,

[45] *S*&P Global Market Intelligence, RRA *Regulatory Focus*, 2024.

so past authorized ROEs have overstated the actual cost of equity capital. Therefore, I believe that my ROE recommendation meets the criteria *Hope* and *Bluefield* established.

VI. CRITIQUE OF TECO'S RATE OF RETURN TESTIMONY

Q. PLEASE SUMMARIZE THE COMPANY'S PROPOSED RATE OF RETURN RECOMMENDATION.

A. The Company's rate-of-return recommendation is summarized on page 1 of Exhibit JRW-7. TECO has proposed a capital structure from investor-provided capital of 42.57% long-term debt, 3.90% short-term debt, and 54.00% common equity and long-term and short-term debt cost rates of 4.53% and 3.90%. TECO witness Mr. D'Ascendis has recommended a common equity cost rate of 11.50% for TECO.

Q. PLEASE REVIEW MR. D'ASCENDIS' EQUITY COST RATE APPROACHES AND RESULTS.

A. Mr. D'Ascendis has developed a proxy group of electric utility companies and employs DCF, risk premium, and CAPM models. He also applies these models to a group of non-price regulated companies. Mr. D'Ascendis' equity-cost-rate estimates for TECO are summarized on page 2 of Exhibit JRW-7. Based on these figures, he concludes that the appropriate equity-cost rate is 11.50% for TECO's electric utility operations.

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

A. As I discuss above, the primary issues related to the Company's rate of return include the following: (1) capital market conditions; (2) the capital structure; (3) DCF Approach; (4) CAPM Approach; (5) risk premium approach; (6) equity cost models applied to non-price regulated companies; and (7) other factors notably a flotation cost adjustment.

The capital market conditions, capital structure, and other factors were previously discussed. I address the remaining items below.

A. DCF Approach

Q. PLEASE SUMMARIZE MR. D'ASCENDIS' DCF ESTIMATES.

A. On pages 28-31 of his testimony and in Document No. 4, Mr. D'Ascendis develops an equity cost rate by applying the DCF model to his electric group. Mr. D'Ascendis' DCF results are summarized on page 2 of Exhibit JRW-7. In the traditional DCF approach, the equity cost rate is the sum of the dividend yield and expected growth. Mr. D'Ascendis computes his dividend yield using the 60-day average stock price for the proxy companies. For the DCF growth rate, Mr. D'Ascendis uses three measures of projected EPS growth: the projected EPS growth of Wall Street analysts as compiled by Yahoo Finance, Zack's, *Value Line*. He reports a DCF equity cost rate of 9.89% for his electric group.

Q. WHAT ARE THE ERRORS IN MR. D'ASCENDIS' DCF ANALYSES?

A. There are several issues with Mr. D'Ascendis' DCF study. First and foremost, he gives very little weight to his DCF results in his final analysis and recommendation. Secondly, he relies exclusively on the overly-optimistic and upwardly-biased earnings per share ("EPS") growth-rate forecasts of Wall Street analysts and *Value Line*.

1. The Low Weight Given the DCF Results and the Reported DCF Results

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

A. Apparently, very little, if any. The average of his mean constant-growth DCF equity cost rates is only 9.89% for his electric group. Had he given his DCF results more weight, he would have arrived at a significantly lower recommendation for his estimated cost of equity.

2. Exclusive Reliance on Analysts' EPS Growth-Rate Forecasts

Q. PLEASE REVIEW MR. D'ASCENDIS' DCF GROWTH RATE.

A. In his constant-growth DCF model, Mr. D'Ascendis' DCF growth rate is the average of the projected EPS growth-rate forecasts of Wall Street analysts as compiled by Yahoo Finance, Zack's, and *Value Line*.

Q. WHAT IS THE EFFECT OF MR. D'ASCENDIS' EXCLUSIVE RELIANCE ON THE PROJECTED GROWTH RATES OF WALL STREET ANALYSTS AND *VALUE LINE*?

A. Mr. D'Ascendis' exclusive reliance on the projected growth rates published by Wall Street analysts and *Value Line* inflates his estimates of growth rates. It seems highly unlikely that investors today would rely exclusively on the EPS growth-rate forecasts of Wall Street analysts and *Value Line* and ignore other growth-rate measures in arriving at their expected growth rates for equity investments.

As I previously stated, the appropriate growth rate in the DCF model is the dividend growth rate rather than the earnings growth rate. Hence, consideration must be given to other indicators of growth, including historical prospective dividend growth, internal growth, as well as projected earnings growth. Due to the inaccuracy of analysts' long-term-earnings growth-rate forecasts, the weight given to analysts' projected EPS growth rates should be limited.

Finally, not only are those forecasts inaccurate but they also are overly optimistic and upwardly biased. I have provided a discussion of this issue on pages 48 to 52 of this testimony and report on a study I conducted in Figure 10. Using the electric utilities and gas distribution companies covered by *Value Line*, this study demonstrates that *Value Line's* mean forecasted EPS growth rates are consistently greater than the achieved actual EPS growth rates over the 1985-2022 time period. Over the entire period, the mean forecasted EPS growth rate is over 200 basis points above the actual EPS growth rate. As such, the projected EPS growth rates for utilities are overly optimistic and upwardly based. Hence, exclusively using these growth rates as a measure of the DCF growth rate produces an overstated equity-cost rate. I also highlighted a study by Szakmary, Conover, and Lancaster (2008) who evaluated the accuracy of *Value Line*'s three-to-five-year EPS growth rate forecasts using companies

in the Dow Jones Industrial Average over a thirty-year time period and found these forecasted EPS growth rates to be significantly higher than the EPS growth rates that these companies subsequently achieved.[46]

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

A. No. A number of studies I cite above demonstrate the upward bias has continued despite changes in regulations and reporting requirements over the past two decades. This observation is supported further by a 2010 McKinsey study entitled "Equity Analysts: Still Too Bullish," which involved a study of the accuracy of analysts' long-term EPS growth rate forecasts. The authors conclude that, after a decade of stricter regulation, analysts' long-term earnings forecasts continue to be excessively optimistic. They made the following observation:[47]

> Alas, a recently completed update of our work only reinforces this view—despite a series of rules and regulations, dating to the last decade, that were intended to improve the quality of the analysts' long-term earnings forecasts, restore investor confidence in them, and prevent conflicts of interest. For executives, many of whom go to great lengths to satisfy Wall Street's expectations in their financial reporting and long-term strategic moves, this is a cautionary tale worth remembering. This pattern confirms our earlier findings that analysts typically lag behind events in revising their forecasts to reflect new economic conditions. When economic growth accelerates, the size of the forecast error declines; when economic growth slows, it increases. So as economic growth cycles up and down, the actual earnings S&P 500 companies report occasionally coincide with the analysts' forecasts, as they did, for example, in 1988, from 1994 to 1997, and from 2003 to 2006. *Moreover, analysts have been persistently overoptimistic for the*

[46] Szakmary, A., Conover, C., & Lancaster, C., *An Examination of* Value Line*'s Long-Term Projections*, J. BANKING & FIN., May 2008, at 820–33.

[47] Marc H. Goedhart, Rishi Raj, and Abhishek Saxena, *Equity Analysts, Still Too Bullish*, McKinsey on Fin., 14–17, (Spring 2010) (emphasis added).

> *past 25 years, with estimates ranging from 10 to 12 percent a year, compared with actual earnings growth of 6 percent. Over this time frame, actual earnings growth surpassed forecasts in only two instances, both during the earnings recovery following a recession. On average, analysts' forecasts have been almost 100 percent too high.*

This is the same observation made in a *Bloomberg Businessweek* article.[48] The author concluded:

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

B. Risk-Premium Approach

Q. PLEASE DISCUSS MR. D'ASCENDIS' RISK-PREMIUM ("RPM") APPROACH.

A. On pages 31-51 of his testimony and in Document No. 5, Mr. D'Ascendis develops an equity cost rate by using the RPM model. Mr. D'Ascendis reports an RPM equity cost rate of 11.47% for his electric group. For the electric group, the 11.47% RPM estimate is based on an RPM ROE of 11.48% using his own Predictive Risk Premium Model ("PRPM") and an RPM ROE of 11.47% using his Risk Premium Using an Adjusted Total Market Approach ("RPATM"). For the electric group, the PRPM uses a prospective A2 utility bond yield of 5.63% plus a PRPM risk premium of 5.67%. The RPATM approach uses an adjusted utility bond yield of 5.63% plus a risk premium of 5.66%.

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

Q. WHAT IS THE PRIMARY ERROR IN MR. D'ASCENDIS' RPM ANALYSIS?

A. The primary error is the excessive magnitude of the risk premiums used by Mr. D'Ascendis which is caused by his use of historical and projected stock and bond-market returns.

Q. PLEASE DISCUSS THE VARIOUS RISK PREMIUMS DEVELOPED BY MR. D'ASCENDIS.

A. Table 10 provides a summary of the six risk premiums developed by Mr. D'Ascendis. The first three approaches use historic stock and bond returns to develop a risk premium and the second three approaches use projected stock returns and risk premiums.

Q. PLEASE INITIALLY IDENTIFY THE OTHER ERRORS IN THE RISK PREMIUMS IN MR. D'ASCENDIS' PRPM ANALYSIS AS WELL AS THE OTHER SIX RISK-PREMIUM STUDIES THAT HE CONDUCTS.

A. There are two primary errors with Mr. D'Ascendis' PRPM and his six other risk-premium studies:

(A) the PRPM and risk-premium studies (1) – (3) listed below in Table 10 are based on historic stock and bond returns/yields, and as discussed below, there are numerous well-known empirical issues with using historical returns to estimate a projected risk premium; and

(B) risk-premium studies (4) – (6) listed below in Table 10 develop risk premiums using projected stock-market returns.

The primary issue with these latter three approaches is that the expected market returns are totally unrealistic and are based on excessive corporate earnings and economic growth rates.

Table 10
D'Ascendis Equity Risk Premium Studies

Equity Risk Premium Measure	Proxy Group of Fourteen Electric Utilities
Kroll Equity Risk Premium (1)	5.82 %
Regression on Kroll Risk Premium Data (2)	7.27
Kroll Equity Risk Premium based on PRPM (3)	9.35
Equity Risk Premium Based on Value Line Summary and Index (4)	10.25
Equity Risk Premium Based on Value Line S&P 500 Companies (5)	9.24
Equity Risk Premium Based on Bloomberg S&P 500 Companies (6)	12.62
Conclusion of Equity Risk Premium	9.09 %
Adjusted Beta (7)	0.81
Forecasted Equity Risk Premium	7.36 %

Source" D'Ascendis Direct Testimony, at 129.

Q. PLEASE EXPLAIN YOUR CRITIQUE MR. D'ASCENDIS' PRPM.

A. Based on his PRPM approach, Mr. D'Ascendis estimates a risk premium based on historic stock and bond returns and his prediction of volatility. The inputs to the model are the historical returns on the common shares of each company in the proxy group minus the historical monthly yield on long-term U.S. Treasury securities for some undefined period. Using a generalized form of ARCH, known as GARCH, each

electric company's projected equity risk premium was determined using statistical software.[49]

Q. PLEASE ADDRESS THE PROBLEMS WITH MR. D'ASCENDIS' PRPM.

A. There are two primary issues with Mr. D'Ascendis' PRPM. First, it is based on the historical relationship between stock and bond returns. The errors associated with computing an expected equity risk premium using historical stock and bond returns are addressed in detail below. In short, there are a myriad of empirical problems, which result in historical market returns producing inflated estimates of expected risk premiums.

Second, I have seen the PRPM approach used by Mr. D'Ascendis and other witness from his firm for over ten years, and I have never seen the approach adopted by any regulatory commission. The approach is effectively a black box approach, as it cannot be duplicated without access to Mr. D'Ascendis' proprietary software. I believe that this is an issue in having this approach approved by a commission, as well as the fact that the PRPM ROE numbers are always high and variable. Finally, as indicated above, there are numerous empirical issues with using historical stock and bond return data to estimate an equity risk premium.

[49] ARCH stands for autoregressive, conditional, heteroskedasticity. It is a statistical approach to modelling the relationship between variables when volatility of the underlying data changes over time.

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

A. As indicated, the PRPM and risk-premium studies (1), (2), and (3) are based on historical stock and bond returns/yields. It is well-known and well-studied that using historical returns to measure an *ex ante* equity risk premium is erroneous and overstates the true market or equity risk premium.[50] This approach can produce differing results depending on several factors, including the measure of central tendency used, the time period evaluated, and the stock-market index employed.

In addition, there are a myriad of empirical problems in the approach, which result in historical market returns producing inflated estimates of expected risk premiums. Among the errors are the U.S. stock market survivorship bias (the "Peso Problem"); the company survivorship bias (only successful companies survive – poor companies do not survive); the measurement of central tendency (the arithmetic versus geometric mean, where geometric means tend to better capture negative returns and thus investor loss); the historical time horizon used; the change in risk and required return over time; the downward bias in bond historical returns; and unattainable return bias (the return computation procedure presumes monthly portfolio rebalancing).

The bottom line is that there are a number of empirical problems in using historical stock and bond returns to measure an expected equity risk premium.

[50] These issues are addressed in a number of studies, including: Aswath. Damodaran, "Equity Risk Premiums (ERP): Determinants, Estimation and Implications – The 2017 Edition" NYU Working Paper, 2017, pp. 30-44; See Richard Roll, "On Computing Mean Returns and the Small Firm Premium," *Journal of Financial Economics*, pp. 371-86, (1983); Jay Ritter, "The Biggest Mistakes We Teach," *Journal of Financial Research* (Summer 2002); Bradford Cornell, *The Equity Risk Premium* (New York, John Wiley & Sons),1999, pp. 36-78; and J. P. Morgan, "The Most Important Number in Finance," p. 6.

Q. WHAT SOURCE DID MR. D'ASCENDIS USE FOR HISTORICAL RETURNS IN HIS RISK-PREMIUM APPROACHES (1), (2), AND (3)?

A. Approaches (1), (2), and (3) use historical stock and bond return series that are compiled and published by Kroll, a subsidiary of the investment advisory firm Duff & Phelps.[51]

Q. IS KROLL A RESPECTED FINANCIAL FIRM?

A. Yes. Kroll is a global investments advisory firm with offices in twenty-eight countries and 3,500 employees.

Q. WHAT IS KROLL'S OPINION REGARDING THE USE OF HISTORICAL STOCK MARKET RETURNS TO ESTIMATE AN EQUITY RISK PREMIUM?

A. In its Client Update on the equity risk premium, dated March 16, 2016, Kroll (Duff & Phelps) made the following statements regarding using historical returns to compute an equity risk premium ("ERP"):

> In estimating the conditional ERP, valuation analysts cannot simply use the long-term historical ERP, without further analysis. A better alternative would be to examine approaches that are sensitive to the current economic conditions. As previously discussed, Duff & Phelps employs a multi-faceted analysis to estimate the conditional ERP that takes into account a broad range of economic information and multiple ERP estimation methodologies to arrive at its recommendation.[52]

[51] The investment firm Duff & Phelps acquired Kroll in 2018 and rebranded itself as Kroll in 2022.
[52] Duff & Phelps, Client Alert, March 16, 2016, p. 37 (emphasis supplied).

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

A. No.

Q. WHAT DOES KROLL SAY ABOUT THE EXPECTED ERP AND HISTORICAL RETURNS?

A. Kroll provides details about its perspective on historical returns versus its estimation of the ERP:

> ERP is a forward-looking concept. It is an expectation as of the valuation date for which no market quotes are directly observable. While an analyst can observe premiums realized over time by referring to historical data (i.e., realized return approach or ex post approach), such realized premium data do not represent the ERP expected in prior periods, nor do they represent the current ERP estimate. Rather, realized premiums represent, at best, only a sample from prior periods of what may have then been the expected ERP. To the extent that realized premiums on the average equate to expected premiums in prior periods, such samples may be representative of current expectations. But to the extent that prior events that are not expected to recur caused realized returns to differ from prior expectations, such samples should be adjusted to remove the effects of these nonrecurring events. Such adjustments are needed to improve the predictive power of the sample.[53]

Q. DOES KROLL PUBLISH ITS RECOMMENDED EQUITY OR MARKET RISK PREMIUM?

A. Yes. In fact, on the same site that Kroll sells their annual valuation handbook used by Mr. D'Ascendis, Kroll publishes its recommended estimate of the equity- or market-

[53] *Id.*, p. 35 (emphasis supplied).

risk premium.[54] Page 7 of Exhibit JRW-6 of my testimony shows Kroll's equity risk premium recommendations.

As noted above, Kroll is currently recommending an equity of market risk premium of 5.50%. This is much below Mr. D'Ascendis' risk premiums using historic data, and especially much lower than his risk premium using his PRPM approach. I find it puzzling that Mr. D'Ascendis would use the historical average annual stock return from the Kroll book and then ignore Kroll's recommendation as to the appropriate equity or market risk premium.

Q. DO YOU AGREE THAT THE U.S. EQUITY RISK PREMIUM OF 5.50% IS A REASONABLE AND WELL-SUPPORTED NUMBER IN THE CURRENT CAPITALIZATION CLIMATE?

A. Yes.

Q. PLEASE ASSESS MR. D'ASCENDIS' MARKET RISK PREMIUMS DERIVED FROM USING (1) *VALUE LINE*'S PROJECTED STOCK MARKET RETURN AND (2) BY APPLYING THE DCF MODEL TO THE S&P 500 AND USING *VALUE LINE* AND BLOOMBERG PROJECTED EPS GROWTH RATES.

A. Mr. D'Ascendis develops three risk premiums using projected stock-market returns. In approach (4), he uses *Value Line*'s projected stock-market return over the next five years. In approaches (5) and (6), he calculates an expected market return by applying

[54] https://www.kroll.com/en/insights/publications/cost-of-capital

the DCF model to the S&P 500 using projected EPS growth rates from Bloomberg and from *Value Line.*

As shown in Table 11, Mr. D'Ascendis uses expected stock-market returns of 15.15%, 14.14%, and 17.52% (average = 15.60%) for the three approaches (*Value Line* Expected Return, *Value Line* DCF Expected Return, and Bloomberg DCF Expected Return) and, using his projected risk-free rate of 4.15%, the resulting risk premiums are 11.00%, 9.99%, and 13.37%. The average market risk premium is 11.45%. With a current adjusted dividend yield of 1.50% for the S&P 500 in 2024, the implied projected EPS growth rates for the three approaches are 13.65%, 12.64%, and 16.02%. The average projected EPS growth rate is 11.45%.

Table 11
D'Ascendis' CAPM Market Risk Premium
Risk Premiums Derived from Expected Market Returns
Using *Value Line* and Bloomberg Projected EPS Growth Rate

	VL Exp. Ret.	VL DCF Exp. Ret.	BL DCF Exp. Ret.	Average
Dividend Yield	1.50%	1.50%	1.50%	2.00%
+ Expected EPS Growth	13.65%	12.64%	16.02%	14.10%
= Expected Market Return	15.15%	14.14%	17.52%	15.60%
+ Risk-Free Rate	4.15%	4.15%	4.15%	4.15%
= Market Risk Premium	11.00%	9.99%	13.37%	11.45%

Q. ARE MR. D'ASCENDIS' RISK PREMIUMS REFLECTIVE OF THE MARKET RISK PREMIUMS?

A. No. Mr. D'Ascendis' average market risk premium, as shown in Table 11, is computed using an average expected market stock return of 15.60%, minus the risk-free interest rate of 4.15%, which produce an average market-risk premium for the three approaches of 11.45%. This figure is well in excess of market risk premiums: (1) found in studies

of the market risk premiums by leading academic scholars; (2) produced by analyses of historic stock and bond returns; and (3) found in surveys of financial professionals.

Page 6 of Exhibit JRW-6 provides the results of over fifteen market risk-premiums studies from the past fifteen years. Historic stock and bond returns suggest a market-risk premium in the 4.40% to 6.80% range, depending on whether one uses arithmetic or geometric mean returns. There have been many studies using *ex ante* models, and their market-risk premiums results vary from as low as 2.61% to as high as 6.00%. Finally, the market-risk premiums developed from surveys of analysts, companies, financial professionals, and academics suggest lower market-risk premiums, in a range of 3.40% to 5.70%. The bottom line is that there is no support in historic return data, surveys, academic studies, or reports from investment firms for Mr. D'Ascendis' average projected market-risk premium of 11.45%. As discussed below, the reason is that they are based on unrealistic long-term, earnings-per-share growth rates.

Q. INITIALLY, PLEASE PROVIDE ADDITIONAL INSIGHTS INTO THE EXPECTED STOCK MARKET RETURN OF 15.60%.

A. Simply put, the assumption of a 15.60% expected stock market return is excessive and unrealistic. The compounded annual return in the U.S. stock market is about 10% (9.80% according to Damodaran between 1928–2023).[55] Mr. D'Ascendis' CAPM results assume that return on the U.S. stock market will be more than 5*0 percent higher* in the future than it has been in the past. The extremely high expected stock market

[55] Aswath Damodaran, *Damodaran Online*, N.Y. Univ., https://pages.stern.nyu.edu/~adamodar/.

return, and the resulting market risk premium and equity cost rate results, is directly related to computing the expected stock market return as the sum of the adjusted dividend yield plus the expected EPS growth rate of 14.10%.

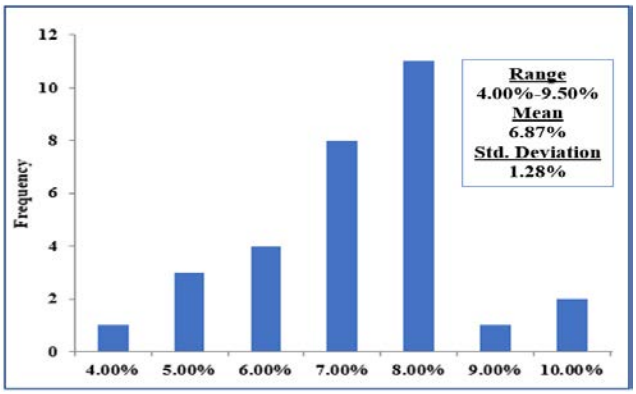
Q. IS MR. D'ASCENDIS' EXPECTED AVERAGE STOCK MARKET RETURN OF 15.60% REFLECTIVE OF THE STOCK MARKET RETURNS THAT INVESTMENT FIRMS TELL INVESTORS TO EXPECT?

A. No. And it is not even close! Many investment firms provide investors with their estimates of the annual stock returns that they should expect in the future. Most publish these expected returns in documents entitled "Capital Market Assumptions" and are available online at their websites. If you do an internet search for "Capital Market Assumptions," you get a long list of investment firms and their base case expected annual return assumptions for stocks, bonds, and other financial assets. In my search, I found thirty-one investment firms that published their capital market assumptions. These are listed in Exhibit JRW-8, and include many of the largest, best-known investment firms, including J.P. Morgan, BlackRock, BNY Mellon, Fidelity, Northern Trust, Vanguard, and State Street. Combined, these thirty firms manage over $50 trillion in assets under management.

Figure 14 provides a histogram of the expected returns listed in Exhibit JRW-8. The average duration of the long-term forecasts is 10 years. The range of the forecasted U.S. annual large cap equity returns is 4.00% to 9.50%. The mean and standard deviation of these expected returns are 6.87% and 1.28%.

Figure 14

Histogram of Investment Firm Expected Large Cap Equity Annual Returns 2023



Date Source: Exhibit JRW-8.

Q. WHAT ARE YOUR OBSERVATIONS ON THE STOCK MARKET RETURNS THAT INVESTMENT FIRMS TELL INVESTORS TO EXPECT?

A. I have three comments: (1) These returns are below the historical average compounded annual stock market return of 9.64% cited above (more on this below); (2) the standard deviation of 1.28% is very low, which indicates that the expected returns provided by these firms are quite similar; and (3) these expected returns indicate Mr. D'Ascendis' expected stock market return of 15.60%, which he calculates with his own study applying the DCF model to the S&P 500 and using analysts projected EPS growth rates, is more than double the returns investment firms tell investors they should expect.

Q. WHY DO YOU THINK THE STOCK MARKET RETURNS THAT INVESTMENT FIRMS TELL INVESTORS TO EXPECT ARE LOWER THAN HISTORICAL STOCK RETURNS?

A. The biggest factor is that the valuation of the overall stock market is high relative to historical standards. When stock prices are high, investors have to pay higher prices to

buy in, which lowers their future expected returns. Figure 16 provides Schiller's cyclically-adjusted PE ratio (CAPE) over the last 100+ years. Stocks prices have remained above the mean historical CAPE level of 17.02% since 2009, with a current level of 28.80. Hence, the higher valuation of the stock market leads to lower expected returns.

Figure 15
Schiller S&P 500 CAPE Ratio
2023

The Schiller S&P 500 CAPE ratio is based on average inflation-adjusted earnings from the previous 10 years.
Date Source: https://www.multpl.com/shiller-pe

Q. PLEASE DIRECTLY ADDRESS MR. D'ASCENDIS' MARKET RISK PREMIUM DERIVED FROM USING *VALUE LINE*'S PROJECTED STOCK-MARKET RETURN.

A. In approach (4), Mr. D'Ascendis develops a market-risk premium using *Value Line's* projected stock-market return over the next three-to-five-years. In the previously cited study by Szakmary, Conover, and Lancaster (2008), the authors also evaluated the accuracy of *Value Line*'s three-to-five-year predicted annual stock return for the stock market over a thirty-year time period and found these predicted stock-market returns

to be "extremely overoptimistic," well in excess of historic market returns, and were not significantly related to future realized returns.[56]

Q. IN APPROACHES (5) AND (6), MR. D'ASCENDIS USES ANALYSTS' EPS GROWTH-RATE FORECASTS IN APPLYING THE DCF MODEL TO THE S&P 500 USING DATA FROM *VALUE LINE* AND BLOOMBERG. PLEASE, ONCE AGAIN, ADDRESS THE ISSUES WITH ANALYSTS' EPS GROWTH-RATE FORECASTS.

A. The key point is that Mr. D'Ascendis' market-risk-premium approaches (5) and (6) are based on the concept that analysts' projections of companies' three-to-five EPS growth rates reflect investors' expected *long-term* EPS growth for those companies. However, this is erroneous given the research on these projections. Numerous studies have shown that the long-term, EPS-growth-rate forecasts of Wall Street securities analysts are overly optimistic and upwardly biased.[57] Moreover, a 2011 study showed that analysts' forecasts of EPS growth over the next three-to-five years' earnings are no more accurate than their forecasts of the next single year's EPS growth.[58] The

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

[57] 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, (2011), *Advances in Business and Management Forecasting (Vol. 8),* Kenneth D. Lawrence, Ronald K. Klimberg (ed.), Emerald Group Publishing Limited, pp. 77-101.

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

inaccuracy of analysts' growth-rate forecasts leads to an upward bias in equity cost estimates of approximately 300 basis points.[59]

I have also completed studies on the accuracy of analysts' projected EPS growth rates. In Figure 10 (page 51), I demonstrated that the EPS growth rate forecasts of Wall Street analysts are upwardly biased for electric utilities and gas distribution companies. In Figure 16, I provide the results of a study I performed using all companies followed by I/B/E/S who have three-to-five-year EPS growth rate forecasts over the 1985 to 2022 time period.

In this study, for each company with a three-to-five-year forecast, I compared the average three-to-five-year average EPG growth rate forecasts to the actual EPS growth rates achieved over the three-to-five-year time period. In Figure 16, the mean of the projected EPS growth rates is the red line and the mean of the actual EPS growth rates is the blue line. Over the thirty-five years of the study, the mean projected three-to-five-year EPS growth rate was 12.50%, while the average actual achieved three-to-five-year EPS growth rate was 6.50%. This study demonstrates that the projected three-to-five-year EPS growth rate forecasts are upwardly biased and overly optimistic.

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

Figure 16
Mean Forecasted vs. Actual Long-Term EPS Growth Rates
All Companies Covered by I/B/E/S
1985–2022

Data Source: I/B/E/S, 2023.

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

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

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

> behind events in revising their forecasts to reflect new economic conditions. When economic growth accelerates, the size of the forecast error declines; when economic growth slows, it increases. So as economic growth cycles up and down, the actual earnings S&P 500 companies report occasionally coincide with the analysts' forecasts, as they did, for example, in 1988, from 1994 to 1997, and from 2003 to 2006. *Moreover, analysts have been persistently overoptimistic for the past 25 years, with estimates ranging from 10 to 12 percent a year, compared with actual earnings growth of 6 percent. Over this time frame, actual earnings growth surpassed forecasts in only two instances, both during the earnings recovery following a recession. On average, analysts' forecasts have been almost 100 percent too high.*[60]

This is the same observation made in a *Bloomberg Businessweek* article.[61] The author concluded:

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

Q. IS THERE OTHER EVIDENCE THAT INDICATES THAT MR. D'ASCENDIS' RISK PREMIUMS COMPUTED BY USING *VALUE LINE*'S PROJECTED STOCK-MARKET RETURN AND BY APPLYING THE DCF MODEL TO THE S&P 500 AND USING *VALUE LINE* AND BLOOMBERG PROJECTED EPS GROWTH RATES ARE EXCESSIVE?

A. Beyond my previous discussion of the upwardly biased nature of analysts' projected EPS growth rates, the fact is that long-term EPS-growth rates of 13.45%, 11.50%, and 10.99% (average = 14.10%) are inconsistent with both historic and projected economic and earnings growth in the U.S for several reasons: (1) long-term EPS and economic growth is about one-half of Mr. D'Ascendis' average projected EPS growth rate of

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

[61] 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.

14.10%; (2) as discussed below, long-term EPS and GDP growth are directly linked; and (3) more recent trends in GDP growth, as well as projections of GDP growth, suggest slower economic and earnings growth in the future.

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

Table 12
GDP, S&P 500 Stock Price, EPS, and DPS Growth
1960-Present

Nominal GDP	6.40%
S&P 500 Stock Price	6.99%
S&P 500 EPS	7.11%
S&P 500 DPS	5.88%
Average	6.60%

The results show that the historical long-run growth rates for GDP, S&P EPS, and S&P DPS are in the 6% to 7% range. By comparison, the average EPS growth rate used by Mr. D'Ascendis, 14.10%, is at best, an outlier. His estimates suggest that companies in the U.S. would be expected to increase their growth rate of EPS in the future by almost 100% and maintain that growth indefinitely in an economy that is expected to grow at about one-third of Mr. D'Ascendis' projected growth rates.

There is a Direct Link Between Long-Term EPS and GDP Growth - The results in Exhibit JRW-9 and Table 12 show that historically there has been a close link between long-term EPS and GDP growth rates. Brad Cornell of the California Institute of Technology published a study on GDP growth, earnings growth, and equity returns. He finds that long-term EPS growth in the U.S. is directly related to GDP growth, with

GDP growth providing an upward limit on EPS growth. In addition, he finds that long-term stock returns are determined by long-term earnings growth and that "real GDP growth in excess of 3 percent in the long run is highly unlikely in the developed world":

> The long-run performance of equity investments is fundamentally linked to growth in earnings. Earnings growth, in turn, depends on growth in real GDP. This article demonstrates that both theoretical research and empirical research in development economics suggest relatively strict limits on future growth. In particular, real GDP growth in excess of 3 percent in the long run is highly unlikely in the developed world. In light of ongoing dilution in earnings per share, this finding implies that investors should anticipate real returns on U.S. common stocks to average no more than about 4–5 percent in real terms.[62]

The Trend Indicates Slower GDP Growth in the Future - The components of nominal GDP growth are real GDP growth and inflation. Annual Growth rates in nominal GDP are shown on page 2 of Exhibit JRW-9. Nominal GDP growth was in the four percent range over the past decade until the COVID-19 Pandemic hit in 2020. Nominal GDP fell by 2.2% in 2020, before rebounding and growing by over 10.0% in 2021 and in 2022. Page 3 of Exhibit JRW-9 shows the annual real GDP growth rate between 1961 and 2022. Real GDP growth has gradually declined from the 5.0% to 6.0% range in the 1960s to the 2.0% to 3.0% range during the 2015–2019 period. Real GDP fell by 3.5% in 2020, but rebounded and grew by 5.7% in 2021 and 2.1% in 2022.

The second component of nominal GDP growth is inflation. Page 4 of Exhibit JRW-9 shows inflation as measured by the annual growth rate in the Consumer Price Index (CPI) from 1961 to 2022. The large increase in prices from the late 1960s to the early 1980s is readily evident. Equally evident is the rapid decline in inflation during

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

the 1980s as inflation declined from above ten percent to about four percent. Since that time, inflation has gradually declined and was in the 2.0% range or below from 2015 to 2020. Prices increased in 2021 and 2022 with the rebounding economy, and increased by 4.7% in 2021 and 8.0% in 2022. Year-over-year inflation in 2022 jumped to 40-year highs in 2022 due to supply chain issues and the Russia-Ukraine conflict, but longer-term inflation is expected to be in the 2.0%–3.0% range.

The graphs on pages 2, 3, and 4 of Exhibit JRW-9 provide clear evidence of the decline, in recent decades, in nominal GDP as well as its components, real GDP, and inflation. To gauge the magnitude of the decline in nominal GDP growth, Table 13 provides the compounded GDP growth rates for 10-, 20-, 30-, 40- and 50- years. Whereas the 50-year compounded GDP growth rate is 6.40%, there has been a significant decline in nominal GDP growth over subsequent 10-year intervals. These figures strongly suggest that nominal GDP growth in recent decades has slowed and that a figure in the range of 4.0% to 5.0% is more appropriate today for the U.S. economy.

Table 13
Historical Nominal GDP Growth Rates

10-Year Average	**4.59%**
20-Year Average	**4.32%**
30-Year Average	**4.65%**
40-Year Average	**5.21%**
50-Year Average	**6.16%**

Long-Term GDP Projections also Indicate Slower GDP Growth in the Future: A lower range is also consistent with long-term GDP forecasts. There are several forecasts of annual GDP growth that are available from economists and government agencies. These are listed in Panel B of on page 5 of Exhibit JRW-9.

The mean 10-year nominal GDP growth forecast (as of February 2023) by economists in the recent *Survey of Financial Forecasters* is 4.40%.[63] The Energy Information Administration (EIA), in its projections used in preparing *Annual Energy Outlook*, forecasts long-term GDP growth of 4.3% for the period 2023 to 2053.[64] The Congressional Budget Office (CBO), in its forecasts for the period 2023 to 2053, projects a nominal GDP growth rate of 3.8%.[65] Finally, the Social Security Administration (SSA), in its Annual OASDI Report, provides a projection of nominal GDP from 2023 to 2100.[66] SSA's projected growth GDP growth rate over this period is 4.1%. The average projected GDP growth rate for these four forecasts is 4.15%.

The bottom line is that the trends and projections suggest a long-term GDP growth rate in the 4.0% to 4.5% range. As such, Mr. D'Ascendis' average projected EPS growth rate of 14.10% is almost three times the projected GDP growth.

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

A. As addressed in a study by the consulting firm McKinsey & Co., two factors drive real GDP growth over time: (1) the number of workers in the economy (employment); and

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63 Ten-year median projected real GDP growth of 2.00% and CPI inflation of 2.37%. *Survey of Professional Forecasters*, Fed. Reserve Bank of Philadelphia, https://www.philadelphiafed.org/research-and-data/real-time-center/survey-of-professional-forecasters/.

64 *Annual Energy Outlook 2023*, U.S. ENERGY INFORMATION ADMINISTRATION, Table: Macroeconomic Indicators.

65 *The 2023 Long-Term Budget Outlook*, CONGRESSIONAL BUDGET OFFICE, July 15, 2023.

66 Social Security Administration, *2023 Annual Report of the Board of Trustees of the Old-Age, Survivors, and Disability Insurance (OASDI) Program*, Table VI.G4, (July 1, 2023). The 4.1% growth rate is the growth in projected GDP from 2023 to 2100.

(2) the productivity of those workers (usually defined as output per hour).[67] According to McKinsey, real GDP growth over the past 50 years was driven by population and productivity growth which grew at compound annual rates of 1.7% and 1.8%, respectively.

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

Q. OVER THE MEDIUM TO LONG RUN, IS S&P 500 EPS GROWTH LIKELY TO OUTPACE GDP GROWTH?

A. No. Figure 17 shows the average annual growth rates for GDP and the S&P 500 EPS since 1960. The one very apparent difference between the two is that the S&P 500 EPS growth rates are much more volatile than the GDP growth rates, when compared using the relatively short, and somewhat arbitrary, annual conventions used in these data.[68] Volatility aside, however, it is clear that over the medium to long run, S&P 500 EPS growth does not outpace GDP growth.

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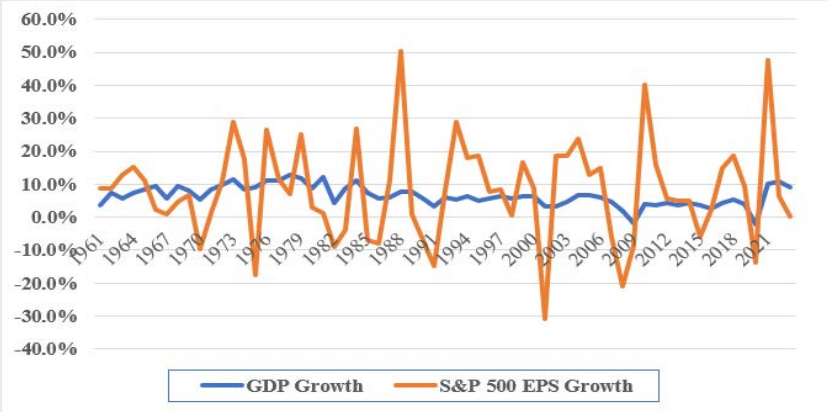
[67] McKinsey & Co., "Can Long-Term Growth be Saved?", McKinsey Global Institute, (Jan. 2015).

[68] 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.

Figure 17
Average Annual Growth Rates
GDP and S&P 500 EPS - 1960-2023



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

A deeper understanding of the relationship between GDP and S&P 500 EPS growth requires consideration of at least three factors, as follows.

Corporate Profits are Constrained by GDP – In a *Fortune* magazine article, Milton Friedman, the winner of the 1976 Nobel Prize in Economic Sciences, warned investors and others not to expect corporate-profit growth to sustainably exceed GDP growth, stating, "Beware of predictions that earnings can grow faster than the economy for long periods. When earnings are exceptionally high, they don't just keep booming."[69] In that same article, Friedman also noted that profits must move back down to their traditional share of GDP. In Table 14, I show that the aggregate net income levels for the S&P 500 companies, using 2022 figures, represent 6.11% of nominal GDP.

[69] 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/.

Table 14
S&P 500 Aggregate Net Income as a Percent of GDP

	2022 Value ($B)
Aggregate Net Income for S&P 500	$1,555.98
2021 Nominal U.S. GDP	25,461.34
Net Income/GDP (%)	6.11%

Data Sources: 2022 Net Income for S&P 500 companies
https://www.gurufocus.com/economic_indicators/5749/sp-500-net-income-ttm.
2022 Nominal GDP – https://pages.stern.nyu.edu/~adamodar/.

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

The Differences Between the S&P 500 EPS and GDP – In the last two years, as the EPS for the S&P 500 has grown at a faster rate than U.S. nominal GDP, some have pointed to the differences between the S&P 500 and GDP.[70] These differences include: (a) corporate profits are about 2/3 manufacturing driven, while GDP is 2/3 services driven; (b) consumer discretionary spending accounts for a smaller share of S&P 500 profits (15%) than of GDP (23%); (c) corporate profits are more international-

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

trade driven, while exports minus imports tend to drag on GDP; and (d) S&P 500 EPS is affected not just by corporate profits but also by share buybacks on the positive side (fewer shares boost EPS), and by share dilution on the negative side (new shares dilute EPS). While these differences may seem significant, it must be remembered that the Income Approach to measure GDP includes corporate profits (in addition to employee compensation and taxes on production and imports) and therefore effectively accounts for the first three factors.[71]

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

Q. PLEASE PROVIDE ADDITIONAL INSIGHTS INTO THE UNREASONABLENESS OF MR. D'ASCENDIS' 14.10% AVERAGE PROJECTED S&P EPS GROWTH RATE IN LIGHT OF PROJECTED GDP GROWTH.

A. Beyond my previous discussion, I have performed the following analysis of S&P 500 EPS and GDP growth in Table 15. Specifically, I started with the 2022 aggregate net income for the S&P 500 companies and 2022 nominal GDP for the U.S. As shown in Table 14, the aggregate profit for the S&P 500 companies represented 6.11% of nominal GDP in 2022.

[71] 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.

In Table 15, I projected the aggregate net income level for the S&P 500 companies and GDP as of the year 2050. For the growth rate for the S&P 500 companies, I used Mr. D'Ascendis' average projected S&P 500 EPS growth rate of 14.10%. As a growth rate for nominal GDP, I used the average of the long-term projected GDP growth rates from CBO, SFF, SSA, and EIA (3.8%, 4.4%, 4.1%, and 4.3%, respectively), which is 4.15%. The projected 2050 level for the aggregate net income level for the S&P 500 companies is $62.52 trillion. Over the same period GDP is expected to grow to $79.5 trillion. As such, if the aggregate net income for the S&P 500 grows in accordance with the growth rate used by Mr. D'Ascendis, and if nominal GDP grows at rates projected by major government agencies, the net income of the S&P 500 companies will represent growth from 6.11% of GDP in 2022 to 78.64% of GDP in 2050. It is totally unrealistic for the net income of the S&P 500 to become such a large component of GDP.

Table 15
Projected S&P 500 Earnings and Nominal GDP
2022-2050
S&P 500 Aggregate Net Income as a Percent of GDP

	2022 Value ($B)	Growth Rate	No. of Years	2050 Value ($B)
Aggregate Net Income for S&P 500	$1,555.98	14.10%	28	$ 62,517.61
2022 Nominal U.S. GDP	$25,461.34	4.15%	28	$ 79,495.21
Net Income/GDP (%)	6.11%			78.64%

Data Sources: 2022 Net Income for S&P 500 companies
https://www.gurufocus.com/economic_indicators/5749/sp-500-net-income-ttm.
S&P 500 EPS Growth Rate - Mr. D'Ascendis' average projected S&P 500 EPS growth rate of 14.10%.
Nominal GDP Growth Rate – The average of the long-term projected GDP growth rates from CBO, SFF, SSA, and EIA (3.8%, 4.4%, 4.1%, and 4.3% = 4.15%).

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

A. The long-term link between corporate profits and GDP is inevitable. The short-term differences in growth between the two indicate that corporate profits as a share of GDP tend to go far higher after periods where they are depressed, and then drop sharply after they have been hovering at historically high levels. In a famous 1999 *Fortune* article, Mr. Buffet made the following observation:

> You know, someone once told me that New York has more lawyers than people. I think that's the same fellow who thinks profits will become larger than GDP. When you begin to expect the growth of a component factor to forever outpace that of the aggregate, you get into certain mathematical problems. In my opinion, you have to be wildly optimistic to believe that corporate profits as a percent of GDP can, for any sustained period, hold much above 6%.[72]

In sum, Mr. D'Ascendis' average long-term S&P 500 EPS growth rate of 14.10% is grossly overstated and has little (if any) basis in economic reality. In the end, the big question remains whether corporate profits can grow faster than GDP. Jeremy Siegel, the renowned finance professor at the Wharton School of the University of Pennsylvania, believes that going forward, earnings per share can grow about half a point faster than nominal GDP, or about 5.0%, due to the big gains in the technology sector. But he also believes that sustained EPS growth matching analysts' near-term projections is absurd: "The idea of 8% or 10% or 12% growth is ridiculous. It will not happen."[73]

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

[73] 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/.

C. CAPM Approach

Q. PLEASE DISCUSS MR. D'ASCENDIS' CAPM.

A. On pages 31-51 of his testimony and in Document No. 6, Mr. D'Ascendis develops an equity cost rate by using the CAPM. Mr. D'Ascendis uses both the CAPM and the so-called empirical CAPM approaches ("ECAPM"). Mr. D'Ascendis' reports CAPM and ECAPM results of 12.48% for his electric group. Mr. D'Ascendis uses a projected rate of 4.15% for the long-term Treasury bond, betas from *Value Line* and Bloomberg, and a market-risk premium of 10.02%. The market risk premium is the average of three *Value Line* and Bloomberg projected market-risk premiums which were reviewed above.[74]

Q. WHAT ARE THE ERRORS IN MR. D'ASCENDIS' CAPM ANALYSIS?

A. There are two primary flaws with Mr. D'Ascendis' CAPM analyses: (1) the use of the so-called ECAPM; and (2) the market-risk premium of 10.02%. The highly overstated market-risk premium was discussed extensively above.

1. <u>The Validity of the ECAPM</u>

Q. WHAT ISSUES DO YOU HAVE WITH MR. D'ASCENDIS' ECAPM?

A. Mr. D'Ascendis has employed a variation of the CAPM which he calls the 'ECAPM.' The ECAPM attempts to model the well-known finding of tests of the CAPM that have indicated the Security Market Line ("SML") is not as steep as predicted by the CAPM.

[74] These include: (1) *Value Line*'s projected stock market return over the next five years minus the yield on Aaa corporate bond yields; (2) applying the DCF model to the S&P 500 companies using Value Line projected EPS growth rates and subtracting the risk-free interest rate; and (3) applying the DCF model to the S&P 500 companies using Bloomberg projected EPS growth rates and subtracting the risk-free interest rate.

The ECAPM is nothing more than an *ad hoc* version of the CAPM and has not been theoretically or empirically validated in refereed journals. The ECAPM provides for weights which are used to adjust the risk-free rate and market-risk premium in applying the ECAPM. Mr. D'Ascendis uses 0.25 and 0.75 factors to boost the equity risk premium measure, but provides no empirical justification for those figures.

Beyond the lack of any theoretical or empirical validation of the ECAPM, there is another error in Mr. D'Ascendis' ECAPM. I am not aware of any tests of the CAPM that use adjusted betas such as those used by Mr. D'Ascendis. Adjusted betas address the empirical issues with the CAPM by increasing the expected returns for low beta stocks and decreasing the returns for high beta stocks.

2. Inflated Market Risk Premium

Q. PLEASE DISCUSS THE ISSUES WITH MR. D'ASCENDIS' CAPM MARKET RISK PREMIUM?

A. Mr. D'Ascendis develops his CAPM market risk premium of 10.02% using the same six approaches employed in his Risk-Premium approach. As discussed extensively on pages 63-71 of this testimony, the 10.02% market-risk premium is much higher than published market-risk premiums, and is developed using highly unrealistic assumptions of future earnings growth and stock-market returns.

D. Equity Cost Rate Models Applied to Non-Price Regulated Proxy Group

Q. PLEASE DISCUSS MR. D'ASCENDIS' NON-PRICE REGULATED PROXY GROUP.

A. Mr. D'Ascendis has applied his equity cost rate approaches to his utility proxy and a proxy group of non-price regulated companies. Mr. D'Ascendis' equity cost rate results are reported on page 2 of Exhibit JRW-7. He reports ROE results of 12.95% for unregulated companies "comparable" to his electric group. The non-price regulated group includes forty-five that Mr. D'Ascendis claims are similar in risk to his electric group.

Q. PLEASE DISCUSS THE PROBLEM WITH MR. D'ASCENDIS' NON-PRICE REGULATED PROXY GROUP.

A. These companies are listed in page 3 of Document No. 7 of his testimonies. This group includes such companies as Abbott Labs, Air Products, Cisco, IBM, Lockheed, Pfizer, Sherwin-Williams, and Texas Instruments. While many of these companies are large and successful, their lines of business are vastly different from the electric and gas distribution businesses, and they do not operate in a highly regulated environment, and certainly none of these companies' product prices or profit margins are regulated. However, most significantly, the upward bias in the EPS growth rate forecasts of Wall Street analysts is particularly severe for non-price regulated companies.

Q. IS THIS BIAS REFLECTED IN MR. D'ASCENDIS' DCF ANALYSIS FOR THE NON-PRICE REGULATED GROUP?

A. Yes. Figure 16 (page 92) shows that the mean analyst projected EPS growth rate for companies covered by I/B/E/S of 12.50%, was almost double the average actual achieved EPS growth rate of 6.50%. Hence, DCF estimates for non-price regulated

companies using analysts' projected EPS growth rates, such as those in this group, are particularly overstated.

E. Other Factors

Q. WHAT OTHER FACTORS DID MR. D'ASCENDIS CONSIDER IN HIS 10.50% ROE RECOMMENDATION?

A. Mr. D'Ascendis includes a flotation cost adjustment of 0.10% in his ROE analysis and recommendation. However, there is no evidence that TECO has paid flotation costs. Hence, TECO should not receive higher revenues in the form of a higher ROE for flotation costs that the Company does not incur.

1. Flotation Costs

Q. DO YOU AGREE THAT AN ADJUSTMENT FOR FLOTATION COSTS IS JUSTIFIED IN THIS CASE?

A. No. First, Mr. D'Ascendis did not provide evidence that TECO has paid flotation costs. As such, there is no need to consider flotation costs in arriving at an equity cost rate for the Company. The Company should not be rewarded with higher revenues (through a higher ROE) for expenses which it does not incur.

In addition, it is commonly argued that a flotation cost adjustment (such as that used by the Company) is necessary to prevent the dilution of the existing shareholders. In this case, a flotation cost adjustment is justified by reference to bonds and the manner in which issuance costs are recovered by including the amortization of bond flotation costs in annual financing costs. However, this is incorrect for several reasons:

(1) If an equity flotation cost adjustment is similar to a debt flotation cost adjustment, the fact that the market-to-book ratios for electric utility companies are over 1.5 times actually suggests that there should be a flotation cost reduction (and not increase) to the equity cost rate. This is because when (a) a bond is issued at a price in excess of face or book value, and (b) the difference between market price and the book value is greater than the flotation or issuance costs, the cost of that debt is lower than the coupon rate of the debt. The amount by which market values of electric utility companies are in excess of book values is much greater than flotation costs. Hence, if common stock flotation costs were exactly like bond flotation costs, and one was making an explicit flotation cost adjustment to the cost of common equity, the adjustment should be downward.

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

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

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

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

VII. SUMMARY AND CONCLUSIONS

Q. DR. WOOLRIDGE, PLEASE SUMMARIZE YOUR TESTIMONY ON THE APPROPRIATE COST OF CAPITAL FOR TECO.

A. I have reviewed the Company's proposed capital structure and overall cost of capital. TECO's proposed capitalization has more equity and less financial risk than the average current capitalizations of the proxy groups. The Company's proposed capital structure includes a common equity ratio of 54.00% versus 41.7% and 41.1% for the averages of the two proxy groups. Nonetheless, while I am not contesting this capital structure, but I have also selected a ROE which recognizes this high common equity ratio. I have also adopted the Company's short-term and long-term debt cost rates. To estimate an equity cost rate for the Company, I have applied the DCF and CAPM approaches to two proxy groups: (1) my group of publicly-held electric utility companies ("Electric Proxy Group"); and (2) the group developed by Mr. D'Ascendis ("D'Ascendis Proxy Group"). My analysis indicates a common equity cost rate in the range of 8.85% to 10.00% for TECO in this case. Given that I rely primarily on the DCF model and the results for the Electric Proxy Group, I believe that the appropriate ROE range for the Company is in the 9.25%-9.75% range. Given that: (1) TECO's investment risk is a little below the average of the two groups; and (2) I have employed a capital structure that has more common equity and less financial risk than the average of the two proxy groups as well as TECO's parent, Emera, I am recommending a ROE of 9.50%. Given this ROE and my proposed capital structure and senior capital cost rates for TECO, I am recommending an overall fair rate of return or cost of capital of 7.19% for TECO. This recommendation is summarized in Table 2 and Exhibit JRW-1.

Q. **DOES THIS COMPLETE YOUR PREFILED DIRECT TESTIMONY?**

A. Yes, at this time. However, the compressed procedural schedule in this proceeding for filing Intervenor testimony has limited the time to complete OPC's investigation into the issues and effects of those issues on the Company's petition. Consequently, it is my understanding that OPC reserves the right to file supplemental testimony to fully address these issues and effects of those issues, if necessary.

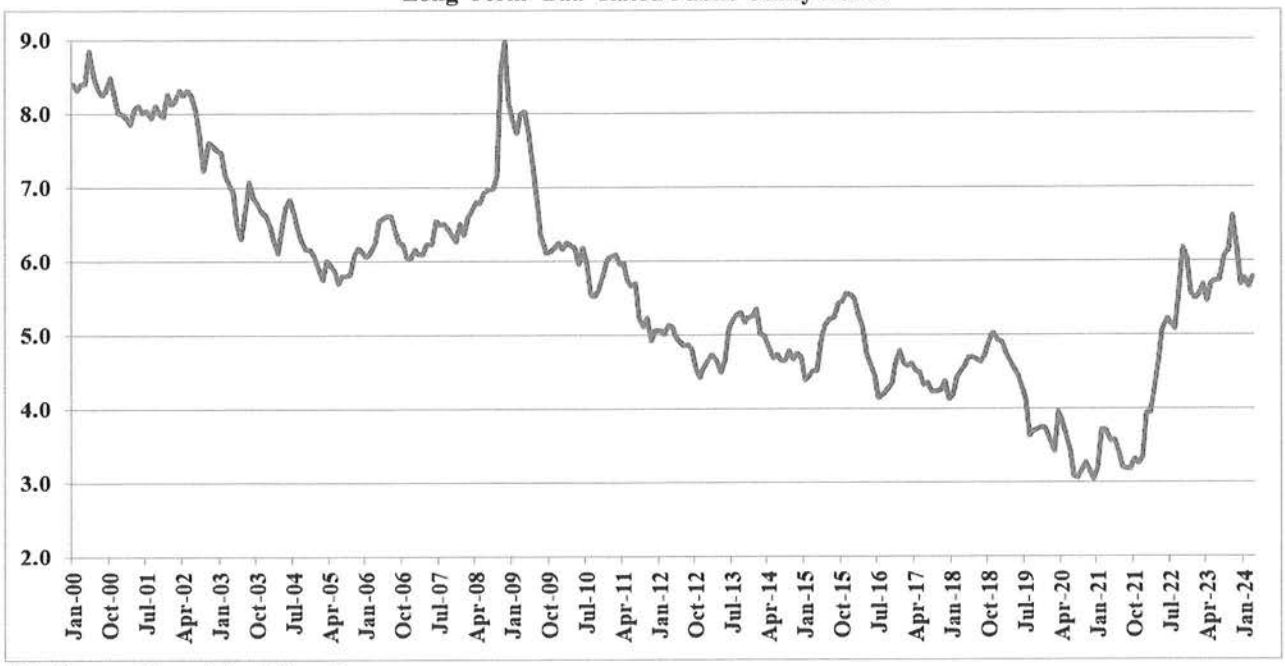
Exhibit JRW-1

Tampa Electric Company

OPC's Recommended Cost of Capital from Investor-Provided Capital

Capital Source	Capitalization Amount	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long Term Debt	$ 3,536,333	41.57%	4.53%	1.88%
Short Term Debt	376,625	4.43%	3.90%	0.17%
Common Equity	4,593,473	54.00%	9.50%	5.13%
Totals	$ 8,506,431	100.00%		7.19%

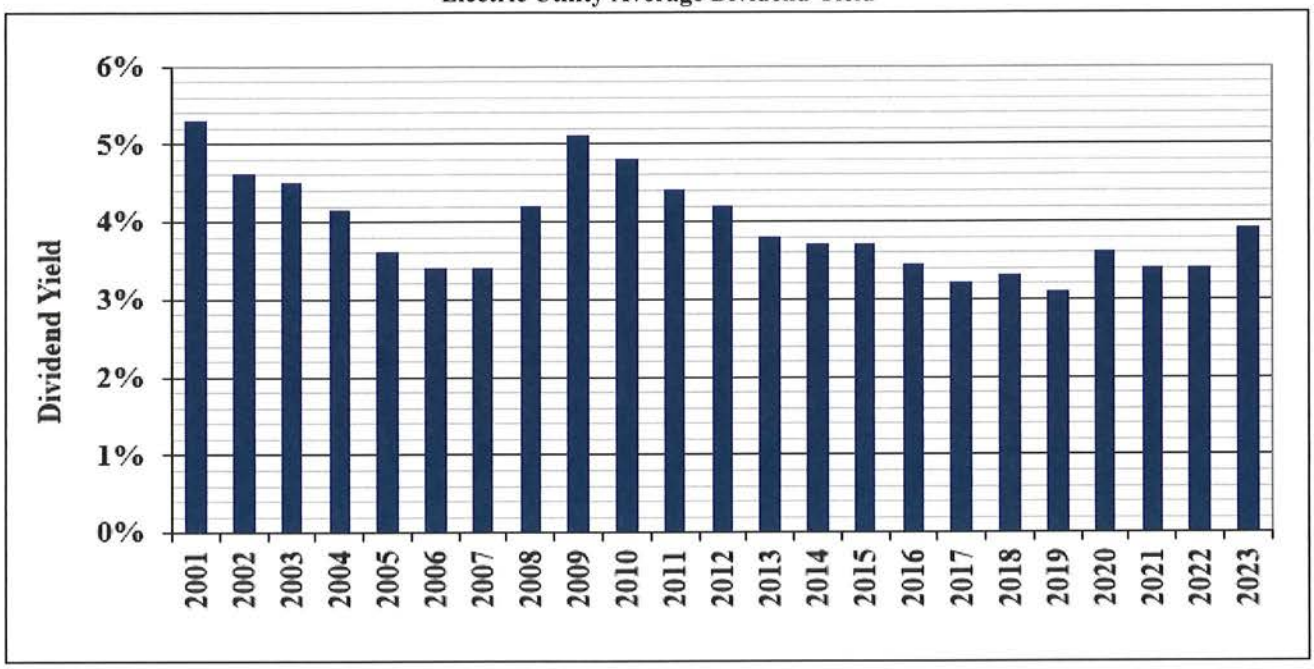
Exhibit JRW-2
Long-Term 'Baa' Rated Public Utility Bonds



Data Source: Mergent Bond Record

Exhibit JRW-2

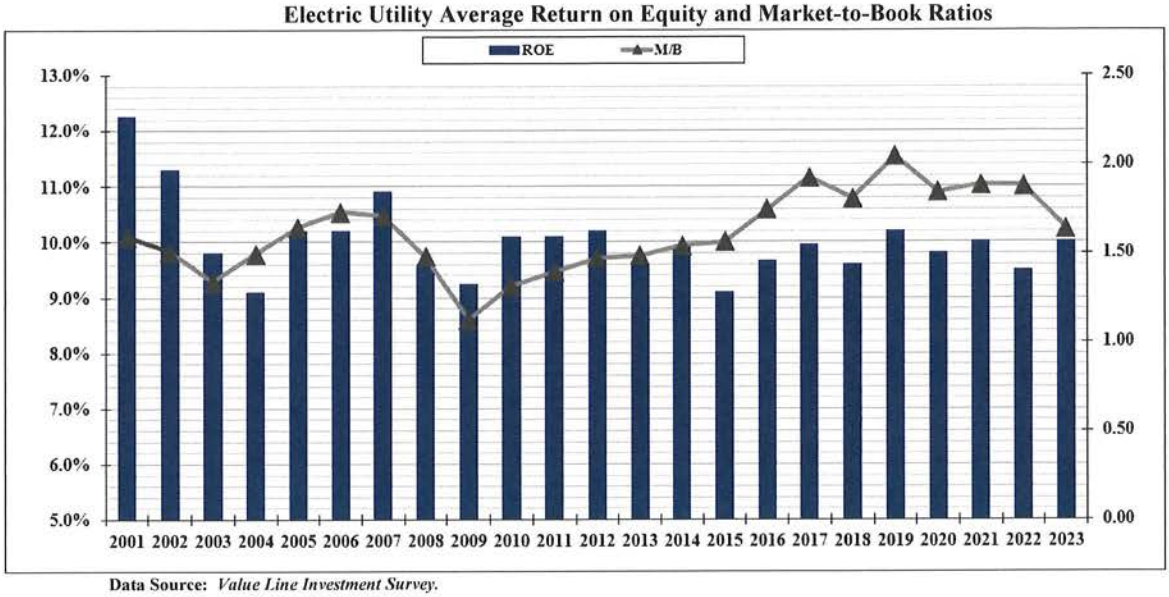
Electric Utility Average Dividend Yield



Data Source: *Value Line Investment Survey.*

Exhibit JRW-2

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



Data Source: *Value Line Investment Survey.*

Data Source: *Value Line Investment Survey.*

Exhibit JRW-3
Tampa Electric Company
Summary Financial Statistics for Proxy Group

Panel A

Electric Proxy Group															
Company		Operating Revenue ($bil)	Reg Elec Revenue	Percent Reg Gas Revenue	Net Plant ($bil)	Market Cap ($bil)	S&P Issuer Credit Rating	Moody's Long Term Rating	Interest Coverage	Primary Service Area	Common Equity Ratio	Return on Equity	Market to Book Ratio	Last Filing Period	
Alliant Energy Corporation (NYSE-LNT)	LNT	$4.03	83%	13%	$17.16	12.22	A-	Baa2	2.33	WI,IA,IL,MN	41.1%	10.77	1.80	12/31/2023	1
Ameren Corporation (NYSE-AEE)	AEE	$7.27	74%	17%	$33.78	18.99	BBB+	Baa1	3.48	IL,MO	40.7%	10.46	1.67	12/31/2023	2
American Electric Power Co. (NYSE-AEP)	AEP	$18.52	90%	0%	$77.31	44.72	A-	Baa2	2.19	10 States	36.6%	8.96	1.77	12/31/2023	3
Avista Corporation (NYSE-AVA)	AVA	$1.75	70%	30%	$5.84	2.60	BBB	Baa2	2.07	NY,CT,ME	44.8%	7.10	1.05	12/31/2023	4
CMS Energy Corporation (NYSE-CMS)	CMS	$7.46	64%	32%	$25.10	17.12	BBB+	Baa2	2.32	MI	31.8%	10.27	2.34	12/31/2023	5
Consolidated Edison, Inc. (NYSE-ED)	ED	$14.66	74%	21%	$50.14	30.06	A-	Baa2	3.04	NY,PA	45.8%	11.97	1.42	12/31/2023	6
Duke Energy Corporation (NYSE-DUK)	DUK	$28.60	93%	8%	$114.90	70.04	BBB+	Baa2	2.41	NC,OH,FL,SC,KY	36.9%	8.48	1.49	12/31/2023	7
Edison International (NYSE-EIX)	EIX	$16.34	100%	0%	$57.18	25.59	BBB	Baa2	1.98	CA	28.1%	6.75	1.85	12/31/2023	8
Entergy Corporation (NYSE-ETR)	ETR	$12.02	97%	1%	$44.25	21.42	BBB+	Baa2	2.99	LA,AR,MS,TX	35.5%	16.69	1.46	12/31/2023	9
Evergy, Inc. (NYSE-EVRG)	EVRG	$5.51	100%		$23.60	11.28	BBB+	Baa2	2.48	KS,MO	42.1%	7.75	1.17	12/31/2023	10
Eversource Energy (NYSE-ES)	ES	$11.91	91%	19%	$39.55	20.43	A-	Baa1	3.33	CT,NH,MA	34.5%	-2.90	1.44	12/31/2023	11
Exelon Corporation (NDW-EXC)	EXC	$21.73	89%	8%	$73.85	35.47	BBB+	Baa2	2.33	PA,IL,MD,DE,NJ	36.7%	9.22	1.38	12/31/2023	12
IDACORP, Inc. (NYSE-IDA)	IDA	$1.76	100%	0%	$5.75	4.41	BBB	Baa2	2.53	ID	50.7%	9.14	1.52	12/31/2023	13
MGE Energy, Inc. (NYSE-MGEE)	MGEE	$0.67	65%	29%	$2.14	2.29	AA-	A1	5.00	WI	59.1%	10.60	2.00	12/31/2023	14
NextEra Energy, Inc. (NYSE-NEE)	NEE	$28.11	100%	0%	$126.61	113.31	A-	Baa1	3.03	FL	39.1%	11.58	2.39	12/31/2023	15
NorthWestern Corporation (NYSE-NWE)	NWE	$1.42	75%	25%	$6.04	2.95	BBB	Baa2	2.59	MT,SD,NE	49.9%	7.12	1.06	12/31/2023	16
OGE Energy Corp. (NYSE-OGE)	OGE	$2.61	100%	0%	$10.95	6.58	BBB+	Baa1	2.87	OK,AR	48.1%	9.34	1.46	12/31/2023	17
Pinnacle West Capital Corp. (NYSE-PNW)	PNW	$4.70	95%	0%	$18.92	7.72	BBB+	Baa1	2.49	AZ	37.5%	8.34	1.25	12/31/2023	18
Portland General Electric Company (NYSE-POR)	POR	$2.92	100%	0%	$9.19	4.06	BBB+	A3	2.21	OR	42.5%	7.48	1.22	12/31/2023	19
PPL Corporation (NYSE-PPL)	PPL	$8.31	90%	10%	$31.49	19.28	A-	Baa1	2.84	PA,KY,MA	46.9%	5.31	1.38	12/31/2023	20
Public Service Enterprise Group Incorporated (NYSE - PI	PEG	$11.24	63%	19%	$38.21	31.03	BBB+	Baa2	5.54	NJ	43.1%	17.55	2.00	12/31/2023	21
Southern Company (NYSE-SO)	SO	$24.30	75%	16%	$101.08	72.95	BBB+	Baa2	2.63	GA,FL,NJ,IL,VA,TN,MS	33.1%	11.04	2.32	12/31/2023	
WEC Energy Group (NYSE-WEC)	WEC	$8.89	73%	26%	$31.61	24.74	A-	Baa1	3.00	WI,IL,MN,MI	38.4%	11.23	2.11	12/31/2023	
Xcel Energy Inc. (NYSE-XEL)	XEL	$14.09	81%	19%	$52.51	27.52	A-	Baa1	2.48	MN,WI,ND,SD,MI	39.0%	10.33	1.56	12/31/2023	
Mean		$10.78	85%	13%	$41.55	$26.12	BBB+	Baa2	2.84		40.9%	9.36	1.63		22
Median		$8.60	89%	13%	$32.69	$19.85	BBB+	Baa2	2.56		39.9%	9.28	1.50		

Data Source: Company 2023 SEC 10-K filings, S&P Capital IQ; *Value Line Investment Survey*, 2024.

Panel B

D'Ascendis Proxy Group														
Company		Operating Revenue ($bil)	Percent Reg Elec Revenue	Percent Reg Gas Revenue	Net Plant ($bil)	Market Cap ($bil)	S&P Issuer Credit Rating	Moody's Long Term Rating	Pre-Tax Interest Coverage	Primary Service Area	Common Equity Ratio	Return on Equity	Market to Book Ratio	Last Filing Period	
Alliant Energy Corporation (NYSE-LNT)	LNT	$4.03	83%	13%	$17.16	12.22	A-	Baa2	2.33	WI,IA,IL,MN	41.1%	10.77	1.80	12/31/2023	
Ameren Corporation (NYSE-AEE)	AEE	$7.27	74%	17%	$33.78	18.99	BBB+	Baa1	3.48	IL,MO	40.7%	10.46	1.67	12/31/2023	
American Electric Power Co. (NYSE-AEP)	AEP	$18.52	90%	0%	$77.31	44.72	A-	Baa2	2.19	10 States	36.6%	8.96	1.77	12/31/2023	1
Duke Energy Corporation (NYSE-DUK)	DUK	$28.60	93%	8%	$114.90	70.04	BBB+	Baa2	2.41	NC,OH,FL,SC,KY	36.9%	8.48	1.49	12/31/2023	
Edison International (NYSE-EIX)	EIX	$16.34	100%	0%	$57.18	25.59	BBB	Baa2	1.98	CA	28.1%	6.75	1.85	12/31/2023	1
Entergy Corporation (NYSE-ETR)	ETR	$12.02	97%	1%	$44.25	21.42	BBB+	Baa2	2.99	LA,AR,MS,TX	35.5%	16.69	1.46	12/31/2023	2
Evergy, Inc. (NYSE-EVRG)	EVRG	$5.51	100%	0%	$23.60	11.28	BBB+	Baa2	2.48	KS,MO	42.1%	7.75	1.17	12/31/2023	
IDACORP, Inc. (NYSE-IDA)	IDA	$1.76	100%	0%	$5.75	4.41	BBB	Baa2	2.53	ID	50.7%	9.14	1.52	12/31/2023	
NorthWestern Corporation (NYSE-NWE)	NWE	$1.42	75%	25%	$6.04	2.95	BBB	Baa2	2.59	MT,SD,NE	49.9%	7.12	1.06	12/31/2023	
OGE Energy Corp. (NYSE-OGE)	OGE	$2.61	100%	0%	$10.95	6.58	BBB+	Baa1	2.87	OK,AR	48.1%	9.34	1.46	12/31/2023	1
Pinnacle West Capital Corp. (NYSE-PNW)	PNW	$4.70	95%	0%	$18.92	7.72	BBB+	Baa1	2.49	AZ	37.5%	8.34	1.25	12/31/2023	
Portland General Electric Company (NYSE-POR)	POR	$2.92	100%	0%	$9.19	4.06	BBB+	A3	2.21	OR	42.5%	7.48	1.22	12/31/2023	
Southern Company (NYSE-SO)	SO	$24.30	75%	16%	$101.08	72.95	BBB+	Baa2	2.63	GA,FL,NJ,IL,VA,TN,MS	33.1%	11.04	2.32	12/31/2023	
Xcel Energy Inc. (NYSE-XEL)	XEL	$14.09	81%	19%	$52.51	27.52	A-	Baa1	2.48	MN,WI,ND,SD,MI	39.0%	10.33	1.56	12/31/2023	
Mean		$10.29	90%	7%	$40.90	$23.60	BBB+	Baa2	2.55		40.1%	9.48	1.54	12/31/2023	
Median		$6.39	94%	1%	$28.69	$15.61	BBB+	Baa2	2.49		39.9%	9.05	1.50		

Data Source: Company 2023 SEC 10-K filings, S&P Capital IQ; *Value Line Investment Survey*, 2024.

Exhibit JRW-3

Tampa Electric Company

***Value Line* Risk Metrics**

Panel A
Electric Proxy Group

Company	Beta	Financial Strength	Safety	Earnings Predictability	Stock Price Stability
Alliant Energy Corporation (NYSE-LNT)	0.90	B++	2	100	95
Ameren Corporation (NYSE-AEE)	0.90	A	1	100	95
American Electric Power Co. (NYSE-AEP)	0.80	A+	1	95	95
Avista Corporation (NYSE-AVA)	0.95	B+	3	70	70
CMS Energy Corporation (NYSE-CMS)	0.85	A	2	90	95
Consolidated Edison, Inc. (NYSE-ED)	0.80	A+	1	100	90
Duke Energy Corporation (NYSE-DUK)	0.90	A	2	100	95
Edison International (NYSE-EIX)	1.00	B++	3	10	85
Entergy Corporation (NYSE-ETR)	0.95	B++	2	80	90
Evergy, Inc. (NYSE-EVRG)	0.95	B++	2	85	90
Eversource Energy (NYSE-ES)	0.95	A	2	100	80
Exelon Corporation (NDW-EXC)	NMF	B++	2	nmf	nmf
IDACORP, Inc. (NYSE-IDA)	0.85	A	2	100	95
MGE Energy, Inc. (NYSE-MGEE)	0.80	B++	2	100	100
NextEra Energy, Inc. (NYSE-NEE)	1.05	A	3	95	55
NorthWestern Corporation (NYSE-NWE)	0.95	B+	3	95	90
OGE Energy Corp. (NYSE-OGE)	1.05	B++	3	95	80
Pinnacle West Capital Corp. (NYSE-PNW)	0.95	B++	3	90	85
Portland General Electric Company (NYSE-POR)	0.90	B++	3	95	90
PPL Corporation (NYSE-PPL)	1.15	A	3	45	75
Public Service Enterprise Group Incorporated (NYSE - PEG)	0.95	A	1	100	95
Southern Company (NYSE-SO)	0.95	A	2	95	90
WEC Energy Group (NYSE-WEC)	0.85	A+	1	100	85
Xcel Energy Inc. (NYSE-XEL)	0.85	A	2	100	95
Mean	0.92	A	2.1	89	88

Data Source: *Value Line Investment Survey* , 2024.

Panel B
D'Ascendis Proxy Group

Company	Beta	Financial Strength	Safety	Earnings Predictability	Stock Price Stability
Alliant Energy Corporation (NYSE-LNT)	0.90	B++	2	100	95
Ameren Corporation (NYSE-AEE)	0.90	A	1	100	95
American Electric Power Co. (NYSE-AEP)	0.80	A+	1	95	95
Duke Energy Corporation (NYSE-DUK)	0.90	A	2	100	95
Edison International (NYSE-EIX)	1.00	B++	3	10	85
Entergy Corporation (NYSE-ETR)	0.95	B++	2	80	90
Evergy, Inc. (NYSE-EVRG)	0.95	B++	2	85	90
IDACORP, Inc. (NYSE-IDA)	0.85	A	2	100	95
NorthWestern Corporation (NYSE-NWE)	0.95	B+	3	95	90
OGE Energy Corp. (NYSE-OGE)	1.05	B++	3	95	80
Pinnacle West Capital Corp. (NYSE-PNW)	0.95	B++	3	90	85
Portland General Electric Company (NYSE-POR)	0.90	B++	3	95	90
Southern Company (NYSE-SO)	0.95	A	2	95	90
Xcel Energy Inc. (NYSE-XEL)	0.85	A	2	100	95
Mean	0.92	A/B++	2.2	89	91

Data Source: *Value Line Investment Survey* , 2024.

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-4
Tampa Electric Company

Panel A
TECO's Proposed Capital Structure and Senior Capital Cost Rates

Capital Source	Capital Ratio	Cost Rate
Long Term Debt	41.57%	4.53%
Short Term Debt	4.43%	3.90%
Common Equity	54.00%	
Totals	100.00%	

Panel B
OPC's Proposed Capital Structure and Debt Cost Rate

Capital Source	Capital Ratio	Cost Rate
Long Term Debt	41.57%	4.53%
Short Term Debt	4.43%	3.90%
Common Equity	54.00%	
Totals	100.00%	

Exhibit JRW-5

Tampa Electric Company
Discounted Cash Flow Analysis

Panel A
Electric Proxy Group

Dividend Yield*	4.10%
Adjustment Factor	1.0275
Adjusted Dividend Yield	4.21%
Growth Rate**	5.50%
Equity Cost Rate	9.70%

* Page 2 of Exhibit JRW-5

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

*** DCF ROE rounded to nearest 0.05%.

Panel B
D'Ascendis Proxy Group

Dividend Yield*	4.30%
Adjustment Factor	1.028
Adjusted Dividend Yield	4.42%
Growth Rate**	5.60%
Equity Cost Rate	10.00%

* Page 2 of Exhibit JRW-5

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

*** DCF ROE rounded to nearest 0.05%.

Exhibit JRW-5

Tampa Electric Company
Monthly Dividend Yields

Panel A
Electric Proxy Group

Company		Annual Dividend	Dividend Yield 30 Day	Dividend Yield 90 Day	Dividend Yield 180 Day
Alliant Energy Corporation (NYSE-LNT)	LNT	$1.92	3.8%	3.9%	3.9%
Ameren Corporation (NYSE-AEE)	AEE	$2.68	3.6%	3.7%	3.6%
American Electric Power Co. (NYSE-AEP)	AEP	$3.52	4.1%	4.2%	4.4%
Avista Corporation (NYSE-AVA)	AVA	$1.90	5.3%	5.5%	5.5%
CMS Energy Corporation (NYSE-CMS)	CMS	$2.06	3.4%	3.5%	3.6%
Consolidated Edison, Inc. (NYSE-ED)	ED	$3.32	3.5%	3.7%	3.7%
Duke Energy Corporation (NYSE-DUK)	DUK	$4.10	4.1%	4.3%	4.4%
Edison International (NYSE-EIX)	EIX	$3.12	4.4%	4.5%	4.6%
Entergy Corporation (NYSE-ETR)	ETR	$4.52	4.2%	4.4%	4.5%
Evergy, Inc. (NYSE-EVRG)	EVRG	$2.57	4.8%	5.0%	5.0%
Eversource Energy (NYSE-ES)	ES	$2.86	4.8%	4.9%	4.9%
Exelon Corporation (NDW-EXC)	EXC	$1.52	4.0%	4.2%	4.0%
IDACORP, Inc. (NYSE-IDA)	IDA	$3.32	3.5%	3.6%	3.5%
MGE Energy, Inc. (NYSE-MGEE)	MGEE	$1.71	2.2%	2.3%	2.3%
NextEra Energy, Inc. (NYSE-NEE)	NEE	$2.06	3.0%	3.3%	3.4%
NorthWestern Corporation (NYSE-NWE)	NWE	$2.60	5.2%	5.3%	5.2%
OGE Energy Corp. (NYSE-OGE)	OGE	$1.67	4.8%	4.9%	4.9%
Pinnacle West Capital Corp. (NYSE-PNW)	PNW	$3.52	4.7%	4.9%	4.8%
Portland General Electric Company (NYSE-POR)	POR	$2.00	4.6%	4.8%	4.8%
PPL Corporation (NYSE-PPL)	PPL	$1.03	3.7%	3.8%	3.9%
Public Service Enterprise Group Incorporated (NYS	PEG	$2.40	3.5%	3.7%	3.8%
Southern Company (NYSE-SO)	SO	$2.88	3.9%	4.1%	4.1%
WEC Energy Group (NYSE-WEC)	WEC	$3.34	4.1%	4.1%	4.1%
Xcel Energy Inc. (NYSE-XEL)	XEL	$2.19	4.0%	3.9%	3.8%
Mean			4.1%	4.2%	4.2%
Median			4.0%	4.2%	4.1%

Data Sources: S&P Cap IQ., May 17, 2024.

Panel B
D'Ascendis Proxy Group

Company		Annual Dividend	Dividend Yield 30 Day	Dividend Yield 90 Day	Dividend Yield 180 Day
Alliant Energy Corporation (NYSE-LNT)	LNT	$1.92	3.8%	3.9%	3.9%
Ameren Corporation (NYSE-AEE)	AEE	$2.68	3.6%	3.7%	3.6%
American Electric Power Co. (NYSE-AEP)	AEP	$3.52	4.1%	4.2%	4.4%
Duke Energy Corporation (NYSE-DUK)	DUK	$4.10	4.1%	4.3%	4.4%
Edison International (NYSE-EIX)	EIX	$3.12	4.4%	4.5%	4.6%
Entergy Corporation (NYSE-ETR)	ETR	$4.52	4.2%	4.4%	4.5%
Evergy, Inc. (NYSE-EVRG)	EVRG	$2.57	4.8%	5.0%	5.0%
IDACORP, Inc. (NYSE-IDA)	IDA	$3.32	3.5%	3.6%	3.5%
NorthWestern Corporation (NYSE-NWE)	NWE	$2.60	5.2%	5.3%	5.2%
OGE Energy Corp. (NYSE-OGE)	OGE	$1.67	4.8%	4.9%	4.9%
Pinnacle West Capital Corp. (NYSE-PNW)	PNW	$3.52	4.7%	4.9%	4.8%
Portland General Electric Company (NYSE-POR)	POR	$2.00	4.6%	4.8%	4.8%
Southern Company (NYSE-SO)	SO	$2.88	3.9%	4.1%	4.1%
Xcel Energy Inc. (NYSE-XEL)	XEL	$2.19	4.0%	3.9%	3.8%
Mean			4.3%	4.4%	4.4%
Median			4.2%	4.3%	4.4%

Data Sources: S&P Cap IQ., May 17, 2024.

Exhibit JRW-5

Tampa Electric Company
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
Alliant Energy Corporation (NYSE-LNT)	6.0	6.5	6.0	7.0	6.5	6.5
Ameren Corporation (NYSE-AEE)	4.0	3.5	2.0	8.0	5.0	5.5
American Electric Power Co. (NYSE-AEP)	5.0	5.0	3.5	4.0	5.0	3.5
Avista Corporation (NYSE-AVA)	3.0	4.5	4.0	1.0	4.5	3.5
CMS Energy Corporation (NYSE-CMS)	6.0	7.0	6.5	5.5	6.5	8.0
Consolidated Edison, Inc. (NYSE-ED)	2.0	2.5	4.0	2.0	2.5	3.5
Duke Energy Corporation (NYSE-DUK)	3.0	3.0	2.0	4.5	3.5	1.0
Edison International (NYSE-EIX)	2.0	8.0	2.0	14.0	5.0	0.5
Entergy Corporation (NYSE-ETR)	2.5	2.0	2.0	5.5	3.0	6.5
Evergy, Inc. (NYSE-EVRG)						
Eversource Energy (NYSE-ES)	6.5	7.0	4.5	5.5	6.0	4.0
Exelon Corporation (NDW-EXC)	-0.5	-3.0	4.5	2.5	4.0	3.5
IDACORP, Inc. (NYSE-IDA)	4.0	8.0	4.5	3.5	6.5	4.5
MGE Energy, Inc. (NYSE-MGEE)	4.5	4.0	5.5	5.5	4.0	5.5
Nextera Energy, Inc. (NYSE-NEE)	9.5	11.5	8.0	12.5	11.5	6.0
NorthWestern Corporation (NYSE-NWE)	3.5	5.5	6.0		3.5	4.0
OGE Energy Corp. (NYSE-OGE)	3.0	7.5	4.0	4.5	6.5	1.5
Pinnacle West Capital Corp. (NYSE-PNW)	3.5	4.0	4.0	2.0	5.0	3.5
Portland General Electric Company (NYSE-POR)	3.5	5.0	3.5	3.0	6.0	3.0
PPL Corporation (NYSE-PPL)	-9.0	-1.0		-17.0	-0.5	3.0
Public Service Enterprise Group Incorporated (NYSE - PEG)	3.0	4.5	3.0	4.0	4.5	1.5
Southern Company (NYSE-SO)	3.0	3.5	3.0	3.0	3.5	2.5
WEC Energy Group (NYSE-WEC)	6.5	10.0	7.0	7.0	6.5	3.5
Xcel Energy Inc. (NYSE-XEL)	5.5	6.0	5.0	6.5	6.5	6.0
Mean	3.5	5.0	4.3	4.3	5.0	3.9
Median	3.5	5.0	4.0	4.5	5.0	3.5
	Average of Median Figures =			4.3		

Data Source: *Value Line Investment Survey.*

Panel B
D'Ascendis Proxy Group

Company	*Value Line* Historic Growth					
	Past 10 Years			Past 5 Years		
	Earnings	Dividends	Book Value	Earnings	Dividends	Book Value
Alliant Energy Corporation (NYSE-LNT)	6.0	6.5	6.0	7.0	6.5	6.5
Ameren Corporation (NYSE-AEE)	4.0	3.5	2.0	8.0	5.0	5.5
American Electric Power Co. (NYSE-AEP)	5.0	5.0	3.5	4.0	5.0	3.5
Duke Energy Corporation (NYSE-DUK)	3.0	3.0	2.0	4.5	3.5	1.0
Edison International (NYSE-EIX)	2.0	7.5	1.5	1.5	6.5	0.5
Entergy Corporation (NYSE-ETR)	2.5	2.0	2.0	5.5	3.0	6.5
Evergy, Inc. (NYSE-EVRG)						
IDACORP, Inc. (NYSE-IDA)	4.0	8.0	4.5	3.5	6.5	4.5
NorthWestern Corporation (NYSE-NWE)	3.5	5.5	6.0		3.5	4.0
OGE Energy Corp. (NYSE-OGE)	3.0	7.5	4.0	4.5	6.5	1.5
Pinnacle West Capital Corp. (NYSE-PNW)	3.5	4.0	4.0	2.0	5.0	3.5
Portland General Electric Company (NYSE-POR)	3.5	5.0	3.5	3.0	6.0	3.0
Southern Company (NYSE-SO)	3.0	3.5	3.0	3.0	3.5	2.5
Xcel Energy Inc. (NYSE-XEL)	5.5	6.0	5.0	6.5	6.5	6.0
Mean	3.7	5.2	3.6	4.4	5.2	3.7
Median	3.5	5.0	3.5	4.3	5.0	3.5
	Average of Median Figures =			4.1		

Data Source: *Value Line Investment Survey.*

Exhibit JRW-5

Tampa Electric Company
DCF Equity Cost Growth Rate Measures
Value Line Projected Growth Rates

Panel A
Electric Proxy Group

Company	*Value Line* Projected Growth Est'd. '21-'23 to '27-'29			*Value Line* Sustainable Growth		
	Earnings	Dividends	Book Value	Return on Equity	Retention Rate	Internal Growth
Alliant Energy Corporation (NYSE-LNT)	6.5	6.0	5.0	12.0%	38.0%	4.6%
Ameren Corporation (NYSE-AEE)	6.5	6.5	6.5	10.0%	40.0%	4.0%
American Electric Power Co. (NYSE-AEP)	6.5	5.5	6.0	11.0%	39.0%	4.3%
Avista Corporation (NYSE-AVA)	6.0	4.5	3.5	8.5%	23.0%	2.0%
CMS Energy Corporation (NYSE-CMS)	5.0	4.0	4.0	13.0%	38.0%	4.9%
Consolidated Edison, Inc. (NYSE-ED)	6.0	3.5	4.5	9.0%	40.0%	3.6%
Duke Energy Corporation (NYSE-DUK)	5.0	2.0	2.5	9.0%	32.0%	2.9%
Edison International (NYSE-EIX)	6.0	5.5	5.0	13.5%	38.0%	5.1%
Entergy Corporation (NYSE-ETR)	0.5	3.5	4.0	9.5%	38.0%	3.6%
Evergy, Inc. (NYSE-EVRG)	7.5	7.0	3.5	10.0%	37.0%	3.7%
Eversource Energy (NYSE-ES)	6.0	6.0	3.5	11.0%	38.0%	4.2%
Exelon Corporation (NDW-EXC)	NMF	NMF	NMF	10.0%	40.0%	4.0%
IDACORP, Inc. (NYSE-IDA)	5.0	5.5	4.0	9.0%	36.0%	3.2%
MGE Energy, Inc. (NYSE-MGEE)	6.0	3.5	2.0	12.5%	58.0%	7.3%
Nextera Energy, Inc. (NYSE-NEE)	8.0	9.0	9.0	13.0%	37.0%	4.8%
NorthWestern Corporation (NYSE-NWE)	4.0	2.0	3.0	8.0%	35.0%	2.8%
OGE Energy Corp. (NYSE-OGE)	6.5	3.0	5.5	13.0%	43.0%	5.6%
Pinnacle West Capital Corp. (NYSE-PNW)	4.5	1.5	4.5	8.5%	37.0%	3.1%
Portland General Electric Company (NYSE-POR)	6.0	5.5	4.0	9.5%	36.0%	3.4%
PPL Corporation (NYSE-PPL)	7.5	-0.5	3.0	9.5%	40.0%	3.8%
Public Service Enterprise Group Incorporated (NYSE - PEG	5.0	5.0	5.0	12.0%	38.0%	4.6%
Southern Company (NYSE-SO)	6.5	3.5	3.5	14.5%	33.0%	4.8%
WEC Energy Group (NYSE-WEC)	6.0	7.0	4.0	13.0%	36.0%	4.7%
Xcel Energy Inc. (NYSE-XEL)	7.0	5.5	5.5	11.5%	43.0%	4.9%
Mean	5.8	4.5	4.4	10.9%	38.0%	4.2%
Median	6.0	5.0	4.0	10.5%	38.0%	4.1%
Average of Median Figures =		5.0			Median =	4.1%

* 'Est'd. '21-'23 to '27-'29 is the estimated growth rate from the base period 2021 to 2023 until the future period 2027 to 2029.

Panel B
D'Ascendis Proxy Group

Company	*Value Line* Projected Growth Est'd. '21-'23 to '27-'29			*Value Line* Sustainable Growth		
	Earnings	Dividends	Book Value	Return on Equity	Retention Rate	Internal Growth
Alliant Energy Corporation (NYSE-LNT)	6.5	6.0	5.0	12.0%	38.0%	4.6%
Ameren Corporation (NYSE-AEE)	6.5	6.5	6.5	10.0%	40.0%	4.0%
American Electric Power Co. (NYSE-AEP)	6.5	5.5	6.0	11.0%	39.0%	4.3%
Duke Energy Corporation (NYSE-DUK)	5.0	2.0	2.5	9.0%	32.0%	2.9%
Edison International (NYSE-EIX)	6.0	5.5	5.0	13.5%	38.0%	5.1%
Entergy Corporation (NYSE-ETR)	0.5	3.5	4.0	9.5%	38.0%	3.6%
Evergy, Inc. (NYSE-EVRG)	7.5	7.0	3.5	10.0%	37.0%	3.7%
IDACORP, Inc. (NYSE-IDA)	5.0	5.5	4.0	9.0%	36.0%	3.2%
NorthWestern Corporation (NYSE-NWE)	4.0	2.0	3.0	8.0%	35.0%	2.8%
OGE Energy Corp. (NYSE-OGE)	6.5	3.0	5.5	13.0%	43.0%	5.6%
Pinnacle West Capital Corp. (NYSE-PNW)	4.5	1.5	4.5	8.5%	37.0%	3.1%
Portland General Electric Company (NYSE-POR)	6.0	5.5	4.0	9.5%	36.0%	3.4%
Southern Company (NYSE-SO)	6.5	3.5	3.5	14.5%	33.0%	4.8%
Xcel Energy Inc. (NYSE-XEL)	7.0	5.5	5.5	11.5%	43.0%	4.9%
Mean	5.6	4.5	4.5	10.6%	37.5%	4.0%
Median	6.3	5.5	4.3	10.0%	37.5%	3.9%
Average of Median Figures =		5.3			Median =	3.9%

* 'Est'd. '21-'23 to '27-'29 is the estimated growth rate from the base period 2021 to 2023 until the future period 2027 to 2029.

Exhibit JRW-5

Tampa Electric Company
DCF Equity Cost Growth Rate Measures
Analysts Projected EPS Growth Rate Estimates

Panel A
Electric Proxy Group

Company		Yahoo	Zacks	S&P	Mean
Alliant Energy Corporation (NYSE-LNT)	LNT	6.30%	6.10%	6.60%	6.3%
Ameren Corporation (NYSE-AEE)	AEE	4.80%	6.48%	6.41%	5.9%
American Electric Power Co. (NYSE-AEP)	AEP	6.19%	5.80%	6.26%	6.1%
Avista Corporation (NYSE-AVA)	AVA	6.20%	NA	5.00%	5.6%
CMS Energy Corporation (NYSE-CMS)	CMS	7.40%	7.38%	7.27%	7.3%
Consolidated Edison, Inc. (NYSE-ED)	ED	6.09%	2.00%	4.91%	4.3%
Duke Energy Corporation (NYSE-DUK)	DUK	6.86%	6.28%	6.40%	6.5%
Edison International (NYSE-EIX)	EIX	7.60%	NA	7.40%	7.5%
Entergy Corporation (NYSE-ETR)	ETR	6.80%	7.46%	7.05%	7.1%
Evergy, Inc. (NYSE-EVRG)	EVRG	6.00%	5.00%	5.27%	5.4%
Eversource Energy (NYSE-ES)	ES	4.20%	5.70%	6.00%	5.3%
Exelon Corporation (NDW-EXC)	EXC	4.20%	5.91%	5.96%	5.4%
IDACORP, Inc. (NYSE-IDA)	IDA	4.40%	NA	6.20%	5.3%
MGE Energy, Inc. (NYSE-MGEE)	MGEE	5.40%	NA	0.00%	2.7%
Nextera Energy, Inc. (NYSE-NEE)	NEE	7.84%	7.99%	8.12%	8.0%
NorthWestern Corporation (NYSE-NWE)	NWE	4.50%	NA	5.08%	4.8%
OGE Energy Corp. (NYSE-OGE)	OGE	-12.34%	5.00%	5.27%	-0.7%
Pinnacle West Capital Corp. (NYSE-PNW)	PNW	6.90%	7.55%	6.82%	7.1%
Portland General Electric Company (NYSE-POR)	POR	12.50%	NA	8.95%	10.7%
PPL Corporation (NYSE-PPL)	PPL	6.80%	6.46%	6.87%	6.7%
Public Service Enterprise Group Incorporated (NYSE - PEG	PEG	5.25%	6.24%	6.51%	6.0%
Southern Company (NYSE-SO)	SO	7.30%	4.50%	5.83%	5.9%
WEC Energy Group (NYSE-WEC)	WEC	6.68%	7.17%	7.04%	7.0%
Xcel Energy Inc. (NYSE-XEL)	XEL	6.73%	6.41%	6.36%	6.5%
Mean		5.6%	6.1%	6.1%	5.9%
Median		6.3%	6.3%	6.4%	6.0%

Data Sources: www.zacks.com, http://quote.yahoo.com, S&P Cap IQ, May 17, 2024.

Panel B
D'Ascendis Proxy Group

Company		Yahoo	Zacks	S&P	Mean
Alliant Energy Corporation (NYSE-LNT)	LNT	6.30%	6.10%	6.60%	6.3%
Ameren Corporation (NYSE-AEE)	AEE	4.80%	6.48%	6.41%	5.9%
American Electric Power Co. (NYSE-AEP)	AEP	6.19%	5.80%	6.26%	6.1%
Duke Energy Corporation (NYSE-DUK)	DUK	6.86%	6.28%	6.40%	6.5%
Edison International (NYSE-EIX)	EIX	7.60%	NA	7.40%	7.5%
Entergy Corporation (NYSE-ETR)	ETR	6.80%	7.46%	7.05%	7.1%
Evergy, Inc. (NYSE-EVRG)	EVRG	6.00%	5.00%	5.27%	5.4%
IDACORP, Inc. (NYSE-IDA)	IDA	4.40%	NA	6.20%	5.3%
NorthWestern Corporation (NYSE-NWE)	NWE	4.50%	NA	5.08%	4.8%
OGE Energy Corp. (NYSE-OGE)	OGE	-12.34%	5.00%	5.27%	-0.7%
Pinnacle West Capital Corp. (NYSE-PNW)	PNW	6.90%	7.55%	6.82%	7.1%
Portland General Electric Company (NYSE-POR)	POR	12.50%	NA	8.95%	10.7%
Southern Company (NYSE-SO)	SO	7.30%	4.50%	5.83%	5.9%
Xcel Energy Inc. (NYSE-XEL)	XEL	6.73%	6.41%	6.36%	6.5%
Mean		5.3%	6.1%	6.4%	6.0%
Median		6.5%	6.2%	6.4%	6.2%

Data Sources: www.zacks.com, http://quote.yahoo.com, S&P Cap IQ, April 27, 2024.

Exhibit JRW-5

Tampa Electric Company
DCF Growth Rate Indicators

Growth Rate Indicator	Electric Proxy Group	D'Ascendis Proxy Group
Historic *Value Line* Growth in EPS, DPS, and BVPS	4.3%	4.1%
Projected *Value Line* Growth in EPS, DPS, and BVPS	5.0%	5.3%
Sustainable Growth ROE * Retention Rate	4.1%	3.9%
Projected EPS Growth from Yahoo, Zacks, and S&P Cap IQ - Mean/Median	5.9%/6.0%	6.0%/6.2%
DCF Growth Rate	5.50%	5.60%

Exhibit JRW-6

Tampa Electric Company
Capital Asset Pricing Model

Panel A
Electric Proxy Group***

Risk-Free Interest Rate	**4.65%**
Beta*	**0.80**
Ex Ante Market Risk Premium**	**5.25%**
CAPM Cost of Equity	**8.85%**

* See page 3 of Exhibit JRW-8

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

*** CAPM ROE rounded to nearest 0.05%.

Panel B
D'Ascendis Proxy Group***

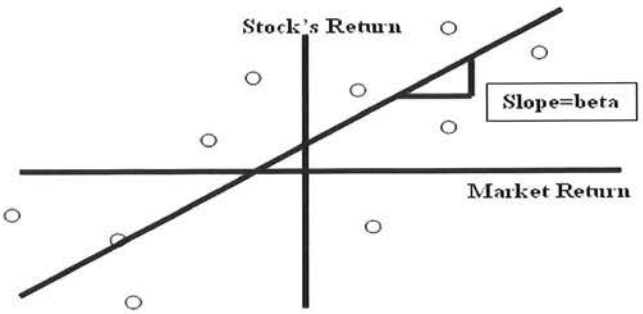
Risk-Free Interest Rate	**4.65%**
Beta*	**0.80**
Ex Ante Market Risk Premium**	**5.25%**
CAPM Cost of Equity	**8.85%**

* See page 3 of Exhibit JRW-8

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

*** CAPM ROE rounded to nearest 0.05%.

Calculation of Beta



Panel A

Company	V-Line Beta	Cap IQ Beta	Average Beta
Alliant Energy Corporation (NYSE-LNT)	0.90	0.69	0.79
Ameren Corporation (NYSE-AEE)	0.90	0.63	0.76
American Electric Power Co. (NYSE-AEP)	0.80	0.67	0.74
Avista Corporation (NYSE-AVA)	0.95	0.66	0.81
CMS Energy Corporation (NYSE-CMS)	0.85	0.58	0.72
Consolidated Edison, Inc. (NYSE-ED)	0.80	0.56	0.68
Duke Energy Corporation (NYSE-DUK)	0.90	0.64	0.77
Edison International (NYSE-EIX)	1.00	0.98	0.99
Entergy Corporation (NYSE-ETR)	0.95	0.80	0.88
Evergy, Inc. (NYSE-EVRG)	0.95	0.70	0.83
Eversource Energy (NYSE-ES)	0.95	0.73	0.84
Exelon Corporation (NDW-EXC)	NMF	0.74	0.74
IDACORP, Inc. (NYSE-IDA)	0.85	0.70	0.78
MGE Energy, Inc. (NYSE-MGEE)	0.80	0.80	0.80
NextEra Energy, Inc. (NYSE-NEE)	1.00	0.66	0.83
NorthWestern Corporation (NYSE-NWE)	0.95	0.62	0.79
OGE Energy Corp. (NYSE-OGE)	1.05	0.81	0.93
Pinnacle West Capital Corp. (NYSE-PNW)	0.95	0.64	0.80
Portland General Electric Company (NYSE-POR)	0.90	0.72	0.81
PPL Corporation (NYSE-PPL)	1.10	0.88	0.99
Public Service Enterprise Group Incorporated (NYSE	0.95	0.72	0.84
Southern Company (NYSE-SO)	0.95	0.66	0.80
WEC Energy Group (NYSE-WEC)	0.85	0.60	0.72
Xcel Energy Inc. (NYSE-XEL)	0.85	0.58	0.71
Mean	0.93	0.71	0.81
Median	0.95	0.70	0.80

Data Source: *Value Line Investment Survey*, 2024; S&P Cap IQ, 2024.

Panel B

D'Ascendis Proxy Group			
Company	V-Line Beta	Cap IQ Beta	Average Beta
Alliant Energy Corporation (NYSE-LNT)	0.90	0.69	0.79
Ameren Corporation (NYSE-AEE)	0.90	0.63	0.76
Duke Energy Corporation (NYSE-DUK)	0.90	0.64	0.77
Edison International (NYSE-EIX)	1.00	0.98	0.99
Entergy Corporation (NYSE-ETR)	0.95	0.80	0.88
Evergy, Inc. (NYSE-EVRG)	0.95	0.70	0.83
Eversource Energy (NYSE-ES)	0.95	0.73	0.84
IDACORP, Inc. (NYSE-IDA)	0.85	0.70	0.78
NextEra Energy, Inc. (NYSE-NEE)	1.00	0.66	0.83
NorthWestern Corporation (NYSE-NWE)	0.95	0.62	0.79
OGE Energy Corp. (NYSE-OGE)	1.05	0.81	0.93
Pinnacle West Capital Corp. (NYSE-PNW)	0.95	0.64	0.80
Portland General Electric Company (NYSE-POR)	0.90	0.72	0.81
Xcel Energy Inc. (NYSE-XEL)	0.85	0.58	0.71
Mean	0.93	0.70	0.82
Median	0.95	0.70	0.80

Data Source: *Value Line Investment Survey*, 2024; S&P Cap IQ, 2024.

Exhibit JRW-6

Thirty-Year U.S. Treasury Yields
2010-2024

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

Exhibit JRW-6
Risk Premium Approaches

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

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

Category	Study Authors	Publication Date	Time Period Of Study	Methodology	Return Measure	Range Low	Range High	Midpoint of Range	Mean	Median
Historical Risk Premium										
	Ibbotson	2016	1928-2015	Historical Stock Returns - Bond Returns	Arithmetic				6.00%	
					Geometric				4.40%	
	Damodaran	2024	1928-2023	Historical Stock Returns - Bond Returns	Arithmetic				6.80%	
					Geometric				5.23%	
	Dimson, Marsh, Staunton Credit Suisse Report	2023	1900-2022	Historical Stock Returns - Bond Returns	Arithmetic				6.40%	
					Geometric				4.60%	
	Bate	2008	1900-2007	Historical Stock Returns - Bond Returns	Geometric				4.50%	
	Shiller	2006	1926-2005	Historical Stock Returns - Bond Returns	Arithmetic				7.00%	
					Geometric				5.50%	
	Siegel	2005	1926-2005	Historical Stock Returns - Bond Returns	Arithmetic				6.10%	
					Geometric				4.60%	
	Dimson, Marsh, and Staunton	2006	1900-2005	Historical Stock Returns - Bond Returns	Arithmetic				5.50%	
	Goyal & Welch	2006	1872-2004	Historical Stock Returns - Bond Returns					4.77%	
	Median									5.50%
Ex Ante Models (Puzzle Research)										
	Claus Thomas	2001	1985-1998	Abnormal Earnings Model					3.00%	
	Arnott and Bernstein	2002	1810-2001	Fundamentals - Div Yld + Growth					2.40%	
	Constantinides	2002	1872-2000	Historical Returns & Fundamentals - P/D & P/E					6.90%	
	Cornell	1999	1926-1997	Historical Returns & Fundamental GDP/Earnings		3.50%	5.50%	4.50%	4.50%	
	Easton, Taylor, et al	2002	1981-1998	Residual Income Model					5.30%	
	Fama French	2002	1951-2000	Fundamental DCF with EPS and DPS Growth		2.55%	4.32%		3.44%	
	Harris & Marston	2001	1982-1998	Fundamental DCF with Analysts' EPS Growth					7.14%	
	McKinsey	2002	1962-2002	Fundamental (P/E, D/P, & Earnings Growth)		3.50%	4.00%		3.75%	
	Siegel	2005	1802-2001	Historical Earnings Yield					2.50%	
	Grabowski	2006	1926-2005	Historical and Projected		3.50%	6.00%	4.75%	4.75%	
	Maheu & McCurdy	2006	1885-2003	Historical Excess Returns, Structural Breaks,		4.02%	5.10%	4.56%	4.56%	
	Bostock	2004	1960-2002	Bond Yields, Credit Risk, and Income Volatility		3.90%	1.30%	2.60%	2.60%	
	Bakshi & Chen	2005	1982-1998	Fundamentals - Interest Rates					7.31%	
	Donaldson, Kamstra, & Kramer	2006	1952-2004	Fundamental, Dividend yld., Returns,, & Volatility		3.00%	4.00%	3.50%	3.50%	
	Campbell	2008	1982-2007	Historical & Projections (D/P & Earnings Growth)		4.10%	5.40%		4.75%	
	Best & Byrne	2001	Projection	Fundamentals - Div Yld + Growth					2.00%	
	Fernandez	2007	Projection	Required Equity Risk Premium					4.00%	
	DeLong & Magin	2008	Projection	Earnings Yield - TIPS					3.22%	
	Siegel - Rethink ERP	2011	Projection	Real Stock Returns and Components					5.50%	
	Kroll (Duff & Phelps)	2024	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%	
	JP Morgan Asset Management	2023	Projection	Equity Return of 7.90% and Long-Term Bond of 3.50%					4.40%	
	Market Risk Premia - 3-1-24	2023	Projection	Fundamental Economic and Market Factors					2.61%	
	KPMG	2024	Projection	Fundamental Economic and Market Factors					5.00%	
	Damodaran 5-1-24	2024	Projection	Fundamentals - Implied from FCF to Equity Model (Trailing 12 month, with adjusted payout)					4.15%	
	John Campbell	2001	1860-2000	Historical & Projections (D/P & Earnings Growth)	Arithmetic	3.00%	4.00%	3.50%	3.50%	
			Projected for 75 Years		Geometric	1.50%	2.50%	2.00%	2.00%	
	Peter Diamond	2001	Projected for 75 Years	Fundamentals (D/P, GDP Growth)		3.00%	4.80%	3.90%	3.90%	
	John Shoven	2001	Projected for 75 Years	Fundamentals (D/P, P/E, GDP Growth)		3.00%	3.50%	3.25%	3.25%	
	Median									4.08%
Surveys										
	New York Fed	2015	Five-Year	Survey of Wall Street Firms					5.70%	
	Survey of Financial Forecasters	2024	10-Year Projection	Equity Return of 7.00% and Long-Term Bond of 3.60%					3.40%	
	Duke - CFO Magazine Survey	2023	10-Year Projection	Approximately 200 CFOs Expected S&P 500 Return of 8.4% and Risk-Free Rate of 3.5%					4.90%	
	Fernandez - Academics, Analysts, and Compani	2024	Long-Term	Survey of Academics, Analysts, and Companies					5.50%	
	Median									5.20%
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 Projectior	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										**4.71%**
Median										**4.64%**

CAPM Study

Market Risk Premium Results - 2010-2023

Category	Study Authors	Publication Date	Time Period Of Study	Methodology	Return Measure	Range Low	Range High	Midpoint of Range	Mean	Median
Historical Risk Premium										
	Ibbotson	2016	1928-2015	Historical Stock Returns - Bond Returns	Arithmetic				6.00%	
					Geometric				4.40%	
	Damodaran	2024	1928-2023	Historical Stock Returns - Bond Returns	Arithmetic				6.80%	
					Geometric				5.23%	
	Dimson, Marsh, Staunton _Credit Suisse Report	2023	1900-2022	Historical Stock Returns - Bond Returns	Arithmetic				6.40%	
					Geometric				4.60%	
	Median									5.57%
Ex Ante Models (Puzzle Research)										
	Siegel - Rethink ERP	2011	Projection	Real Stock Returns and Components					5.50%	
	Kroll (Duff & Phelps)	2024	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%	
	JP Morgan Asset Management	2023	Projection	Equity Return of 7.90% and Long-Term Bond of 3.50%					4.40%	
	Market Risk Premia - 3-1-24	2023	Projection	Fundamental Economic and Market Factors					2.61%	
	KPMG	2024	Projection	Fundamental Economic and Market Factors					5.00%	
	Damodaran 5-1-24	2024	Projection	Fundamentals - Implied from FCF to Equity Model (Trailing 12 month, with adjusted payout)					4.15%	
	Median									5.25%
Surveys										
	New York Fed	2015	Five-Year	Survey of Wall Street Firms					5.70%	
	Survey of Financial Forecasters	2024	10-Year Projection	Equity Return of 7.00% and Long-Term Bond of 3.60%					3.40%	
	Duke - CFO Magazine Survey	2023	10-Year Projection	Approximately 200 CFOs Expected S&P 500 Return of 8.4% and Risk-Free Rate of 3.5%					4.90%	
	Fernandez - Academics, Analysts, and Companies	2024	Long-Term	Survey of Academics, Analysts, and Companies					5.50%	
	Median									5.20%
Building Block										
	Ibbotson and Chen	2015	Projection	Historical Supply Model (D/P & Earnings Growth)	Arithmetic			6.22%	5.21%	
					Geometric			4.20%		
	Chen - Rethink ERP	2010	20-Year Projection	Combination Supply Model (Historic and Projection)	Geometric				4.00%	
	Ilmanen - Rethink ERP	2010	Projection	Current Supply Model (D/P & Earnings Growth)	Geometric				3.00%	
	Grinold, Kroner, Siegel - Rethink ERP	2011	Projection	Current Supply Model (D/P & Earnings Growth)	Arithmetic			4.63%	4.12%	
					Geometric			3.60%		
	Median									4.06%
Mean										**5.02%**
Median										**5.23%**

CAPM Study
Kroll (Duff & Phelps) and KPMG Equity Risk Premium Estimates

KROLL

Kroll Recommended U.S. Equity Risk Premium (ERP) and Corresponding Risk-free Rates (R_f): January 2008–Present

For additional information, please visit kroll.com/cost-of-capital-resource-center

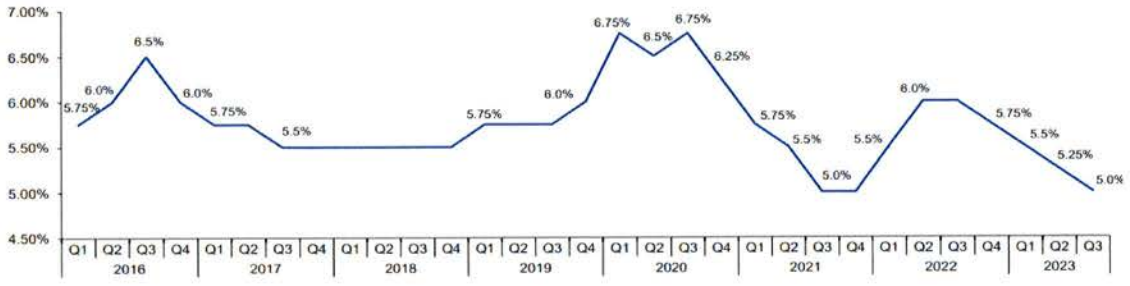
Date	Risk-free Rate (R_f)	R_f (%)	Kroll Recommended U.S. ERP (%)	What Changed
Current Guidance:				
June 8, 2023 – UNTIL FURTHER NOTICE*	Normalized 20-year U.S. Treasury yield*	3.50*	5.50	*ERP*
October 18, 2022 – June 7, 2023	Normalized 20-year U.S. Treasury yield	3.50	6.00	*ERP*
June 16, 2022 – October 17, 2022	Normalized 20-year U.S. Treasury yield	3.50	5.50	*Rf*
April 7, 2022 – June 15, 2022	Normalized 20-year U.S. Treasury yield	3.00	5.50	*Rf*
December 7, 2020 – April 6, 2022	Normalized 20-year U.S. Treasury yield	2.50	5.50	*ERP*
June 30, 2020 – December 6, 2020	Normalized 20-year U.S. Treasury yield	2.50	6.00	*Rf*
March 25, 2020 – June 29, 2020	Normalized 20-year U.S. Treasury yield	3.00	6.00	*ERP*
December 19, 2019 – March 24, 2020	Normalized 20-year U.S. Treasury yield	3.00	5.00	*ERP*
September 30, 2019 – December 18, 2019	Normalized 20-year U.S. Treasury yield	3.00	5.50	*R_f*
December 31, 2018 – September 29, 2019	Normalized 20-year U.S. Treasury yield	3.50	5.50	*ERP*
September 5, 2017 – December 30, 2018	Normalized 20-year U.S. Treasury yield	3.50	5.00	*ERP*
November 15, 2016 – September 4, 2017	Normalized 20-year U.S. Treasury yield	3.50	5.50	*R_f*
January 31, 2016 – November 14, 2016	Normalized 20-year U.S. Treasury yield	4.00	5.50	*ERP*
December 31, 2015	Normalized 20-year U.S. Treasury yield	4.00	5.00	
December 31, 2014	Normalized 20-year U.S. Treasury yield	4.00	5.00	
December 31, 2013	Normalized 20-year U.S. Treasury yield	4.00	5.00	
February 28, 2013 – January 30, 2016	Normalized 20-year U.S. Treasury yield	4.00	5.00	*ERP*
December 31, 2012	Normalized 20-year U.S. Treasury yield	4.00	5.50	
January 15, 2012 – February 27, 2013	Normalized 20-year U.S. Treasury yield	4.00	5.50	*ERP*
December 31, 2011	Normalized 20-year U.S. Treasury yield	4.00	6.00	
September 30, 2011 – January 14, 2012	Normalized 20-year U.S. Treasury yield	4.00	6.00	*ERP*
July 1 2011 – September 29, 2011	Normalized 20-year U.S. Treasury yield	4.00	5.50	*R_f*
June 1, 2011 – June 30, 2011	Spot 20-year U.S. Treasury yield	Spot	5.50	*R_f*
May 1, 2011 – May 31, 2011	Normalized 20-year U.S. Treasury yield	4.00	5.50	*R_f*
December 31, 2010	Spot 20-year U.S. Treasury yield	Spot	5.50	
December 1, 2010 – April 30, 2011	Spot 20-year U.S. Treasury yield	Spot	5.50	*R_f*
June 1, 2010 – November 30, 2010	Normalized 20-year U.S. Treasury yield	4.00	5.50	*R_f*
December 31, 2009	Spot 20-year U.S. Treasury yield	Spot	5.50	
December 1, 2009 – May 31, 2010	Spot 20-year U.S. Treasury yield	Spot	5.50	*ERP*
June 1, 2009 – November 30, 2009	Spot 20-year U.S. Treasury yield	Spot	6.00	*R_f*
December 31, 2008	Normalized 20-year U.S. Treasury yield	4.50	6.00	
November 1, 2008 – May 31, 2009	Normalized 20-year U.S. Treasury yield	4.50	6.00	*R_f*
October 27, 2008 – October 31, 2008	Spot 20-year U.S. Treasury yield	Spot	6.00	*ERP*
January 1, 2008 – October 26, 2008	Spot 20-year U.S. Treasury yield	Spot	5.00	*Initialized*

*** We recommend using the spot 20-year U.S. Treasury yield as the proxy for the risk-free rate, if the prevailing yield as of the valuation date is higher than our recommended U.S. normalized risk-free rate of 3.5%. This guidance is effective when developing USD-denominated discount rates as of June 16, 2022 and thereafter.**

"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.kroll.com/-/media/cost-of-capital/kroll-us-erp-rf-table-2023.pdf

KPMG Equity Risk Premium



KPMG

Source: https://indialogue.io/clients/reports/public/5d9da61986db2894649a7ef2/5d9da63386db2894649a7ef5

Exhibit JRW-7
TECO's Recommended Cost of Capital from Investor-Provided Capital

Capital Source	Capitalization Amount	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long Term Debt	$ 3,536,333	41.57%	4.53%	1.88%
Short Term Debt	376,625	4.43%	3.90%	0.17%
Common Equity	4,593,473	54.00%	11.50%	6.21%
Totals	$ 8,506,431	100.00%		8.27%

D'Ascendis ROE Results

Line No.	Principal Methods	Proxy Group of Fourteen Electric Utilities	Proxy Group of Fourteen Electric Utilities (excl. PRPM)
1.	Discounted Cash Flow Model (DCF) (1)	9.89%	9.89%
2.	Risk Premium Model (RPM) (2)	11.47%	11.46%
3.	Capital Asset Pricing Model (CAPM) (3)	12.48%	12.41%
4.	Market Models Applied to Comparable Risk, Non-Price Regulated Companies (4)	12.95%	12.89%
5.	Indicated Common Equity Cost Rate before Adjustment for Unique Risk	9.89% - 12.48%	9.89% - 12.41%
6.	Credit Risk Adjustment (5)	-0.08%	-0.08%
7.	Flotation Cost Adjustment (6)	0.10%	0.10%
8.	Indicated Common Equity Cost Rate after Adjustment	9.90% - 12.49%	9.90% - 12.42%
9.	Recommended Common Equity Cost Rate	11.50%	11.50%

Investment Firms' Expected U.S. Large Cap Equity Market Annual Returns
12/31/2022

Investment Firm	AUM ($ in Bn) 12/31/2022	Duration of Forecast 5-, 10-,20- Year	Expected Return US Large Cap Equities
AQR	$100.00	5-10 Years	5.70%
Allianz	$1,782.64	10 Years	7.50%
Bar's	$468.22	10 Years	7.80%
BlackRock	$8,600.00	10 Years	7.90%
BNY Mellon	$1,800.00	10 Years	6.40%
Callan	$15.42	10 Years	7.25%
Capital Group	$2,300.00	20 Years	7.20%
Citi	$250.00	10 Years	9.50%
Cresset	$30.00	10 Years	7.00%
Fidelity	$3,876.00	20 Years	4.00%
Franklin Templeton	$1,300.00	10 Years	7.90%
Invesco	$1,409.20	10 Years	7.70%
Janney Montgomery	$2.90	10 Years	7.50%
JPMorgan	$2,760.00	10 - 15 Years	7.90%
Mackenzie	$192.20	10 Years	8.20%
Morgan Stanley	$1,300.00	7 Years	4.60%
Morningstar	$253.60	-	7.40%
Neuberger Bergman	$427.00	20 Years	5.79%
Northern Trust	$1,000.00	5 Years	6.00%
Nuveen	$1,100.00	10 Years	6.96%
PGIM	$1,200.00	10 Years	7.76%
PIMCO	$1,740.00	5 Years	6.80%
RBC	$389.00	10 Years	7.85%
RVK	$1.30	20 Years	6.75%
Schroeder	$915.53	10 Years	9.10%
Schwab	$755.00	10 Years	6.10%
State Street	$3,500.00	10 Years	6.60%
T-Rowe Price	$1,275.00	5 Years	4.90%
UBS	$3,960.00	5 Years	4.90%
Vanguard	$7,200.00	10 Years	5.30%
Voya	$321.00	10 Years	6.75%
Average	$50,224.01	10 Years	6.87%

Data Source: Company websites. Source documents provided in work papers.

GDP and S&P 500 Growth Rates

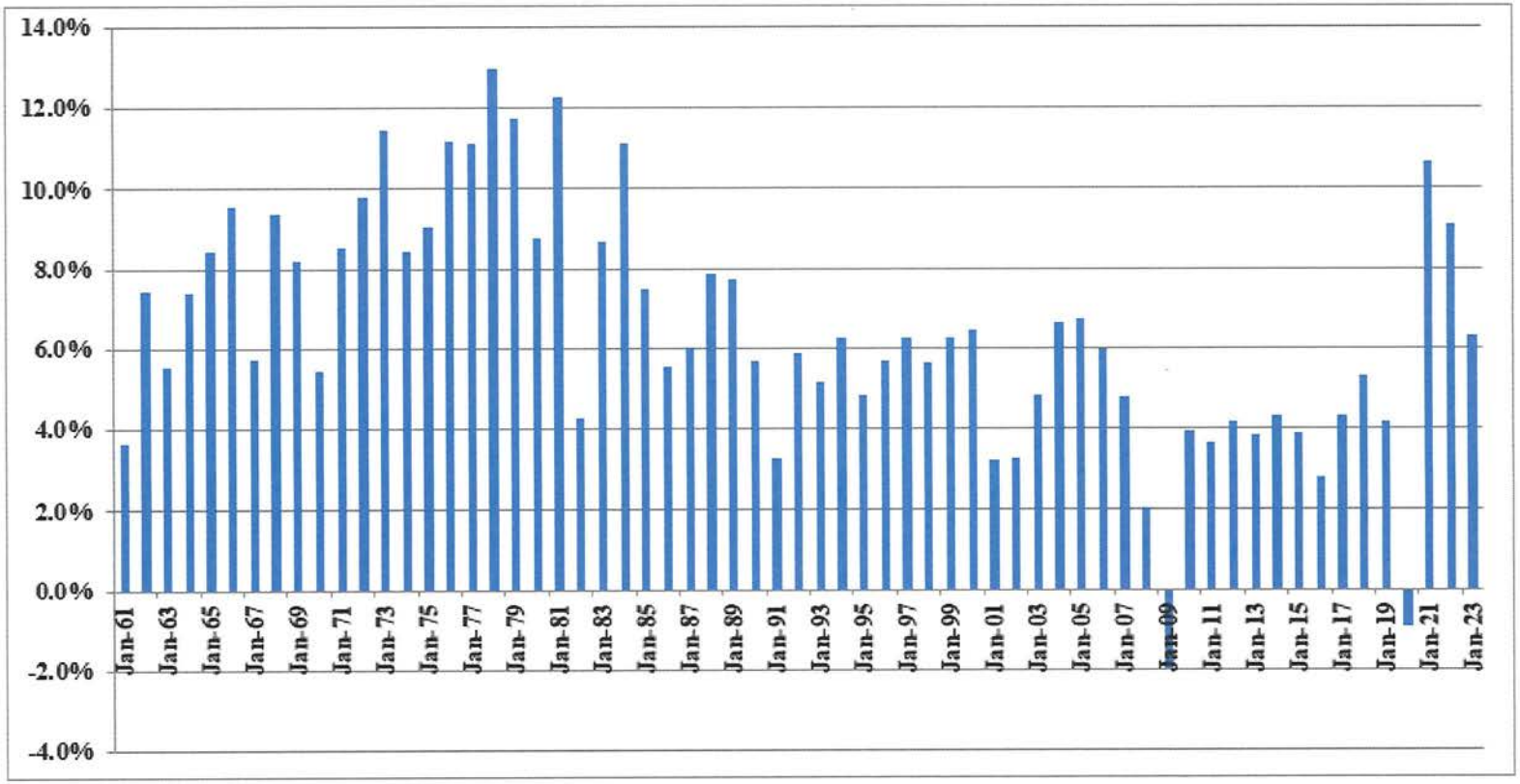
Growth Rates
GDP, S&P 500 Price, EPS, and DPS

		GDP	S&P 500	S&P 500 EPS	S&P 500 DPS	
	1960	542.38	58.11	3.10	1.98	
1	1961	562.21	71.55	3.37	2.04	
2	1962	603.92	63.10	3.67	2.15	
3	1963	637.45	75.02	4.13	2.35	
4	1964	684.46	84.75	4.76	2.58	
5	1965	742.29	92.43	5.30	2.83	
6	1966	813.41	80.33	5.41	2.88	
7	1967	859.96	96.47	5.46	2.98	
8	1968	940.65	103.86	5.72	3.04	
9	1969	1,017.62	92.06	6.10	3.24	
10	1970	1,073.30	92.15	5.51	3.19	
11	1971	1,164.85	102.09	5.57	3.16	
12	1972	1,279.11	118.05	6.17	3.19	
13	1973	1,425.38	97.55	7.96	3.61	
14	1974	1,545.24	68.56	9.35	3.72	
15	1975	1,684.90	90.19	7.71	3.73	
16	1976	1,873.41	107.46	9.75	4.22	
17	1977	2,081.83	95.10	10.87	4.86	
18	1978	2,351.60	96.11	11.64	5.18	
19	1979	2,627.33	107.94	14.55	5.97	
20	1980	2,857.31	135.76	14.99	6.44	
21	1981	3,207.04	122.55	15.18	6.83	
22	1982	3,343.79	140.64	13.82	6.93	
23	1983	3,634.04	164.93	13.29	7.12	
24	1984	4,037.61	167.24	16.84	7.83	
25	1985	4,338.98	211.28	15.68	8.20	
26	1986	4,579.63	242.17	14.43	8.19	
27	1987	4,855.22	247.08	16.04	9.17	
28	1988	5,236.44	277.72	24.12	10.22	
29	1989	5,641.58	353.40	24.32	11.73	
30	1990	5,963.14	330.22	22.65	12.35	
31	1991	6,158.13	417.09	19.30	12.97	
32	1992	6,520.33	435.71	20.87	12.64	
33	1993	6,858.56	466.45	26.90	12.69	
34	1994	7,287.24	459.27	31.75	13.36	
35	1995	7,639.75	615.93	37.70	14.17	
36	1996	8,073.12	740.74	40.63	14.89	
37	1997	8,577.55	970.43	44.09	15.52	
38	1998	9,062.82	1,229.23	44.27	16.20	
39	1999	9,631.17	1,469.25	51.68	16.71	
40	2000	10,250.95	1,320.28	56.13	16.27	
41	2001	10,581.93	1,148.09	38.85	15.74	
42	2002	10,929.11	879.82	46.04	16.08	
43	2003	11,456.45	1,111.91	54.69	17.88	
44	2004	12,217.20	1,211.92	67.68	19.407	
45	2005	13,039.20	1,248.29	76.45	22.38	
46	2006	13,815.58	1,418.30	87.72	25.05	
47	2007	14,474.23	1,468.36	82.54	27.73	
48	2008	14,769.86	903.25	65.39	28.05	
49	2009	14,478.07	1,115.10	59.65	22.31	
50	2010	15,048.97	1,257.64	83.66	23.12	
51	2011	15,599.73	1,257.60	97.05	26.02	
52	2012	16,253.97	1,426.19	102.47	30.44	
53	2013	16,843.20	1,848.36	107.45	36.28	
54	2014	17,550.69	2,058.90	113.01	39.44	
55	2015	18,206.02	2,043.94	106.32	43.16	
56	2016	18,695.11	2,238.83	108.86	45.03	
57	2017	19,479.62	2,673.61	124.94	49.73	
58	2018	20,527.16	2,506.85	148.34	53.61	
59	2019	21,372.58	3,230.78	162.35	58.80	
60	2020	20,893.75	3,756.07	139.76	56.70	
61	2021	22,997.50	4,766.18	206.38	59.20	
62	2022	25,461.34	3,839.50	219.49	68.34	
63	2023	27,750.00	4769.83	219.70	69.69	Average
	Growth Rates	6.45	7.25	7.00	5.81	6.63

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

S&P 500, EPS and DPS - http://pages.stern.nyu.edu/~adamodar/

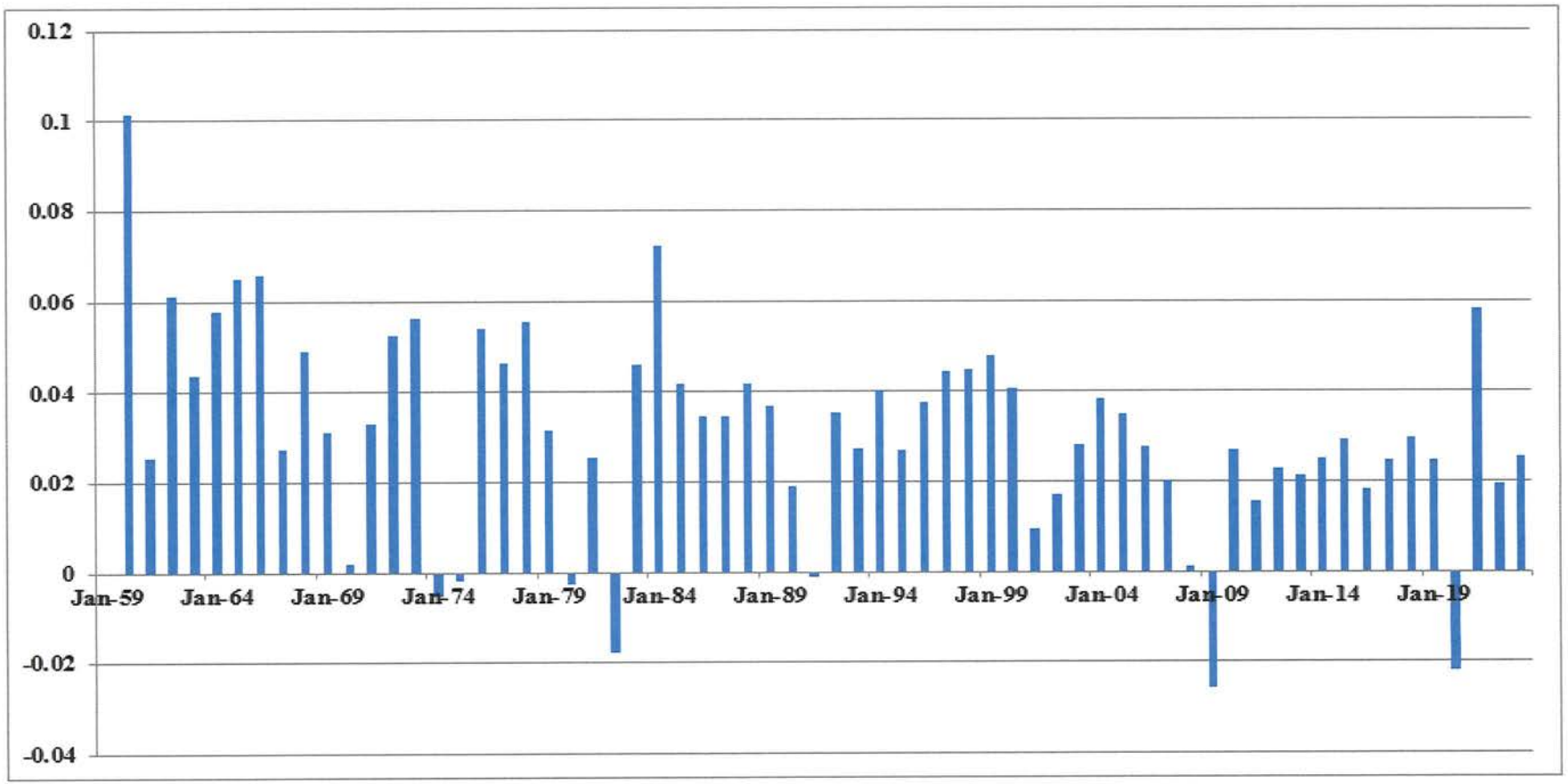
Annual Nominal GDP Growth Rates



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

Real GDP Growth Rates

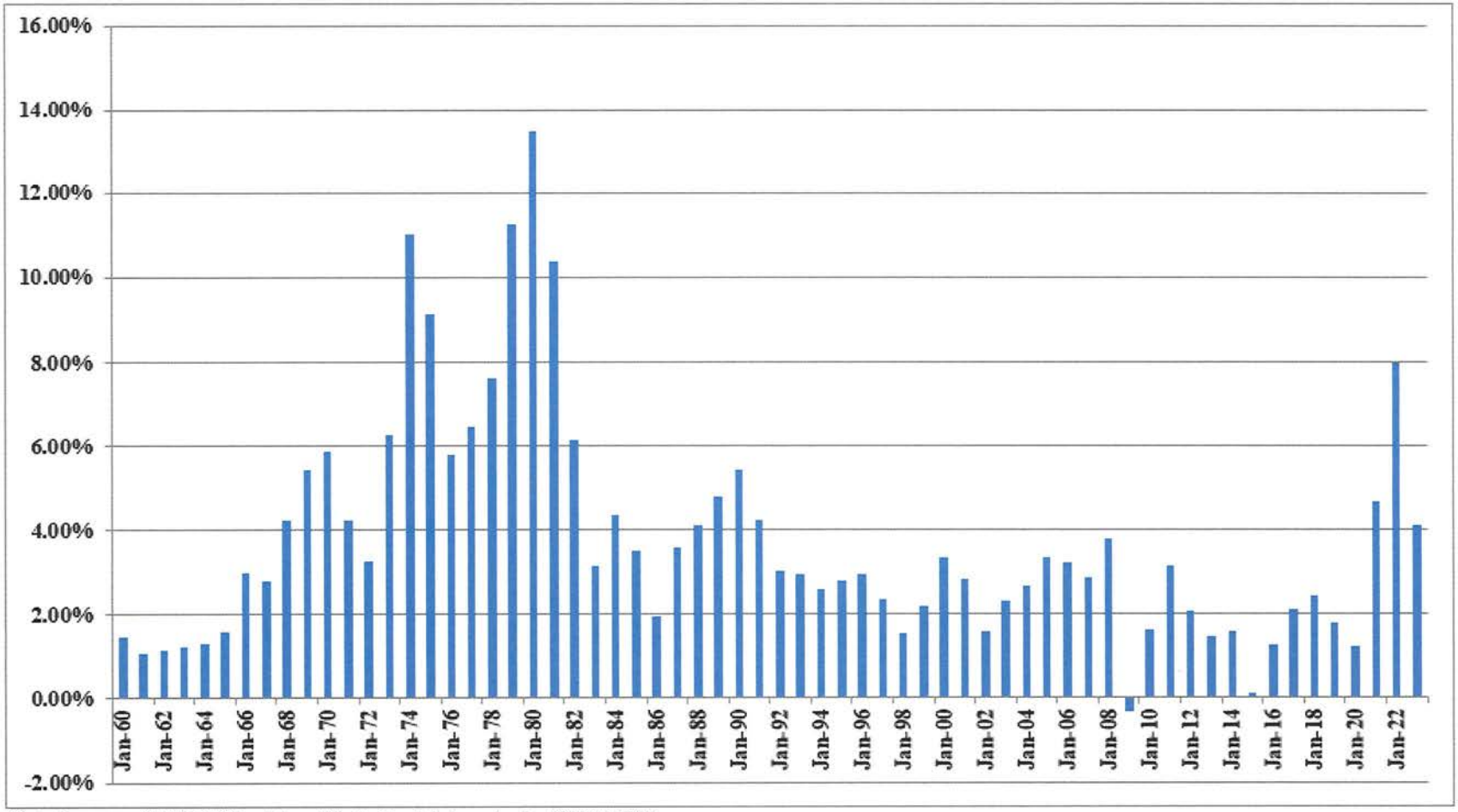
Annual Average Real GDP Growth Rates
1961-2023



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

Inflation Rates

Annual CPI Inflation Rates
1961-2023



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

Historical and Projected Nominal GDP Growth Rates

Panel A
Historic GDP Growth Rates

10-Year Average	**4.59%**
20-Year Average	**4.32%**
30-Year Average	**4.65%**
40-Year Average	**5.21%**
50-Year Average	**6.16%**

Calculated using GDP data on Page 1 of Exhibit JRW-9

Panel B
Projected GDP Growth Rates

	Time Frame	Projected Nominal GDP Growth Rate
Congressional Budget Office	**2023-2053**	**3.8%**
Survey of Financial Forecasters	**Ten Year**	**4.4%**
Social Security Administration	**2023-2100**	**4.1%**
Energy Information Administration	**2023-2050**	**4.3%**
	Average	**4.15%**

Sources:

Congressional Budget Office,The *2023 Long-Term Budget Outlook* , July 15, 2023.

U.S. Energy Information Administration, *Annual Energy Outlook 2023* , Table: Macroeconomic Indicators,

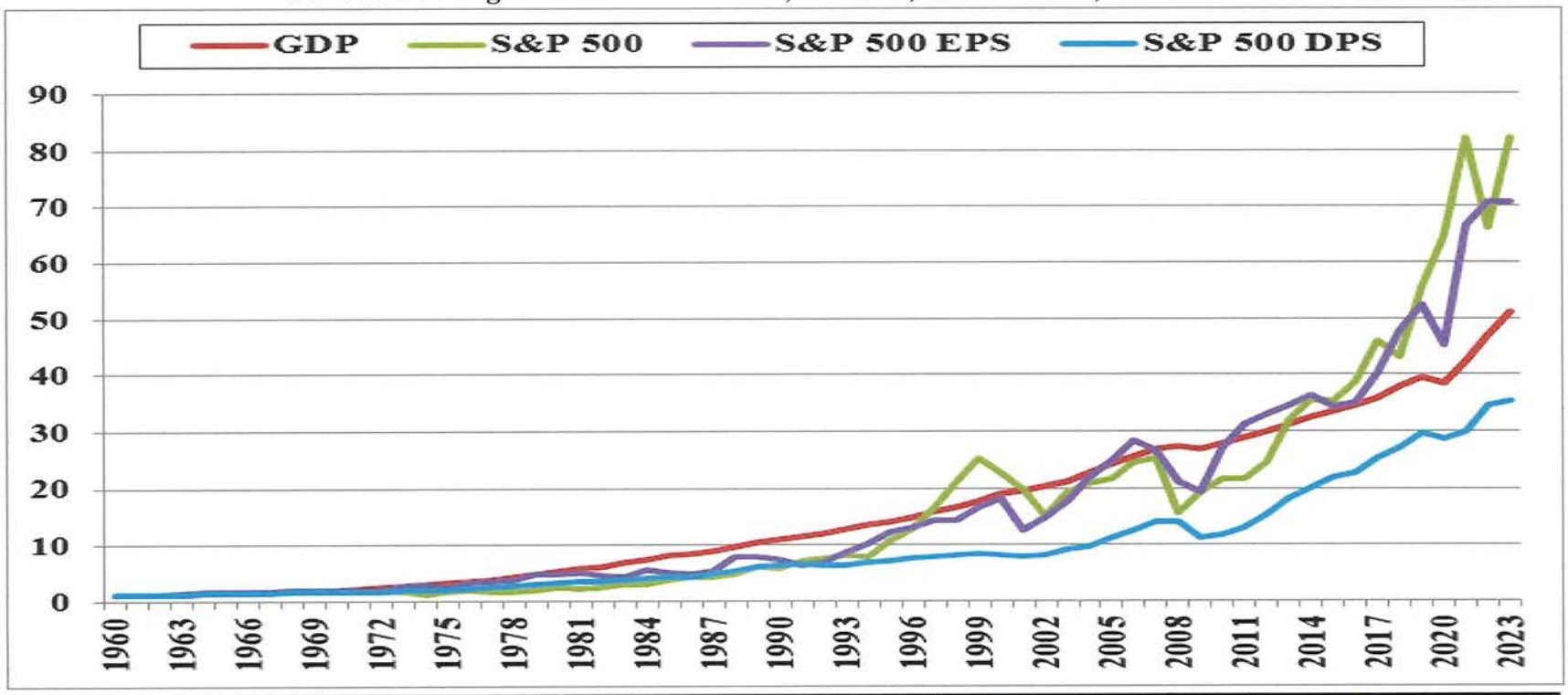
Social Security Administration, 2023 Annual Report of the Board of Trustees of the Old-Age, Survivors, and Disability Insurance (OASDI) Program, Table VI.G4,

The 4.1% growth rate is the growth in projected GDP from 26 trillion in 2023 to $582 trillion in 2100.

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

GDP and S&P 500 Growth

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



	GDP	S&P 500	S&P 500 EPS	S&P 500 DPS
Growth Rates	6.45	7.25	7.00	5.81

Data Sources: GDPA -http://research.stlouisfed.org/fred2/series/GDPA/downloaddata
S&P 500, EPS and DPS - http://pages.stern.nyu.edu/~adamodar/