[EXTERNAL] 22-00286-UT OAG's Direct Testimony

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6 attachments (5 MB)

22-00286-UT-2023-04-21-OAG-Direct Testimony of Andrea Crane.pdf; 22-00286-UT-2023-04-21-OAG-Direct Testimony of Doug Gegax.pdf; 22-00286-UT-2023-04-21-OAG-Direct Testimony of Andrea Crane.docx; 22-00286-UT-2023-04-21-OAG-Direct Testimony of Doug Gegax.docx; 22-0286-UT- 2023-04-21 OAG-Direct Testimony of Randall Woolridge.docx; 22-0286-UT- 2023-04-21 OAG-Direct Testimony of Randall Woolridge.pdf;

Good Afternoon,

Please see the attached *Direct Testimony of Andrea Crane, Doug Gegax, and J. Randall Woolridge* for filing and service.

Thank you,

Sydnee Wright
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Before the

NEW MEXICO
REGULATORY COMMISSION

IN THE MATTER OF SOUTHWESTERN PUBLIC SERVICE COMPANY'S APPLICATION FOR: (1) REVISION OF ITS RETAIL RATES UNDER ADVICE NOTICE NO. 312; (2) AUTHORITY TO ABANDON THE PLANT X UNIT 1, PLANT X UNIT 2, AND CUNNINGHAM UNIT 1 GENERATING STATIONS AND AMEND THE ABANDONMENT DATE OF THE TOLK GENERATING STATION; AND (3) OTHER ASSOCIATED RELIEF, SOUTHWESTERN PUBLIC SERVICE COMPANY, APPLICANT.	)	**CASE NO. 22-00286-UT**

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SOUTHWESTERN PUBLIC SERVICE COMPANY
CASE NO. 22-00286-UT

Direct Testimony and Exhibits of

J. Randall Woolridge, Ph. D.
For the State of New Mexico
Office of the Attorney General

April 26, 2023

SOUTHWESTERN PUBLIC SERVICE COMPANY
CASE NO. 22-00286-UT

Direct Testimony of
J. Randall Woolridge, Ph.D.

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I. INTRODUCTION

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

A. My name is J. Randall Woolridge, and my business address is 120 Haymaker Circle, State College, PA 16801. I am a Professor of Finance and the Goldman, Sachs & Co. and Frank P. Smeal Endowed University Fellow in Business Administration at the University Park Campus of the Pennsylvania State University. I am also the Director of the Smeal College Trading Room and President of the Nittany Lion Fund, LLC. I provide a summary of my educational background, research, and related business experience in Exhibit JRW-2.

Q. ON WHOSE BEHALF ARE YOU TESTIFYING?

A. I have been asked by the State of New Mexico Office of the Attorney General ("OAG") to provide an opinion as to the overall fair rate of return or cost of capital for the regulated electric service of the Southwestern Public Service Company ("SPS" or the "Company") and to evaluate SPS's rate of return testimony in this proceeding.[1]

Q. HOW IS YOUR TESTIMONY ORGANIZED?

A. The following outlines my testimony:

- First, I summarize my cost of capital recommendation for the Company and review the primary areas of contention on the Company's position.
- Second, I provide an assessment of capital costs in today's capital markets.
- Third, I discuss the selection of proxy groups for estimating the cost of equity capital for the Company.
- Fourth, I discuss the Company's recommended capital structure and debt cost rates.

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

- Fifth, I provide an overview of the concept of the cost of equity capital, and then estimate the equity cost rate for the Company.
- Finally, I critique rate of return analysis and testimony.

II. SUMMARY OF RECOMMENDATIONS

A. Overview

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

A. A company's overall rate of return has three main components:

(1) capital structure (*i.e.*, ratios of short-term debt, long-term debt, preferred stock and common equity);

(2) cost rates for short-term debt, long-term debt, and preferred stock; and

(3) common equity cost, otherwise known as Return on Equity (ROE).

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

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

utilities in two cases: (1) *Hope* and (2) *Bluefield*.[2] In those cases, the Court recognized that the fair rate of return on equity should be:

(1) comparable to returns investors expect to earn on 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.

Accordingly, finding 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 the economic models and formulas in cost of capital testimony, such as my testimony's Discounted Cash Flow ("DCF") Model and the Capital Asset Pricing Model ("CAPM"), is to use market data of firms with similar risk to estimate the rate of return on equity investors require for this specific risk-class of firms, in order to set an appropriate ROE for a regulated firm.

B. Summary of Positions

Q. PLEASE REVIEW YOUR PROPOSED RECOMMENDATIONS REGARDING THE APPROPRIATE RATE OF RETURN FOR THE COMPANY.

A. I provide SPS's proposed capital structure and debt and equity cost rates in Table 1. The Company has proposed a capital structure consisting of 45.30% long-term debt and

[2] *Fed. Power Comm'n v. Hope Natural Gas Co.*, 320 U.S. 591 (1944) (hereinafter "*Hope*"); *Bluefield Water Works and Improvement Co. v. Pub. Serv. Comm'n of W. Va.*, 262 U.S. 679 (1923) (hereinafter "*Bluefield*").

54.70%. SPS has proposed a long-term debt cost rate of 4.34%%. SPS witness Mr. Dylan D. D'Ascendis proposes a ROE of 10.75% for SPS. SPS is proposing an overall rate of return or cost of capital of 7.85%.

Table 1
SPS's Rate of Return Recommendation

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	**45.30%**	**4.34%**	**1.97%**
Common Equity	**54.70%**	**10.75%**	**5.88%**
Total	**100.00%**		**7.85%**

I provide my proposed cost of capital for SPS in Table 2. The Company's proposed capital structure includes a higher common equity ratio than: (1) the average of the two proxy groups and (2) Xcel Energy. As such, I have employed a capital structure with a common equity ratio of 50.57, which is SPS's average quarterly common equity ratio over the past three years. I have adopted SPS's proposed long-term debt cost rate. I have applied the DCF Model and the CAPM to a proxy group of publicly-held electric utility companies ("Electric Proxy Group") and the group developed by D'Ascendis ("D'Ascendis Proxy Group"). My analysis indicates a common equity cost rate in the range of 8.70% to 9.00%. Since I rely primarily on the DCF model and the results for the Electric Proxy Group, I am using an ROE of 9.0% for the Company. Given my proposed capital structure and senior capital cost rates for SPS, I am recommending an overall fair rate of return or cost of capital for the Company of 6.70%. This is summarized in Table 2 and Exhibit JRW-1.

Table 2
AGO's Rate of Return Recommendation

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	**49.43%**	**4.34%**	**2.15%**
Common Equity	**50.57%**	**9.00%**	**4.55%**
Total	**100.00%**		**6.70%**

C. Primary Rate of Return Issues in this Case

Q. PLEASE DESCRIBE THE PRIMARY RATE OF RETURN ISSUES IN THIS CASE.

A. The primary rate of return issues in this case are the appropriate capital structure and ROE for SPS.

1. **SPS'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 year, 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 increase in year-over-year inflation, long-term inflation expectations are about 2.25%; (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; (3) interest rates have fallen since their peak in October of 2022; (4) utility stock prices have held up very well over the past year compared to the overall market; and (5) while authorized ROEs for utilities hit all-time lows in 2020 and 2021, these ROEs did not decline

nearly as much as interest rates and in 2022, with the 30-year Treasury yield up 106 basis points, authorized ROEs for electric utilities only increased 16 basis points.

2. **SPS's Investment Risk is in Line with Other Electric Utility Companies**: SPS' Standard & Poor ("S&P") and Moody's issuer credit ratings are A- and Baa2. The average S&P and Moody's issuer credit ratings for the two proxy groups are BBB+ and Baa1. Overall, this suggests that SPS's investment risk is in line with the two proxy groups.

3. **SPS's Proposed Capital Structure Includes an inflated Common Equity Ratio with Lower Financial Risk than the Two Proxy Groups and SPS' Parent, Xcel Energy**: SPS's proposed capital structure includes a higher common equity ratio (54.70%) and lower financial risk than: (1) the capital structure and common equity ratio SPS has maintained and operated with over the past three years; (2) the average capital structure and common equity ratio for the companies in the two proxy groups; and (3) the capital structure and common equity ratio of SPS' parent, Xcel Energy. As discussed later in this testimony, the latter observation is a clear indication of double leverage. Consequently, I have recommended a capital structure with a common equity ratio of 50.57% which is the average common equity ratio maintained by SPS over the past three years.

4. **DCF Equity Cost Rate**: Mr. D'Ascendis and I both employ the traditional constant-growth DCF model. However, D'Ascendis overstates reported DCF results in two ways: (1) by exclusively using the overly optimistic and upwardly biased earnings per share (EPS) growth rate forecasts of Wall Street analysts and *Value Line*; and (2) by giving very little, if any, weight to his DCF results. His mean

DCF result for his proxy group is 8.56%, yet he concludes that the Company's cost of equity is in the range of 10.35% to 11.35%. By contrast, to develop the DCF growth rate I use in my analysis I reviewed 13 growth rate measures, including historical and projected growth rate measures, and have evaluated growth in dividends, book value, and earnings per share.

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: (1) in three of his methods he uses historical stock and bond return data; and (2) the other three of his approaches he bases his market-risk premium on projected stock-market returns. As I further explain in my critique of SPS' 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. On this point, he makes the assumption that the companies in the S&P 500 can grow their earnings, on average, at 13.07%, which is nearly triple the long-term projected growth rate of the economy as measured by 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: (1) he has used a non-traditional CAPM approach, the empirical CAPM (ECAPM), as an equity-cost-rate approach;

and (2) more significantly, his market-risk premium of 10.42% is developed by the same six approaches he used in his Risk-Premium approach I noted above. The market risk premium of 10.42% is larger than: (1) indicated by historic stock and bond return data; and (2) found in the published studies and surveys of the market risk premium. In addition, I will demonstrate that the 10.42% 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 6.00%, which: (1) factors in all three approaches—historic returns, surveys, and expected return models—to estimate a market premium; and (2) employs the results of many studies of the market risk premium. As I note, the 6.00% figure reflects the market risk premiums: (1) determined in recent academic studies by leading finance scholars; (2) employed by leading investment banks and management consulting firms; and (3) found in surveys of companies, financial forecasters, financial analysts, and corporate CFOs;

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

8. **Other Issues**: Mr. D'Ascendis concludes that his equity-cost-rate studies suggest a ROE range of 10.35% to 11.35%. He then also considers four other factors in order to arrive at his 10.75% ROE recommendation. These factors include: (1) a size premium of 0.15% to account for SPS' size; (2) a credit risk premium of 0.00% to account for SPS' credit ratings relative to his proxy group; (3) a consideration of SPS regulatory risk; and (4) a flotation cost adjustment of .08%. As I discuss in my testimony, a small-size premium is not appropriate for regulated public utilities, as indicated, SPS' credit ratings are similar to the two proxy groups and hence there is no need for a credit risk adjustment or a consideration of regulatory risk, and there is no evidence that SPS has paid flotation costs. SPS should not receive higher revenues in the form of a higher ROE for expenses the Company does not incur.

III. CAPITAL MARKET CONDITIONS AND AUTHORIZED ROEs

A. Capital Market Conditions

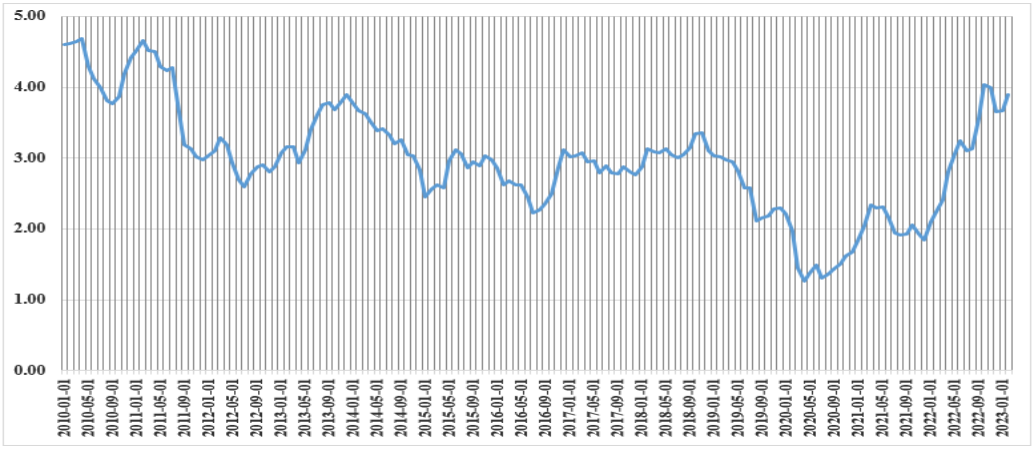
A. Page 1 of Exhibit JRW-2 shows the yields on A rated public utility bonds. These yields have gradually declined in the past decade from 7.5% to the 3.0% range. These yields bottomed out in the 3.0% range in 2020 and 2021 due to the economic fallout from the Covid-19 pandemic. They increased with interest rates in general over the past year, peaked at almost 6.0%, and now are in the 5.25% range. 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 increased to 3.6% in 2020 but declined to 3.40% in 2022. Page 3 of Exhibit JRW-2 shows the average earned ROE and market-to-book ratio

for publicly held 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 decade, peaked at 2.0X in 2019, and declined to 1.75X range in 2021 and 2022.

Q. PLEASE REVIEW INTEREST RATE MOVEMENTS IN RECENT YEARS.

A. Figure 1, below, shows 30-year Treasury yields over the past four years (2019 to 2022). These yields were in the 3.0% range at the end of 2018. These yields 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, declining about 100 basis points to the 1.25% range. They began their recovery in the summer of 2020 and increased to about 2.50% in the first quarter of 2021. They subsequently fell to below 2.0% in the fourth quarter of 2021, but have increased significantly in 2022, peaking at 4.40% in October. They have since retreated to the 3.60% range.

Figure 1
30-Year Treasury Yields

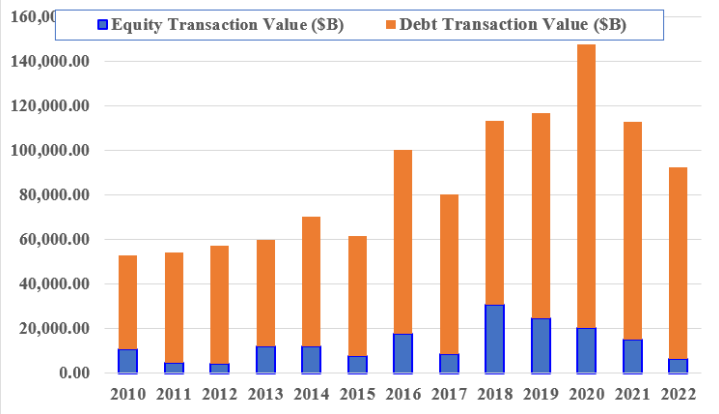


Data source: https://fred.stlouisfed.org/series/DGS30

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

A. Yes. Figure 2 shows the annual amounts of debt and equity capital raised by public utility companies over the past decade. 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 raised a total of over $100 billion in debt and equity. The totals dropped to $92 billion in 2022.

Figure 2
Debt and Equity Capital Raised by Public Utilities
2010–2022



Data Source: S&P Global Market Intelligence, S&P Cap IQ, 2023.

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

A. Several factors have led to higher interest rates in 2022 generally tied to an improving economy and higher inflation. Real GDP growth increased 5.7% in 2021, compared to a decline of -3.4% in 2020. This recovery led to greater business activity, higher levels of business and consumer spending, and record increases in housing prices. Unemployment, which was 6.7% in 2020, has declined to 3.5% in 2022. The recovery in the economy puts upward pressure on interest rates by increasing the demand for capital.

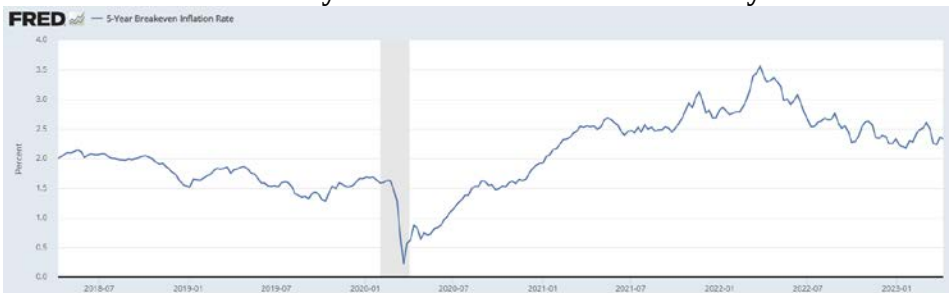
In addition, as reported extensively in the financial press, inflation has picked up significantly over the past year, putting additional pressure on interest rates. Reported year-over-year inflation has been as high as 9.20% in 2022. The high inflation reported in the past year primarily reflects three factors: (1) the recovering economy, as discussed above; (2) the production shutdowns during the pandemic leading 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.

In response to the higher inflation, the Federal Reserve increased the discount rate by 25 basis points in March, 50 basis points in May, and 75 basis points in June, July, September, and November, 50 basis points in December and 25 basis points in January of 2023. However, the Federal Reserve's actions on the discount rate directly affect only short-term rates. Long-term rates are more a function of expected economic growth and expected inflation. One conundrum is that whereas the government has reporting annual year-over-year inflation rates as high as 9.10% in the past year, the 30-year Treasury yield is still only about 3.60%.

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. Panel A of Figure 3 shows the expected inflation rate over the next five years. One can see the increase since 2022, but it has fallen off and is now at an expected inflation rate of 2.33% over the next five years. Panels B and C of Figure 3 show the expected inflation rate over the next ten and thirty years. The expected inflation rates over the next ten and thirty years are 2.25% and 2.26%. When the expected inflation rate is higher over five years than over ten years, as is the case now, it is known as a bond-market inversion and it

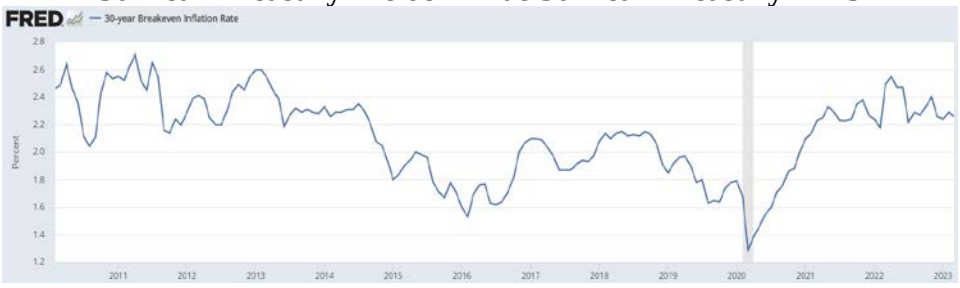
reflects that, despite a short-term expectation of higher inflation, the long-term inflation rate is about 2.25%.

Figure 3
Panel A
5-Year Treasury Yields Minus 5-Year Treasury TIPS



Panel B
10-Year Treasury Yields Minus 10-Year Treasury TIPS

Panel C
30-Year Treasury Yields Minus 30-Year Treasury TIPS



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

Q. HOW DID UTILITY STOCK PERFORMED IN 2022?

A. The higher inflation and interest rates, combined with the potential of an economic recession, have hit the stock market in a negative way. As shown in Figure 4, since January

1, 2022, the S&P 500 is down double digits (-12.03%) while the S&P Utilities is up slightly +1.33%.[3]

Figure 4
S&P Utility Index vs. the S&P 500

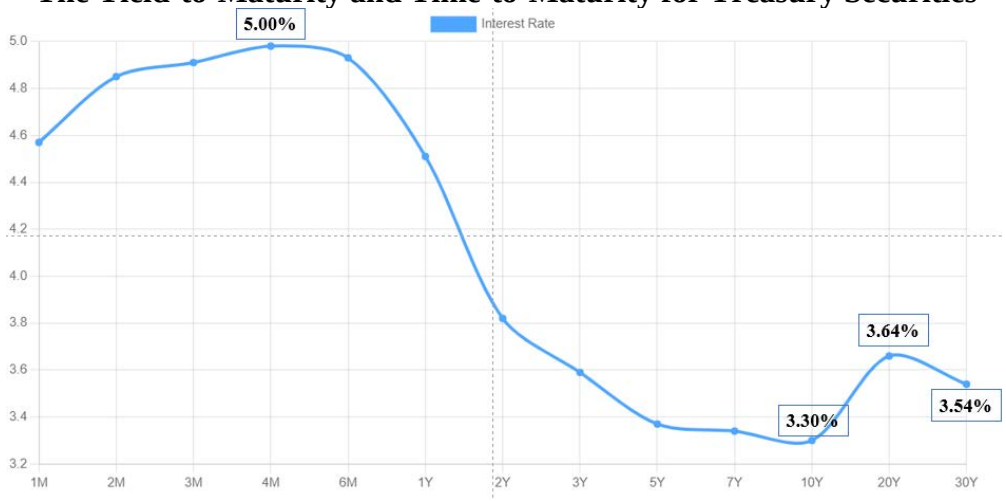
Source: S&P Cap IQ.

Q. DO YOU BELIEVE THAT INTEREST RATES WILL CONTINUE TO INCREASE INTO 2023?

A. No. Obviously, as discussed above, the current inflationary environment has pushed up interest rates significantly over the past year. Also, as noted above, the Federal Reserve has responded with a series of discount rate increases, with the intention of slowing the economy and cooling 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.

[3] The S&P Utilities Index is made up of the 29 utilities that are in the S&P 500. The index primarily is made up of electric utilities.

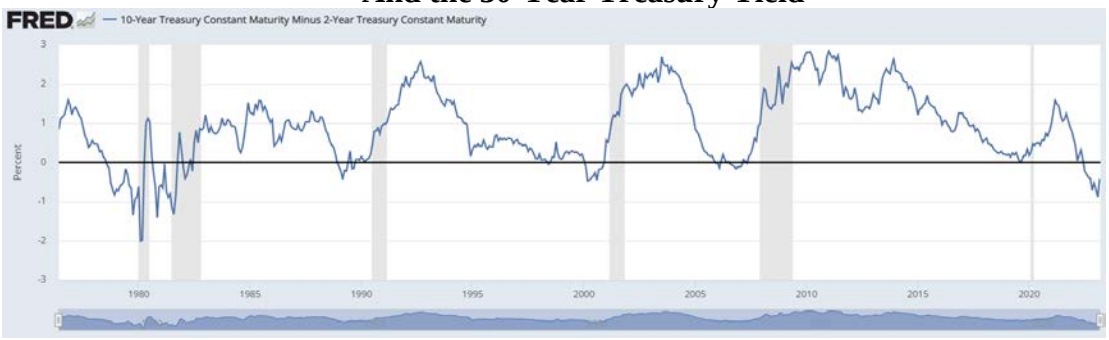
Figure 5
The Yield Curve
The Yield-to-Maturity and Time-to-Maturity for Treasury Securities



Source: https://www.ustreasuryyieldcurve.com/ - 4-7-23.

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 two-year Treasury yield is above the ten-year Treasury yield. Figure 6 graphs two lines: (1) the 10-year Treasury yield minus the two-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 fifty 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, which declined nearly twenty percent in the first half of 2020, rebounded significantly in 2021 and continued the rebound in 2022. 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. This has been further exacerbated by the post-COVID supply chain issues and the higher energy prices brought on by the Russia-Ukraine conflict.

Nonetheless, utilities took advantage of the low yields in 2020 and 2021 to raise record amounts of capital, and utility stocks have held up quite well in 2022 compared to the overall stock market, which is down about over 15%. The big economic issue is reported year-over-year inflation. However, while year-over-year inflation is expected to be high in the short-term, the yields on TIPS suggest that longer-term inflation expectations are still about 2.50%. However, as I noted 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 Figure 7, I graphed quarterly authorized ROEs for electric and gas companies from 2000 to 2021. Over the years, as interest rates have come down, authorized ROEs for electric utility and gas distribution companies have slowly declined to reflect a low-capital-cost environment. In 2020 and 2021, authorized ROEs for utilities hit an all-time low. The average annual authorized ROEs for electric utilities and gas distribution companies are shown in Table 3.

Figure 7
Authorized ROEs for Electric Utilities and Gas Distribution Companies
2000–2022

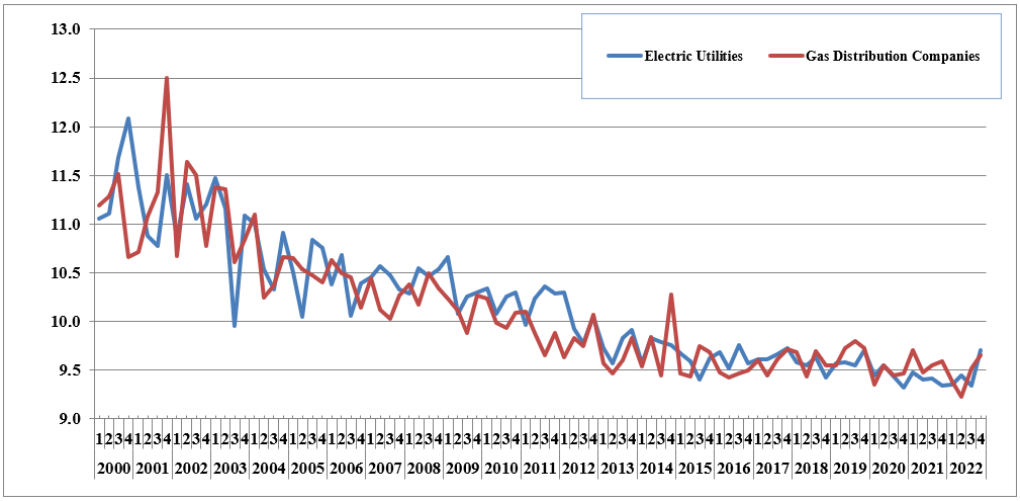


Table 3
Average Annual Authorized ROEs for Electric Utilities and Gas Distribution Companies
2010–2022

	Electric	Gas		Electric	Gas
2010	**10.37**	**10.15**	**2017**	**9.74**	**9.72**
2011	**10.29**	**9.92**	**2018**	**9.60**	**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**	**9.60**	**2022**	**9.54**	**9.53**
2016	**9.77**	**9.54**			

Data Source: S&P Global Market Intelligence, RRA Regulatory Focus, 2023.

Q. DID THE HIGHER INTEREST RATES IN 2022 MEAN AUTHORIZED ROES HAVE INCREASED SIGNIFICANTLY?

A. No, not necessarily. As I note above, authorized ROEs for utilities reached record low levels in 2020 and 2021 due to record low interest rates and capital costs. However, utility ROEs did not decline to the extent interest rates did over these two years. Figure 8 and Table 5 show the average annual 30-year Treasury yields and authorized ROEs for electric utilities and gas distribution companies. A key observation from Figure 9 and Table 4 is that authorized ROEs for electric utilities, despite hitting record lows in 2020–21, did not decline nearly as much as interest rates. The daily 30-year Treasury yield averaged 2.85% in 2018 and 2019, versus 1.81% in 2020 and 2021, a decrease of 104 basis points. However, the authorized ROE for electric utilities averaged 9.63% in 2018 and 2019, and declined to an average of 9.41% in 2020 and 2021, a decline of only 22 basis points. In 2022, the average daily 30-year Treasury yield increased by 105 basis points to 3.11%, while authorized ROEs increased 16 basis points to 9.54%.

Figure 8
Authorized ROEs for Electric Utilities and 30-Year Treasury Yields
2007–2022

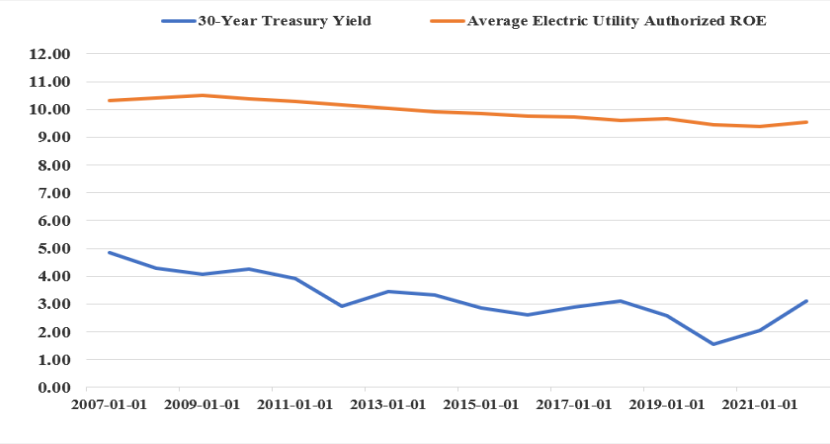


Table 4
Average Annual 30-Year Treasury Yields and Authorized ROEs
for Electric Utility Companies
2018–2022

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

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

A. Table 4 shows the authorized ROEs for electric utilities and gas distribution companies in New Mexico from 2010-23. These authorized ROEs have been in the 9.40%-9.55% range over the past five years. SPS's last three rate cases all were settlements with no specified ROE or common equity ratio.

Table 5
New Mexico Authorized ROEs
2010–2023

Company	SMBL	Docket	Service Type	Date	Decision Type	Revenue Increase	ROE (%)	CE Ratio
Public Service Co. of NM	PNM	C-10-00086-UT	Electric	8/8/2011	Settled	72.1	10.00	51.28
Southwestern Public Svc Co.	XEL	C-10-00395-UT	Electric	12/28/2011	Settled	13.5	NA	NA
New Mexico Gas Co.	EMA	C-11-00042-UT	Natural Gas	1/31/2012	Settled	21.5	10.00	52.00
Southwestern Public Svc Co.	XEL	C-12-00350-UT	Electric	3/26/2014	Fully Litigated	12.7	9.96	53.89
Public Service Co. of NM	PNM	C-14-00332-UT	Electric	5/13/2015	Fully Litigated	NA	NA	NA
Southwestern Public Svc Co.	XEL	C-15-00139-UT	Electric	6/24/2015	Fully Litigated	NA	NA	NA
El Paso Electric Co.		C-15-00127-UT	Electric	6/8/2016	Fully Litigated	1.1	9.48	49.29
Southwestern Public Svc Co.	XEL	C-15-00296-UT	Electric	8/10/2016	Settled	23.5	NA	NA
Public Service Co. of NM	PNM	C-15-00261-UT	Electric	9/28/2016	Fully Litigated	61.2	9.58	49.61
Southwestern Public Svc Co.	XEL	C-16-00269-UT	Electric	4/19/2017	Fully Litigated	0.0	NA	NA
Public Service Co. of NM	PNM	C-16-00276-UT	Electric	12/20/2017	Settled	10.3	9.58	49.61
Southwestern Public Svc Co.	XEL	C-17-00255-UT	Electric	9/5/2018	Fully Litigated	12.5	9.56	53.97
New Mexico Gas Co.	EMA	C-18-00038-UT	Natural Gas	7/17/2019	Settled	2.5	NA	NA
Southwestern Public Svc Co.	XEL	C-19-00170-UT	Electric	5/20/2020	Settled	31.0	9.45	54.77
New Mexico Gas Co.	EMA	C-19-00317-UT	Natural Gas	12/16/2020	Settled	4.5	9.38	52.00
El Paso Electric Co.		C-20-00104-UT	Electric	6/23/2021	Fully Litigated	(4.3)	9.00	49.21
Southwestern Public Svc Co.	XEL	C-20-00238-UT	Electric	2/16/2022	Settled	62.4	9.35	54.72
New Mexico Gas Co.	EMA	C-21-00267-UT	Natural Gas	11/30/2022	Settled	19.3	9.38	52.00

Data Sources: S&P Global Market Intelligence, RRA *Regulatory Focus*, 2023.

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

A. Yes, I do. As I noted previously, 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.[4] As page 3 of Exhibit JRW-2 shows, in recent years, electric utilities and gas distribution companies have been earning ROEs in the range of 8.0% to 10.0%. With such an ROE, electric utilities and gas companies, such as those in the proxy group, have strong investment grade credit ratings, sell stocks well over book value, and raise abundant amounts of capital. While my recommendation is slightly below the average authorized ROE for electric utility and gas distribution companies, it reflects the relatively low levels of interest rates and capital costs

[4] *Fed. Power Comm'n v. Hope Natural Gas Co.*, 320 U.S. 591 (1944); *Bluefield Water Works and Improvement Co. v. Pub. Serv. Comm'n of W. Va.*, 262 U.S. 679 (1923).

in the current market. Therefore, I believe that my ROE recommendation meets the criteria *Hope* and *Bluefield* established.

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

A. The article, entitled "Utilities Have a High-Wire Act Ahead," discusses the issue utilities are facing today to meet the needs of its primary stakeholders – customers and investors.[5] In years past, utilities could invest and grow their rate bases without undue burden on ratepayers because low interest rates and natural gas prices moderated rate increases. However, the big increase in gas prices and interest rates in 2022 means that the environment of the past is over.[6] Going forward, the greater financial burden on utility ratepayers associated with higher gas prices and interest rates will likely put the pressure on regulatory commissions to look hard at utility rate increase requests.

The article also highlights this utility rate issue in the context of a recent study on rate of return regulation. Werner and Jarvis (2022) evaluated the authorized ROEs in 3,500 electric and gas rate case decisions in the U.S. from 1980-2021. They compare 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 returns on equity

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

[6] Higher gas prices do not hurt the utilities because they are passed on to consumers in the form of higher rates.

by their regulators?; (2) How has this return on equity affected utilities' capital investment decisions?; and (3) What impact has this had on the costs paid by consumers?[7]

The authors reported the following empirical results:

(1) The real (inflation-adjusted) return regulators allow equity investors to earn has been pretty 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% - 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 return on equity 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 incentive to overinvest in capital projects if they are earning an outsized return on those investments;[8]

(5) Both the return on equity 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 indicate that their results are similar to those found in a previous study by Rode and Fischback (2019).[9]

In summary, these results indicate that over the past four decades authorized ROEs have not declined in line with capital costs and therefore past authorized ROEs have

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

[8] https://regulationbodyofknowledge.org/glossary/a/averch-johnson-effect-aj-effect/

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

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 THE COMPANY.

A. To develop a fair rate of return recommendation for the Company, I evaluated the return requirements of investors on the common stock of a proxy group of publicly-held electric utility companies ("Electric Proxy Group"). I also employed the group developed by D'Ascendis ("D'Ascendis Proxy Group").

Q. PLEASE DESCRIBE YOUR PROXY GROUP OF ELECTRIC COMPANIES.

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

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

(2) *Value Line Investment Survey* lists it as a U.S.-based electric utility;

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

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

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

(6) Its analysts' long-term EPS growth rate forecasts are available from Yahoo, S&P Cap IQ, and/or Zacks.

The Electric Proxy Group includes 24 companies. Page 1 of Exhibit JRW-3 provides

summary financial statistics for the proxy group, showing median operating revenues and net plant among members of the Electric Proxy Group of $8.28 billion and $25.93 billion respectively. The group on average receives 83% of its revenues from regulated electric operations, has a BBB+ bond rating from S&P's and a Baa1 rating from Moody's, has a current average common equity ratio of 42.0% and an average earned return on common equity of 8.88%.

Q. PLEASE DESCRIBE THE D'ASCENDIS PROXY GROUP.

A. Mr. D'Ascendis' group is smaller (12 utilities). Panel B of page one of Exhibit JRW-5 provides summary financial statistics for the D'Ascendis proxy group, showing median operating revenues and net plant of $6.91 billion and $26.77 billion respectively. The group on average receives 91% of its revenues from regulated electric operations, has a BBB+ bond rating from S&P's and a Baa1 rating from Moody's, has an average common equity ratio of 41.7%, and has an earned return on common equity of 9.28%.

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

A. I believe bond ratings provide a good assessment of a company's investment risk. SPS's Standard & Poor (S&P) and Moody's issuer credit ratings are A- and Baa2. The average S&P and Moody's issuer credit rating of the two Proxy Groups are BBB+ and Baa1. On average and on balance, I believe that this indicates that SPS's investment risk is in line with the two proxy groups.

Q. PLEASE DISCUSS THE RISK ANALYSIS YOU PERFORMED ON PAGE TWO OF EXHIBIT JRW-5.

A. On page two of Exhibit JRW-5, I use five different risk measures to assess the riskiness of

the three proxy groups: Beta, Financial Strength, Safety, Earnings Predictability, and Stock Price Stability. These risk measures indicate the two proxy groups are similar in risk. The comparisons of the risk measures include Beta (0.86 vs. 0.87), Financial Strength (A vs. A) Safety (1.7 vs. 1.8), Earnings Predictability (90 vs. 87), and Stock Price Stability (91 vs. 93). Overall, these measures suggest that the investment risk of the two groups (1) is very low and (2) is similar to each other.

V. CAPITAL STRUCTURE RATIOS AND DEBT COST RATES

Q. WHAT ARE SPS'S RECOMMENDED CAPITAL STRUCTURE AND SENIOR CAPITAL COST RATES FOR RATEMAKING PURPOSES?

A. Panel A of Exhibit JRW-4 provide SPS's proposed capital structure and debt cost rates. The Company has proposed a capital structure consisting of 45.30% long-term debt and 54.70%. SPS has proposed a long-term debt cost rate of 4.34%%.

Q. PLEASE DISCUSS THE CAPITAL STRUCTURES OF THE COMPANIES IN THE PROXY GROUPS.

A. Page 1 of Exhibit JRW-3 provides the average common equity ratios for the companies in the two proxy groups. As of December 31, 2022, the average common equity ratios for the Electric and D'Ascendis Proxy Groups were 42.0% and 41.7%. As such, the average common equity ratio for the proxy group companies includes a much lower common equity ratio and higher financial risk than SPS's proposed structure. That means the proposed capital structure includes more common equity and less financial risk than the proxy groups.

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

Q. IS IT APPROPRIATE TO INCLUDE SHORT-TERM DEBT IN THE CAPITALIZATION IN COMPARING THE COMMON EQUITY RATIOS OF THE HOLDING COMPANIES WITH SPS'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 SPS'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. HOW DOES SPS' PROPOSED CAPITALIZATION COMPARE TO THAT OF ITS PARENT COMPANY, XCEL ENERGY?

A. Panel B of Exhibit JRW-4 provides the average quarterly capitalization ratios for SPS and Xcel Energy, including and excluding short-term debt, over the 2019-2022 time period. SPS has used relatively low levels of short-term debt over the last three years (average of 1.7%), and so I will focus on the capitalizations excluding short-term debt. In its last rate case, SPS received a capital structure with a 54.7% common equity ratio. Over the past

three years, SPS' average common equity ratio have been 50.57%. By contrast, Xcel Energy has an average common equity ratio of 40.50% over the past three years. Hence, Xcel has a much lower common equity ratio and greater financial risk than its subsidiary. This is clear evidence that Xcel is benefiting from using double leverage.

Q. PLEASE DISCUSS THE ISSUE OF PUBLIC UTILITY HOLDING COMPANIES SUCH AS XCEL ENERGY, INC. USING DEBT TO FINANCE THE EQUITY IN SUBSIDIARIES SUCH AS SPS.

A. Moody's published an article on the use of low-cost debt financing by public utility holding companies to increase their earned ROEs. Specifically, the holding companies (Xcel Energy) use low-cost debt to purchase equity in their subsidiaries (DEO). 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

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

> operations are financed by debt raised at the subsidiary level and by debt financed at the holding-company level. In this way, the subsidiary's equity is leveraged twice, once with the subsidiary debt and once with the holding-company debt. In a simple operating-company/holding-company structure, this practice results in a consolidated debt-to-capitalization ratio that is higher at the parent than at the subsidiary because of the additional debt at the parent.[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](emphasis added).

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

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

[11] *Id.* at 5.

[12] *Id.* at 1.

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

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

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

Q. HOW HAVE UTILITIES TYPICALLY STRUCK THIS BALANCE?

A. Due to regulation and the essential nature of its output, a regulated utility is exposed to less business risk than other companies that are not regulated. This means that a regulated electric distribution company 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. Typically, one may see equity ratios for electric utilities range from 40% to 50%.

Q. GIVEN THAT SPS HAS PROPOSED AN EQUITY RATIO THAT IS HIGHER THAN THAT OF THE PROXY GROUP, AS WELL AS ITS PARENT COMPANY, XCEL EVERGY, WHAT SHOULD THE COMMISSION DO IN THIS RATEMAKING PROCEEDING TO PROTECT CONSUMERS?

A. When a regulated utility's actual capital structure contains a high equity ratio, the options are: (1) to impute a more reasonable capital structure and to reflect the imputed capital structure in revenue requirements; or (2) to recognize the downward impact that an unusually high equity ratio will have on the financial risk of a utility and authorize a lower common equity cost rate than that for 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 low proportion of debt translates into a lower required return on equity, all other things being equal. Stated differently, a utility cannot expect to "have it both ways." Specifically, a utility cannot maintain an unusually high equity ratio and not expect to have the resulting lower risk reflected in its authorized return on equity. The fundamental

relationship between the lower risk and the appropriate authorized return should not be ignored.

Q. GIVEN THIS DISCUSSION, WHAT CAPITALIZATION RATIOS AND SENIOR CAPITAL COST RATES ARE YOU RECOMMENDING FOR THE COMPANY?

A. As shown in Panel C of Exhibit JRW-3, I am using a capital structure with a common equity ratio of 50.6%. This is the common equity ratio that SPS has employed for the past three years to finance its operations and to attract capital. Furthermore, this capital structure excludes short-term debt. This is a very reasonable capitalization, given: (1) the large difference between the average common equity ratios and financial risk of the two proxy groups; and (2) the large difference in the capitalizations and the double leverage employed by SPS' parent, Xcel Energy. I am using SPS's has proposed long-term debt cost rate of 4.34%.

VI. 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 price of the firm equals average cost, including the firm's capital costs. In equilibrium, total revenues equal total costs, and because capital costs represent investors' required return on the firm's capital, actual returns equal required returns, and the market value must equal the book value of the firm's securities.

In a competitive market, firms can achieve competitive advantage due to product-market imperfections. Most notably, companies can gain competitive advantage through

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

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

> 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. [13]

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

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

Conversely, a firm that earns a return on equity below its cost of equity will see its common stock sell at a price below its book value.

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

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

> 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. [14]

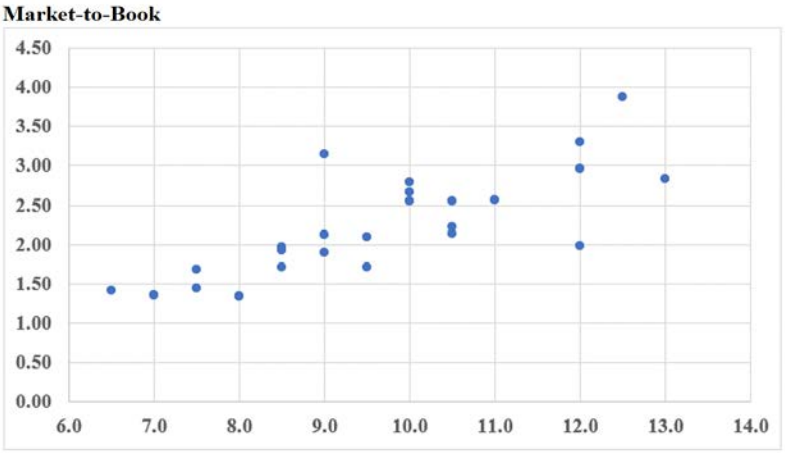
Profitability	*Value*
If ROE > K	*then Market/Book > 1*
If ROE = K	*then Market/Book =1*
If ROE < K	*then Market/Book< 1*

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 9. The average R-square is 0.58.[15] This demonstrates the strong positive relationship between ROEs and market-to-book ratios for public utilities. Given that the market-to-book ratios have been above 1.0 for a number of years, this also demonstrates that utilities have been earning ROEs above the cost of equity capital for many years.

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

[15] 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.

Figure 9
The Relationship Between Expected ROE and Market-to-Book Ratios
Electric Proxy Group



Source: *Value Line Investment Survey*, 2022.

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

A. The expected or required rate of return on common stock is a function of market-wide as well as company-specific factors. The most important market factor is the time value of money, as indicated by the level of interest rates in the economy. Common-stock investor requirements generally increase and decrease with like changes in interest rates. The perceived risk of a firm is the predominant factor 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 92 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.[16] The average betas for electric, gas, and water utility companies are 0.89, 0.87, and 0.78, respectively.[17] As such, the cost of equity for utilities is the lowest of all industries in the U.S., based on modern capital market theory.

[16] 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.

[17] The beta for the *Value Line* electric utilities is the simple average of *Value Line*'s Electric East (0.89), Central (0.88), and West (0.89) group betas.

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

Industry Average Betas*
Value Line Investment Survey **Betas****
15-Jan-23

Rank	Industry	Beta	Rank	Industry	Beta	Rank	Industry	Beta
1	Hotel/Gaming	1.52	33	Paper/Forest Products	1.16	65	IT Services	1.05
2	Oilfield Svcs/Equip.	1.44	34	Heavy Truck & Equip	1.16	66	Packaging & Container	1.02
3	Insurance (Life)	1.40	35	Bank	1.16	67	Telecom. Equipment	1.02
4	Apparel	1.38	36	Computer Software	1.16	68	Information Services	1.01
5	Advertising	1.38	37	Bank (Midwest)	1.15	69	Retail Store	1.01
6	Petroleum (Integrated)	1.37	38	Engineering & Const	1.15	70	Med Supp Non-Invasive	1.01
7	Petroleum (Producing)	1.36	39	Diversified Co.	1.15	71	Environmental	1.00
8	Air Transport	1.34	40	Entertainment	1.15	72	Cable TV	1.00
9	Homebuilding	1.34	41	Chemical (Specialty)	1.14	73	Retail Building Supply	0.99
10	Metals & Mining (Div.)	1.33	42	Internet	1.14	74	Thrift	0.98
11	Shoe	1.31	43	Maritime	1.14	75	Educational Services	0.96
12	Auto Parts	1.30	44	Machinery	1.14	76	Entertainment Tech	0.95
13	Building Materials	1.30	45	Semiconductor	1.13	77	Drug	0.95
14	Retail (Hardlines)	1.29	46	Wireless Networking	1.13	78	Telecom. Services	0.93
15	Metal Fabricating	1.29	47	Computers/Peripherals	1.13	79	Trucking	0.91
16	Public/Private Equity	1.29	48	Toiletries/Cosmetics	1.12	80	Beverage	0.91
17	Natural Gas (Div.)	1.28	49	Medical Services	1.12	81	Tobacco	0.90
18	Steel	1.27	50	Electronics	1.12	82	Telecom. Utility	0.90
19	Recreation	1.25	51	Chemical (Basic)	1.12	83	Electric Utility (West)	0.89
20	Retail (Softlines)	1.25	52	E-Commerce	1.11	84	Electric Utility (East)	0.89
21	Restaurant	1.23	53	Automotive	1.11	85	Electric Util. (Central)	0.88
22	Furn/Home Furnishings	1.23	54	Insurance (Prop/Cas.)	1.10	86	Natural Gas Utility	0.87
23	Retail Automotive	1.22	55	Power	1.10	87	Biotechnology	0.85
24	Aerospace/Defense	1.22	56	Investment Co.(Foreign)	1.08	88	Household Products	0.81
25	Semiconductor Equip	1.22	57	Investment Co.(Foreign)	1.08	89	Retail/Wholesale Food	0.81
26	Chemical (Diversified)	1.21	58	Industrial Services	1.08	90	Water Utility	0.78
27	Financial Svcs. (Div.)	1.19	59	Precision Instrument	1.07	91	Food Processing	0.77
28	Pipeline MLPs	1.19	60	Publishing	1.07	92	Precious Metals	0.70
29	Electrical Equipment	1.19	61	Healthcare Information	1.06			
30	Oil/Gas Distribution	1.18	62	Human Resources	1.06			
31	R.E.I.T.	1.17	63	Railroad	1.06			
32	Med Supp Invasive	1.17	64	Reinsurance	1.05		Mean	1.11

* Industry averages for 92 industries using *Value Line*'s database of 1,705 companies - Updated 1-15-23.

** *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 of these decisions must take into consideration the firm involved as well as current conditions in the economy and the financial markets.

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

A. 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 capital asset pricing model ("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. Discounted Cash Flow (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:

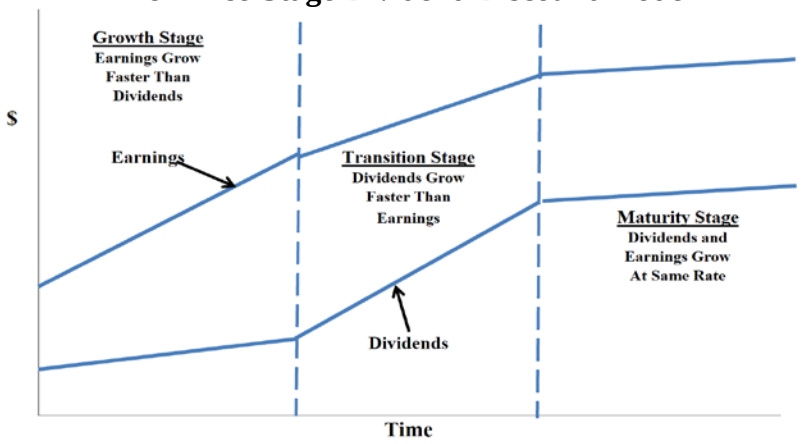
$$P = \frac{D_1}{(1+k)^1} + \frac{D_2}{(1+k)^2} + \cdots + \frac{D_n}{(1+k)^n}$$

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 10. This model presumes that a company's dividend payout progresses initially through a growth stage, then proceeds through a transition stage, and finally assumes a maturity (or steady-state) stage. The dividend-payment stage of a firm depends on the profitability of its internal investments, which, in turn, is largely a function of the life cycle of the product or service.

Figure 11
The Three-Stage Dividend Discount Model



1. **Growth stage**: Characterized by rapidly expanding sales, high profit margins, and an abnormally high growth in earnings per share. Because of highly profitable

expected investment opportunities, the payout ratio is low. Competitors are attracted by the unusually high earnings, leading to a decline in the growth rate.

2. **Transition stage**: In later years, increased competition reduces profit margins and earnings growth slows. With fewer new investment opportunities, the company begins to pay out a larger percentage of earnings.
3. **Maturity (steady-state) stage**: Eventually, the company reaches a position where its new investment opportunities offer, on average, only slightly more attractive ROEs. At that time, its earnings growth rate, payout ratio, and ROE stabilize for the remainder of its life. As I will explain below, the constant-growth DCF model is appropriate when a firm is in the maturity stage of the life cycle.

In using the 3-stage model to estimate a firm's cost-of-equity capital, dividends are projected into the future using the different growth rates in the alternative stages, and then the equity-cost rate is the 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 return on equity, and g is the expected growth rate of dividends. This is known as the constant-growth version of the DCF model. To use the constant-growth DCF model to estimate a firm's cost of equity, one solves for "k" in the above expression to obtain the following:

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

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

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

A. One should be sensitive to several factors when using the DCF model to estimate a firm's cost of equity capital. In general, one must recognize the assumptions under which the DCF model was developed in estimating its components (the dividend yield and the expected growth rate). The dividend yield can be measured precisely at any point in time; however, it tends to vary somewhat over time. Estimation of expected growth is

considerably more difficult. One 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. These dividend yields are provided in Panels A and B of page 2 of Exhibit JRW-5. I have shown the mean and median dividend yields using 30-day, 90-day, and 180-day average stock prices. For the Electric Proxy Group, the mean and median dividend yields range from 3.50% to 3.60%. As such, I will use 3.55% as the dividend yield for the Electric Proxy Group.[18] For the D'Ascendis Proxy Group, the mean and median dividend yield results range from 3.60% to 3.70%. I will use the midpoint of this range, 3.65%, as the dividend yield for the D'Ascendis Proxy Group.

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

A. According to the traditional DCF model, the dividend yield term relates the dividend paid over the coming period to the current stock price. As indicated by Professor Myron Gordon, who is commonly associated with the development of the DCF model for popular use, this is obtained by: (1) multiplying the expected dividend over the coming quarter by 4, and (2) dividing this dividend by the current stock price to determine the appropriate dividend yield for a firm that pays dividends on a quarterly basis.[19]

[18] For the dividend yields and ROEs, I round to the nearest .05%.

[19] *Petition for Modification of Prescribed Rate of Return*, Federal Communications Commission, Docket No. 79-

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:

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 earnings per share ("EPS"), dividends per share ("DPS"), and book value per share ("BVPS"). In addition, I utilized the average EPS growth-rate forecasts of Wall Street analysts as provided by

05, Direct Testimony of Myron J. Gordon and Lawrence I. Gould at 62 (April 1980).

Yahoo, Zacks, and S&P Cap IQ. These services solicit five-year earnings growth-rate projections from securities analysts and compile and publish the means and medians of these forecasts. Finally, I also assessed prospective growth as measured 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, for example, 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 (the return on equity). The internal growth rate is computed as the retention rate times the return on equity. Internal growth is significant in determining long-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 Lacina, Lee, and Xu (2011) has shown that analysts' three-to-five year EPS growth-rate forecasts are not more accurate at forecasting future earnings than naïve random walk forecasts of future earnings.[20] Employing data over a twenty-year period, these authors demonstrate that using the most recent year's actual EPS figure to forecast EPS in the next 3-5 years proved to be just as accurate as using the EPS estimates from analysts' three-to-five year EPS growth-rate forecasts. In the authors' opinion, these results indicate that analysts' long-term earnings growth-rate forecasts should be used with caution as inputs for valuation and cost-of-capital purposes. Finally, and most significantly, it is well known that the long-term EPS growth-rate forecasts of Wall Street securities analysts are overly optimistic and

[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.

upwardly 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 Easton and Sommers (2007) found that optimism in analysts' growth rate forecasts leads to an upward bias in estimates of the cost of equity capital of almost 3.0 percentage points.[22]

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

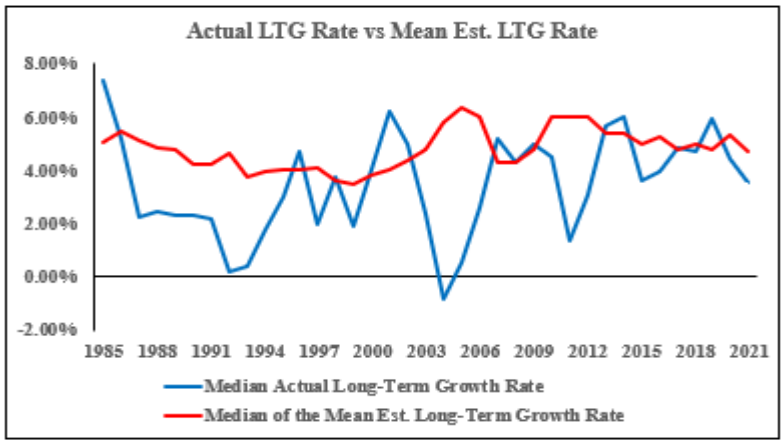
A. Yes. I have completed a study of the accuracy of analysts' EPS growth rates for electric utilities and gas distribution companies over the 1985 to 2021 time period. In the study, I used the utilities listed in the electric utilities and gas distribution companies covered by *Value Line*. I collected 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 11, the mean forecasted EPS growth rate (depicted in the red line in Figure 11) is consistently greater than the achieved actual EPS growth rate over the time period, with the exception of short periods in 1996, 2001, 2007, 2013, and 2019. Over the entire period, the mean forecasted EPS growth rate is over 200

[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).

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 11
Mean Forecasted vs. Actual Long-Term EPS Growth Rates
Electric Utilities and Gas Distribution Companies
1985–2021



Data Source: S&P Global Market Intelligence, Capital IQ, I/B/E/S, 2022.

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

A. Yes. A study by Szakmary, Conover, and Lancaster (2008) evaluated the accuracy of *Value Line*'s three-to-five-year EPS growth rate forecasts using companies in the Dow Jones Industrial Average over a 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.[23] Szakmary, Conover, and Lancaster (SCL) studied the predicted versus the projected stock returns, sales, profit margins, and earnings per share made by *Value Line* over the 1969 to 2001 time period. *Value Line* projects variables from a three-year base period (e.g., 2012 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

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

Transports and 15 Utilities). SCL found that the projected annual stock returns for the Dow Jones stocks were "incredibly overoptimistic" and of no predictive value. The mean annual stock return of 20% for the Dow Jones stocks' *Value Line*'s forecasts was nearly double the realized annual stock return. The authors also found that *Value Line*'s forecasts of earnings per share and profit margins were "strikingly overoptimistic." *Value Line*'s forecasts of annual sales were higher than achieved levels, but not statistically significant. SCL concluded that the overly optimistic projected annual stock returns were attributable to *Value Line*'s upwardly biased forecasts of earnings per share and profit margins.

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

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

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

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

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

A. Page 3 of Exhibit JRW-5 provides the 5- and 10- year historical growth rates for EPS, DPS, and BVPS for the companies in the two proxy groups, as published in the *Value Line*

Investment Survey. The median historical growth measures for EPS, DPS, and BVPS for the Electric Proxy Group, as provided in Panel A, range from 4.00% to 5.50%, with an average of the medians of 4.60%. For the D'Ascendis Proxy Group, as shown in Panel B of page 3 of Exhibit JRW-5, the historical growth measures in EPS, DPS, and BVPS, as measured by the medians, range from 3.50% to 6.00%, with an average of the medians of 4.70%.

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

A. *Value Line's* projections of EPS, DPS, and BVPS growth for the companies in the proxy groups are shown on page 4 of Exhibit JRW-5. As stated above, due to the presence of outliers, the medians are used in the analysis. For the Electric Proxy Group, as shown in Panel A of page 4 of Exhibit JRW-5, the medians range from 4.00% to 6.00%, with an average of the medians of 5.00%. The range of the medians for the D'Ascendis Proxy Group, shown in Panel B of page 4 of Exhibit JRW-5, is from 4.80% to 6.00%, with an average of the medians of 5.50%.

Also provided on page 4 of Exhibit JRW-5 are the prospective sustainable growth rates for the companies in the two proxy groups as measured by *Value Line*'s average projected retention rate and return on shareholders' equity. As noted above, sustainable growth is a significant and a primary driver of long-run earnings growth. For the Electric Proxy Group and D'Ascendis Proxy Group, the median prospective sustainable growth rates are 4.0% and 3.9%, respectively.

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

A. Yahoo, Zacks, and S&P Cap IQ collect, summarize, and publish Wall Street analysts' three-to-five year EPS growth-rate forecasts for the companies in the proxy groups. These forecasts are provided for the companies in the proxy groups on page 5 of Exhibit JRW-5. I have reported both the mean and median growth rates for the groups. Since there is considerable overlap in analyst coverage between the three services, and not all of the companies have forecasts from the different services, I have averaged the expected five-year EPS growth rates from the three services for each company to arrive at an expected EPS growth rate for each company. The mean/median of analysts' projected EPS growth rates for the Electric and D'Ascendis Proxy Groups are 5.7%/5.8% and 5.0%/5.3%, respectively.[24]

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

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

The historical growth rate indicators for my Electric Proxy Group imply a baseline growth rate of 4.6%. 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 4.0%. The projected EPS growth rates of Wall Street analysts for the Electric Proxy Group are 5.70%

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

and 5.80% as measured by the mean and median growth rates. The overall range for the projected growth-rate indicators (ignoring historical growth) is 4.0% to 5.8%. Giving primary 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 the range of 5.25% to 5.50%. I will use the midpoint of this range, 5.375%, as 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 4.7%. The average of the projected EPS, DPS, and BVPS growth rates from *Value Line* is 5.5%, and *Value Line*'s projected sustainable growth rate is 3.9%. The projected EPS growth rates of Wall Street analysts are 4.8% and 5.3% as measured by the mean and median growth rates. The overall range for the projected growth rate indicators is 3.9% to 5.5%. Again, giving primary 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 is 5.25%. Similar to 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. BASED ON THE ABOVE ANALYSIS, WHAT ARE YOUR INDICATED COMMON EQUITY COST RATES FROM THE DCF MODEL FOR THE PROXY GROUPS?

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

Table 1
DCF-Derived Equity Cost Rate/ROE

	Dividend Yield	1 + ½ Growth Adjustment	DCF Growth Rate	Equity Cost Rate
Electric Proxy Group	**3.55%**	**1.026875**	**5.375%**	**9.00%**
D'Ascendis Proxy Group	**3.65%**	**1.026250**	**5.250%**	**9.00%**

The result for the Electric Proxy Group is the 3.55% dividend yield, times the one and one-half growth adjustment of 1.02687, plus the DCF growth rate of 5.375%, which results in an equity cost rate of 9.00%. The result for the D'Ascendis Proxy Group is 9.00%, which includes a dividend yield of 3.65%, an adjustment factor of 1.02625, and a DCF growth rate of 5.25%.

B. Capital Asset Pricing Model

Q. PLEASE DISCUSS THE CAPITAL ASSET PRICING MODEL ("CAPM").

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

$$k = R_f + RP$$

The yield on long-term U.S. Treasury securities is normally used as R_f. Risk premiums are measured in different ways. The CAPM is a theory of the risk and expected returns of common stocks. In the CAPM, two types of risk are associated with a stock:

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

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

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 4.75% range over the 2010–2022 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, they have 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. The illiquidity and resulting yield distortion has also been highlighted in the financial press.[26] As shown in Figure 5 (page 14), the yield curve is currently inverted with a yield "hump" at the 20-year mark. The current 10-year, 20-year, and 30-year Treasury yields are in the 3.30%, 3.64%, and 3.54% range.[27] Given the recent range of yields, and recognizing the "hump," I am using 3.60% as the risk-free rate, or R_f, in my CAPM.

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

[27] Duff & Phelps, "Impact of High Inflation and Market Volatility on Cost of Capital Assumptions – October 2022 Update." - //efaidnbmnnnibpcajpcglclefindmkaj/https://www.kroll.com/-/media/cost-of-capital/impact-high-inflation-market-volatility-coc-assumptions-2022.pdf.

Q. DOES THE 3.60% RISK-FREE INTEREST RATES TAKE INTO CONSIDERATION OF FORECASTS OF HIGHER INTEREST RATES?

A. No, it does not. The 3.60% percent 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. Therefore, my risk-free interest rate of 3.60% percent.

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 ß. 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 ß and greater-than-average market risk. A less steep line indicates a lower ß and less market risk. Several online investment information services, such as Yahoo and Reuters, provide estimates of stock betas. Usually these services report different betas for the same stock. The differences are usually due to:

(1) the time period over which ß is measured; and (2) any adjustments that are made to reflect the fact that betas tend to regress to 1.0 over time.

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 as:[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 percent-age changes in the price of a stock and weekly percentage changes in the NYSE Index over a period of five years. In the case of shorter price histories, a smaller time period is used, but two years is the minimum. The Betas are adjusted for their long-term tendency to converge toward 1.00. Value Line then adjusts these Betas to account for their long-term tendency to converge toward 1.00.

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

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

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

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 over-the-counter market and not the NYSE. Technology stocks, which make up about 25 percent 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. As shown on page 3 of Exhibit JRW-6, the median *Value Line* beta for the two Proxy Groups are 0.85 and 0.85. At present, I will continue to use *Value Line* betas in my CAPM, which I believe is a conservative approach.

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 discus 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

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

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

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

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]

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

A. Derrig and Orr, Fernandez, and 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

[32] *The CFO Survey*, DUKE UNIVERSITY (Mar. 30, 2022), https://www.richmondfed.org/cfosurvey.

[33] *Survey of Professional Forecasters*, FEDERAL RESERVE BANK OF PHILADELPHIA (Feb. 14, 2020), 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 95 COUNTRIES IN 2022, IESE BUSINESS SCHOOL WORKING PAPER (June 2022).

[35] *See* Richard Derrig & Elisha Orr, *Equity Risk Premium: Expectations Great and Small (Version 3.0)*, Aug. 28, 2003 (https://www.casact.org/sites/default/files/database/forum_04wforum_04wf001.pdf); 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).

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 primary risk premium studies reviewed by Derrig and Orr, as well as other more recent studies of the market risk premium. In developing page 5 of Exhibit JRW-6, I have categorized the types of studies discussed on page 4 of Exhibit JRW-6. I have also included the results of studies of the "building blocks" approach to estimating the equity risk premium. The building blocks approach is a hybrid approach employing elements of both historical and *ex ante* models.

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

A. 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 4.83%.

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 5.40%.

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

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

Historic Stock and Bond Returns: Historic stock and bond returns suggest a market risk premium in the 4.40% to 6.64% 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 3.53% to 6.00%.

Surveys: Market risk premiums developed from surveys of analysts, companies, financial professionals, and academics are lower, with a range from 3.15% 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/surveys.

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 Exhibit JRW-6. The results of his 2023 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 5.7%.[37] His estimated market risk premium for the U.S. has been in the 5.00% to 5.70% range in recent years.

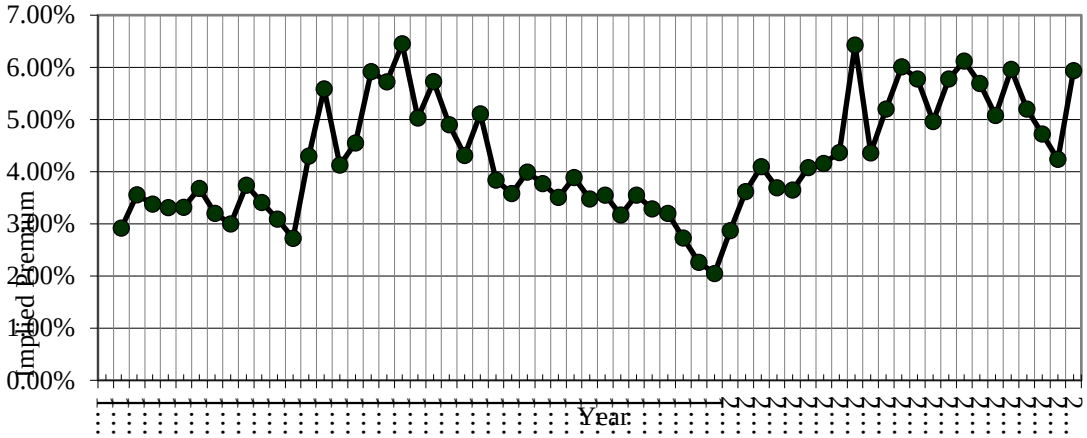
Professor Aswath Damodaran of New York University, a leading expert on valuation and the market risk premium, provides a monthly updated market risk premium based on projected S&P 500 EPS and stock-price level and long-term interest rates. His estimated market risk premium, shown graphically in Figure 13, below, has primarily been in the range of 4.0% to 6.0% since 2010. As of March 1, 2023, his estimate of the implied market risk premium was 4.78%.[38]

[36] 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 (March 2023).

[37] *Id.* at 3.

[38] Aswath Damodaran, DAMODARAN ONLINE, N.Y. UNIV., http://pages.stern.nyu.edu/~adamodar/.

Figure 12
Damodaran Implied Market Risk Premium
1960–2022



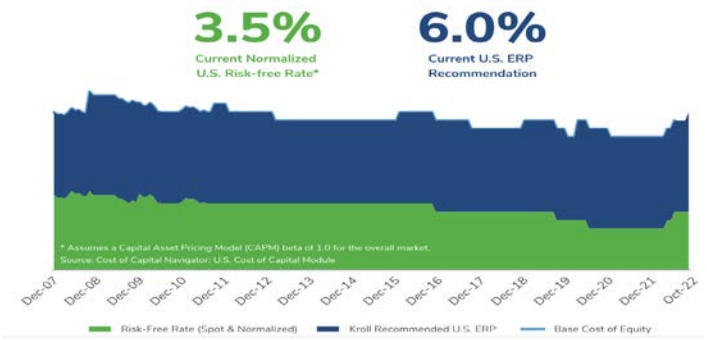
Source: Aswath Damodaran, DAMODARAN ONLINE, N.Y. UNIV., http://pages.stern.nyu.edu/~adamodar/.

As noted above, 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 2008–2023 time periods are shown on page 7 of Exhibit JRW-6 and are shown graphically in Figure 14. 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 the novel coronavirus, 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%. Subsequently, on December 9, 2020, Kroll reduced its recommended market risk premium to 5.50%.[39] On October 18, 2022, Kroll once again increased its market risk premium to 6.00%.

[39] Carla Nunes, James P. Harrington, *Duff & Phelps Recommended U.S. Equity Risk Premium Decreased from 6.0% to 5.5%, Effective December 9, 2020*, COST OF CAPITAL RESOURCE CTR., KROLL, Dec. 10, 2020, https://www.duffandphelps.com/insights/publications/cost-of-capital/duff-and-phelps-recommended-us-equity-risk-premium-decreased-december-2020 ("DUFF & PHELPS 2020").

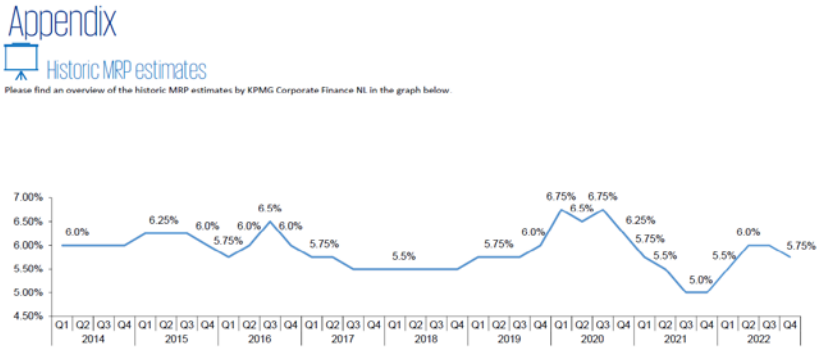
Finally, KPMG, the international accounting firm, regularly publishes an update to their market risk premium to be used in their valuation practice. KPMG's market risk premium is shown in Figure 15, which was as high as 6.75% in 2020, was lowered to as low as 5.00% on September 30, 2021, to 5.00%. KPMG increased its market risk premium to 6.0% on June 30, 2022, but lowered it to 5.75% on December 31, 29022.[40]

Figure 13
Kroll
Normalized Risk-Free Rate and Market Risk Premium Recommendations
2007–2022



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

Figure 14
KPGM
Market Risk Premium Recommendations
2013–2023



Data: https://home.kpmg/nl/nl/home/insights/2020/04/equity-market-risk-premium-2020.html.

[40] https://diaprodnlreports.blob.core.windows.net/report-5d9da61986db2894649a7ef2-media/document_63c179a19c35860e6d30e045.pdf?sv=2019-02-02&spr=https&st=2023-01-16T12%3A13%3A35Z&se=2023-01-16T13%3A22%3A35Z&sr=c&sp=r&sig=CWyi5ejFEMTC4fyqm4tH97zpZRTN9uZ4yxAOkiBAk%2Bk%3D&rscd=inline

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 just cited suggest that the appropriate market risk premium in the U.S. is in the 4.0% to 6.0% range. I will use an expected market risk premium of 6.00%, which is the upper end of the range. I gave most weight to the market risk-premium estimates of Kroll, KPMG, the Fernandez survey, and Damodaran. This is a conservatively high estimate of the market risk premium considering the many studies and surveys of the market risk premium.

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

A. The results of my CAPM study for the proxy group are summarized on page 1 of Exhibit JRW-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	Market Risk Premium	Equity Cost Rate
Electric Proxy Group	**3.60%**	**0.85**	**6.00%**	**8.70%**
D'Ascendis Proxy Group	**3.60%**	**0.85**	**6.00%**	**8.70%**

For both proxy groups, the risk-free rate of 3.60% plus the product of the beta of 0.85 times the equity risk premium of 6.00% results in a 8.70% equity cost rate.

C. 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	**9.00%**	**8.70%**
D'Ascendis Proxy Group	**9.00%**	**8.70%**

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

A. Given these results, I conclude that the appropriate equity cost rate for companies in the Electric and D'Ascendis Proxy Groups is in the 8.70% to 9.00% range. Since I rely primarily on the DCF model and the results for the Electric Proxy Group, I am using a ROE of 9.00% for the Company. The 9.00% is a conservatively high ROE recommendation given the results of my DCF and CAPM analyses.

Q. PLEASE INDICATE WHY AN EQUITY COST RATE OF 9.00% IS APPROPRIATE FOR SPS.

A. A number of reasons support an equity cost rate of 9.00% as appropriate and fair for SPS:

1. I have employed a capital structure that reflects how SPS has financed its self in recent years that includes a higher common equity ratio and lower financial risk than the average of the proxy groups and of SPS' parent, Xcel.

2. As Exhibit JRW-2 shows, capital costs for utilities, as indicated by

long-term bond yields, are still at historically low levels, despite the increase in rates since 2022.

3. As Table 6 (page 37) shows, the electric utility industry is among the lowest risk industries in the U.S. as measured by beta. As such, according to CAPM, the cost of equity capital for this industry is among the lowest in the U.S.

4. While the overall stock market is down over 10% over the past year, public utility stocks have help up very well. Hence, utility stocks have performed well relative to the market in the face of higher inflation and interest rates.

5. SPS' investment risk is in line with the average of the proxy groups. SPS' S&P and Moody's issuer credit ratings are A- and Baa2, which average out to be equal to the equal to the average of the two proxy groups, which are BBB+ and Baa1.

6. On an annual basis, the average authorized ROEs for electric utility companies have been an average of 9.60% in 2018, 9.66% in 2019, 9.44% in 2020, 9.38% in 2021, and 9.54% in 2022, according to Regulatory Research Associates.[41] As I discuss above, authorized ROEs have lagged behind capital market cost rates. This observation is supported by the Werner and Jarvis (2022) study which evaluated over 3,500 authorized ROEs over the past four decades authorized ROEs and concluded that authorized ROEs did not decline in line with capital costs and therefore past authorized ROEs have overstated the actual cost of equity capital. Accordingly, I believe my recommended ROE reflects the current capital market

[41] S&P Global Market Intelligence, *RRA Regulatory Focus* (2023).

environment.

Q. DO YOU BELIEVE THAT YOUR 9.00% ROE RECOMMENDATIONS 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-3 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 below the average authorized ROEs for electric utility and gas distribution companies, it reflects the downward trend in authorized and earned ROEs of utilities.

VII. CRITIQUE OF SPS' RATE OF RETURN TESTIMONY

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

A. The Company has proposed a capital structure consisting of 45.30% long-term debt and 54.70%. SPS has proposed a long-term debt cost rate of 4.34%%. SPS witness Mr. Dylan D. D'Ascendis proposes a ROE of 10.75% for SPS. SPS is proposing an overall rate of return or cost of capital of 7.85%. These recommendations are summarized on page 1 of Exhibit JRW-7.

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 SPS are summarized on page 2 of Exhibit JRW-7. Based on these figures, he concludes that the appropriate equity-cost rate is 10.75% for SPS' 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) SPS's investment risk, (4) DCF Approach; (5) CAPM Approach; (6) the alternative risk premium model; and (7) equity cost models applied to non-price regulated companies; and (8) other factors including: (a) a size premium of 0.15% to account for SPS' size; (b) a credit risk premium of 0.00% to account for SPS' credit ratings relative to his proxy group; (c) a consideration of SPS regulatory risk; and (d) a flotation cost adjustment of .08%.business and regulatory risks and flotation costs.

The capital market conditions, capital structure, and SPS's investment risk were previously discussed. I address the remaining items below.

A. DCF Approach

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

A. On pages 48-53 of his testimony and in Schedule 3 of Attachment_(DWD-1, 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. 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*.

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

A. There are two issues with Mr. D'Ascendis' DCF study: (1) First and foremost, he gives very little, if any, weight to his DCF results. His mean DCF result for his proxy group is 8.54%; (2) he reports a DCF result of 9.20% which is not his mean DCF result but is the average of his mean and mean high DCF result; and (2) 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 8.54%. `He claims that the indicated range of equity cost estimates is 10.35% to 11.35% (midpoint = 10.85%). Had he given his DCF results any weight, he would have arrived at a much lower recommendation for his estimated cost of equity. Furthermore, he misrepresents his DCF results. While his mean DCF result is 8.54%, he reports the average of his mean and mean high DCF results, which is 9.20%. This is because he reports a DCF

result of 9.20% which is not his mean DCF result but is the average of his mean and mean high DCF results.

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, *Value Line's* and Bloomberg.

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 provide

a discussion of this issue on pages 47-51 of this testimony and report on a study I conducted in Figure 12. Using the electric utilities and gas distribution companies covered by *Value Line*, this study demonstrates that the mean forecasted EPS growth rates are consistently greater than the achieved actual EPS growth rates over the 1985-2021 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 DCF growth rate produces an overstated equity-cost rate.

B. Risk-Premium Approach

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

A. On pages 53-76 of his testimony and in Schedule 4 of Attachment_(DWD-1, Mr. D'Ascendis develops an equity cost rate by using the RPM model. Mr. D'Ascendis reports a RPM equity cost rate of 11.72% which is based on a ROE of 12.12% using his own Predictive Risk Premium Model ("PRPM") and a ROE of 11.31% using his Risk Premium Using an Adjusted Total Market Approach ("RPATM"). The PRPM uses a prospective risk-free rate of 3.56% plus a PRPM risk premium of 8.56%. The RPATM approach uses an adjusted utility bond yield of 5.44% plus a risk premium of 5.44%.

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

A. The primary error is the magnitude of the risk premiums which are based on historical and projected stock- and bond-market returns.

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

A. The primary error is the magnitude of the risk premiums which are based on historical and projected stock and bond returns. 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 approached use project 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 above 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) 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 2
D'Ascendis Equity Risk Premium Studies

Historical Spread Between Total Returns of Large Stocks and Aaa and Aa2-Rated Corporate Bond Yields (1928 – 2021)	6.13%
Regression Analysis on Historical Data	7.63%
PRPM Analysis on Historical Data	10.35%
Prospective Equity Risk Premium using Total Market Returns from *Value Line* Summary & Index less Projected Aaa Corporate Bond Yields	11.24%
Prospective Equity Risk Premium using Measures of Capital Appreciation and Income Returns from *Value Line* for the S&P 500 less Projected Aaa Corporate Bond Yields	11.83%
Prospective Equity Risk Premium using Measures of Capital Appreciation and Income Returns from Bloomberg Professional Services for the S&P 500 less Projected Aaa Corporate Bond Yields	7.86%
Average	9.17%

Q. PLEASE 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.[42]

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

[42] 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.

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 effective a black box approach, as it cannot be duplicated without access to Mr. D'Ascendis' proprietary software. And, as indicated above, there are numerous empirical issues with using historical stock and bond return data to estimate n equity risk premium.

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)-(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.[43] 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

[43] 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.

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.

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

A. He says that he uses "Ibbotson" returns, but Ibbotson does not publish these returns anymore. As previously discussed, these historical return series are now compiled and published by Kroll, a subsidiary of the investment advisory firm Duff & Phelps .

Q. IS DUFF & PHELPS A RESPECTED FINANCIAL FIRM?

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

Q. WHAT IS DUFF & PHELPS' 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, 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.[44]

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

A. No.

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

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

> 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.[45]

[44] Duff & Phelps, Client Alert, March 16, 2016, p. 37 (emphasis supplied).

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

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

A. Yes, but it is now distributed by its subsidiary Kroll. In fact, on the same site (https://www.kroll.com/en/insights/publications/cost-of-capital) that Kroll sells their annual valuation handbook used by Mr. D'Ascendis, Duff & Phelps publishes its recommended estimate of the equity- or market-risk premium. Page 7 of Exhibit JRW-6 of my testimony shows Duff & Phelps' equity-risk-premium recommendations (https://www.kroll.com/en/insights/publications/cost-of-capital/recommended-us-equity-risk-premium-and-corresponding-risk-free-rates). As noted, Kroll is currently recommending an equity of market risk premium of 6.0%. This is 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 Duff & Phelps book and then ignore Duff & Phelps' recommendation as to the appropriate equity or market risk premium.

Q. DO YOU AGREE THAT THE U.S. EQUITY RISK PREMIUM OF 6.00% 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 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 16.00%, 16.59%, and 12.62% 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 3.56%, the resulting risk premiums are 12.44%, 13.03%, and 9.06%. With a current adjusted dividend yield of 2.00% for the S&P 500 in 2023, the implied projected EPS growth rates for the three approaches are 14.00%, 14.59%, and 10.62%.

Table 3
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	2.00%	2.00%	2.00%	2.00%
+ Expected EPS Growth	14.00%	14.59%	10.62%	13.07%
= Expected Market Return	16.00%	16.59%	12.62%	15.07%
+ Risk-Free Rate	3.56%	3.56%	3.56%	3.56%
= Market Risk Premium	12.44%	13.03%	9.06%	11.51%

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

A. No. Mr. D'Ascendis' market risk premiums shown in Table 8, computed using his expected market returns (average = 15.07%), minus the risk-free interest rate (3.56%), which produce an average market-risk premium for the three approaches of 11.51%. 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 thirty (30) market risk-premiums studies from the past fifteen years. Historic stock and bond returns suggest a market-risk premium in the 4.40% to 6.40% 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 3.53% 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 between 3.15% 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 11.51%. As discussed below, the reason is that they are based on unrealistic long-term, earnings-per-share growth rates,

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.[46]

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 in Mr. D'Ascendis' market-risk-premium approaches (5) and (6) are based on the concept that analyst projections of companies' three-to-five EPS growth rates reflect investors' expected *long-term* EPS growth for those companies. However, this 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.[47] 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.[48] The inaccuracy of analysts' growth-rate

[46] 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.

[47] 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.

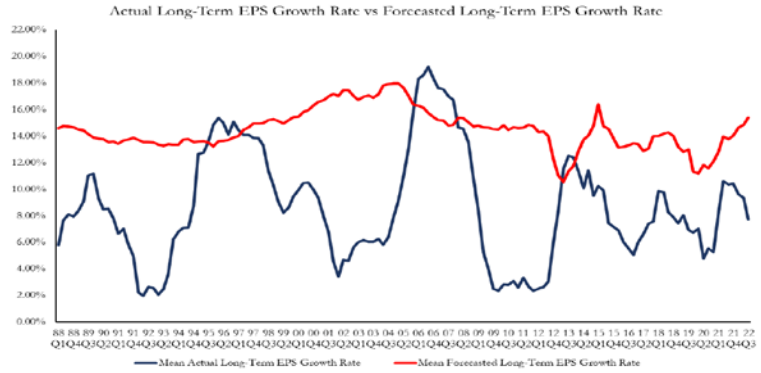
[48] M. Lacina, B. Lee, & Z. Xu, (2011), *Advances in Business and Management Forecasting*, Vol. 8, Kenneth D. Lawrence, Ronald K. Klimberg (ed.), Emerald Group Publishing Limited, pp. 77-101.

forecasts leads to an upward bias in equity cost estimates of approximately 300 basis points.[49]

I have also completed studies on the accuracy of analysts' projected EPS growth rates. In Figure 11 (page 49), I demonstrated that the EPS growth rate forecasts of Wall Street analysts are upwardly biased for electric utilities and gas distribution companies. In Figure 15, I provide the results of a study I did using all companies followed by I/B/E/S who have three-to-five-year EPS growth rate forecasts over the 1985 to 2021 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.

[49] 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 15
Mean Forecasted vs. Actual Long-Term EPS Growth Rates
All Companies Covered by I/B/E/S
1985–2021



Data Source: I/B/E/S, 2022.

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.*[50]

This is the same observation made in a *Bloomberg Businessweek* article.[51] 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 14.00%, 14.59%, and 10.62% (average = 13.07%) 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

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

[51] 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.

is about one-half of Mr. D'Ascendis' average projected EPS growth rates of 13.07%; (2) as discussed below, long-term EPS and GDP growth are directly linked; and (3) more recent trends in GDP growth, as well as projections of GDP growth, suggest slower economic and earnings growth in the future.

Long-Term Historic EPS and GDP Growth 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-8, and a summary is shown in Table 12.

Table 4
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, 13.07%, is at best, an outlier. These 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-8 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.[52]

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-8. 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. The components of nominal GDP growth are real GDP growth and inflation. Page 3 of Exhibit JRW-8 shows the annual real GDP growth rate between 1961 to 2022. Real GDP growth has gradually declined from the 5.0 percent to 6.0 percent 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-8 shows inflation as measured by the annual growth rate in the Consumer Price Index (CPI)

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

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 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-8 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-8. The mean 10-year nominal GDP growth forecast (as of February 2023) by economists in the recent *Survey of Financial Forecasters* is 4.37%.[53] The federal Energy Information Administration (EIA), in its projections used in preparing *Annual Energy Outlook*, forecasts long-term GDP growth of 4.5% for the period 2020 to 2050.[54] The Congressional Budget Office (CBO), in its forecasts for the period 2020 to 2030, projects a nominal GDP growth rate of 4.0%.[55] Finally, the Social Security Administration (SSA), in its Annual OASDI Report, provides a projection of nominal GDP from 2020 to 2095.[56] SSA's projected growth GDP growth rate over this period is 4.2%. 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 13.07% is almost three times projected GDP growth.

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

A. As addressed in a study by the consulting firm McKinsey & Co., two factors drive real GDP growth over time: (a) the number of workers in the economy (employment); and (2) the productivity of those workers (usually defined as output per hour).[57] According to

[53] 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/.

[54] *Annual Energy Outlook 2021*, U.S. ENERGY INFORMATION ADMINISTRATION, Table: Macroeconomic Indicators.

[55] *The 2021 Long-Term Budget Outlook*, CONGRESSIONAL BUDGET OFFICE, July 15, 2021.

[56] Social Security Administration, *2021 Annual Report of the Board of Trustees of the Old-Age, Survivors, and Disability Insurance (OASDI) Program*, Table VI.G4, (July 1, 2021). The 4.2% growth rate is the growth in projected GDP from 2020 to 2095.

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

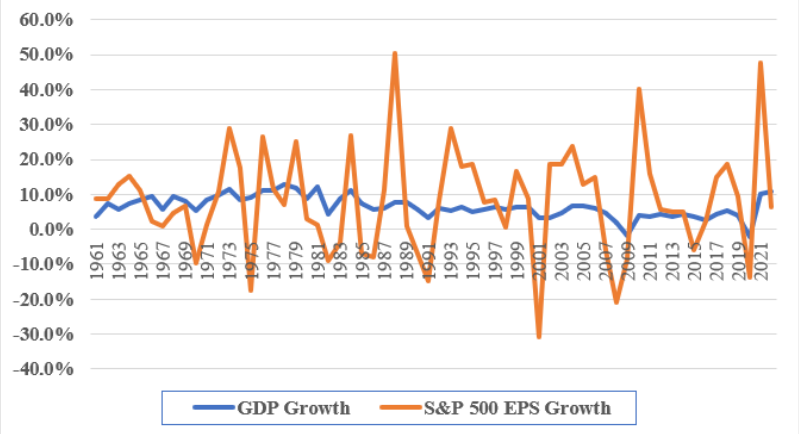
McKinsey, real GDP growth over the past 50 years was driven by population and productivity growth which grew at compound annual rates of 1.7% and 1.8%, respectively. However, global economic growth is projected to slow significantly in the years to come. The primary factor leading to the decline is slow 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.[58] Volatility aside, however, it is clear that over the medium to long run, S&P 500 EPS growth does not outpace GDP growth.

[58] 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 16
Average Annual Growth Rates
GDP and S&P 500 EPS
1960-2022



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

A fuller understanding of the relationship between GDP and S&P 500 EPS growth requires consideration of 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."[59] 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.

[59] 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 5
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.[60] 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

[60] *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/.

(23%); (c) corporate profits are more international-trade driven, while exports minus imports tend to drag on GDP; and (d) S&P 500 EPS is 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.[61]

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' 13.07% 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 2021 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 2021. In Table 15, I then projected the aggregate net income level for the S&P 500 companies and GDP as of the year 2050. For the growth rate for the S&P 500 companies, I used Mr. D'Ascendis' average projected S&P 500 EPS growth rate of 13.07%. As a

[61] 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.

growth rate for nominal GDP, I used the average of the long-term projected GDP growth rates from SFF, CBO, SSA, and EIA (4.3%, 3.8%, 4.1%, and 4.0%, respectively), which is 4.35%. The projected 2050 level for the aggregate net income level for the S&P 500 companies is $48.5 trillion. Over the same period GDP is expected to grow to $83.9 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 2021 to 57.82% 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 6
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	13.07%	28	$ 48,498.83
2021 Nominal U.S. GDP	$25,461.34	4.35%	28	$ 83,882.23
Net Income/GDP (%)	6.11%			57.82%

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 13.07%.
Nominal GDP Growth Rate – The average of the long-term projected GDP growth rates from SFF, CBO, SSA, and EIA (4.3%, 3.8%, 4.1%, and 4.0%).

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%.[62]

In sum, Mr. D'Ascendis' average long-term S&P 500 EPS growth rate of 13.07% 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."[63]

C. CAPM Approach

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

A. On pages 76-84 of his testimony and in Schedule 5 of Attachment_(DWD-1, Mr. D'Ascendis develops an equity cost rate by using the CAPM. Mr. D'Ascendis uses both the

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

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

CAPM and the so-called empirical CAPM approaches ("ECAPM"). Mr. D'Ascendis' reports CAPM and ECAPM results of 11.81%. Mr. D'Ascendis uses a projected rate of 3.56% for the long-term Treasury bond, betas from *Value Line* and Bloomberg, and a market-risk premium of 10.42%. The market risk premium is the average of three *Value Line* and Bloomberg projected market-risk premiums which were reviewed above.[64]

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 9.84%. The highly overstated market-risk premium was discussed extensively above.

1. The Validity of the ECAPM

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. As such, the ECAPM is nothing more than an *ad hoc* version of the CAPM and has not been theoretically or empirically validated in refereed journals. The ECAPM provides for weights which are used to adjust the risk-free rate and market-risk premium in applying the

[64] 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 one difference is that the risk-free rate of 2.09% is the base yield.

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. Upward Biased 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 10.42% using the same six approaches employed in his Risk-Premium approach. As discussed extensively above, the 10.42% 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. The non-price regulated group includes thirty-eight companies 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 Schedule 6 of his testimony. This group includes such companies as Abbot Labs, Air Products, Alphabet Inc. McCormick, Pfizer, and Sherwin-William. While many of these companies are large and successful, their lines of business are vastly different from the electric distribution business, and they do not operate in a highly regulated environment, and certainly none of those companies' prices for their products or their profit margins are regulated. Mr. D'Ascendis' equity cost rate results on page 2 of Exhibit JRW-7. However, most significantly, the upward bias in the EPS growth rate forecasts of Wall Street analysts is particularly severe for non-regulated companies.

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

A. Yes. Given the results in Figure 16 (page 86) and the studies cited on the topic, you would expect the DCF equity cost rate estimates for this group are particularly overstated. Page 1 of Mr. D'Ascendis' Schedule 9 provides the DCF results for the non-price regulated proxy group. As noted above, the mean DCF results for Mr. D'Ascendis' electric group is 8.56%. The mean DCF equity cost rate for the non-price regulated group is 12.80%. Clearly, the fact that the mean DCF result for the non-price regulated group is over 400 basis points above the mean DCF result for the electric group indicates the equity cost rate results for this group to be inappropriate for SPS. As such, the non-regulated group is not

an appropriate proxy for the Company, and therefore the equity cost rate results for this group should be ignored. This results in highly-inflated DCF equity cost rate results for Mr. D'Ascendis' study of non-price regulated companies.

E. Other Factors

Q. WHAT OTHER FACTORS DID MR. D'ASCENDIS CONSIDER IN HIS 10.75% ROE RECOMMENDATION?

A. Mr. D'Ascendis concludes that his equity-cost-rate studies suggest a ROE range of 10.35% to 11.35%. He then also considers four other factors in order to arrive at his 10.75% ROE recommendation. These factors include: (1) a size premium of 0.15% to account for SPS' size; (2) a credit risk premium of 0.00% to account for SPS' credit ratings relative to his proxy group; (3) a consideration of SPS regulatory risk; and (4) a flotation cost adjustment of .08%. As I discuss in my testimony, a small-size premium is not appropriate for regulated public utilities, as indicated, SPS' credit ratings are similar to the two proxy groups and hence there is no need for a credit risk adjustment or a consideration of regulatory risk, and there is no evidence that SPS has paid flotation costs. SPS should not receive higher revenues in the form of a higher ROE for expenses the Company does not incur.

VIII. SUMMARY AND CONCLUSIONS

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

A. The Company has proposed a capital structure consisting of 45.30% long-term debt and 54.70%. SPS has proposed a long-term debt cost rate of 4.34%. SPS witness Mr. Dylan D. D'Ascendis proposes a ROE of 10.75% for SPS. SPS is proposing an overall rate of return or cost of capital of 7.85%.

I have reviewed the Company's proposed capital structure and overall cost of capital. Since equity is more expensive than debt, ratepayers pay more when a company's capital structure leans toward the equity side. SPS's proposed capital structure includes a higher common equity ratio (54.70%) and lower financial risk than: (1) the capital structure and common equity ratio SPS has maintained and operated with over the past three years; (2) the average capital structure and common equity ratio for the companies in the two proxy groups; and (3) the capital structure and common equity ratio of SPS' parent, Xcel Energy. The latter observation is an indication of double leverage. Consequently, I have recommended a capital structure with a common equity ratio of 50.57% which is the average common equity ratio maintained by SPS over the past three years.

I have applied the DCF and CAPM models to a proxy group of publicly-held electric utility companies as well as to Mr. D'Ascendis' proxy group. My analysis indicates a common equity cost rate in the range of 8.70% to 9.00%. Since I rely primarily on the DCF model and the results for the Electric Proxy Group, I am using an ROE of 9.0% for the Company. Given my proposed capital structure and senior capital cost rates for SPS,

I am recommending an overall fair rate of return or cost of capital for the Company of 6.70%. This is summarized in Table 2 and Exhibit JRW-1.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

BEFORE THE NEW MEXICO PUBLIC REGULATION COMMISSION

IN THE MATTER OF SOUTHWESTERN PUBLIC SERVICE COMPANY'S APPLICATION FOR: (1) REVISION OF ITS RETAIL RATES UNDER ADVICE NOTICE NO. 312; (2) AUTHORITY TO ABANDON THE PLANT X UNIT 1, PLANT X UNIT 2, AND CUNNINGHAM UNIT 1 GENERATING STATIONS AND AMEND THE ABANDONMENT DATE OF THE TOLK GENERATING STATION; AND (3) OTHER ASSOCIATED RELIEF	)	Case No. 22-00286-UT

AFFIRMATION (IN LIEU OF AFFIDAVIT)

OF J. RANDALL WOOLRIDGE

In compliance with the *Temporary NMPRC Electronic Filing Policy of March 20, 2020*, and under Rule 1-011(B) NMRA of the New Mexico Rules of Procedures for the District Courts, I, J. Randall Woolridge, hereby file this testimony on behalf of the New Mexico Attorney General and state as follows:

I hereby affirm in writing under penalty of perjury under the laws of the State of New Mexico that the statements contained in the foregoing *Direct Testimony and Exhibits of J. Randall Woolridge on Behalf of the Office of Attorney General* are true and correct to the best of my knowledge, information, and belief.

I further declare under penalty of perjury that the foregoing is true and correct.

Executed on April 18, 2023.

/s/ J. Randall Woolridge
J. Randall Woolridge (electronically signed)
Expert Witness on Behalf of the New Mexico Attorney General
120 Haymaker Circle
State College, PA 16801

Appendix A

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

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

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

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

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

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

Over the past 35 years Dr. Woolridge has prepared testimony and/or provided consultation services in regulatory rate cases in the rate of return area in following states: Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, Florida, Hawaii, Indiana, Kansas, Kentucky, Maryland, Massachusetts, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New Mexico, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, South Carolina, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, and Washington, D.C. He has also testified before the Federal Energy Regulatory Commission.

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Academic Experience

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

President, Nittany Lion Fund LLC, (January 1, 2005 to the present)
Director, the Smeal College Trading Room (January 1, 2001 to the present)
Goldman, Sachs & Co. and Frank P. Smeal Endowed University Fellow in Business Administration (July 1, 1987 to the present).

Associate Professor of Finance, College of Business Administration, the Pennsylvania State University (July 1, 1984 to June 30, 1990).
Assistant Professor of Finance, College of Business Administration, the Pennsylvania State University (September, 1979 to June 30, 1984).

Education

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

Books

James A. Miles and J. Randall Woolridge, *Spinoffs and Equity Carve-Outs: Achieving Faster Growth and Better Performance* (Financial Executives Research Foundation), 1999
Patrick Cusatis, Gary Gray, and J. Randall Woolridge, *The StreetSmart Guide to Valuing a Stock* (2nd Edition, McGraw-Hill), 2003.
J. Randall Woolridge and Gary Gray, *The New Corporate Finance, Capital Markets, and Valuation: An Introductory Text* (Kendall Hunt, 2003).

Research

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

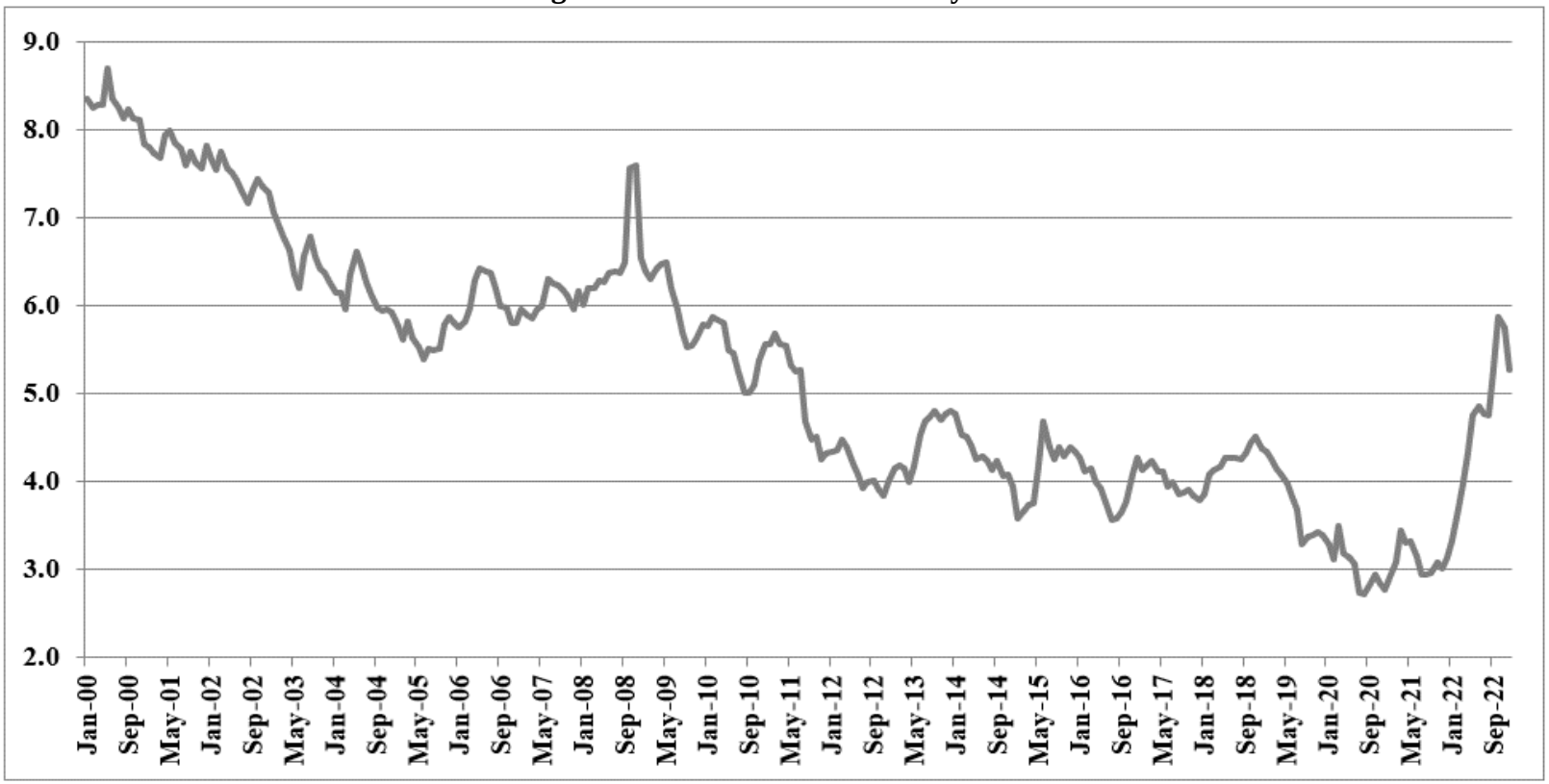
Case No. 22-00270-UT
Exhibit JRW-1
Cost of Capital Recommendation
Page 1 of 1

Exhibit JRW-1
Southwestern Public Service Company
Cost of Capital

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	49.43%	4.34%	2.15%
Common Equity	50.57%	9.00%	4.55%
Total	100.00%		6.70%

Case No. 22-00270-UT
Exhibit JRW-2
Public Utility Capital Cost Indicators
Page 1 of 3

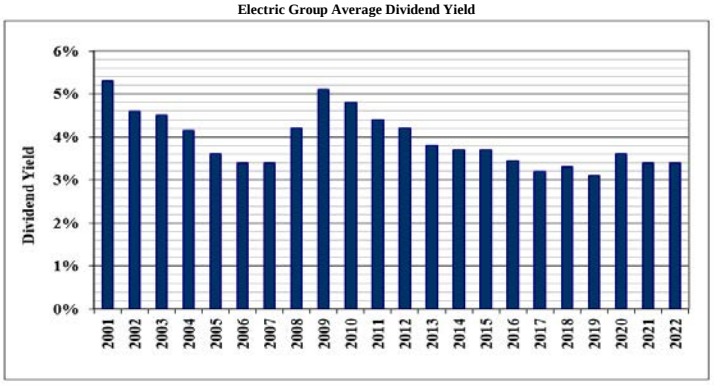
Exhibit JRW-2
Long-Term 'A' Rated Public Utility Bonds



Data Source: Mergent Bond Record

Exhibit JRW-2

Panel A
Electric Group Average Dividend Yield



Data Source: *Value Line Investment Survey.*

2011	10.29	9.92	2018	9.6	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	9.84	9.6	2022	9.39	9.33
2016	9.77	9.54			

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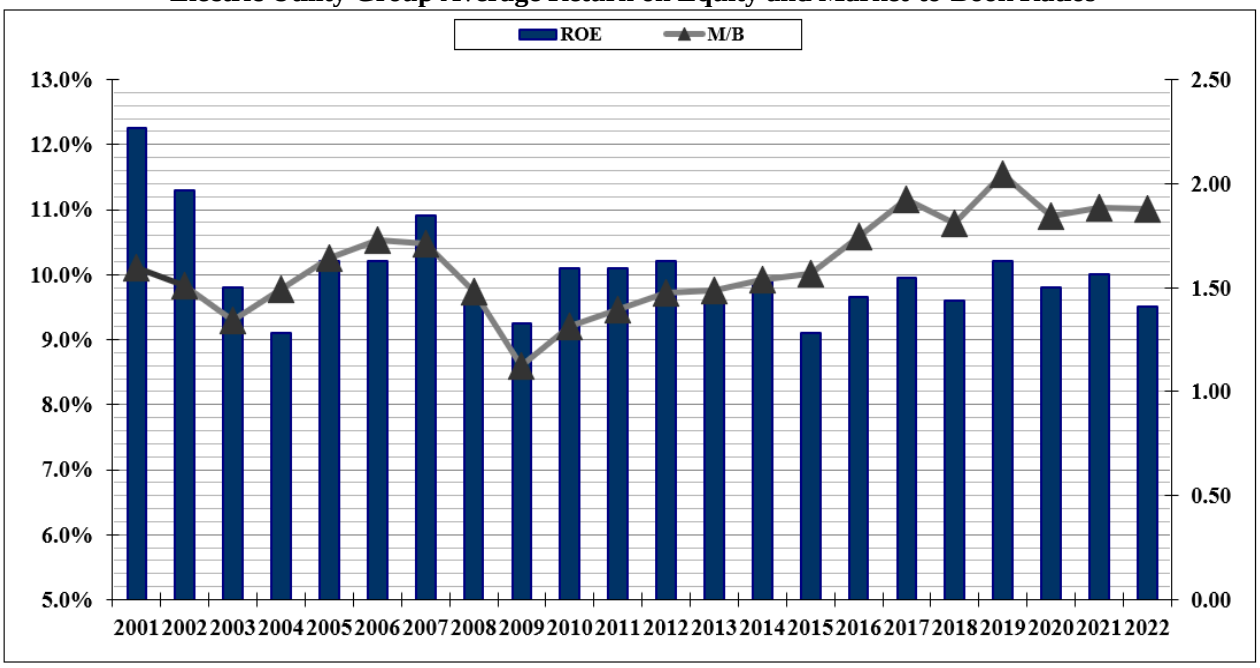
Exhibit JRW-2

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



Data Source: *Value Line Investment Survey.*

Exhibit JRW-3
Southwestern Public Service Company
Summary Financial Statistics for Proxy Group

Panel A
Electric Proxy Group

Company		Operating Revenue ($bil)	Elec Revenue	Percent Reg Gas Revenue	Net Plant ($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
ALLETE, Inc. (NYSE-ALE)	ALE	$1.57	87%	0%	$5.02	3.51	BBB	Baa1	1.91	MN, WI	58.2%	4.18	1.30	12/31/2022
Alliant Energy Corporation (NYSE-LNT)	LNT	$4.21	84%	12%	$16.25	13.30	A-	Baa2	2.86	WI,IA,IL,MN	41.9%	11.19	2.12	12/31/2022
Ameren Corporation (NYSE-AEE)	AEE	$7.96	78%	15%	$31.26	22.26	BBB+	NR	3.12	IL,MO	41.0%	10.54	2.12	12/31/2022
American Electric Power Co. (NYSE-AEP)	AEP	$19.23	86%	0%	$71.93	46.61	A-	Baa1	2.84	10 States	37.2%	9.85	1.99	12/31/2022
Avista Corporation (NYSE-AVA)	AVA	$1.71	64%	22%	$5.58	3.13	BBB	Baa2	1.74	NY,CT,ME	44.2%	6.91	1.34	12/31/2022
CMS Energy Corporation (NYSE-CMS)	CMS	$8.60	68%	28%	$22.74	17.55	BBB+	NR	2.77	MI	32.1%	10.95	2.58	12/31/2022
Consolidated Edison, Inc. (NYSE-ED)	ED	$15.67	64%	17%	$47.33	32.50	A-	Baa2	2.71	NY,PA	44.3%	7.75	1.57	12/31/2022
Dominion Resources, Inc. (NYSE-D)	D	$17.17	79%	19%	$63.88	47.85	BBB+	NR	4.77	VA,NC,SC,OH,WV,UT	35.9%	3.57	1.83	12/31/2022
Duke Energy Corporation (NYSE-DUK)	DUK	$28.77	90%	8%	$112.79	74.57	BBB+	Baa2	2.66	NC,OH,FL,SC,KY	38.4%	7.59	1.57	12/31/2022
Edison International (NYSE-EIX)	EIX	$17.22	100%	0%	$54.93	25.17	BBB	Baa3	2.22	CA	29.2%	3.47	1.85	12/31/2022
Entergy Corporation (NYSE-ETR)	ETR	$13.76	94%	0%	$42.84	22.64	BBB+	Baa2	2.02	LA,AR,MS,TX	32.6%	8.75	1.75	12/31/2022
Evergy, Inc. (NYSE-EVRG)	EVRG	$5.86	100%	0%	$22.28	13.95	A-	NR	3.30	KS,MO	44.1%	8.17	1.47	12/31/2022
Eversource Energy (NYSE-ES)	ES	$12.29	75%	18%	$36.17	27.20	A-	Baa1	3.85	CT,NH,MA	40.2%	9.30	1.76	12/31/2022
Hawaiian Electric Industries (NYSE-HEC)	HE	$3.73	89%	0%	$5.72	4.51	BBB-	Baa1	3.66	HI	40.4%	10.43	2.08	12/31/2022
IDACORP, Inc. (NYSE-IDA)	IDA	$1.64	100%	0%	$5.17	5.26	BBB	Baa1	3.27	ID	56.1%	9.46	1.87	12/31/2022
MGE Energy, Inc. (NYSE-MGEE)	MGEE	$0.70	63%	31%	$1.98	2.61	NR	NR	5.90	WI	59.5%	10.52	2.41	12/31/2022
NextEra Energy, Inc. (NYSE-NEE)	NEE	$20.96	83%	0%	$111.82	144.83	A-	Baa1	6.43	FL	37.5%	6.83	3.69	12/31/2022
NorthWestern Corporation (NYSE-NWE)	NWE	$1.48	77%	23%	$5.66	3.45	BBB	NR	2.71	MT,SD,NE	50.3%	7.31	1.29	12/31/2022
OGE Energy Corp. (NYSE-OGE)	OGE	$3.30	100%	0%	$10.55	7.46	BBB+	NR	3.74	OK,AR	49.2%	15.72	1.69	12/31/2022
Pinnacle West Capital Corp. (NYSE-PNW)	PNW	$4.11	95%	0%	$17.06	8.30	BBB+	Baa1	3.20	AZ	42.0%	8.80	1.33	9/30/2022
Portland General Electric Company (NYSE-POR)	POR	$2.65	100%	0%	$8.18	4.32	BBB+	A3	2.45	OR	41.1%	8.49	1.55	12/31/2022
Southern Company (NYSE-SO)	SO	$28.55	81%	19%	$95.86	70.50	BBB+	Baa1	3.06	GA,FL,NJ,IL,VA,TN,MS	33.8%	10.18	2.32	12/31/2022
WEC Energy Group (NYSE-WEC)	WEC	$9.60	59%	23%	$29.11	28.74	A-	Baa1	3.73	WI,IL,MN,MI	39.7%	12.39	2.53	12/31/2022
Xcel Energy Inc. (NYSE-XEL)	XEL	$15.20	83%	16%	$48.44	36.30	A-	Baa1	2.55	MN,WI,ND,SD,MI	39.2%	10.85	2.21	12/31/2022
Mean		$10.25	83%	11%	$36.36	$27.8	BBB+	Baa1	3.23		42.0%	8.88	1.93	
Median		$8.28	84%	10%	$25.93	$19.9	BBB+	Baa1	2.96		40.7%	9.05	1.84	

Data Source: Company 2022 SEC 10-K filings, S&P Capital IQ; *Value Line Investment Survey*, 2023.

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	$4.21	84%	12%	$16.25	13.30	A-	Baa2	2.86	WI,IA,IL,MN	41.9%	11.19	2.12	12/31/2022
Ameren Corporation (NYSE-AEE)	AEE	$7.96	78%	15%	$31.26	22.26	BBB+	NR	3.12	IL,MO	41.0%	10.54	2.12	12/31/2022
American Electric Power Co. (NYSE-AEP)	AEP	$19.23	86%	0%	$71.93	46.61	A-	Baa1	2.84	10 States	37.2%	9.85	1.99	12/31/2022
Duke Energy Corporation (NYSE-DUK)	DUK	$28.77	90%	8%	$112.79	74.57	BBB+	Baa2	2.66	NC,OH,FL,SC,KY	38.4%	7.59	1.57	12/31/2022
Edison International (NYSE-EIX)	EIX	$17.22	100%	0%	$54.93	25.17	BBB	Baa3	2.22	CA	29.2%	3.47	1.85	12/31/2022
Entergy Corporation (NYSE-ETR)	ETR	$13.76	94%	0%	$42.84	22.64	BBB+	Baa2	2.02	LA,AR,MS,TX	32.6%	8.75	1.75	12/31/2022
Evergy, Inc. (NYSE-EVRG)	EVRG	$5.86	100%	0%	$22.28	13.95	A-	NR	3.30	KS,MO	44.1%	8.17	1.47	12/31/2022
IDACORP, Inc. (NYSE-IDA)	IDA	$1.64	100%	0%	$5.17	5.26	BBB	Baa1	3.27	ID	56.1%	9.46	1.87	12/31/2022
NorthWestern Corporation (NYSE-NWE)	NWE	$1.48	77%	23%	$5.66	3.45	BBB	NR	2.71	MT,SD,NE	50.3%	7.31	1.29	12/31/2022
OGE Energy Corp. (NYSE-OGE)	OGE	$3.30	100%	0%	$10.55	7.46	BBB+	NR	3.74	OK,AR	49.2%	15.72	1.69	12/31/2022
Portland General Electric Company (NYSE-POR)	POR	$2.65	100%	0%	$8.18	4.32	BBB+	A3	2.45	OR	41.1%	8.49	1.55	12/31/2022
Xcel Energy Inc. (NYSE-XEL)	XEL	$15.20	83%	16%	$48.44	36.30	A-	Baa1	2.55	MN,WI,ND,SD,MI	39.2%	10.85	2.21	12/31/2022
Mean		$10.11	91%	6%	$35.86	$22.94	BBB+	Baa1	2.81		41.7%	9.28	1.79	
Median		$6.91	92%	0%	$26.77	$18.10	BBB+	Baa1	2.78		41.1%	9.10	1.80	

Data Source: Company 2022 SEC 10-K filings, S&P Capital IQ; *Value Line Investment Survey*, 2023.

Proxy Group of Twelve Electric Companies	Long-Term Issuer Rating (1)	Numerical Weighting (2)	Long-Term Issuer Rating (1)	Numerical Weighting (2)
Alliant Energy Corporation	Baa2	7.5	A/A-	6.5
Ameren Corporation	Baa1	8.0	BBB+	8.0
American Electric Power Company, Inc.	Baa2	9.0	A-	7.0
Duke Energy Corporation	Baa2	9.0	BBB+	8.0
Edison International	Baa3	10.0	BBB	9.0
Entergy Corporation	Baa2	9.0	BBB+	8.0
Evergy, Inc.	Baa2	9.0	A-	7.0
IDACORP, Inc.	Baa2	9.0	BBB	9.0
NorthWestern Corporation	A3	7.0	BBB	9.0
OGE Energy Corporation	Baa1	8.0	BBB+	8.0
Portland General Electric Company	A3	7.0	BBB+	8.0
Xcel Energy Inc.	Baa1	8.0	A-	7.0

Exhibit JRW-3
Southwestern Public Service Company
***Value Line* Risk Metrics**

Panel A
Electric Proxy Group

	Company	Beta	Financial Strength	Safety	Earnings Predictability	Stock Price Stability
1	ALLETE, Inc. (NYSE-ALE)	0.90	A	2	90	90
2	Alliant Energy Corporation (NYSE-LNT)	0.85	A	2	95	95
3	Ameren Corporation (NYSE-AEE)	0.85	A	1	100	100
4	American Electric Power Co. (NYSE-AEP)	0.75	A+	1	95	100
5	Avista Corporation (NYSE-AVA)	0.90	B++	2	65	75
6	CMS Energy Corporation (NYSE-CMS)	0.80	A	2	90	95
7	Consolidated Edison, Inc. (NYSE-ED)	0.80	A+	1	100	90
8	Dominion Energy Inc. (NYSE-D)	0.80	B++	2	100	90
9	Duke Energy Corporation (NYSE-DUK)	0.85	A	2	100	95
10	Edison International (NYSE-EIX)	0.95	B++	3	10	75
11	Entergy Corporation (NYSE-ETR)	0.95	B++	2	75	90
12	Evergy, Inc. (NYSE-EVRG)	0.90	B++	2	NMF	90
13	Eversource Energy (NYSE-ES)	0.90	A	1	100	85
14	Hawaiian Electric Industries (NYSE-HE)	0.85	A	2	80	85
15	IDACORP, Inc. (NYSE-IDA)	0.80	A+	1	100	100
16	MGE Energy, Inc. (NYSE-MGEE)	0.75	B++	1	100	100
17	NextEra Energy, Inc. (NYSE-NEE)	0.95	A+	1	90	85
18	NorthWestern Corporation (NYSE-NWE)	0.90	B++	2	90	90
19	OGE Energy Corp. (NYSE-OGE)	1.00	A	2	95	85
20	Pinnacle West Capital Corp. (NYSE-PNW)	0.90	A	2	95	90
21	Portland General Electric Company (NYSE-POR)	0.85	B++	2	95	95
22	Southern Company (NYSE-SO)	0.90	A	2	95	95
23	WEC Energy Group (NYSE-WEC)	0.80	A+	1	100	90
24	Xcel Energy Inc. (NYSE-XEL)	0.80	A+	1	100	95
	Mean	0.86	A	1.7	90	91

Data Source: *Value Line Investment Survey*, 2023.

Panel B
D'Ascendis Proxy Group

	Company	Beta	Financial Strength	Safety	Earnings Predictability	Stock Price Stability
Alliant Energy C	Alliant Energy Corporation (NYSE-LNT)	0.85	A	2	95	95
Ameren Corpora	Ameren Corporation (NYSE-AEE)	0.85	A	1	100	100
American Electr	American Electric Power Co. (NYSE-AEP)	0.75	A+	1	95	100
Duke Energy Co	Duke Energy Corporation (NYSE-DUK)	0.85	A	2	100	95
Edison Internati	Edison International (NYSE-EIX)	0.95	B++	3	10	75
Entergy Corpora	Entergy Corporation (NYSE-ETR)	0.95	B++	2	75	90
Evergy, Inc. (NY	Evergy, Inc. (NYSE-EVRG)	0.90	B++	2	NMF	90
IDACORP, Inc.	IDACORP, Inc. (NYSE-IDA)	0.80	A+	1	100	100
NorthWestern C	NorthWestern Corporation (NYSE-NWE)	0.90	B++	2	90	90
OGE Energy Co	OGE Energy Corp. (NYSE-OGE)	1.00	A	2	95	85
Portland Genera	Portland General Electric Company (NYSE-POR)	0.85	B++	2	95	95
Xcel Energy Inc	Xcel Energy Inc. (NYSE-XEL)	0.80	A+	1	100	95
	Mean	0.87		1.8	87	93

Data Source: *Value Line Investment Survey*, 2023.

Proxy Group of Twelve Electric Companies	Long-Term Issuer Rating (1)	Numerical Weighting (2)	Long-Term Issuer Rating (1)	Numerical Weighting (2)
Alliant Energy Corporation	Baa2	7.5	A/A-	6.5
Ameren Corporation	Baa1	8.0	BBB+	8.0
American Electric Power Company, Inc.	Baa2	9.0	A-	7.0
Duke Energy Corporation	Baa2	9.0	BBB+	8.0
Edison International	Baa3	10.0	BBB	9.0
Entergy Corporation	Baa2	9.0	BBB+	8.0
Evergy, Inc.	Baa2	9.0	A-	7.0
IDACORP, Inc.	Baa2	9.0	BBB	9.0
NorthWestern Corporation	A3	7.0	BBB	9.0
OGE Energy Corporation	Baa1	8.0	BBB+	8.0
Portland General Electric Company	A3	7.0	BBB+	8.0
Xcel Energy Inc.	Baa1	8.0	A-	7.0

1	A
2	A
3	A
4	A
5	A
6	A
7	A
8	A
9	A
10	A
11	A+
12	A+
13	A+
14	A+
15	A+
16	A+
17	B+
18	B++
19	B++
20	B++
21	B++
22	B++
23	B++

	Financial Strength
1	A
2	A
3	A
4	A
5	A
6	A
7	A
8	A
9	A
10	A
11	A
12	A+
13	A+
14	A+
15	A+
16	A+
17	A+
18	A+
19	A++
20	B+
21	B+
22	B++
23	B++
24	B++
25	B++
26	B++
27	B++
28	B++
29	B++

Case No. 22-00270-UT
Exhibit JRW-3
***Value Line* Risk Metrics for Proxy Groups**
Page 3 of 3

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* .

Case No. 22-00270-UT
Exhibit JRW-4
Capital Structure and Debt Cost Rates
Page 1 of 2

Exhibit JRW-4
Southwestern Public Service Company

Panel A
PSO's Proposed Capital Structure and Debt Cost Rate

Capital Source	Capitalization Ratio	Cost Rate
Short-Term Debt	0.00%	
Long-Term Debt	45.30%	4.34%
Common Equity	54.70%	
Total	100.00%	

Panel B
SPS and XEL Average Quarterly Capital Structure Ratios
2019-2022

Including Short-Term Debt

Capital Source	SPS	XEL
Short-Term Debt	1.66%	5.01%
Long-Term Debt	48.60%	56.52%
Common Equity	49.74%	38.47%
Total	100.00%	100.00%

Excluding Short-Term Debt

Capital Source	SPS	XEL
Long-Term Debt	49.43%	59.50%
Common Equity	50.57%	40.50%
Total	100.00%	100.00%

Source: Page 2 of Exhibit JRW-4.

Panel C
AG's Proposed Capital Structure and Debt Cost Rate

Capital Source	Capitalization Ratio	Cost Rate
Long-Term Debt	49.43%	4.34%
Common Equity	50.57%	
Total	100.00%	

Exhibit JRW-4
Southwestern Public Service Company
SPS and XEL Capital Structures
Panel A
SPS Capital Structure Ratios With and Without Short-Term Debt

SPS	*CQ1 2019*	*CQ2 2019*	*CQ3 2019*	*CQ4 2019*	*CQ1 2020*	*CQ2 2020*	*CQ3 2020*	*CQ4 2020*	*CQ1 2021*	*CQ2 2021*	*CQ3 2021*	*CQ4 2021*	*CQ1 2022*	*CQ2 2022*	*CQ3 2022*	*CQ4 2022*	Average
Short-Term Debt	3.74%	0.45%	0.46%	0.46%	2.81%	0.42%	0.58%	4.09%	0.39%	1.29%	2.04%	3.53%	4.63%	0.40%	0.41%	0.86%	1.66%
Long-Term Debt	49.14%	50.16%	50.02%	50.03%	48.81%	49.30%	49.23%	47.43%	48.82%	48.41%	47.92%	47.17%	46.53%	48.35%	48.36%	48.00%	48.60%
Common Equity	47.12%	49.39%	49.52%	49.51%	48.39%	50.28%	50.19%	48.48%	50.79%	50.31%	50.04%	49.30%	48.84%	51.25%	51.22%	51.14%	49.74%
Total Capital	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

SPS	*CQ1 2019*	*CQ2 2019*	*CQ3 2019*	*CQ4 2019*	*CQ1 2020*	*CQ2 2020*	*CQ3 2020*	*CQ4 2020*	*CQ1 2021*	*CQ2 2021*	*CQ3 2021*	*CQ4 2021*	*CQ1 2022*	*CQ2 2022*	*CQ3 2022*	*CQ4 2022*	Average
Long-Term Debt	51.05%	50.39%	50.25%	50.26%	50.22%	49.51%	49.52%	49.46%	49.01%	49.04%	48.92%	48.89%	48.79%	48.54%	48.56%	48.42%	49.43%
Common Equity	48.95%	49.61%	49.75%	49.74%	49.78%	50.49%	50.48%	50.54%	50.99%	50.96%	51.08%	51.11%	51.21%	51.46%	51.44%	51.58%	50.57%
Total Capital	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Data Source: S&P Capital IQ.

Panel B
XEL Capital Structure Ratios With and Without Short-Term Debt

XEL	*CQ1 2019*	*CQ2 2019*	*CQ3 2019*	*CQ4 2019*	*CQ1 2020*	*CQ2 2020*	*CQ3 2020*	*CQ4 2020*	*CQ1 2021*	*CQ2 2021*	*CQ3 2021*	*CQ4 2021*	*CQ1 2022*	*CQ2 2022*	*CQ3 2022*	*CQ4 2022*	Average
Short-Term Debt	4.56%	7.30%	6.01%	4.42%	8.76%	7.26%	3.06%	3.31%	4.39%	5.03%	6.47%	4.49%	5.07%	2.42%	2.45%	5.10%	5.01%
Long-Term Debt	56.29%	54.60%	54.95%	56.37%	52.68%	56.20%	58.92%	57.06%	58.09%	57.59%	55.60%	56.82%	56.06%	58.90%	58.33%	55.91%	56.52%
Common Equity	39.15%	38.10%	39.04%	39.21%	38.56%	36.54%	38.01%	39.62%	37.52%	37.39%	37.93%	38.69%	38.86%	38.68%	39.21%	38.98%	38.47%
Total Capital	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

XEL	*CQ1 2019*	*CQ2 2019*	*CQ3 2019*	*CQ4 2019*	*CQ1 2020*	*CQ2 2020*	*CQ3 2020*	*CQ4 2020*	*CQ1 2021*	*CQ2 2021*	*CQ3 2021*	*CQ4 2021*	*CQ1 2022*	*CQ2 2022*	*CQ3 2022*	*CQ4 2022*	Average
Long-Term Debt	58.98%	58.90%	58.46%	58.98%	57.74%	60.60%	60.79%	59.02%	60.75%	60.63%	59.44%	59.49%	59.06%	60.36%	59.80%	58.92%	59.50%
Common Equity	41.02%	41.10%	41.54%	41.02%	42.26%	39.40%	39.21%	40.98%	39.25%	39.37%	40.56%	40.51%	40.94%	39.64%	40.20%	41.08%	40.50%
Total Capital	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Data Source: S&P Capital IQ.

Exhibit JRW-5

Southwestern Public Service Company
Discounted Cash Flow Analysis

Panel A
Electric Proxy Group

Dividend Yield*	3.55%
Adjustment Factor	1.026875
Adjusted Dividend Yield	3.65%
Growth Rate**	5.38%
Equity Cost Rate	9.02%

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

Panel B
D'Ascendis Proxy Group

Dividend Yield*	3.65%
Adjustment Factor	1.02625
Adjusted Dividend Yield	3.75%
Growth Rate**	5.25%
Equity Cost Rate	9.00%

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

	DCF	CAPM
Electric Proxy Group	9.02%	8.70%
D'Ascendis Proxy Grou	9.00%	########

Exhibit JRW-5

Southwestern Public Service Company
Monthly Dividend Yields

Panel A
Electric Proxy Group

Company		Annual Dividend	Dividend Yield 30 Day	Dividend Yield 90 Day	Dividend Yield 180 Day
ALLETE, Inc. (NYSE-ALE)	ALE	$2.60	4.2%	4.1%	4.3%
Alliant Energy Corporation (NYSE-LNT)	LNT	$1.71	3.3%	3.2%	3.1%
Ameren Corporation (NYSE-AEE)	AEE	$2.36	2.8%	2.7%	2.7%
American Electric Power Co. (NYSE-AEP)	AEP	$3.12	3.5%	3.4%	3.3%
Avista Corporation (NYSE-AVA)	AVA	$1.76	4.2%	4.2%	4.3%
CMS Energy Corporation (NYSE-CMS)	CMS	$1.84	3.1%	3.0%	2.9%
Consolidated Edison, Inc. (NYSE-ED)	ED	$3.16	3.4%	3.3%	3.4%
Dominion Energy Inc. (NYSE-D)	D	$2.52	4.6%	4.3%	3.8%
Duke Energy Corporation (NYSE-DUK)	DUK	$3.94	4.1%	4.0%	3.9%
Edison International (NYSE-EIX)	EIX	$2.80	4.1%	4.2%	4.3%
Entergy Corporation (NYSE-ETR)	ETR	$4.04	3.9%	3.7%	3.7%
Evergy, Inc. (NYSE-EVRG)	EVRG	$2.29	3.8%	3.8%	3.7%
Eversource Energy (NYSE-ES)	ES	$2.55	3.4%	3.2%	3.1%
Hawaiian Electric Industries (NYSE-HE)	HE	$1.40	3.6%	3.5%	3.5%
IDACORP, Inc. (NYSE-IDA)	IDA	$3.00	2.9%	2.8%	2.8%
MGE Energy, Inc. (NYSE-MGEE)	MGEE	$1.55	2.1%	2.1%	2.1%
NextEra Energy, Inc. (NYSE-NEE)	NEE	$1.70	2.3%	2.2%	2.1%
NorthWestern Corporation (NYSE-NWE)	NWE	$2.52	4.4%	4.4%	4.5%
OGE Energy Corp. (NYSE-OGE)	OGE	$1.64	4.5%	4.3%	4.2%
Pinnacle West Capital Corp. (NYSE-PNW)	PNW	$3.40	4.4%	4.5%	4.6%
Portland General Electric Company (NYSE-POR)	POR	$1.72	3.6%	3.6%	3.6%
Southern Company (NYSE-SO)	SO	$2.64	4.0%	3.9%	3.8%
WEC Energy Group (NYSE-WEC)	WEC	$2.91	3.2%	3.1%	3.0%
Xcel Energy Inc. (NYSE-XEL)	XEL	$1.95	3.0%	2.9%	2.8%
Mean			3.6%	3.5%	3.5%
Median			3.6%	3.5%	3.5%

Data Sources: S&P Cap IQ., April 7, 2023.

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	$1.71	3.3%	3.2%	3.1%
Ameren Corporation (NYSE-AEE)	AEE	$2.36	2.8%	2.7%	2.7%
American Electric Power Co. (NYSE-AEP)	AEP	$3.12	3.5%	3.4%	3.3%
Duke Energy Corporation (NYSE-DUK)	DUK	$3.94	4.1%	4.0%	3.9%
Edison International (NYSE-EIX)	EIX	$2.80	4.1%	4.2%	4.3%
Entergy Corporation (NYSE-ETR)	ETR	$4.04	3.9%	3.7%	3.7%
Evergy, Inc. (NYSE-EVRG)	EVRG	$2.29	3.8%	3.8%	3.7%
IDACORP, Inc. (NYSE-IDA)	IDA	$3.00	2.9%	2.8%	2.8%
NorthWestern Corporation (NYSE-NWE)	NWE	$2.52	4.4%	4.4%	4.5%
OGE Energy Corp. (NYSE-OGE)	OGE	$1.64	4.5%	4.3%	4.2%
Portland General Electric Company (NYSE-POR)	POR	$1.72	3.6%	3.6%	3.6%
Xcel Energy Inc. (NYSE-XEL)	XEL	$1.95	3.0%	2.9%	2.8%
Mean			3.7%	3.6%	3.6%
Median			3.7%	3.6%	3.6%

Data Sources: S&P Cap IQ., April 7, 2023.

Exhibit JRW-5

Southwestern Public Service 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
ALLETE, Inc. (NYSE-ALE)	3.0	3.5	4.5	0.5	3.5	3.5
Alliant Energy Corporation (NYSE-LNT)	6.0	6.5	6.0	8.0	6.5	7.0
Ameren Corporation (NYSE-AEE)	3.5	3.0	1.5	7.0	4.0	4.5
American Electric Power Co. (NYSE-AEP)	5.0	5.0	3.5	4.0	5.0	3.5
Avista Corporation (NYSE-AVA)	3.5	5.5	4.0	3.5	4.0	3.5
CMS Energy Corporation (NYSE-CMS)	6.0	7.5	6.0	5.5	6.5	6.5
Consolidated Edison, Inc. (NYSE-ED)	1.5	2.5	3.5	1.0	3.0	3.5
Dominion Energy Inc. (NYSE-D)	3.0	4.0	4.5	2.0	1.0	5.0
Duke Energy Corporation (NYSE-DUK)	3.0	3.0	2.0	4.5	3.5	1.0
Edison International (NYSE-EIX)	-2.5	7.5	1.5	-9.0	8.5	1.0
Entergy Corporation (NYSE-ETR)	-0.5	1.5	1.5	1.5	2.5	4.0
Evergy, Inc. (NYSE-EVRG)						
Eversource Energy (NYSE-ES)	6.5	7.0	5.0	6.0	6.5	4.5
Hawaiian Electric Industries (NYSE-HE)	5.5	0.5	3.0	2.0	1.5	3.5
IDACORP, Inc. (NYSE-IDA)	4.5	8.5	5.0	4.0	7.0	4.5
MGE Energy, Inc. (NYSE-MGEE)				6.0	4.5	6.0
Nextera Energy, Inc. (NYSE-NEE)	7.5	10.5	7.5	9.5	11.0	7.0
NorthWestern Corporation (NYSE-NWE)	4.5	5.5	6.0	2.0	5.5	4.5
OGE Energy Corp. (NYSE-OGE)	3.0	7.5	4.0	4.5	6.5	1.5
Pinnacle West Capital Corp. (NYSE-PNW)	6.0	4.5	4.0	5.5	5.5	4.0
Portland General Electric Company (NYSE-POR)	5.0	4.5	3.5	4.5	6.0	3.0
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)	6.0	5.5	5.0	6.0	6.0	5.0
Mean	4.1	5.3	4.2	3.8	5.1	4.0
Median	4.5	5.3	4.0	4.5	5.5	4.0

Data Source: *Value Line Investment Survey.*

Average of Median Figures =	4.6

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	8.0	6.5	7.0
Ameren Corporation (NYSE-AEE)	3.5	3.0	1.5	7.0	4.0	4.5
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)	-2.5	7.5	1.5	-9.0	8.5	1.0
Entergy Corporation (NYSE-ETR)	-0.5	1.5	1.5	1.5	2.5	4.0
Evergy, Inc. (NYSE-EVRG)						
IDACORP, Inc. (NYSE-IDA)	4.5	8.5	5.0	4.0	7.0	4.5
NorthWestern Corporation (NYSE-NWE)	4.5	5.5	6.0	2.0	5.5	4.5
OGE Energy Corp. (NYSE-OGE)	3.0	7.5	4.0	4.5	6.5	1.5
Portland General Electric Company (NYSE-POR)	5.0	4.5	3.5	4.5	6.0	3.0
Xcel Energy Inc. (NYSE-XEL)	6.0	5.5	5.0	6.0	6.0	5.0
Mean	3.4	5.3	3.6	3.4	5.5	3.6
Median	4.5	5.5	3.5	4.5	6.0	4.0

Data Source: *Value Line Investment Survey.*

Average of Median Figures =	4.7

Exhibit JRW-5

Southwestern Public Service Company
DCF Equity Cost Growth Rate Measures
***Value Line* Projected Growth Rates**

Panel A
Electric Proxy Group

Company	*Value Line* Projected Growth Est'd. '19-'21 to '25-'27			*Value Line* Sustainable Growth		
	Earnings	Dividends	Book Value	Return on Equity	Retention Rate	Internal Growth
ALLETE, Inc. (NYSE-ALE)	6.0	3.5	3.5	9.0%	40.0%	3.6%
Alliant Energy Corporation (NYSE-LNT)	6.5	6.0	5.0	12.0%	40.0%	4.8%
Ameren Corporation (NYSE-AEE)	6.5	6.5	6.5	10.0%	40.0%	4.0%
American Electric Power Co. (NYSE-AEP)	6.0	5.5	6.0	11.0%	39.0%	4.3%
Avista Corporation (NYSE-AVA)	3.5	4.0	3.0	8.0%	28.0%	2.2%
CMS Energy Corporation (NYSE-CMS)	6.5	6.0	7.0	14.0%	37.0%	5.2%
Consolidated Edison, Inc. (NYSE-ED)	4.5	3.0	3.0	8.5%	36.0%	3.1%
Dominion Energy Inc. (NYSE-D)	4.0	0.5	4.5	12.5%	35.0%	4.4%
Duke Energy Corporation (NYSE-DUK)	5.0	2.0	2.5	9.0%	32.0%	2.9%
Edison International (NYSE-EIX)	16.0	5.0	4.5	13.0%	44.0%	5.7%
Entergy Corporation (NYSE-ETR)	0.5	4.0	4.0	9.0%	33.0%	3.0%
Evergy, Inc. (NYSE-EVRG)	7.5	7.0	3.5	10.0%	37.0%	3.7%
Eversource Energy (NYSE-ES)	6.5	6.5	5.0	10.0%	38.0%	3.8%
Hawaiian Electric Industries (NYSE-HE)	4.5	3.5	3.0	12.5%	38.0%	4.8%
IDACORP, Inc. (NYSE-IDA)	4.0	6.5	5.0	9.5%	34.0%	3.2%
MGE Energy, Inc. (NYSE-MGEE)						
Nextera Energy, Inc. (NYSE-NEE)	10.0	10.0	7.0	14.5%	38.0%	5.5%
NorthWestern Corporation (NYSE-NWE)	3.5	2.0	3.0	8.0%	33.0%	2.6%
OGE Energy Corp. (NYSE-OGE)	6.5	3.0	5.5	13.0%	43.0%	5.6%
Pinnacle West Capital Corp. (NYSE-PNW)	0.5	2.0	3.0	9.0%	31.0%	2.8%
Portland General Electric Company (NYSE-POR)	5.0	6.0	4.0	9.5%	36.0%	3.4%
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)	6.0	6.5	5.5	11.0%	38.0%	4.2%
Mean	5.7	4.8	4.4	10.9%	36.5%	4.0%
Median	6.0	5.0	4.0	10.0%	37.0%	4.0%
Average of Median Figures =		5.0			Median =	4.0%

* 'Est'd. '19-'21 to '25-'27' is the estimated growth rate from the base period 2019 to 2021 until the future period 2025 to 2027.
Data Source: *Value Line Investment Survey.*

Panel B
D'Ascendis Proxy Group

Company	*Value Line* Projected Growth Est'd. '19-'21 to '25-'27			*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%	40.0%	4.8%
Ameren Corporation (NYSE-AEE)	6.5	6.5	6.5	10.0%	40.0%	4.0%
American Electric Power Co. (NYSE-AEP)	6.0	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)	16.0	5.0	4.5	13.0%	44.0%	5.7%
Entergy Corporation (NYSE-ETR)	0.5	4.0	4.0	9.0%	33.0%	3.0%
Evergy, Inc. (NYSE-EVRG)	7.5	7.0	3.5	10.0%	37.0%	3.7%
IDACORP, Inc. (NYSE-IDA)	4.0	6.5	5.0	9.5%	34.0%	3.2%
NorthWestern Corporation (NYSE-NWE)	3.5	2.0	3.0	8.0%	33.0%	2.6%
OGE Energy Corp. (NYSE-OGE)	6.5	3.0	5.5	13.0%	43.0%	5.6%
Portland General Electric Company (NYSE-POR)	5.0	6.0	4.0	9.5%	36.0%	3.4%
Xcel Energy Inc. (NYSE-XEL)	6.0	6.5	5.5	11.0%	38.0%	4.2%
Mean	6.1	5.0	4.6	10.4%	37.4%	4.0%
Median	6.0	5.8	4.8	10.0%	37.5%	3.9%
Average of Median Figures =		5.5			Median =	3.9%

* 'Est'd. '19-'21 to '25-'27' is the estimated growth rate from the base period 2019 to 2021 until the future period 2025 to 2027.
Data Source: *Value Line Investment Survey.*

Proxy Group of Twelve Electric Companies	Long-Term Issuer Rating (1)	Numerical Weighting (2)	Long-Term Issuer Rating (1)	Numerical Weighting (2)
Alliant Energy Corporation	Baa2	7.5	A/A-	6.5
Ameren Corporation	Baa1	8.0	BBB+	8.0
American Electric Power Company, Inc.	Baa2	9.0	A-	7.0
Duke Energy Corporation	Baa2	9.0	BBB+	8.0
Edison International	Baa3	10.0	BBB	9.0
Entergy Corporation	Baa2	9.0	BBB+	8.0
Evergy, Inc.	Baa2	9.0	A-	7.0
IDACORP, Inc.	Baa2	9.0	BBB	9.0
NorthWestern Corporation	A3	7.0	BBB	9.0
OGE Energy Corporation	Baa1	8.0	BBB+	8.0
Portland General Electric Company	A3	7.0	BBB+	8.0
Xcel Energy Inc.	Baa1	8.0	A-	7.0

Exhibit JRW-5

Southwestern Public Service Company
DCF Equity Cost Growth Rate Measures
Analysts Projected EPS Growth Rate Estimates

Panel A
Electric Proxy Group

Company		Yahoo	Zacks	S&P	Mean
ALLETE, Inc. (NYSE-ALE)	ALE	8.7%	7.3%	6.9%	7.6%
Alliant Energy Corporation (NYSE-LNT)	LNT	5.6%	6.1%	6.0%	5.9%
Ameren Corporation (NYSE-AEE)	AEE	6.7%	6.9%	7.3%	6.9%
American Electric Power Co. (NYSE-AEP)	AEP	5.7%	6.1%	6.0%	5.9%
Avista Corporation (NYSE-AVA)	AVA	5.2%	5.2%	4.9%	5.1%
CMS Energy Corporation (NYSE-CMS)	CMS	8.0%	8.0%	7.8%	8.0%
Consolidated Edison, Inc. (NYSE-ED)	ED	6.1%	2.0%	5.0%	4.4%
Dominion Energy Inc. (NYSE-D)	D	5.6%	14.9%	2.5%	7.7%
Duke Energy Corporation (NYSE-DUK)	DUK	5.3%	5.4%	5.4%	5.4%
Edison International (NYSE-EIX)	EIX	7.0%	3.0%	5.2%	5.1%
Entergy Corporation (NYSE-ETR)	ETR	6.6%	6.0%	6.5%	6.4%
Evergy, Inc. (NYSE-EVRG)	EVRG	2.7%	5.2%	5.5%	4.4%
Eversource Energy (NYSE-ES)	ES	6.7%	6.5%	6.4%	6.5%
Hawaiian Electric Industries (NYSE-HE)	HE	1.3%	4.4%	5.7%	3.8%
IDACORP, Inc. (NYSE-IDA)	IDA	3.0%	3.0%	4.2%	3.4%
MGE Energy, Inc. (NYSE-MGEE)	MGEE	4.2%	5.4%	5.4%	5.0%
Nextera Energy, Inc. (NYSE-NEE)	NEE	11.0%	9.0%	9.7%	9.9%
NorthWestern Corporation (NYSE-NWE)	NWE	4.5%	6.5%	4.7%	5.2%
OGE Energy Corp. (NYSE-OGE)	OGE	-12.3%	10.2%	1.3%	-0.3%
Pinnacle West Capital Corp. (NYSE-PNW)	PNW	7.1%	NA	6.2%	6.6%
Portland General Electric Company (NYSE-POR)	POR	4.2%	6.1%	5.0%	5.1%
Southern Company (NYSE-SO)	SO	7.3%	4.0%	5.8%	5.7%
WEC Energy Group (NYSE-WEC)	WEC	5.7%	5.8%	6.3%	6.0%
Xcel Energy Inc. (NYSE-XEL)	XEL	6.4%	6.6%	6.1%	6.5%
Mean		5.1%	6.2%	5.7%	5.7%
Median		5.7%	6.1%	5.7%	5.8%

Data Sources: www.zacks.com, http://quote.yahoo.com, S&P Cap IQ, April 7, 2023.

Panel B
D'Ascendis Proxy Group

	Company		Yahoo	Zacks	S&P	Mean
	Alliant Energy Corporation (NYSE-LNT)	LNT	5.6%	6.1%	6.0%	5.9%
	Ameren Corporation (NYSE-AEE)	AEE	6.7%	6.9%	7.3%	6.9%
	American Electric Power Co. (NYSE-AEP)	AEP	5.7%	6.1%	6.0%	5.9%
	Duke Energy Corporation (NYSE-DUK)	DUK	5.3%	5.4%	5.4%	5.4%
	Edison International (NYSE-EIX)	EIX	7.0%	3.0%	5.2%	5.1%
	Entergy Corporation (NYSE-ETR)	ETR	6.6%	6.0%	6.5%	6.4%
	Evergy, Inc. (NYSE-EVRG)	EVRG	2.7%	5.2%	5.5%	4.4%
	IDACORP, Inc. (NYSE-IDA)	IDA	3.0%	3.0%	4.2%	3.4%
	NorthWestern Corporation (NYSE-NWE)	NWE	4.5%	6.5%	4.7%	5.2%
	OGE Energy Corp. (NYSE-OGE)	OGE	-12.3%	10.2%	1.3%	-0.3%
	Portland General Electric Company (NYSE-POR)	POR	4.2%	6.1%	5.0%	5.1%
	Xcel Energy Inc. (NYSE-XEL)	XEL	6.4%	6.6%	6.1%	6.5%
	Mean		3.8%	5.9%	5.3%	5.0%
	Median		5.4%	6.1%	5.4%	5.3%

Data Sources: www.zacks.com, http://quote.yahoo.com, S&P Cap IQ, April 7, 2023.

Proxy Group of Twelve Electric Companies	Long-term Issuer Rating (1)	Numerical Weighting (2)	Long-term Issuer Rating (1)	Numerical Weighting (2)
Alliant Energy Corporation	Baa2	7.5	A/A-	6.5
Ameren Corporation	Baa1	8.0	BBB+	8.0
American Electric Power Company, Inc.	Baa2	9.0	A-	7.0
Duke Energy Corporation	Baa2	9.0	BBB+	8.0
Edison International	Baa3	10.0	BBB	9.0
Entergy Corporation	Baa2	9.0	BBB+	8.0
Evergy, Inc.	Baa2	9.0	A-	7.0
IDACORP, Inc.	Baa2	9.0	BBB	9.0
NorthWestern Corporation	A3	7.0	BBB	9.0
OGE Energy Corporation	Baa1	8.0	BBB+	8.0
Portland General Electric Company	A3	7.0	BBB+	8.0
Xcel Energy Inc.	Baa1	8.0	A-	7.0

Exhibit JRW-5

Southwestern Public Service Company
DCF Growth Rate Indicators

Growth Rate Indicator	Electric Proxy Group	D'Ascendis Proxy Group
Historic *Value Line* Growth in EPS, DPS, and BVPS	4.6%	4.7%
Projected *Value Line* Growth in EPS, DPS, and BVPS	5.0%	5.5%
Sustainable Growth ROE * Retention Rate	4.0%	3.9%
Projected EPS Growth from Yahoo, Zacks, and S&P Cap IQ - Mean/Median	5.7%/5.8%	5.0%/5.3%

Case No. 22-00270-UT
Exhibit JRW-6
CAPM Study

Exhibit JRW-6

Southwestern Public Service Company
Capital Asset Pricing Model

Panel A
Electric Proxy Group

Risk-Free Interest Rate	**3.60%**
Beta*	**0.85**
Ex Ante Market Risk Premium**	**6.00%**
CAPM Cost of Equity	**8.70%**

* See page 3 of Exhibit JRW-6

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

Panel B
D'Ascendis Proxy Group

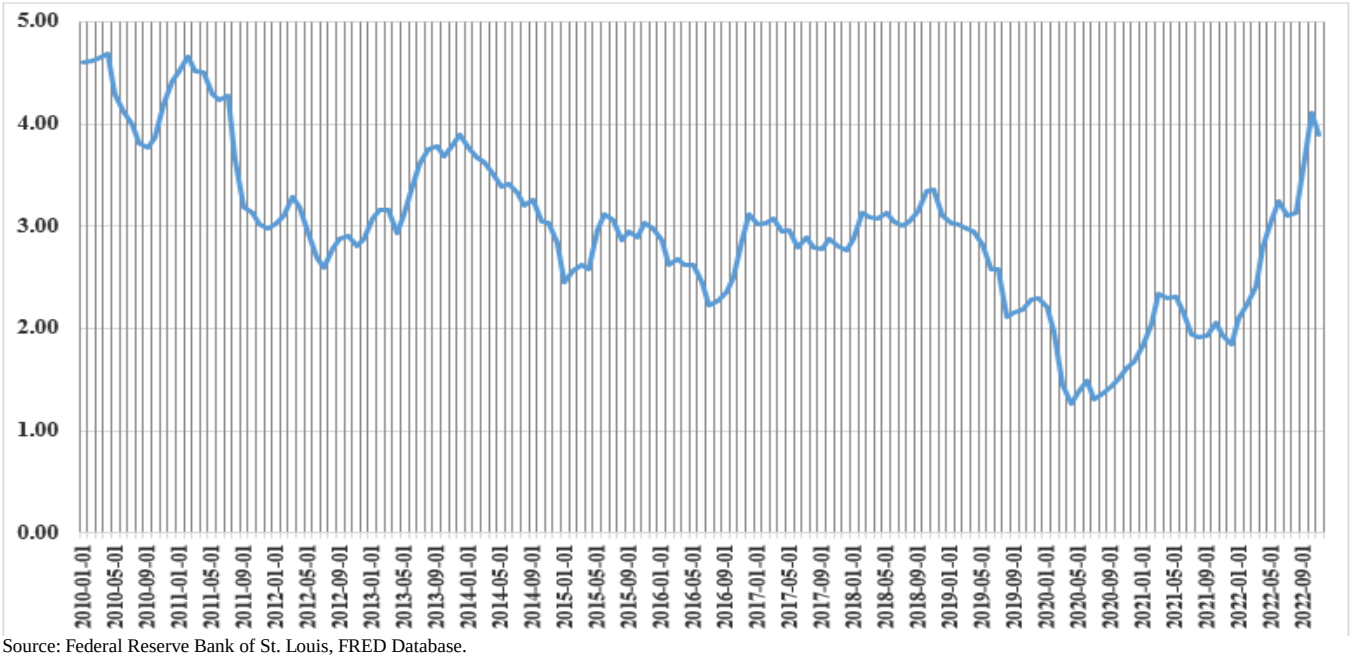
Risk-Free Interest Rate	**3.60%**
Beta*	**#NAME?**
Ex Ante Market Risk Premium**	**6.00%**
CAPM Cost of Equity	**#NAME?**

* See page 3 of Exhibit JRW-6

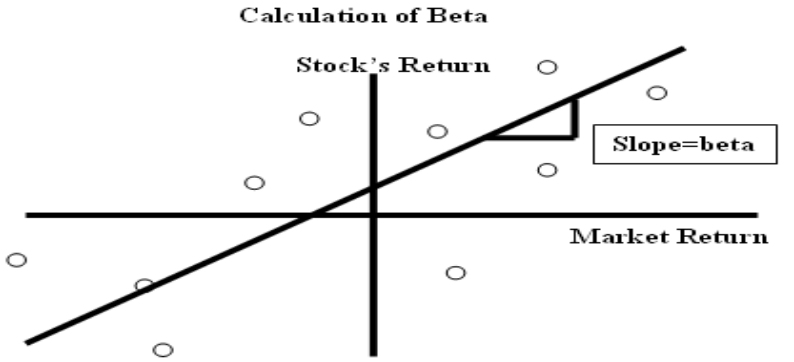
** See pages 5 and 6 of Exhibit JRW-6

Exhibit JRW-6

Thirty-Year U.S. Treasury Yields
2010-2023



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



Company	Beta
ALLETE, Inc. (NYSE-ALE)	0.90
Alliant Energy Corporation (NYSE-LNT)	0.85
Ameren Corporation (NYSE-AEE)	0.85
American Electric Power Co. (NYSE-AEP)	0.75
Avista Corporation (NYSE-AVA)	0.90
CMS Energy Corporation (NYSE-CMS)	0.80
Consolidated Edison, Inc. (NYSE-ED)	0.80
Dominion Energy Inc. (NYSE-D)	0.80
Duke Energy Corporation (NYSE-DUK)	0.85
Edison International (NYSE-EIX)	0.95
Entergy Corporation (NYSE-ETR)	0.95
Evergy, Inc. (NYSE-EVRG)	0.90
Eversource Energy (NYSE-ES)	0.90
Hawaiian Electric Industries (NYSE-HE)	0.85
IDACORP, Inc. (NYSE-IDA)	0.80
MGE Energy, Inc. (NYSE-MGEE)	0.75
NextEra Energy, Inc. (NYSE-NEE)	0.95
NorthWestern Corporation (NYSE-NWE)	0.90
OGE Energy Corp. (NYSE-OGE)	1.00
Pinnacle West Capital Corp. (NYSE-PNW)	0.90
Portland General Electric Company (NYSE-POR)	0.85
Southern Company (NYSE-SO)	0.90
WEC Energy Group (NYSE-WEC)	0.80
Xcel Energy Inc. (NYSE-XEL)	0.80
Mean	0.86
Median	0.85

Data Source: *Value Line Investment Survey*, 2023.

Panel B
D'Ascendis Proxy Group

Company	Beta
Alliant Energy Corporation (NYSE-LNT)	0.85
Ameren Corporation (NYSE-AEE)	0.85
American Electric Power Co. (NYSE-AEP)	0.75
Duke Energy Corporation (NYSE-DUK)	0.85
Edison International (NYSE-EIX)	0.95
Entergy Corporation (NYSE-ETR)	0.95
Evergy, Inc. (NYSE-EVRG)	0.90
IDACORP, Inc. (NYSE-IDA)	0.80
NorthWestern Corporation (NYSE-NWE)	0.90
OGE Energy Corp. (NYSE-OGE)	1.00
Portland General Electric Company (NYSE-POR)	0.85
Xcel Energy Inc. (NYSE-XEL)	0.80

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).

CAPM Study

Market Risk Premium - 2000-2023

Category	Category	Study Authors	Publication Date	Time Period Of Study	Methodology	Return Measure	Range Low	Range High	Midpoint of Range	Mean	Median
Historical Ris	**Historical Risk Premium**										
		Ibbotson	2016	1928-2015	Historical Stock Returns - Bond Returns	Arithmetic				6.00%	
						Geometric				4.40%	
		Damodaran	2023	1928-2022	Historical Stock Returns - Bond Returns	Arithmetic				6.64%	
						Geometric				5.06%	
		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 Mode	**Ex Ante Models (Puzzle Research)**										
		Claus Thomas	2001	1985-1998	Abnormal Earnings Model					3.00%	
		Arnott and Bernstein	2002	1810-2001	Fundamentals - Div Yld + Growth					2.40%	
		Constantinides	2002	1872-2000	Historical Returns & Fundamentals - P/D & P/E					6.90%	
		Cornell	1999	1926-1997	Historical Returns & Fundamental GDP/Earnings		3.50%	5.50%	4.50%	4.50%	
		Easton, Taylor, et al	2002	1981-1998	Residual Income Model					5.30%	
		Fama French	2002	1951-2000	Fundamental DCF with EPS and DPS Growth		2.55%	4.32%		3.44%	
		Harris & Marston	2001	1982-1998	Fundamental DCF with Analysts' EPS Growth					7.14%	
		McKinsey	2002	1962-2002	Fundamental (P/E, D/P, & Earnings Growth)		3.50%	4.00%		3.75%	
		Siegel	2005	1802-2001	Historical Earnings Yield					2.50%	
		Grabowski	2006	1926-2005	Historical and Projected		3.50%	6.00%	4.75%	4.75%	
		Maheu & McCurdy	2006	1885-2003	Historical Excess Returns, Structural Breaks,		4.02%	5.10%	4.56%	4.56%	
		Bostock	2004	1960-2002	Bond Yields, Credit Risk, and Income Volatility		3.90%	1.30%	2.60%	2.60%	
		Bakshi & Chen	2005	1982-1998	Fundamentals - Interest Rates					7.31%	
		Donaldson, Kamstra, & Kramer	2006	1952-2004	Fundamental, Dividend yld., Returns,, & Volatility		3.00%	4.00%	3.50%	3.50%	
		Campbell	2008	1982-2007	Historical & Projections (D/P & Earnings Growth)		4.10%	5.40%		4.75%	
		Best & Byrne	2001	Projection	Fundamentals - Div Yld + Growth					2.00%	
		Fernandez	2007	Projection	Required Equity Risk Premium					4.00%	
		DeLong & Magin	2008	Projection	Earnings Yield - TIPS					3.22%	
		Siegel - Rethink ERP	2011	Projection	Real Stock Returns and Components					5.50%	
		Duff & Phelps	2022	Projection	Normalized with 3.5% Long-Term Treasury Yield					6.00%	
		Mschchowski - VL - 2014	2014	Projection	Fundamentals - Expected Return Minus 10-Year Treasury Rate					5.50%	
		American Appraisal Quarterly ERP	2015	Projection	Fundamental Economic and Market Factors					6.00%	
		JP Morgan Asset Management	2023	Projection	Equity Return of 7.90% and Long-Term Bond of 3.50%					4.40%	
		Market Risk Premia	2023	Projection	Fundamental Economic and Market Factors					3.53%	
		KPMG	2022	Projection	Fundamental Economic and Market Factors					5.75%	
		Damodaran -3-1-23	2023	Projection	Fundamentals - Implied from FCF to Equity Model (Trailing 12 month, with adjusted payout)					4.78%	
		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									4.20%
Surveys	**Surveys**										
		New York Fed	2015	Five-Year	Survey of Wall Street Firms					5.70%	
		Survey of Financial Forecasters	2023	10-Year Projection	Equity Return of 7.50% and Long-Term Bond of 3.35%					3.15%	
		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	2023	Long-Term	Survey of Academics, Analysts, and Companies					5.70%	
		Median									5.30%
Building Bloc	**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	**Mean**										**4.76%**
Median	**Median**										**4.83%**

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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	Average
Historical Risk Premium										
	Ibbotson	2016	1928-2015	Historical Stock Returns - Bond Returns	Arithmetic				6.00%	
					Geometric				4.40%	
	Damodaran	2023	1928-2022	Historical Stock Returns - Bond Returns	Arithmetic				6.64%	
					Geometric				5.06%	
	Dimson, Marsh, Staunton _Credit Suisse Report	2023	1900-2022	Historical Stock Returns - Bond Returns	Arithmetic				6.40%	
					Geometric				4.60%	
	Median									5.52%
Ex Ante Models (Puzzle Research)										
	Siegel - Rethink ERP	2011	Projection	Real Stock Returns and Components					5.50%	
	Duff & Phelps	2022	Projection	Normalized with 3.5% Long-Term Treasury Yield					6.00%	
	Mschchowski - VL - 2014	2014	Projection	Fundamentals - Expected Return Minus 10-Year Treasury Rate					5.50%	
	American Appraisal Quarterly ERP	2015	Projection	Fundamental Economic and Market Factors					6.00%	
	JP Morgan Asset Management	2023	Projection	Equity Return of 7.90% and Long-Term Bond of 3.50%					4.40%	
	Market Risk Premia	2023	Projection	Fundamental Economic and Market Factors					3.53%	
	KPMG	2022	Projection	Fundamental Economic and Market Factors					5.75%	
	Damodaran -3-1-23	2023	Projection	Fundamentals - Implied from FCF to Equity Model (Trailing 12 month, with adjusted payout)					4.78%	
	Median									5.50%
Surveys										
	New York Fed	2015	Five-Year	Survey of Wall Street Firms					5.70%	
	Survey of Financial Forecasters	2023	10-Year Projection	Equity Return of 7.50% and Long-Term Bond of 3.35%					3.15%	
	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	2023	Long-Term	Survey of Academics, Analysts, and Companies					5.70%	
	Median									5.30%
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										**5.09%**
Median										**5.40%**

CAPM Study

Duff & Phelps 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:				
October 18, 2022 – UNTIL FURTHER NOTICE*	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.

To learn more about cost of capital issues, and to ensure that you are using the most recent Kroll's Global Cost of Capital Inputs, visit kroll.com/cost-of-capital-resource-center.

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Source: https://www.kroll.com/-/media/cost-of-capital/kroll-us-erp-rf-table-2022.pdf

Case No. 22-00270-UT
Exhibit JRW-7
Southwestern Public Service Company's Rate of Return Recemmendation
Page 1 of 2

Exhibit JRW-7
ıthwestern Public Service Company's Rate of Return Recemmendation

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	45.30%	4.34%	1.97%
Common Equity	54.70%	10.75%	5.88%
Total	100.00%		7.85%

Case No. 22-00270-UT
Exhibit JRW-7
SPS' ROE Results
Page 2 of 2

D'Ascendis ROE Results

Discounted Cash Flow Model	9.20%[4]
Risk Premium Model	11.72%
Capital Asset Pricing Model	11.81%
Market Models Applied to Comparable Risk, Non-Price Regulated Companies	12.74%
Indicated Range of Common Equity Cost Rates Before Adjustments for Company-Specific Risk	10.35% - 11.35%
Size Risk Adjustment	0.15%
Credit Risk Adjustment	0.00%
Flotation Costs	0.08%
Indicated Range of Common Equity Cost Rates after Adjustment	10.58% - 11.58%
Recommended Cost of Common Equity	10.75%

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	Average
62	2022	25,461.34	3,839.50	219.49	68.34	
	Growth Rates	**6.40%**	**6.99%**	**7.11%**	**5.88%**	**6.60%**

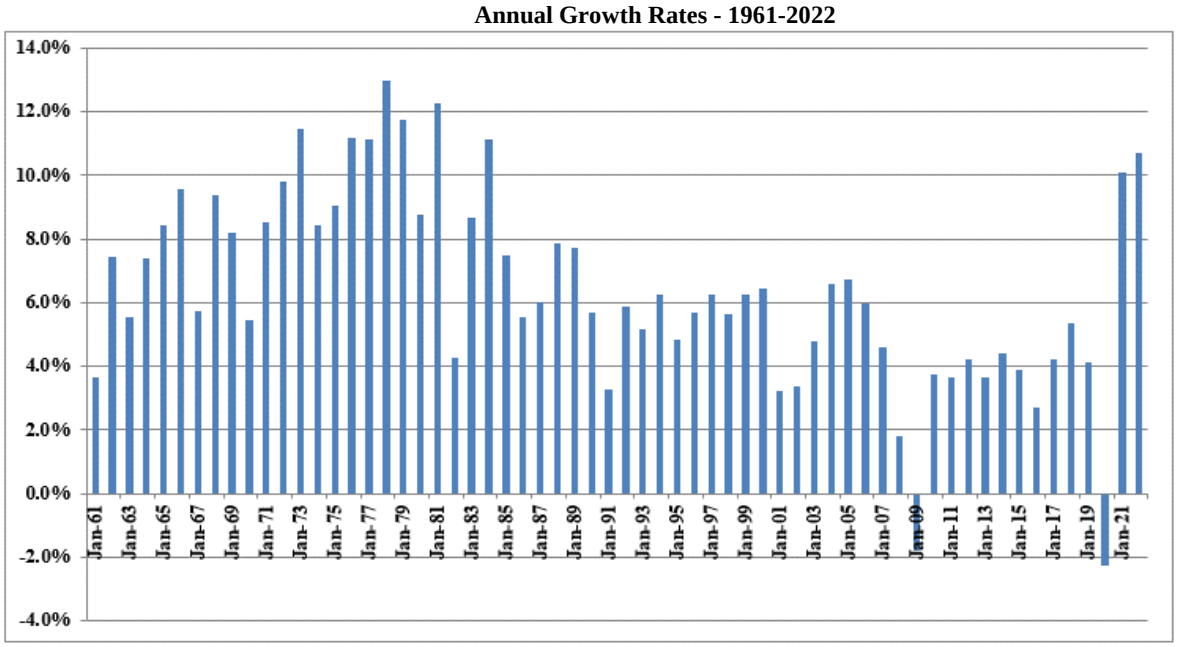
Data Sources: GDPA -http://research.stlouisfed.org/fred2/series/GDPA/downloaddata
S&P 500, EPS and DPS - http://pages.stern.nyu.edu/~adamodar/

10-Year Average	**4.59%**	**10.41%**	**7.91%**	**8.42%**
20-Year Average	**4.32%**	**7.65%**	**8.12%**	**7.50%**
30-Year Average	**4.65%**	**7.52%**	**8.16%**	**5.79%**
40-Year Average	**5.21%**	**8.62%**	**7.16%**	**5.89%**
50-Year Average	**6.16%**	**7.21%**	**7.40%**	**6.32%**

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%**

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%**

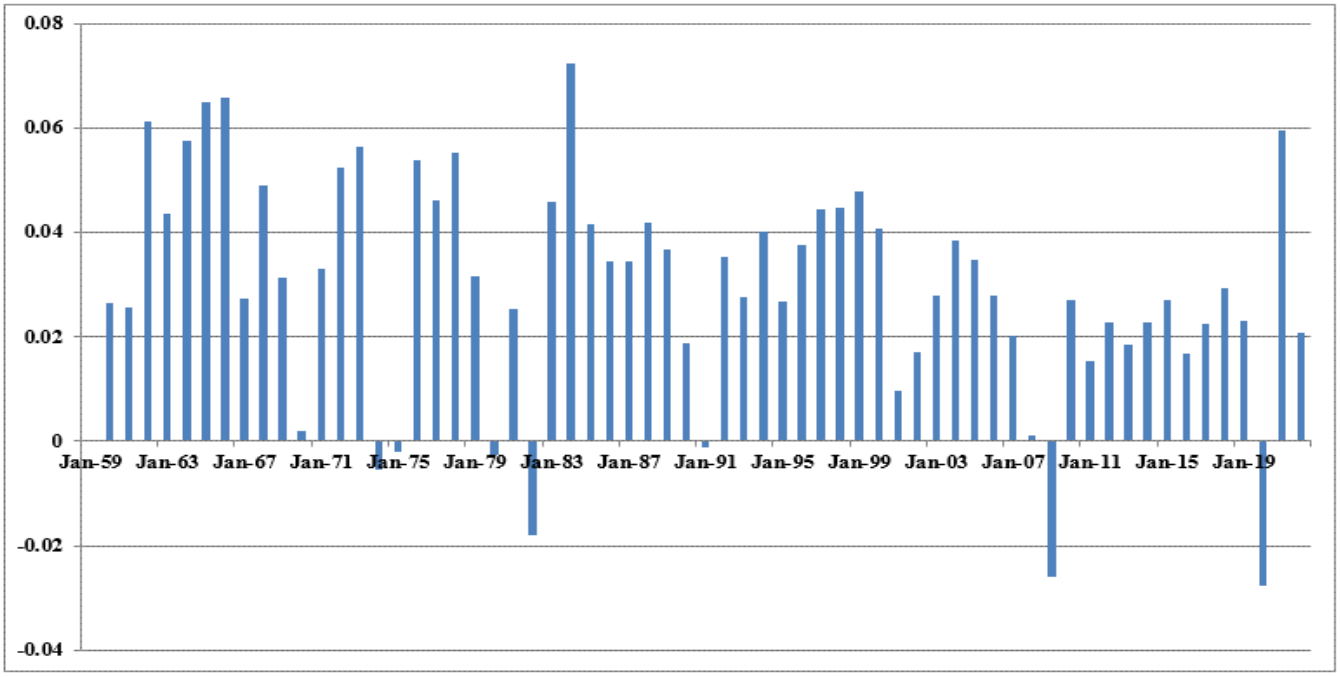
Annual Nominal GDP Growth Rates



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

Real GDP Growth Rates

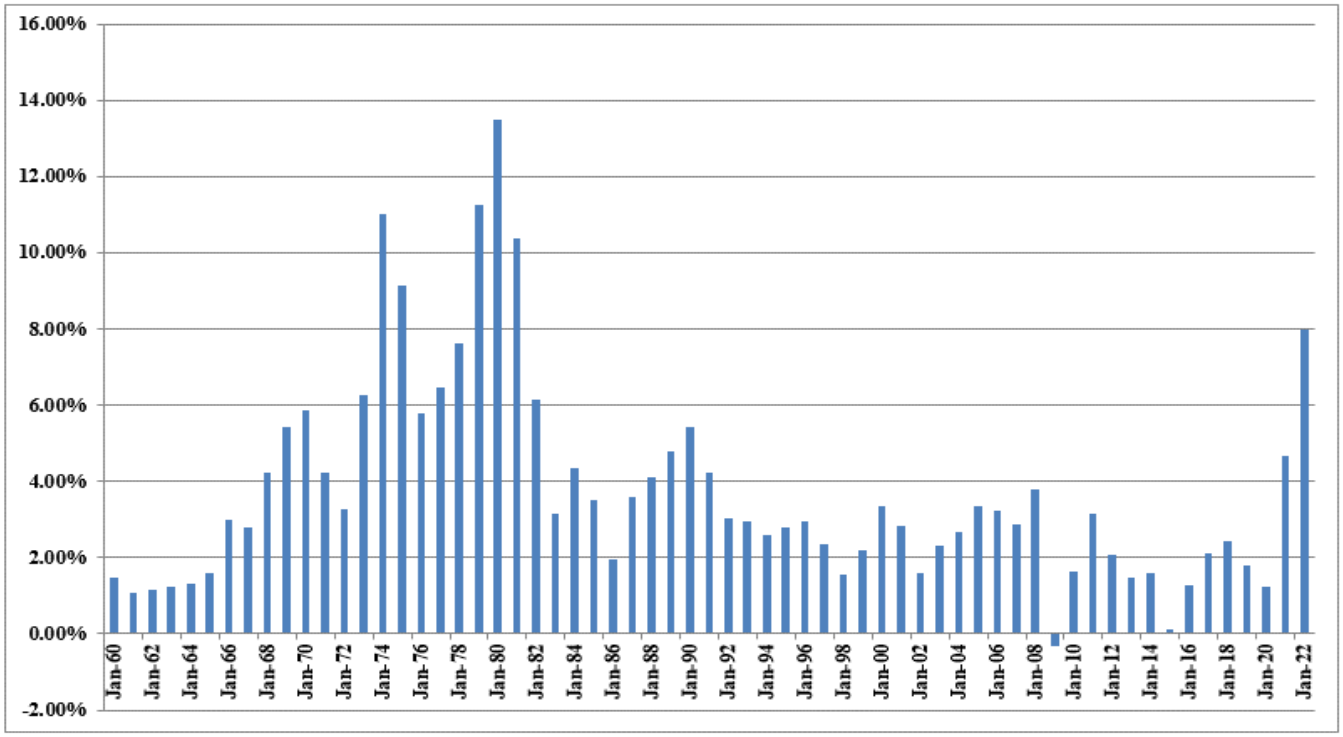
Annual Average Real GDP Growth Rates
1961-2022



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

Inflation Rates

Annual Inflation Rates
1961-2022



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

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-6

Panel B
Projected GDP Growth Rates

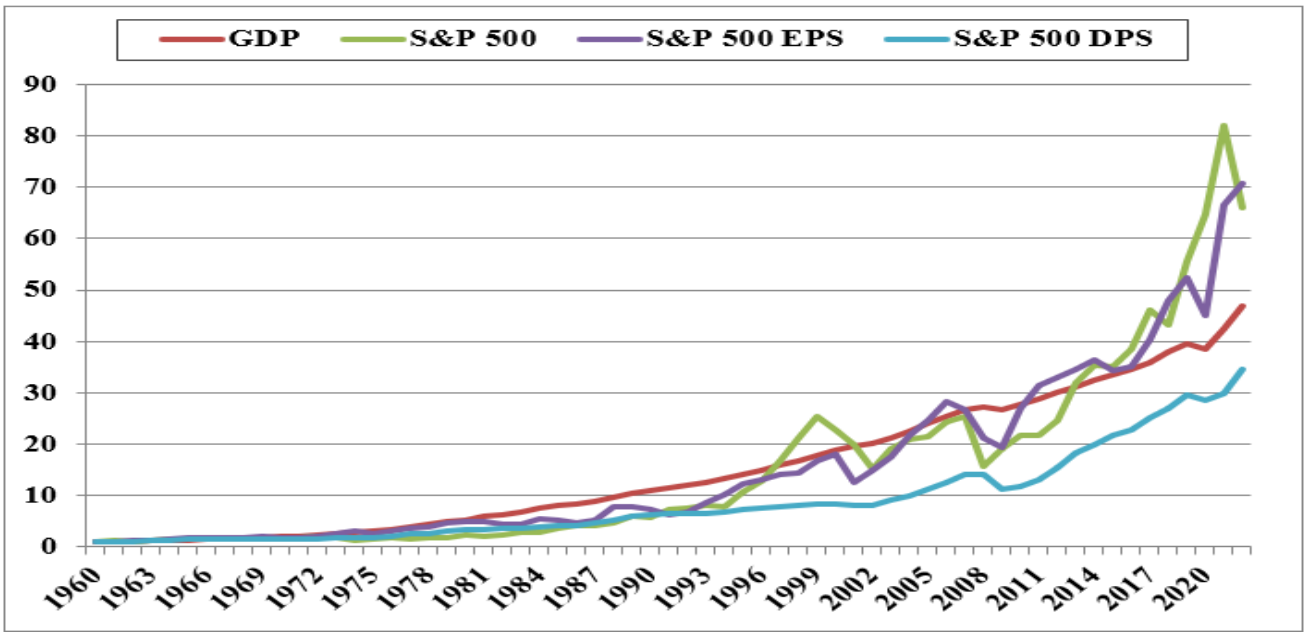
	Time Frame	Projected Nominal GDP Growth Rate
Congressional Budget Office	**2020-30**	**4.0%**
Survey of Financial Forecasters	**Ten Year**	**4.7%**
Social Security Administration	**2020-2095**	**4.2%**
Energy Information Administration	**2020-2050**	**4.5%**

Sources:

Congressional Budget Office,The *2021 Long-Term Budget Outlook* , July 15, 2021.
U.S. Energy Information Administration, *Annual Energy Outlook 2021* , Table: Macroeconomic Indicators,
Social Security Administration, 2021 Annual Report of the Board of Trustees of the Old-Age,
Survivors, and Disability Insurance (OASDI) Program, Table VI.G4,
The 4.2% growth rate is the growth in projected GDP from 20 trillion in 2020 to $444 trillion in 2095.
https://www.philadelphiafed.org/research-and-data/real-time-center/survey-of-professional-forecasters/

GDP and S&P 500 Growth Rates

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



BEFORE THE NEW MEXICO PUBLIC REGULATION COMMISSION

IN THE MATTER OF SOUTHWESTERN PUBLIC SERVICE COMPANY'S APPLICATION FOR: (1) REVISION OF ITS RETAIL RATES UNDER ADVICE NOTICE NO. 312; (2) AUTHORITY TO ABANDON THE PLANT X UNIT 1, PLANT X UNIT 2, AND CUNNINGHAM UNIT 1 GENERATING STATIONS AND AMEND THE ABANDONMENT DATE OF THE TOLK GENERATING STATION; AND (3) OTHER ASSOCIATED RELIEF	)	**Case No. 22-00286-UT**

CERTIFICATE OF SERVICE

I CERTIFY that on this date I served upon the individuals listed below, via email only, a true and correct copy of the *Direct Testimony of J. Randall Woolridge* issued on the same date.

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DATED THIS April 21, 2023.

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