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Exhibit Number	:	CA-10
Commissioner	:	M. Baker
Admin Law Judge	:	J. Lee
Witness	:	J.R.Woolridge, PhD

PUBLIC ADVOCATES OFFICE
CALIFORNIA PUBLIC UTILITIES COMMISSION

Report on the Results of Operations for Southwest Gas Corporation's General Rate Case

Test Year 2026

Cost of Capital
and
Rate of Return

San Francisco, California
April 4, 2025

Southwest Gas Corporation
Application No. A. 24-09-001

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

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

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

I. SUBJECT OF TESTIMONY AND SUMMARY OF RECOMMENDATIONS

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

A. I have been asked by Public Advocates' Office ("Cal Advocates") of the California Public Utility Commission to provide an opinion as to the overall fair rate of return or cost of capital for Southwest Gas Corporation ("SWG" or "Company") and to evaluate SWG's rate of return testimony in this proceeding.[1]

Q. HOW IS YOUR TESTIMONY ORGANIZED?

A. First, I review my cost of equity recommendation for SWG and review the primary areas of contention between SWG's rate of return position and my position. Second, I discuss the selection of a proxy group of companies for estimating the market cost of equity for SWG. Third, I discuss the capital structure of the Company. Fourth, I estimate the equity cost rate

[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.

for SWG. Finally, I critique the Company's rate of return analysis and testimony. Appendix A is my curriculum vitae.

A. Overview

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

A. A company's overall rate of return consists of 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) cost of common equity, otherwise known as Rate of Return or Return on Equity ("ROE").

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

A. An ROE is most simply described as the allowed rate of profit for a regulated company. In a competitive market, a company's profit level is determined by a variety of factors, including the state of the economy, the degree of competition a company faces, the ease of entry into its markets, the existence of substitute or complementary products/services, the company's cost structure, the impact of technological changes, and the supply and demand for its products and/or services. 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.[3]

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

[3] *Hope*, 320 U.S at 603-607; *Bluefield*, 262 U.S. at 689-695

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

B. Summary of Positions

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

A. SWG witness Mr Justin L. Forsberg has proposed capital structure and debt cost rates for both SWG's Southern California and Northern California/South Lake Tahoe Rate Jurisdiction Districts. The Company has proposed a hypothetical capital structure with 50.00% long-term debt and 50.00% and common equity for both districts. The Company has proposed long-term debt cost rates of 4.14% for the Southern California District and 4.34% for the Northern California/South Lake Tahoe Districts. The Company's witness, Mr. Dylan D'Ascendis ("Mr. D'Ascendis") has recommended a common equity cost rate of 11.35% for the Company. The Company's overall recommended rate of returns are 7.75% for the Southern California District and 7.85% for the Northern California/South Lake Tahoe Districts. These are presented in Table 1 and Exhibit JRW-7. In the Company's last rate case (Docket No. A-19-08-015), dated March 25, 2021, the Commission issued a decision accepting a settlement between all parties adopting a 10.00% return on equity and a capital

structure with a common equity ratio of 52.00%.

Table 1
SWG's Rate of Return Recommendation

SWG's Southern California Rate Jurisdiction District

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	50.00%	4.14%	2.07%
Common Equity	50.00%	11.35%	5.68%
Total	100.00%		7.75%

SWG's Northern California and South Lake Tahoe Rate Jurisdiction District

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	50.00%	4.34%	2.17%
Common Equity	50.00%	11.35%	5.68%
Total	100.00%		7.85%

In my recommendation, I have adjusted the Company's proposed capital structure, but I have still employed a capital structure that includes a higher common equity ratio and lower financial risk than the companies in the Gas Proxy Group. I am recommending a capital structure with a common equity ratio of 48.0% for both districts. This capitalization includes a common equity ratio that: (1) is consistent the current capitalization of the Company, and includes a higher common equity ratio than the Company has maintained in recent years; (2) represents the capitalization of the Company that has been used by S&P and Moody's to rate the Company's investment risk; and (3) includes a higher common equity ratio and lower financial risk than the average of the two proxy groups and SWG's parent, SWX. I am using SWG'S proposed long-term debt cost rates of 4.14% and 4.34%

for both SWG's Southern California and Northern California/South Lake Tahoe Rate Jurisdiction Districts.

I have applied the Discounted Cash Flow ("DCF") Model and the ("Capital Asset Pricing Model ("CAPM")) to Mr. D'Ascendis' proxy group of publicly-held gas distribution companies ("Gas Proxy Group") as well as a proxy group of publicly-held combination electric and gas companies ("Combination Proxy Group"). D'Ascendis' Gas Proxy Group includes only six gas companies, and I believe that a proxy group of only six companies is too small of a group to provide reliable results. My analysis indicates that an equity cost rate in the range of 8.70% to 9.70% is appropriate for gas companies at this time. Given these results as well as the fact that: (1) I rely primarily on the DCF Model; (2) SWG's investment risk is a little above the average of the two proxy groups; (3) but I have employed a capital structure that has more common equity and less financial risk than the proxy groups; and (4) the Gas Proxy Group is small so I give it less weight, I conclude that a ROE in the range of 9.00% to 9.50% is appropriate for a gas company at this time. I would normally employ the midpoint of this range, but since SWG's investment risk is a little above the average of the gas group, I will use the upper end of the range, 9.50%, as a ROE for SWG. My overall recommended rates of return are 6.71% for the Southern California District and 6.82% for the Northern California/South Lake Tahoe Districts. This is summarized in Table 2 and Exhibit JRW-1.

Table 2
Cal Advocates Rate of Return Recommendation

SWG's Southern California Rate Jurisdiction District

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	52.00%	4.14%	2.15%
Common Equity	48.00%	9.50%	4.56%
Total	100.00%		6.71%

SWG's Northern California and South Lake Tahoe Rate Jurisdiction District

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	52.00%	4.34%	2.26%
Common Equity	48.00%	9.50%	4.56%
Total	100.00%		6.82%

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 SWG.

1. **Capital Market Conditions:** Mr. D'Ascendis' analyses, ROE results, and recommendations suggest that higher interest rates and capital costs are on the horizon. However, despite the increase in inflation and interest rates over the past two years, several factors suggest the equity cost rate for utilities has not risen significantly. To support this contention, I show that: (1) despite the higher inflation of the past two years, long-term inflation expectations are about 2.50%; and (2) the

yield curve is once again positively sloped which is normal and means that investors require higher returns to commit capital for longer periods of time. The yield curve was inverted for two years which means that the yields on shorter-term maturity securities were higher than the yields on longer-term securities. This is primarily because the Federal Reserve raised the discount rate eleven times in 2022 and 2023 (from 0.25% to 5.25%) to address the increase in inflation and the rebounding economy associated with the economic recovery from the Covid pandemic. In 2024, as year-over-year inflation subsided, the Federal Reserve began the process of normalizing interest rates by cutting the discount rate three times – most recently in December to 4.50%. As a result, with short-term rates declining and long-term rates remaining in the 4.0%-5.0% range, the yield curve is again positively sloped. The curve is positively sloped but relatively flat, with long-term rates only being about 30 basis points above short-term rates. Interest rates have increased since the election, but the Federal Reserve is expected to cut rates again in 2025, and President Trump and Treasury Secretary Scott Bissent have called for lower interest rates, and so I do not expect rates to rise in 2025.

2. **<u>Capital Structure</u>** – The Company has proposed a hypothetical capital structure with 50.00% long-term debt and 50.00% and common equity for both SWG's Southern California and Northern California/South Lake Tahoe Districts. The Company has proposed long-term debt cost rates of 4.14% for 4.34% for the two districts.

SWG's proposed hypothetical capital structure includes a common equity ratio that: (1) is higher than the current capitalization of the Company as well as the common

equity ratio the Company has maintained in recent years; and (2) includes a higher common equity ratio and lower financial risk than the average of the proxy groups and SWG's parent, SWX. Consequently, I am recommending a capital structure with a common equity ratio of 48.0% for both districts. This capitalization includes a common equity ratio that: (1) is consistent the current capitalization of the Company, and includes a higher common equity ratio than the Company has maintained in recent years; (2) represents the capitalization of the Company that has been used by S&P and Moody's to rate the Company's investment risk; and (3) includes a higher common equity ratio and lower financial risk than the average of the proxy groups and SWG's parent, SWX. I am using SWG'S proposed long-term debt cost rates of 4.14% and 4.34% for both SWG's Southern California and Northern California/South Lake Tahoe Rate Jurisdiction Districts.

3. **Gas Proxy Group** – Mr. D'Ascendis' Gas Proxy Group includes only six gas companies, and I do not believe that a proxy group of only six companies can produce reliable results. As a result, I have given this group less weight and have also employed the Combination Proxy Group. This is a group of ten combination electric and gas companies that receive at least 20% of their operating revenues from regulated gas operations.

4. **SWG's S&P and Moody's Issuer Credit Ratings Indicate the Company's Investment Risk is a Little Above the Gas Group and is in Line with Combination Group –** SWG's S&P and Moody's issuer credit ratings are BBB and Baa1. SWG's parent company, Southwest Gas Holdings ("SWX"), has S&P and Moody's issuer credit ratings of BBB- and Baa2, which indicates the parent company

is a little riskier than SWG. The average S&P and Moody's issuer credit ratings for the Gas Proxy Group are A-/BBB+ and A3/Baa1 and for the Combination Proxy Groups are BBB+ and Baa2. As such, SWG's S&P and Moody's issuer credit ratings are both below the average of the Gas Proxy Group. For the Combination Group, SWG's S&P rating is BBB is one notch below the group and SWG's Moody's rating is one notch above the group. Overall, I believe that these ratings suggest that SWG is a little riskier than the gas group and similar in risk to the combination group.

5. **DCF Equity Cost Rate** – Mr. D'Ascendis and I both employ the traditional constant-growth DCF model. However, Mr. 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. On (1), I show that analysts' projected 5-year EPS growth rates for utilities have been overly optimistic and upwardly biased for over 40 years. With respect to (2), Mr. D'Ascendis' mean DCF result for his proxy group is 9.99% yet he concludes that the Company's cost of equity is in the range of 10.46% to 12.48%. By contrast, to develop the DCF growth rate I use in my DCF analyses, I reviewed thirteen growth rate measures, including historical and projected growth rate measures, and evaluated growth in dividends, book value, and earnings per share.

6. **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 his estimate of projected stock-market returns. As I further explain in my critique of SWG's rate-of-return analysis later in my testimony, there are a number of empirical issues with using historical stock and bond returns to estimate an expected market risk premium. In addition, Mr. D'Ascendis' projected market returns are based on highly unrealistic assumptions about future earnings and economic growth and the resulting stock returns. First, I have conducted a study that shows Mr. D'Ascendis' estimate of the average expected stock market return of 13.62% is more than double the average annual stock return (6.80%) that investment firms tell investors to expect over the next ten years. Second, as I demonstrate later in my testimony, the EPS growth-rate projection (12.02%) used for the S&P 500 and the resulting expected market return (13.62%) and market risk premium (9.12%) include unrealistic assumptions regarding future economic and earnings growth and stock returns. On this point, Mr. D'Ascendis makes the assumption that the companies in the S&P 500 can grow their earnings, on average, at 12.02% annually, which is three times the long-term projected growth rate of the economy as measured by Gross Domestic Product ("GDP").

7. **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) most significantly, his CAPM market-risk premium of 8.59% is developed by the same six approaches he used in his Risk-Premium approach I noted above.

The market risk premium of 8.59% 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 8.59% market risk premium is based on totally unrealistic assumptions of future economic and earnings growth and stock returns.

As I highlight in my testimony, there are three commonly used procedures for estimating a market risk premium—historic returns, surveys, and expected return models. I have used a market risk premium of 5.00%, 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 5.00% 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.

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

9. **Adjustments to Equity Cost Rate** – Mr. D'Ascendis includes three adjustments totaling 47 basis points ("BPs") estimates a ROE: (1) a business size adjustment of

20 basis points to account for the relatively small size of SWG; (2) a credit risk adjustment of 15 BPs to account for SWG's credit ratings; and (3) a flotation cost adjustment of 12 BPs. I show that a size adjustment is not appropriate for regulated public utilities. With respect to the credit risk adjustment, I note that SWG's S&P and Moody's credit ratings indicate that its investment risk is a little above the gas group and is in line with the combination group. As a result, I have made a similar risk adjustment as Mr. D'Ascendis, selecting a ROE at the top end of my ROE range, effectively including a 25 basis point credit risk adjustment. On the flotation cost adjustment, there is no evidence that SWG has paid flotation costs. Hence, SWG should not receive higher revenues in the form of a higher ROE for flotation costs that the Company does not incur.

II. CAPITAL MARKET CONDITIONS AND AUTHORIZED ROEs

A. Capital Market Conditions

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

A. Page 1 of Exhibit JRW-2 shows the yields on 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 years 2022-2024, and now are in the 5.75% range in 2025.

The average dividend yields for gas companies are shown on page 2 of Exhibit JRW-2. For the gas companies, yields have declined from the 4.0% range a decade ago to 2.75% in 2018 but have increased since that time, and were in the 3.70% range in 2024. The average earned ROE and market-to-book ratio for the gas companies are shown on page 3 of Exhibit JRW-2. The average ROE for gas companies has been in the 8.0%-10.0% range over the past decade and was near the bottom of this range as of the last three years (2022-24). Over the past decade, the gas companies' average market-to-book ratio increased from 1.40X, peaked at 2.25X in 2019, but has declined to 1.50X range in 2021-24 time period.

Q. PLEASE REVIEW RECENT DEVELOPMENTS IN THE ECONOMY AND CAPITAL MARKETS.

A. Figure 1, below, shows 30-year Treasury yields over the past 15 years (2010 to 2025). In 2020, with the advent of the COVID-19 pandemic, 30-year Treasury yields declined to record low levels, dropping about 100 basis points to settle in the 1.25% range. They began their recovery in the summer of 2020 and increased significantly in 2022 and 2023 with the massive government spending, improving economy, and higher inflation. These yields peaked at about 5.00% range in 2023, declined to the 4.0% range in 2024, and then increased again to over 5.0% after the election. In 2025, these yields have declined, and now are in the 4.60% range.

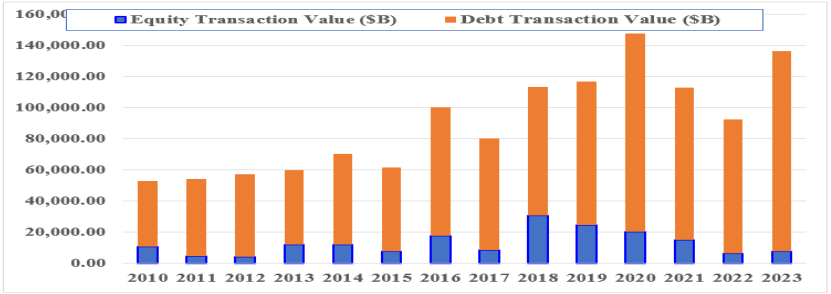
Figure 1
30-Year Treasury Yields

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

Q. DID UTILITIES TAKE 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 13 years. Electric utility and gas distribution companies have taken advantage of the low interest rate and capital cost environment of recent years and raised record amounts of capital in the markets. In fact, in four of the past five years, public utilities have annually raised more than $100 billion in combined debt and equity capital.

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

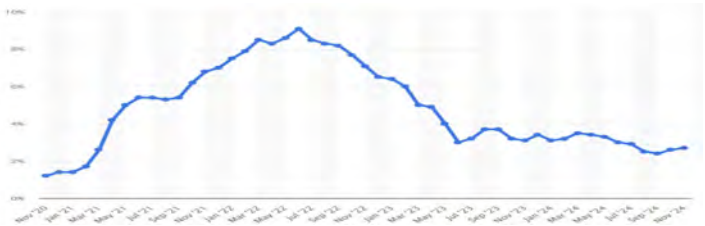


Data Source: S&P Global Market Intelligence, S&P Cap IQ, 2024.

Q. PLEASE DISCUSS THE INCREASE IN INTEREST RATES OVER THE PAST THREE YEARS.

A. Several factors led to higher interest rates in the 2022 – 2025 time period. Coming out of the pandemic, real GDP growth has increased 5.9% in 2021, 2.1% in 2022, 2.9% in 2023, and 2.8% in 2024, compared to a decline of -3.4% in 2020. In the 2022-24 years, the improving economy and business activity, supply chain shortages associated with the Covid shut downs, higher levels of business and consumer spending, and record increases in housing prices put pressure on inflation and interest rates. As shown in Figure 3, reported year-over-year inflation has been as high as 9.20% in 2022, and has declined to the 2.5%-3.0% range since that time. Year-over-year inflation was reported to be 2.8% as of February, 2025.

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



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

In response to the higher inflation, the Federal Reserve in 2022 increased the discount rate by 25 basis points in March, 50 basis points in May, and 75 basis points in June, July, September, and November, 50 basis points in December, and 25 basis points in February, March, May, and July of 2023. The Fed held the discount rate firm at 5.50% until September 18, 2024, when it cut the rate by 50 basis points. Subsequently, the Fed cut the discount rate by 25 basis points at its November and December 2024 meetings.

Investor sentiment strongly favored additional rate cuts leading into the January, 2025 Fed meeting. However, the Fed did not bow to market pressure and put additional rate cuts on hold as the economy has remained strong.

Investors' inflation expectations can be seen by looking at the difference between yields on ordinary Treasuries and the yields on inflation-protected Treasuries, known as TIPS. Figure 4 shows the expected inflation rate over the last five, ten, and thirty years. One can see the big increase in 2022, although it has fallen off since mid-2022 and is now at an expected inflation rate of about 2.5%.

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

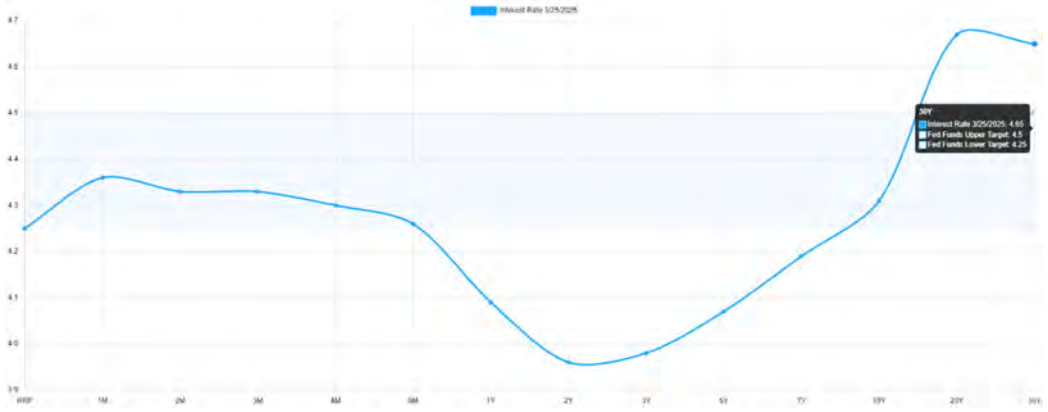
Date source: https://fred.stlouisfed.org/.

Q. DO YOU BELIEVE THAT INTEREST RATES WILL INCREASE IN 2025?

A. No. As discussed above, the recovery of the economy pushed up inflation and interest rates in the 2022-24 time period. But inflationary expectations are now back to the 2.5% range. Figure 5 shows the yield curve, which plots the yield-to-maturity and time-to-maturity for Treasury securities. The yield curve is once again positively sloped, which is normal and means that investors require higher returns to commit capital for longer periods of time. The yield curve was inverted for two years. which means that the yields on shorter-term maturity securities were higher than the yields on longer-term securities. This is primarily because the Federal Reserve raised the discount rate eleven times in 2022 and 2023 (from 0.25% to 5.25%) to address the increase in inflation and the rebounding economy associated with the economic recovery from the Covid pandemic. In 2024, as year-over-year inflation has subsided, the Federal Reserve began the process of normalizing interest rates by cutting the discount rate three times – most recently in March to 4.60%. As a result, with short-term rates declining and long-term rates remaining in the 4.0%-5.0% range, the yield curve is again positively sloped. The curve is positively sloped but relatively flat, with long-term rates only being about 30 basis points above short-term rates.

Interest rates have increased since the election, but the Federal Reserve is expected to cut rates again in 2025, and President Trump has called for lower interest rates, and so I do not expect rates to rise in 2025.

Figure 5
The Yield Curve



Source: https://www.ustreasuryyieldcurve.com/ - 3-25-25.

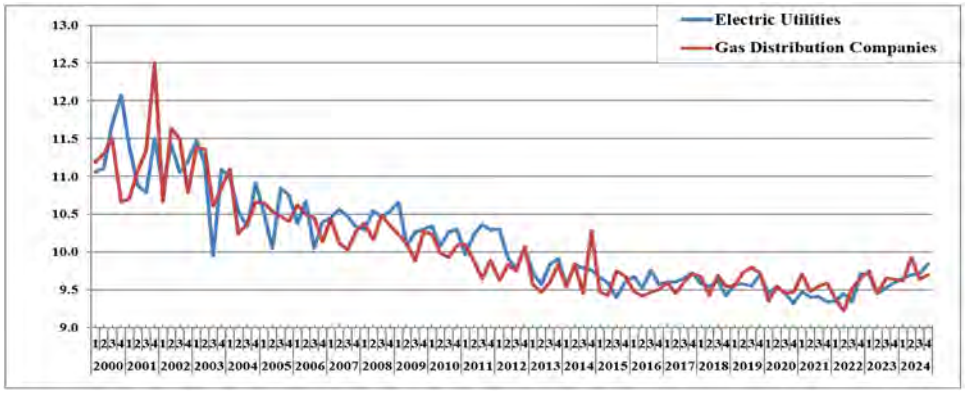
B. Authorized ROEs

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

A Figure 6 shows the authorized ROEs for electric utility and gas distribution companies from 2000-2024. The authorized ROEs have trended downward with interest rates and capital costs in the past 15 years. The average annual authorized ROEs for gas distribution companies have been below 10.0% for over a decade (2011). In 2020 and 2021, authorized ROEs for utilities hit an all-time low. Table 3 provides the average annual authorized ROEs for electric utility and gas distribution from 2010 to 2024.[4]

[4] The data and numbers discussed in this section come from S&P Global Market Intelligence, RRA *Regulatory Focus*, 2025.

Figure 6
Authorized ROEs for Electric Utilities and Gas Distribution Companies
2000-2024



Data Source: S&P Global Market Intelligence, RRA *Regulatory Focus*, 2025.

Table 3
Average Annual Authorized ROEs for Electric Utilities
and Gas Distribution Companies
2010–2024

	Electric	Gas		Electric	Gas
2010	10.37	10.15	2017	9.74	9.72
2011	10.29	9.92	2018	9.65	9.59
2012	10.17	9.94	2019	9.66	9.72
2013	10.03	9.68	2020	9.44	9.47
2014	9.91	10.70	2021	9.38	9.56
2015	10.70	9.60	2022	9.54	9.53
2016	9.77	9.54	2023	9.60	9.64
			2024	9.74	9.72

Data Source: S&P Global Market Intelligence, RRA Regulatory Focus, 2025.

Q. DID THE HIGHER INTEREST RATES IN 2022, 2023, AND 2024 MEAN THAT AUTHORIZED ROES INCREASED IN LINE WITH INTEREST RATES?

A. No. As noted above, authorized ROEs for utilities reached record low levels in 2020 and 2021 due to the record low interest rates and capital costs. However, authorized utility ROEs never declined to the same extent that interest rates declined in these two years. This

implies that while utilities benefited from the low-cost environment, the benefit was not proportionally passed on to the ratepayers.

In Panel A of Table 4, I have averaged the 2018/2019 (pre-COVID period) figures and the 2020/2021 (COVID period) figures for the Treasury yields and authorized ROEs, and then compared the pre-COVID and COVID period ROEs and yields to those in 2022, 2023, and 2024 (post-COVID period). A key observation from Panel A of Table 4 is that authorized ROEs for electric and gas distribution companies, 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 and gas distribution companies averaged 9.38% and 9.65% in 2018 and 2019, respectively, and declined to an average of 9.07% and 9.51% in 2020 and 2021, respectively, a decline of only 31 and 14 basis points.

Table 4
Average Annual 30-Year Treasury Yields and Authorized ROEs
for Electric and Gas Distribution Companies

Panel A
2018–2021

	2018 Average	2019 Average	2018-19 Average	2020 Average	2021 Average	2020-21 Average	2020-21 Avg. Minus 2018-19 Avg.
30-Year Treasury Yield	3.11%	2.58%	2.85%	1.56%	2.06%	1.81%	-1.04%
Average Elec. Dist. ROE	9.38%	9.37%	9.38%	9.10%	9.04%	9.07%	-0.31%
Average Gas ROE	9.59%	9.72%	9.66%	9.46%	9.56%	9.51%	-0.14%

Panel B
2022–2024

	2022 Average	2022 Avg. Minus 2021 Avg.	2023 Average	2023 Avg. Minus 2022 Avg.	2024 Average	2024 Avg. Minus 2023 Avg.	2022-2024 Average	2022-24 Avg. Minus 2020-21 Avg.
30-Year Treasury Yield	3.11%	1.05%	4.03%	0.92%	4.41%	0.38%	3.85%	2.04%
Average Elec. Dist. ROE	9.11%	0.07%	9.24%	0.13%	9.53%	0.29%	9.29%	0.22%
Average Gas ROE	9.53%	-0.03%	9.64%	0.11%	9.72%	0.08%	9.63%	0.12%

Data Source: S&P Global Market Intelligence, RRA Regulatory Focus, 2025.

Panel B of Table 4 provides the authorized ROE and Treasury yield data for the post-Covid years 2022, 2023, and 2024. In 2022, the average daily 30-year Treasury yield increased by 105 basis points to 3.11%, while authorized ROEs for electric and gas distribution companies increased by 0.07% and -0.03% to 9.11% and 9.53%, respectively. Likewise, the average daily 30-year Treasury yield increased by 92 basis points to 4.03% in 2023, while authorized ROEs for electric and gas distribution companies increased by 0.13% and 0.11% to 9.24% and 9.64%, respectively. In 2024, the average daily 30-year Treasury yield increased by 38 basis points to 4.41%, while authorized ROEs for electric and gas distribution companies increased by 0.29% and 0.08% to 9.53% and 9.72%, respectively.

In sum, the far-right column of Panel B of Table 4 shows the average authorized ROEs and 30-year Treasury yields for the Covid period (2020-21) and the post-Covid years (2022-23-24). The figures show that whereas the average 30-year Treasury yield has increased by 2.04% or 204 basis points in the post-Covid years (2022-24), the authorized ROEs for electric and gas distribution companies only increased by 0.22% and 0.12%. Hence, the bottom line is that since authorized ROEs never declined as much as interest rates during the Covid years, they are now not increasing at the same pace as interest rates during the post-Covid years.

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

A. Table 5 shows the rate case outcomes for electric and gas distribution companies in California over the 2010-25 time period. Authorized ROEs for electric utilities and gas distribution companies in California have primarily been in the 10.0%-10.5% range in the past five

years, averaging 50 to 100 basis points above national averages. In the Company's last rate case in Docket A-19-08-015, with an Order date of March 25, 2021, the Company entered into a settlement that provided for a 10.00 return on equity and a capital structure with a common equity ratio of 52.00%.

Table 5
California Electric and Gas Rate Cases
2020-2025

Company	TKR	Docket	Service	Type	Date	Decision	Rate Increase	Rate of Return	ROE	CE Ratio
PacifiCorp	BRK.A	A-18-04-002	Electric	Vertically Integrated	2/6/2020	Fully Litigated	(5.8)	NA	10.00	51.96
Liberty Utilities (CalPeco Ele	AQN	A-18-12-001	Electric	Vertically Integrated	8/27/2020	Fully Litigated	1.4	7.63	10.00	52.50
Pacific Gas and Electric Co.	PCG	A-18-12-009 (Elec)	Electric	Vertically Integrated	12/3/2020	Settled	534.0	NA	NA	NA
Pacific Gas and Electric Co.	PCG	A-18-12-009 (Gas)	Natural Gas	Distribution	12/3/2020	Settled	51.0	NA	NA	NA
Southern California Edison Co.	EIX	A-19-08-013 (Track 2	Electric	Limited-Issue Rider	1/14/2021	Settled	391.3	NA	NA	NA
Southwest Gas Corp.	SWX	A-19-08-015 (SoCal)	Natural Gas	Distribution	3/25/2021	Settled	3.0	7.11	10.00	52.00
Southwest Gas Corp.	SWX	A-19-08-015 (NoCal	Natural Gas	Distribution	3/25/2021	Settled	0.0	7.44	10.00	52.00
Southwest Gas Corp.	SWX	A-19-08-015 (LkTah	Natural Gas	Distribution	3/25/2021	Settled	3.4	7.44	10.00	52.00
Southern California Edison Co.	EIX	A-19-08-013 (Track 1	Electric	Vertically Integrated	8/19/2021	Fully Litigated	489.3	7.68	NA	NA
Southern California Edison Co.	EIX	A-19-08-013 (Track 3	Electric	Limited-Issue Rider	6/30/2022	Fully Litigated	385.2	NA	NA	NA
Pacific Gas and Electric Co.	PCG	A-21-08-015	Electric	Vertically Integrated	11/3/2022	Fully Litigated	NA	7.81	10.25	52.00
San Diego Gas & Electric Co.	SRE	A-21-08-014 (Elec)	Electric	Vertically Integrated	11/3/2022	Fully Litigated	NA	7.55	10.20	52.00
San Diego Gas & Electric Co.	SRE	A-21-08-014 (Gas)	Natural Gas	Distribution	11/3/2022	Fully Litigated	NA	7.55	10.20	52.00
Southern California Edison Co.	EIX	A-21-08-013	Electric	Vertically Integrated	11/3/2022	Fully Litigated	NA	7.68	10.30	52.00
Pacific Gas and Electric Co.	PCG	A-22-04-008	Electric	Vertically Integrated	12/15/2022	Fully Litigated	(9.0)	7.27	10.00	52.00
San Diego Gas & Electric Co.	SRE	A-22-04-012	Electric	Vertically Integrated	12/15/2022	Fully Litigated	(16.0)	7.18	9.95	52.00
Southern California Edison Co.	EIX	A-22-04-009	Electric	Vertically Integrated	12/15/2022	Fully Litigated	(106.0)	7.44	10.05	52.00
Southern California Gas Co.	SRE	A-22-04-011	Natural Gas	Distribution	12/15/2022	Fully Litigated	(36.0)	7.10	9.80	52.00
Pacific Gas and Electric Co.	PCG	A-22-12-009	Electric	Limited-Issue Rider	2/2/2023	Settled	1,037.9	NA	NA	NA
Liberty Utilities (CalPeco Ele	AQN	A-21-05-017	Electric	Vertically Integrated	4/27/2023	Fully Litigated	26.1	NA	10.00	52.50
Pacific Gas and Electric Co.	PCG	A-21-06-021 (Track 2	Electric	Limited-Issue Rider	11/16/2023	Settled	221.2	NA	NA	NA
Pacific Gas and Electric Co.	PCG	A-21-06-021 (Elec)	Electric	Vertically Integrated	11/16/2023	Fully Litigated	1,104.0	NA	NA	NA
Pacific Gas and Electric Co.	PCG	A-21-06-021 (Gas)	Natural Gas	Distribution	11/16/2023	Fully Litigated	202.0	NA	NA	NA
Southern California Edison Co.	EIX	A-19-08-013 (Track 4	Electric	Limited-Issue Rider	11/30/2023	Settled	790.0	NA	NA	NA
PacifiCorp	BRK.A	A-22-05-006	Electric	Vertically Integrated	12/14/2023	Fully Litigated	19.0	7.34	10.00	52.25
Pacific Gas and Electric Co.	PCG	dvice 4813-G/7046-	Electric	Vertically Integrated	12/22/2023	Fully Litigated	158.0	7.80	10.70	52.00
San Diego Gas & Electric Co.	SRE	e Letter 4300-E / 32	Electric	Vertically Integrated	12/22/2023	Fully Litigated	44.3	7.67	10.65	52.00
Southern California Edison Co.	EIX	e Letter 5120-E (U 3	Electric	Vertically Integrated	12/22/2023	Fully Litigated	200.7	7.87	10.75	52.00
Southern California Gas Co.	SRE	vice Letter No. 6207	Natural Gas	Distribution	12/22/2023	Fully Litigated	77.0	7.67	10.50	52.00
Pacific Gas and Electric Co.	PCG	-22-04-008 (Phase 2	Electric	Vertically Integrated	10/17/2024	Fully Litigated	(114.9)	7.66	10.28	NA
San Diego Gas & Electric Co.	SRE	-22-04-012 (Phase 2	Electric	Vertically Integrated	10/17/2024	Fully Litigated	(24.9)	7.45	10.23	NA
Southern California Edison Co.	EIX	-22-04-009 (Phase 2	Electric	Vertically Integrated	10/17/2024	Fully Litigated	(104.4)	7.66	10.33	NA
Southern California Gas Co.	SRE	-22-04-011 (Phase 2	Natural Gas	Distribution	10/17/2024	Fully Litigated	(28.9)	7.49	10.08	NA
San Diego Gas & Electric Co.	SRE	A-22-05-016 (Elec)	Electric	Vertically Integrated	12/19/2024	Fully Litigated	177.5	NA	NA	NA
San Diego Gas & Electric Co.	SRE	A-22-05-016 (Gas)	Natural Gas	Distribution	12/19/2024	Fully Litigated	11.1	NA	NA	NA
Southern California Gas Co.	SRE	A-22-05-015	Natural Gas	Distribution	12/19/2024	Fully Litigated	323.6	NA	NA	NA
Bear Valley Electric Svc Inc	AWR	A-22-08-010	Electric	Vertically Integrated	1/16/2025	Settled	13.1	8.07	10.00	57.00

Data Source: S&P Global Market Intelligence, RRA *Regulatory Focus*, 2025.

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

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

on page 1 of Exhibit JRW-3, gas distribution companies have been earning ROEs in the range of 8.0% to 10.0% in recent years. With such a ROE, gas distribution companies such as those in the proxy group have strong investment grade credit ratings, their stocks have been selling well over book value, and they have been raising large amounts of capital. While my recommendation is a little below the average authorized ROEs for gas distribution companies, it reflects current market conditions. Therefore, I believe that my ROE recommendation meets the criteria established in the *Hope* and *Bluefield* decisions.

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

A. The *Wall Street Journal* article, entitled "Utilities Have a High-Wire Act Ahead," discussed the issues utilities face today to meet the needs of their primary stakeholders – customers and investors.[5] The article also highlights current utility rate issues 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 compared the allowed rate of return on equity to a number of capital cost benchmarks (government and corporate bonds, CAPM equity cost rate estimates, and U.K. authorized ROEs) and focused on three questions: (1) To what extent are utilities being allowed to earn excess returns on equity 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?[6]

The authors reported the following empirical results:

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

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

(1) The real (inflation-adjusted) return regulators allow equity investors to earn has remained 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% to 5.50% above the cost of equity estimates;

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

(4) An extra 1.0% of allowed 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;

(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 (i.e., the time lag) for decreases is twice as long as for increases.

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

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

(8) The authors also indicated that their results are similar to those found in a previous study by Rode and Fischback (2019).[7]

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 overstated the actual cost of equity capital. Hence, the Commission should not be concerned that my recommended ROE is below other authorized ROEs.

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

III. PROXY GROUP SELECTION

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

A. To develop a fair rate of return recommendation for the Company, I evaluated the return requirements of investors on the common stock using two proxy groups: (1) Mr. D'Ascendis' proxy group of six gas distribution companies (Gas Proxy Group); and (2) a proxy group of ten publicly-held combination electric and gas distribution companies (Combination Proxy Group). Mr. D'Ascendis' Gas Proxy Group only includes six gas companies, and I do not believe that a proxy group of only six companies can produce reliable results.

Q. PLEASE DISCUSS THE FINANCIAL STATISTICS FOR THE GAS PROXY GROUP.

A. In Panel A of page 1 of Exhibit JRW-3, I list the summary financial statistics for the Gas Proxy Group. The mean operating revenues and net plant among members of the Gas Proxy Group are $2.86 billion and $10.67 billion, respectively. On average, the group receives 82% of revenues from regulated gas operations, has average issuer credit ratings from S&P and Moody's of A-/BBB+ and A3/Baa1, has an average common equity ratio of 43.4% and an average earned return on common equity of 8.60%.

Q. PLEASE DESCRIBE YOUR COMBINATION PROXY GROUP.

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

(1) Receives at least 20% of revenues from regulated gas distribution 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 is 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 Combination Proxy Group includes ten companies.[8] Panel B of Page 1 of Exhibit JRW-3 provides summary financial statistics for the proxy group, showing mean operating revenues and net plant among members of the Combination Proxy Group of $8.73 billion and $30.21 billion, respectively. On average, the group receives 59% of its revenues from regulated electric operations and 36% from regulated gas operations; has a BBB+ bond rating from S&P and a Baa2 rating from Moody's; has a current average common equity ratio of 41.7%; and an average earned return on common equity of 10.50%.

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. SWG's S&P and Moody's issuer credit ratings of BBB and Baa1. SWG's parent company, Southwest Gas Holdings ("SWX"), has S&P and Moody's issuer credit ratings of BBB- and Baa2, which indicates the parent company is a little riskier than SWG. The average S&P and Moody's issuer credit ratings for the Gas Proxy Group are A-/BBB+ and A3/Baa1 and for the

[8] MGE also reported regulated gas revenues of greater than 20%, but the company did not have EPS projected growth rates from S&P, Moody's, or S&P Cap IQ.

Combination Proxy Groups are BBB+ and Baa2. As such, SWG's S&P and Moody's issuer credit ratings are both below the average of the Gas Proxy Group. For the Combination Group, SWG's S&P rating of BBB is one notch below the group (BBB+) and SWG's Moody's rating of Baa1 is one notch above the group (Baa2). Overall, I believe that these ratings indicate that SWG's investment risk is a little above the gas group and is similar to the combination group.

Q. PLEASE DISCUSS THE RISK ANALYSIS YOU PERFORMED ON PAGE TWO OF EXHIBIT JRW-3.

A. On page 4 of Exhibit JRW-3, I use five different risk measures to assess the riskiness of the two 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 (0.92 vs. 0.96), financial strength (A vs. A) safety (1.8 vs. 1.9), earnings predictability (68 vs. 91), and stock price stability (89 vs. 87). Overall, these measures suggest that the investment risk of the two groups (1) is very low and (2) is similar to each other.[9]

[9] The average earnings predictability ("EP") score for the gas group of 68 is below the average for the combination group of 91. This relatively low figure is attributable to the low EP score for one company - NWN. However, given that the stock price stability for NWN is 89, it appears that the low EP score is not a significant risk factor in NWN's investment risk.

IV. CAPITAL STRUCTURE RATIOS AND DEBT COST RATES

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

A. Panel A of Exhibit JRW-4 provides SWG's proposed capital structure and debt cost rates for both SWG's Southern California and Northern California/South Lake Tahoe Rate Jurisdiction Districts. The Company has proposed a hypothetical capital structure with 50.00% long-term debt and 50.00% and common equity for both districts. The Company has proposed long-term debt cost rates of 4.14% for the Northern California District and 4.34% for the Northern California/South Lake Tahoe Districts.

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, 2023, the average common equity ratios for the Gas and Combination Proxy Groups were 43.4% and 41.7%. As such, the average common equity ratio for the proxy group companies includes a lower common equity ratio and higher financial risk than SWG's proposed hypothetical structure. That means the proposed capital structure includes more common equity and less financial risk, than do 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 SWG'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 SWG.

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

A. Yes. Short-term debt, like long-term debt, has priority over common equity 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 SWG'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 THE COMPANY'S PROPOSED CAPITALIZATION COMPARE TO THAT OF ITS PARENT COMPANY, SWX?

A. Page 2 of Exhibit JRW-4 provides the capitalization statistics for SWG and its parent, SWX, for the past five years. SWG's common equity ratio has been in the 48% range in the past year, both with and without short-term debt. On the other hand, SWX's common equity ratio has been in the 40% range (with and without short-term debt). Hence, the Company is proposing a capitalization with a much higher common equity ratio (50.0%) than that of its parent company (40.0%).

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

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

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

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

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

[10] *High Leverage at the Parent Often Hurts the Whole Family*, MOODY'S INVESTORS' SERVICE, May 11, 2015, at 1.

[11] *Id.* at 5.

> 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.

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.

[12] *Id.* at 1.

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 gas distribution companies range from 40% to 50%.

Q. GIVEN THAT THE COMPANY HAS PROPOSED AN EQUITY RATIO THAT IS HIGHER THAN THAT OF THE PROXY GROUP AND ITS PARENT, SWX, WHAT SHOULD THE COMMISSION DO IN THIS RATEMAKING PROCEEDING?

A. When a regulated utility's actual capital structure contains a high equity ratio, the options are: (1) to impute a more reasonable capital structure 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. PLEASE COMMENT ON MR. D'ASCENDIS' CAPITAL STRUCTURE STUDY PRESENTED IN EXHIBIT NO.__(DWD-2) AND DISCUSSED ON PAGES 16-19 OF HIS TESTIMONY.

A. Mr. D'Ascendis supports the Company's proposed capital structure in a study he performed in Exhibit No.__(DWD-2). On page 1 of Exhibit No.__(DWD-2) he reports

that the average 5-year common equity ratio of the proxy utilities has been 48.64%, which is similar to the capitalization maintained by the Company in the past year. On page 2 of Exhibit No.__(DWD-2) he reports that the 2023 average common equity ratio of operating subsidiaries of the proxy utilities was 51.38%.

There are two errors in his study. First, the operating subsidiary companies are not the proxy utility companies in their proxy group. The proxy utilities are the parent holding companies that own the operating companies. As shown in Exhibit JRW-3, the average common equity ratio for the parent holding companies in the Gas and Combination Proxy Groups as of December 31, 2023 were 43.4% and 41.7%. Hence, Mr. D'Ascendis' study does not support the Company's proposed capital structures since he did not use the actual proxy companies. Second, Mr. D'Ascendis' study does not include short-term debt for the proxy operating utilities. As discussed above, when assessing financial risk and computing a common equity ratio, it is appropriate to include short-term debt. As noted, 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. Therefore, the financial risk of a company is based on total debt, which includes both short-term and long-term debt. This is why credit rating agencies use total debt in assessing the leverage and financial risk of companies.

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

A. I am recommending a capital structure with a common equity ratio of 48.0% for both districts. This capitalization includes a common equity ratio that: (1) is consistent with the current capitalization of the Company, and includes a higher common equity ratio than the

Company has maintained in recent years; (2) represents the capitalization of the Company that has been used by S&P and Moody's to rate the Company's investment risk; and (3) includes a higher common equity ratio and lower financial risk than the average of the proxy groups and SWG's parent, SWX. I am using SWG's proposed long-term debt cost rates of 4.14% and 4.34% for both SWG's Southern California and Northern California/South Lake Tahoe Rate Jurisdiction Districts. My capital structure and debt cost rate recommendations are provided in Panel B of page 2 of Exhibit JRW-4.

V. THE COST OF COMMON EQUITY CAPITAL

A. Overview

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

A. In a competitive industry, the return on a firm's common equity capital is determined through the competitive market for its goods and services. Due to the capital requirements needed to provide utility services and the economic benefit to society from avoiding duplication of these services and the construction of utility-infrastructure facilities, most public utilities are monopolies. Because of the lack of competition and the essential nature of their services, it is not appropriate to permit monopoly utilities to set their own prices.

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

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

A. The total cost of operating a business includes the cost of capital. The cost of common-equity capital is the expected return on a firm's common stock that the marginal investor would deem sufficient to compensate for risk and the time value of money. In equilibrium, the expected and required rates of return on a company's common stock are equal. Normative economic models of a company or firm, developed under very restrictive assumptions, provide insight into the relationship between a firm's performance or profitability, capital costs, and the value of the firm. Under the economist's ideal model of perfect competition, where entry and exit are costless, products are undifferentiated, and there are increasing marginal costs of production, firms produce up to the point where price equals marginal cost. Over time, a long-run equilibrium is established where 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. 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.

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

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]

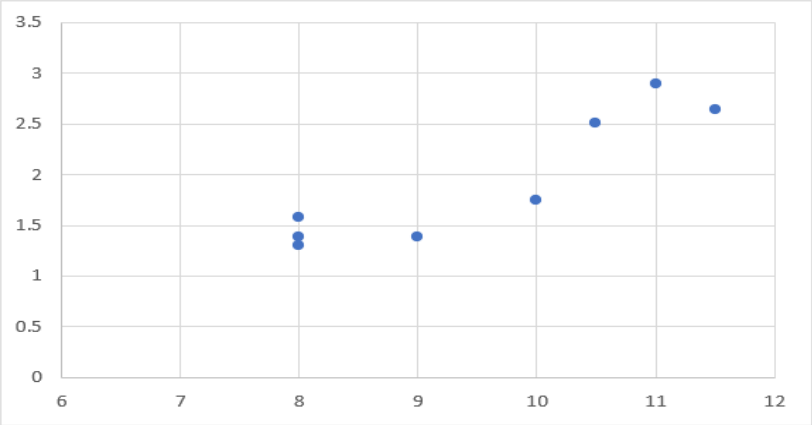
Profitability	*Value*
If ROE > K	*then Market/Book > 1*
If ROE = K	*then Market/Book =1*
If ROE < K	*then Market/Book< 1*

To assess the relationship by industry, as suggested above, I performed a regression study between estimated ROE and market-to-book ratios of gas companies. The results are presented in Figure 7. The average R-square is 0.83.[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 7
The Relationship Between Expected ROE and Market-to-Book Ratios
Gas Companies



R Square = 0.83, N=8.

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
Industry Average Betas*
Value Line Investment Survey Betas**

Industry Average Betas*
Value Line Investment Survey* Betas*
20-Feb-25

Rank	Industry	Beta	Rank	Industry	Beta	Rank	Industry	Beta
1	Hotel/Gaming	1.46	32	Electrical Equipment	1.21	63	Chemical (Basic)	1.07
2	Public/Private Equity	1.44	33	Computer Software	1.21	64	Human Resources	1.07
3	Advertising	1.41	34	Healthcare Information	1.21	65	Educational Services	1.07
4	Homebuilding	1.40	35	Toiletries/Cosmetics	1.20	66	Packaging & Container	1.06
5	Apparel	1.36	36	R.E.I.T.	1.19	67	Pipeline MLPs	1.06
6	Insurance (Life)	1.36	37	Machinery	1.19	68	Information Services	1.05
7	Air Transport	1.35	38	Bank	1.18	69	Retail Building Supply	1.04
8	Shoe	1.34	39	Paper/Forest Products	1.18	70	Railroad	1.04
9	Metals & Mining (Div.)	1.34	40	Med Supp Invasive	1.18	71	IT Services	1.04
10	Retail (Softlines)	1.33	41	Semiconductor	1.17	72	Retail Store	1.03
11	Auto Parts	1.32	42	Chemical (Diversified)	1.16	73	Cable TV	1.02
12	Building Materials	1.31	43	Computers/Peripherals	1.15	74	Investment Co.	0.99
13	Financial Svcs. (Div.)	1.30	44	Maritime	1.14	75	Electric Utility (West)	0.99
14	Metal Fabricating	1.30	45	Industrial Services	1.14	76	Telecom. Services	0.98
15	Oilfield Svcs/Equip.	1.29	46	E-Commerce	1.14	77	Med Supp Non-Invasive	0.98
16	Retail (Hardlines)	1.29	47	Reinsurance	1.14	78	Environmental	0.97
17	Power	1.28	48	Chemical (Specialty)	1.13	79	Electric Utility (East)	0.97
18	Furn/Home Furnishings	1.28	49	Publishing	1.13	80	Trucking	0.95
19	Restaurant	1.27	50	Entertainment	1.12	81	Natural Gas Utility	0.94
20	Entertainment Tech	1.27	51	Diversified Co.	1.11	82	Drug	0.93
21	Recreation	1.26	52	Precision Instrument	1.11	83	Electric Util. (Central)	0.93
22	Steel	1.26	53	Investment Co.(Foreign)	1.11	84	Beverage	0.92
23	Retail Automotive	1.26	54	Thrift	1.11	85	Tobacco	0.92
24	Automotive	1.25	55	Engineering & Const	1.10	86	Water Utility	0.88
25	Internet	1.25	56	Insurance (Prop/Cas.)	1.10	87	Precious Metals	0.85
26	Aerospace/Defense	1.24	57	Medical Services	1.10	88	Household Products	0.84
27	Petroleum (Producing)	1.24	58	Heavy Truck & Equip	1.10	89	Retail/Wholesale Food	0.83
28	Bank (Regional)	1.24	59	Electronics	1.09	90	Biotechnology	0.83
29	Petroleum (Integrated)	1.24	60	Telecom. Equipment	1.08	91	Food Processing	0.78
30	Semiconductor Equip	1.24	61	Natural Gas (Div.)	1.08			
31	Wireless Networking	1.22	62	Oil/Gas Distribution	1.07		Mean	1.14

* Industry averages for 91 industries using *Value Line*'s database of 1,700 companies - Updated 2-20-25.

** *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.

Table 6 provides an assessment of investment risk for 91 industries as measured by beta, which, according to modern capital market theory, is the only relevant measure of investment risk. These betas come from the *Value Line Investment Survey*. The study shows that the investment risk of utilities is low compared to other industries.[16] The average betas for electric, gas, and water utility companies are 0.96, 0.94, and .88, respectively.[17] As such, the cost of equity for utilities is among the lowest of all industries in the U.S., based on modern capital market theory.

Q. WHAT IS THE COST OF COMMON EQUITY CAPITAL?

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

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

[16] The overall stock market 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. However, *Value Line* betas are computed differently than betas from other sources, such as Yahoo Finance, and are generally higher than other betas. For example, as shown in Table 6, the average beta for all 1,700 companies covered by *Value Line* is 1.14 and not the market average of 1.00. This is discussed in more detail in the CAPM section of the testimony.

[17] The beta for the *Value Line* electric utilities is the simple average of *Value Line*'s Electric East (0.97), Central (0.93), and West (0.99) group betas.

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:

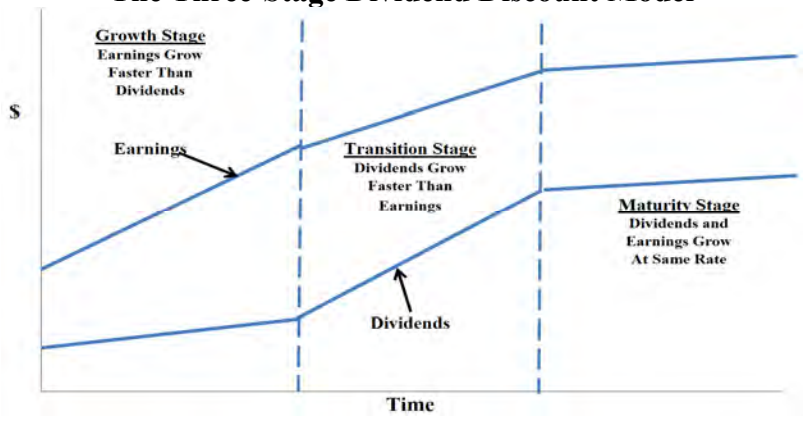
$$P = \frac{D_1}{(1+k)^1} + \frac{D_2}{(1+k)^2} + \cdots + \frac{D_n}{(1+k)^n}$$

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 8. 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 8
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:

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

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

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

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

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

Q. WHAT DIVIDEND YIELDS HAVE YOU REVIEWED?

A. I have calculated the dividend yields for the companies in the proxy groups using the current annual dividend and the 30-day, 90-day, and 180-day average stock prices. The dividend yields for the Gas Proxy Group are provided in Panel A of page 2 of Exhibit JRW-5. For the group, the mean and median dividend yields using the 30-day, 90-day, and 180 day average stock prices range from 3.6% to 3.8%. Hence, I will use 3.7% as the dividend yield for the Gas Proxy Group. The dividend yields for the Combination Proxy Group are provided in Panel B of page 2 of Exhibit JRW-5. For the group, the range of the mean and median dividend yields using the 30-day, 90-day, and 180-day average stock prices is 3.3% to 3.7%. Therefore I will use 3.5% as the dividend yield for the Combination Proxy Group.

Q. PLEASE DISCUSS THE APPROPRIATE ADJUSTMENT TO THE SPOT OR MOST CURRENT 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 Company that pays dividends on a quarterly basis.[18]

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

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

opposed to the coming year can be quite different. Consequently, it is common for analysts to adjust the dividend yield by some fraction of the long-term expected growth rate.

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

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

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

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 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 Company 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 Company (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, dividends 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.[19] Employing data over a twenty-year period, these authors demonstrate that using the most recent year's actual EPS figure to forecast EPS in the next 3-5 years proved to be just as accurate as using the EPS estimates from analysts' three-to-five year EPS growth-rate forecasts. In the authors' opinion, these results indicate that analysts' long-term earnings growth-rate forecasts should be used with caution as inputs for valuation and cost-of-capital purposes.

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

[19] 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.

has been demonstrated in a number of academic studies over the years.[20] 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.[21]

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

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

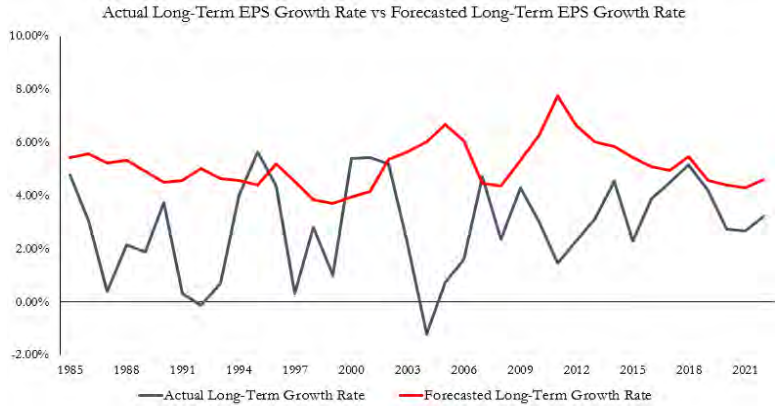
I collected the three-to-five-year projected EPS growth rate from I/B/E/S for each utility and compared that growth rate to the utility's actual subsequent three-to-five-year EPS growth rate. As shown in Figure 9, the mean forecasted EPS growth rate (depicted in the red line in Figure 9) is consistently greater than the achieved actual EPS growth rate over the time period, with the exception of short periods. Over the entire period, the mean

[20] 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).

[21] 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).

forecasted EPS growth rate is over 200 basis points above the actual EPS growth rate. As such, the projected EPS growth rates for electric utilities and gas distribution companies are overly optimistic and upwardly based.

Figure 9
Mean Forecasted vs. Actual Long-Term EPS Growth Rates
Electric Utilities and Gas Distribution Companies
1985–2023



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

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

A. Yes. A study by 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.[22]

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.,

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

2022 to 2024) to a future three-year projected period (e.g., 2028 to 2030). SCL used the 65 stocks included in the Dow Jones Indexes (30 Industrials, 20 Transports and 15 Utilities). SCL found that the projected annual stock returns for the Dow Jones stocks were "incredibly 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 believe that investors are well aware of the bias in analysts' EPS growth-rate forecasts, and therefore stock prices reflect the fact that analysts' projected EPS growth rates are upwardly 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 well 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 analysts' projected EPS growth rates 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 Gas Proxy Group, as provided in Panel A, range from 4.0% to 7.5%, with an average of the medians of 5.7%. For the Combination 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 4.5% to 6.0%, with an average of the medians of 5.1%.

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 Gas Proxy Group, as shown in Panel A of page 4 of Exhibit JRW-5, the medians range from 4.3% to 5.5%, with an average of the medians of 4.8%. The range of the medians for the Combination Proxy Group, shown in Panel B of page 4 of Exhibit JRW-5, is from 4.5% to 6.0%, with an average of the medians of 5.3%.

Also provided on page 4 of Exhibit JRW-5 are the prospective sustainable growth rates for the companies in the 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

and Combination Proxy Groups, the median prospective sustainable growth rates are 3.8%, and 4.5%, 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 Combination Proxy Groups are 6.6%/6.8% and 6.5%/6.3%, respectively.[23]

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 Gas Proxy Group imply a baseline growth rate of 5.7%. The average of the projected EPS, DPS, and BVPS growth rates from

[23] 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.

Value Line is 4.8%, and *Value Line*'s projected sustainable growth rate is 3.8%. The projected EPS growth rates of Wall Street analysts for the Gas Proxy Group are 6.6% and 6.8% (average = 6.7%) as measured by the mean and median growth rates. The overall range for the projected growth-rate indicators (ignoring historical growth) is 3.8% to 6.7% and the average of the three projected growth rates is 5.1% (4.8%, 3.8%, 6.7%). 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 5.1% to 6.7%. I will use the midpoint of this range, 5.9%, as my DCF growth rate for the Gas Proxy Group. This growth rate figure is in the upper end of the range of historic and projected growth rates for the Gas Proxy Group.

For the Combination Proxy Group, the historical growth rate indicators suggest a growth rate of 5.1%. The average of the projected EPS, DPS, and BVPS growth rates from *Value Line* is 5.3%, and *Value Line*'s projected sustainable growth rate is 4.5%. The projected EPS growth rates of Wall Street analysts are 6.5% and 6.3% (average = 6.4%) as measured by the mean and median growth rates. The overall range for the projected growth-rate indicators (ignoring historical growth) is 4.5% to 6.4% and the average of the three projected growth rates is 5.4% (5.3%, 4.5%, 6.4%). 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 range is 5.4% to 6.4%. I will use the midpoint of this range, 5.90%, as my DCF growth rate for the Combination Proxy Group. Similar to the Gas Proxy Group, this growth rate figure is in the upper end of the range of historic and projected growth rates for the Combination 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.[24]

Table 7
DCF-Derived Equity Cost Rate/ROE

	Dividend Yield	1 + ½ Growth Adjustment	DCF Growth Rate	Equity Cost Rate
Gas Proxy Group	**3.70%**	**1.0295**	**5.90%**	**9.70%**
Combination Proxy Group	**3.50%**	**1.0295**	**5.90%**	**9.50%**

The result for the Gas Proxy Group is the 3.70% dividend yield, times the one and one-half growth adjustment of 1.0295, plus the growth rate of 5.90%, which results in an equity cost rate of 9.70%. The result for the Combination Proxy Group is 9.50%, which includes a dividend yield of 3.50%, an adjustment factor of 1.0295, and a DCF growth rate of 5.90%.

C. Capital Asset Pricing Model

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

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

[24] The ROE numbers have been rounded to the nearest 0.05%.

$$k = R_f + RP$$

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:

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

Where:

K represents the estimated rate of return on the stock;
E(Rm) represents the expected return on the overall stock market. (Frequently, the 'market' refers to the S&P 500);
(*Rf*) represents the risk-free rate of interest;
[E(Rm) - (Rf)] 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 (*Rf*), the beta (ß), and the expected equity or market risk premium *[E(Rm) - (Rf)]*. *Rf* 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(Rm) - (Rf)*). I will discuss each of these inputs below.

Q. PLEASE DISCUSS YOUR CAPM STUDY IN EXHIBIT JRW-6.

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

Q. PLEASE DISCUSS THE RISK-FREE INTEREST RATE.

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

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

A. As shown on page 2 of Exhibit JRW-6, the yield on 30-year U.S. Treasury bonds has been in the 1.3% to 5.00% range over the 2010–2025 time period. The current 30-year Treasury yield is in the upper end 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."[26] The illiquidity and resulting yield distortion has also been highlighted in the financial

[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] 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.

press.[27] Given the recent range of yields, and recognizing the "hump," I am using the most recent 30-year Treasury yield of 4.60% as the risk-free rate, or R_f, in my CAPM.

Q. DOES THE 4.60% RISK-FREE INTEREST RATES TAKE INTO CONSIDERATION FORECASTS OF HIGHER INTEREST RATES?

A. No, it does not. Forecasts of higher interest rates have been notoriously wrong for a decade.[28] My 4.60% risk-free interest rate considers 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 4.60% is effectively a normalized risk-free rate of interest.

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

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

[28] Ben Eisen, "Yes, 100% of economists were dead wrong about yields, *Market Watch*," October 22, 2014. Perhaps reflecting this fact, *Bloomberg* reported that the Federal Reserve Bank of New York has stopped using the interest rate estimates of professional forecasters in the Bank's interest rate model due to the unreliability of those interest rate forecasts. See Susanne Walker and Liz Capo McCormick, "Unstoppable $100 Trillion Bond Market Renders Models Useless," *Bloomberg.com* (June 2, 2014). http://www.bloomberg.com/news/2014-06-01/the-unstoppable-100-trillion-bond-market-renders-models-useless.html. Joe Weisenthal, "How Interest Rates Keep Making People on Wall Street Look Like Fools," Bloomberg.com, March 16, 2015. http://www.bloomberg.com/news/articles/2015-03-16/how-interest-rates-keep-making-people-on-wall-street-look-like-fools. Akin Oyedele, "Interest Rate Forecasters are Shockingly Wrong Almost All of the Time," Business *Insider*, July 18, 2015. http://www.businessinsider.com/interest rate-forecasts-are-wrong-most-of-the-time-2015-7. "*Market Watch*," October 22, 2014.

market also has a beta of 1.0. A stock whose price movement is greater than that of the market, such as a technology stock, is riskier than the market and has a beta greater than 1.0. A stock with below average price movement, such as that of a regulated public utility, is less risky than the market and has a beta less than 1.0. Estimating a stock's beta involves running a linear regression of a stock's return on the market return.

As shown on page 3 of Exhibit JRW-6, the slope of the regression line is the stock's beta. A steeper line indicates that the stock is more sensitive to the return on the overall market. This means that the stock has a higher beta and greater-than-average market risk. A less steep line indicates a lower beta and less market risk. Several online investment information services, such as Yahoo and Reuters, provide estimates of stock betas. Usually these services report different betas for the same stock. The differences are usually due to: (1) the time period over which beta is measured; and (2) any adjustments that are made to reflect the fact that betas tend to regress to 1.0 over time.

Q. PLEASE DISCUSS THE 2020 CHANGE IN BETAS.

A. I have traditionally used the betas as provided in the *Value Line Investment Survey*. As discussed above, the betas for utilities recently increased significantly as a result of the volatility of utility stocks during the stock market meltdown associated with the novel coronavirus in March 2020. Utility betas as measured by *Value Line* were in the 0.55 to 0.70 range over the 2000-2020 time period. However, during Covid, utility stocks were much more volatile relative to the market in March and April of 2020, and this resulted in an increase to the average utility beta.

Value Line defines their computation of beta in the following manner:[29]

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

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

1. *Value Line* betas are computed using weekly returns, and the volatility of utility stocks during March 2020 was impacted by using weekly and not monthly returns. Yahoo Finance uses five years of monthly returns to compute betas, and Yahoo Finance's betas for utilities are lower than *Value Lin*e's.

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

3. Major vendors of CAPM betas such as Merrill Lynch, *Value Line*, and Bloomberg publish adjusted betas. The so-called Blume adjustment cited by *Value Line* adjusts betas calculated using historical returns data to reflect the tendency of stock betas to regress

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

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.[30]

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

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

A. In the past, I have used *Value Line* betas exclusively. However, given the discussion above, I am also using betas published by S&P Capital IQ. S&P Capital IQ computes betas over a five-year period using monthly returns and the S&P 500 as the market return. S&P Capital IQ does not use the Blume adjustment, but I have included that adjustment in my analysis. As shown on page 3 of Exhibit JRW-6, I have averaged the *Value Line* betas and my adjusted S&P Capital IQ betas for the proxy groups. The median betas for the Electric and Combination Proxy Groups are 0.82 and 0.82, respectively (Exhibit JRW-6, page 3).

Q. PLEASE DISCUSS THE MARKET RISK PREMIUM.

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

A. The market risk premium is equal to the expected return on the stock market (e.g., the expected return on the S&P 500, $E(R_m)$ minus the risk-free rate of interest (R_f)). The market risk premium is the difference in the expected total return between investing in equities and investing in "safe" fixed-income assets, such as long-term government bonds. However, while the market risk premium is easy to define conceptually, it is difficult to measure because it requires an estimate of the expected return on the market—$E(R_m)$. As I discuss below, there are different ways to measure $E(R_m)$, and studies have come up with significantly different magnitudes for $E(R_m)$. As Merton Miller, the 1990 Nobel Prize winner in economics, indicated, $E(R_m)$ is very difficult to measure and is one of the great mysteries in finance.[31]

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

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

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

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 Rajnish Mehra and Edward Prescott in which the authors first questioned the magnitude of historical equity risk premiums relative to fundamentals.[32]

In addition, there are a number of surveys of financial professionals regarding the market risk premium, as well as several published surveys of academics on the equity risk premium. Duke University, along with the Federal Reserve Bank of Richmond, has published a survey of over 200 CFOs on a quarterly basis for over 10 years.[33] Also, the Federal Reserve Bank of Philadelphia publishes its *Survey of Professional Forecasters* which includes questions regarding expected stock and bond returns.[34] This survey of

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

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

[34] *Survey of Professional Forecasters*, FEDERAL RESERVE BANK OF PHILADELPHIA, 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

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.[35]

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

A. Richard Derrig and Elisha Orr, Pablo Fernandez, and Zhiyi Song completed the most comprehensive reviews of the research on the market risk premium.[36] Derrig and Orr's study evaluated the various approaches to estimating market risk premiums, discussed the issues with the alternative approaches, and summarized the findings of the published research on the market risk premium. Fernandez examined four alternative measures of the market risk premium – historical, expected, required, and implied. He also reviewed the major studies of the market risk premium and presented the summary market risk premium results. Song provided an annotated bibliography and highlighted the alternative approaches to estimating the market risk premium.

Page 5 of Exhibit JRW-6 provides a summary of the results of the market risk premium studies that I have reviewed. These include the results of: (1) the various studies of the historical risk premium: (2) *ex ante* market risk premium studies; (3) market risk premium surveys of CFOs, financial forecasters, analysts, companies, and academics; and

each quarter. The Federal Reserve Bank of Philadelphia, in cooperation with the NBER, assumed responsibility for the survey in June 1990.

[35] Pablo Fernandez, Teresa Garcia, and Pablo Acín, SURVEY: MARKET RISK PREMIUM AND RISK-FREE RATE USED FOR 80 COUNTRIES IN 2024, IESE BUSINESS SCHOOL WORKING PAPER

[36] *See* Richard Derrig & Elisha Orr, *Equity Risk Premium: Expectations Great and Small (Version 3.0)*, Aug. 28, 2003); Pablo Fernandez, EQUITY PREMIUM: HISTORICAL, EXPECTED, REQUIRED, AND IMPLIED, IESE BUSINESS SCHOOL WORKING PAPER (2007); ZHIYI SONG, THE EQUITY RISK PREMIUM: AN ANNOTATED BIBLIOGRAPHY (The CFA Institute Research (2007).

(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 4.50%.

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 5.03%.

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

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

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

***Ex Ante* Models**: Market risk-premium studies that use expected or *ex ante* return models indicate a market risk premium in the range of 2.51% to 6.00%.

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

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

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

A. I will highlight several studies and surveys.

First, Pablo Fernandez conducts annual surveys of financial analysts and companies regarding the equity risk premiums used in their investment and financial decision-making.[37] His survey results are included on pages 5 and 6 of Exhibits JRW-6. The results of his 2024 survey of academics, financial analysts, and companies, which included 4,000 responses, indicated a mean market risk premium employed by U.S. analysts and companies of 5.5%.[38] His estimated market risk premium for the U.S. has been in the 5.00% to 5.70% range in recent years.

Second, Professor Aswath Damodaran of New York University, a leading expert on valuation and the market risk premium, provides a monthly updated market risk premium based on projected S&P 500 EPS and stock-price level and long-term interest rates.[39] His estimated market risk premium has been in the range of 4.0% to 6.0% since

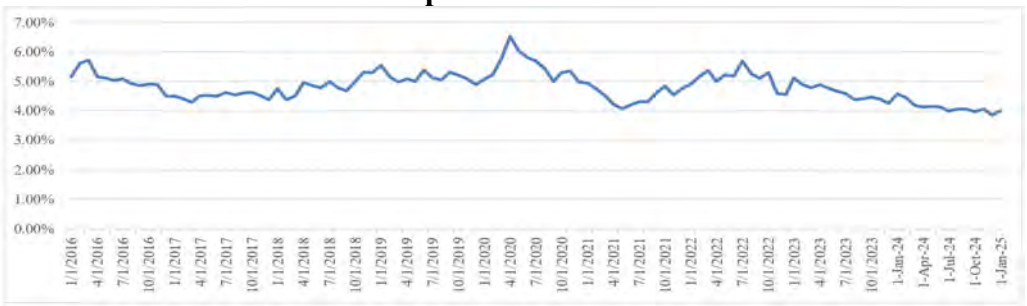
[37] Pablo Fernandez, Teresa Garcia, & Pablo Acín, *Survey: Market Risk Premium and Risk-Free Rate Used for 80 Countries in 2024, IESE Business School Working Paper* (March 2024).

[38] *Id.* at 3.

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

2010. As shown in Figure 10 as of March 1, 2025, Damodaran's estimate of the equity risk premium was 4.12%.[40]

Figure 10
Damodaran Implied Market Risk Premium



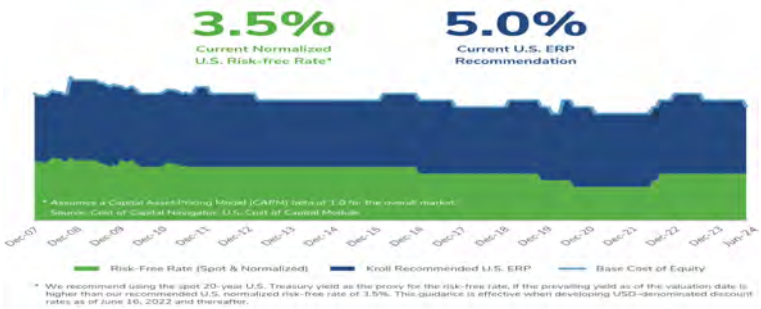
Source: http://pages.stern.nyu.edu/~adamodar/.

Next, as explained previously, Kroll provides recommendations for the normalized risk-free interest rate and market risk premiums to be used in calculating the cost-of-capital data. Its recommendations over the 2008 to 2023 period are shown on page 7 of Exhibit JRW-6 and are also depicted graphically in Figure 11 below. Over the past decade, Kroll's recommended normalized risk-free interest rates have been in the 2.50% to 4.50% range and market risk premiums have been in the 5.0% to 6.0% range. Most recently, Kroll reduced its market risk premium from 5.50% to 5.00% on June 5, 2024.[41]

[40] *Id.* On August 12, 2023, Professor Damodaran appeared on CNBC to discuss the equity risk premium. *See* CNBC Television, *Equity Risk Premium is Core to Understanding Long-Term Market Returns, says NYU Aswath Damodaran*, YouTube https://www.youtube.com/watch?v=VPkQ7_3Sf1E (last visited Apr. 24, 2024)).

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

Figure 11
Kroll
Normalized Risk-Free Rate and Market Risk Premium Recommendations
2007–2024



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

Fourth, Dr. David Kelly, the Chief Global Strategist at J.P. Morgan Asset Management, is one of the best-known market strategists on Wall Street. His annual publication, the *JP Long-Term Capital Markets Assumptions*, is a must-read guide for stockbrokers and financial professionals.[42] In presenting their annual expectations for the markets, JP Morgan provides details about inputs and assumptions of expected market returns. In its 2025 update, JP Morgan details the 2025 expected long-term stock market return of 6.70%, bond yield of 3.80%, and resulting market risk premium of 3.90%.[43]

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 12, which was as high as 6.75% in 2020, and was lowered to as low as 5.00% on September 30, 2021. KPMG increased its market risk premium to

[42] JP Morgan, *2025 Long-Term Capital Market Assumptions*, (2025), p. 30.

[43] *Id.*

6.00% on June 30, 2022, but lowered it to 5.75% on December 31, 2022, to 5.50% on March 31, 2023, to 5.25% on June 30, 2023, and to 5.00% on September 30, 2023.[44]

Figure 12
KPMG
Market Risk Premium Recommendations
2020–2025

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

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

A. The studies on page 6 of Exhibit JRW-6 and, more importantly, the more timely and relevant studies cited in the previous section, suggest that the appropriate market risk premium in the U.S. is in the 4.0% to 6.0% range. In the last year, as interest rates have increased, estimates of the market risk premium have declined. I give most weight to the market risk-premium estimates of Kroll, KPMG, JP Morgan, Damodaran, and the

[44] *KPMG Corporate Finance & Valuations NL Recommends A MRP of 5.0% as per March 31, 2024*, KMPG (Mar. 31, 2024).
https://indialogue.io/clients/reports/public/5d9da61986db2894649a7ef2/5d9da 63386db2894649a7ef5.

Fernandez and Duke-CFO surveys. Given the recent estimates, I believe a market risk premium in the 5.00% range should be used in my CAPM study.

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

A. The results of my CAPM study for the proxy group are summarized on page 1 of Exhibit JRW-6 and in Table 8.[45]

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
Gas Proxy Group	**4.60%**	**0.82**	**5.00%**	**8.70%**
Combination Proxy Group	**4.60%**	**0.82**	**5.00%**	**8.70%**

For the Gas Proxy Group, the risk-free rate of 4.60% plus the product of the beta of 0.82 times the equity risk premium of 5.00% results in an 8.70% equity cost rate. For the Combination Proxy Group, the risk-free rate of 4.60% plus the product of the beta of 0.82 multiplied by the equity risk premium of 5.00% results in an 8.70% equity cost rate.

D. Equity Cost Rate Summary

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

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

Table 9
ROEs Derived from DCF and CAPM Models

	DCF	CAPM
Gas Proxy Group	**9.50%**	**8.70%**
Combination Proxy Group	**9.70%**	**8.70%**

[45] These ROE numbers have been rounded to nearest 0.05%.

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

A. Given these results, my analysis indicates that an equity cost rate in the range of 8.70% to 9.70% is appropriate for gas companies at this time. Given these results as well as the fact that: (1) I rely primarily on the DCF Model; (2) SWG'S investment risk is similar to the proxy groups; (3) I have employed a capital structure that has more common equity and less financial risk than the proxy groups; and (4) the Gas Proxy Group is small so I give it less weight, I conclude that a ROE in the range of 9.00% to 9.50% is appropriate for a gas company at this time. I would normally employ the midpoint of this range, but since SWG's investment risk is a little above the average of the gas group, I will use the upper end of the range, 9.50%, as a ROE for SWG. My overall recommended rates of return are 6.71% for the Southern California District and 6.82% for the Northern California/South Lake Tahoe Districts.

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

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

As shown on page 3 of Exhibit JRW-2, utilities have been earning ROEs of about 9.0% (on average) in recent years. As shown on page 1 of Exhibit JRW-3, utilities in the proxy group earned an average ROE of 8.60% in 2023. And, as shown in Figure 2 (page 14), utilities have been raising about $100 billion a year in debt and equity capital in recent

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

1. I have employed a capital structure that has more equity and less financial risk than the average of the proxy groups;
2. As Table 6 (page 40) shows, the gas distribution 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.;
3. SWG's S&P and Moody's issuer credit ratings of BBB and Baa1. The average S&P and Moody's issuer credit ratings for the Gas Proxy Group are A-/BBB+ and A3/Baa1 and for the Combination Proxy Groups are BBB+ and Baa2. Overall, I believe that these ratings suggest that SWG is a little riskier than the gas group and similar in risk to the combination group.
4. On an annual basis, the authorized ROEs for gas distribution companies have increased from 9.47% in 2020, 9.56% in 2021, 9.53% in 2022, 9.64% in 2023, and 9.72% in 2024. However, as I previously discussed, the Werner and Jarvis (2022) study 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.

VI. CRITIQUE OF SWG'S RATE OF RETURN TESTIMONY

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

A. SWG has proposed a capital structure consisting of 0.0% short-term debt, 50.00% long-term debt and 50.00% common equity. The Company has proposed a long-term debt cost rate of 4.50%. The Company's ROE witness, Mr. D'Ascendis, has recommended a common equity cost rate of 11.35% for the Company. The Company's overall recommended rates of return are 7.75% for the Southern California District and 7.85% for the Northern California/South Lake Tahoe Districts. These are presented in Exhibit JRW-7.

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) the Company's investment risk; (4) the Gas Proxy Group; (5) DCF Approach; (4) CAPM Approach; (5) the risk premium approach; (6) the equity cost models applied to non-price regulated companies; and (7) other factors - notably a size premium and the flotation cost adjustment.

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

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

A. Mr. D'Ascendis developed a proxy group of gas distribution companies and employs DCF, CAPM, and his alternative risk premium model. Mr. D'Ascendis' equity cost rate estimates for SWG are summarized on page 2 Exhibit JRW-7. Based on these figures, Mr. D'Ascendis concludes that the appropriate equity cost rate is 11.35% for SWG's gas distribution operations.

A. DCF Approach

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

A. On pages 21-3 of his testimony and in Exhibit No.__(DWD-3), Mr. D'Ascendis develops an equity cost rate by applying the DCF model to his proxy group. Mr. D'Ascendis' DCF results are summarized on page 2 of Exhibit JRW-7. In the traditional DCF approach, the equity cost rate is the sum of the dividend yield and expected growth. Mr. D'Ascendis uses a sixty-day period to compute an average dividend yield in his DCF analysis. In the constant-growth DCF models, Mr. D'Ascendis has relied on the forecasted EPS growth rates of Zacks, Yahoo Finance, and *Value Line*. Based on these figures, Mr. D'Ascendis reports a DCF equity cost rate of 9.99%.

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

A. There are two issues with Mr. D'Ascendis' DCF study: (1) in his final analysis and recommendation he gives very little weight to his DCF results; 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. <u>The Low Weight Given the DCF Results</u>

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. The average of his mean constant-growth DCF equity cost rates is only 9.99% for his gas group. However, he claims that his recommended range of equity

cost estimates is 10.46% to 12.48% for the Gas Proxy Group. Had he given his DCF results more weight, he would have arrived at a lower recommendation for his estimated cost of equity.

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

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

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

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

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

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

term-earnings growth-rate forecasts, the weight given to analysts' projected EPS growth rates, should be limited.

Finally, not only are those forecasts inaccurate but they also are overly optimistic and upwardly biased. I have provided a discussion of this issue on page 51 of this testimony and report on a study I conducted in Figure 9 (page 53). Using the electric utilities and gas distribution companies covered by *Value Line*, this study demonstrates that *Value Line's* mean forecasted EPS growth rates are consistently greater than the achieved actual EPS growth rates over the 1985-2023 time period. Over the entire period, the mean forecasted EPS growth rate is over 200 basis points above the actual EPS growth rate. As such, the projected EPS growth rates for utilities are overly optimistic and upwardly based. Hence, exclusively using these growth rates as a measure of the DCF growth rate produces an overstated equity-cost rate. I also highlighted a study by Szakmary, Conover, and Lancaster (2008) who evaluated the accuracy of *Value Line's* three-to-five-year EPS growth rate forecasts using companies in the Dow Jones Industrial Average over a thirty-year time period and found these forecasted EPS growth rates to be significantly higher than the EPS growth rates that these companies subsequently achieved.[46]

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

A. No. A number of studies I cite above demonstrate the upward bias has continued despite changes in regulations and reporting requirements over the past two decades. This

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

observation is supported further by a 2010 McKinsey study entitled "Equity Analysts: Still Too Bullish," which involved a study of the accuracy of analysts' long-term EPS growth rate forecasts. The authors conclude that, after a decade of stricter regulation, analysts' long-term earnings forecasts continue to be excessively optimistic. They made the following observation:[47]

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

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

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

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

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

B. Risk-Premium Approach

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

A. On pages 23-35 of his testimony and in Exhibit No.__(DWD-4), Mr. D'Ascendis develops an equity cost rate by using the RPM model. Mr. D'Ascendis reports an RPM equity cost rate of 10.82% for his gas group. He uses a projected A2 rated bond yield of 5.65% and a risk premium of 5.17%. For the group, the risk premium of 5.17% in his 10.82% RPM cost of equity estimate is the average of three risk premium estimates: (1) his total market return - beta approach of 6.20%; (2) a historic risk premium of 4.51% based on historic utility stock and bond returns; and (3) a risk premium of 4.79% based on a regression of authorized gas company ROEs and utility bond yields.

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 INITIALLY IDENTIFY THE OTHER ERRORS IN THE RISK PREMIUMS IN MR. D'ASCENDIS' RISK-PREMIUM STUDIES.

A. Mr. D'Ascendis performs a number of studies in developing his three risk premiums listed above. These follow three approaches:

(1) **The Projected Market Return Risk Premium** of 6.20% using his total market return - beta approach uses his projections of future stock-market returns;
(2) **The Historic Stock-Bond Return Risk Premium** of 4.51% based on historic utility stock and bond returns; and
(3) **The Authorized ROE Risk Premium** of 4.79% based on a regression of authorized gas company ROEs and utility bond yields.

The errors with these approaches are discussed below.

Q. PLEASE OUTLINE MR. D'ASCENDIS' MARKET RISK PREMIUM DERIVED FROM USING HIS PROJECTED MARKET RETURN – BETA APPROACH.

A. The components of Mr. D'Ascendis' projected market return- beta approach employs: (1) an expected market equity risk premium over corporate bonds, and (2) the beta. Then Mr. D'Ascendis develops three risk premiums using projected stock-market returns: (1) three market or equity risk premiums based on historical stock and bond returns; (2) a *Value Line*-based market risk premium; and (3) a combined *Value Line*, Bloomberg, and S&P Capital IQ-based equity risk premium. The various studies that produce this risk premium are shown in Table 10, which is from page 6 of Exhibit DWD-4.

Table 10
D'Ascendis Market Risk Premium Studies

Line No.	Equity Risk Premium Measure	Proxy Group of Six Natural Gas Distribution Companies
1.	Kroll Equity Risk Premium (1)	5.96 %
2.	Regression on Kroll Risk Premium Data (2)	6.92
3.	Kroll Equity Risk Premium based on PRPM (3)	8.46
4	Equity Risk Premium Based on Value Line Summary and Index (4)	6.91
5.	Equity Risk Premium Based on Bloomberg, Value Line, and S&P Global Market Intelligence S&P 500 Companies (5)	10.05
6.	Conclusion of Equity Risk Premium	7.66 %
7.	Adjusted Beta (6)	0.81
8.	Forecasted Equity Risk Premium	6.20 %

The first three approaches (1-3 above) use historic stock and bond returns to project a future market risk premium. In approach (4), he uses *Value Line's* projected stock-market return over the next five years. In approach (5) he calculates an expected market return by applying the DCF model to the S&P 500 using projected EPS growth rates from

Bloomberg, S&P Cap IQ, and from *Value Line.* One note on the risk premium results shown in Table 10: A market risk premium is normally defined as a market return minus the risk-free interest rate. These risk premiums are measured relative to the long-term A2 bond yield, which is higher than the Treasury yield of the same maturity. For example, as of January 27, 2025, the US Corporate AA yield was 5.01% while the 30-year Treasury yield was 4.76%. As such, the risk premiums listed in Table 10 would be 25-50 basis points higher if measured relative to Treasuries.

1. Market Risk Premiums Derived from Historic Bond and Stock Returns

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 risk-premium studies (1), (2), and (3) are based on historical stock and bond returns/yields. It is well-known and well-studied that using historical returns to measure an *ex ante* equity risk premium is erroneous and overstates the true market or equity risk premium.[49] 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.

[49] 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.

In addition, there are a myriad of empirical problems in the approach, which result in historical market returns producing inflated estimates of expected risk premiums. Among the errors are the U.S. stock market survivorship bias (the "Peso Problem"); the company survivorship bias (which posits that 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. Approaches (1), (2), and (3) use historical stock and bond return series that are compiled and published by Kroll.[50]

Q. IS KROLL A RESPECTED FINANCIAL FIRM?

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

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

[50] Kroll is a financial and risk advisory firm established in 1932 and based in New York City. In 2018, Kroll was acquired by Duff & Phelps. In 2021, Duff & Phelps decided to rebrand itself as Kroll, a process it completed in 2022.

A. In its Client Update on the equity risk premium, dated March 16, 2016, Kroll 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, Kroll 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.[51]

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

A. No.

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

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

> ERP is a forward-looking concept. It is an expectation as of the valuation date for which no market quotes are directly observable. While an analyst can observe premiums realized over time by referring to historical data (i.e., realized return approach or *ex post* approach), such realized premium data do not represent the ERP expected in prior periods, nor do they represent the current ERP estimate. Rather, realized premiums represent, at best, only a sample from prior periods of what may have then been the expected ERP. To the extent that realized premiums on the average equate to expected premiums in prior periods, such samples may be representative of current expectations. But to the extent that prior events that are not expected to recur caused realized returns to differ from prior expectations, such samples should be adjusted to remove the effects of these nonrecurring events. Such adjustments are needed to improve the predictive power of the sample.[52]

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

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

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

A. Yes. In fact, on the same site that Kroll sells their annual valuation handbook used by Mr. D'Ascendis, Kroll publishes its recommended estimate of the equity- or market-risk premium.[53] Page 7 of Exhibit JRW-6 of my testimony shows Kroll's equity-risk-premium recommendations.

As noted above, Kroll is currently recommending an equity of market risk premium of 5.00%. This is much below Mr. D'Ascendis' risk premiums using historic data, especially when you consider the risk premiums in Table 10 would be 25-50 basis points higher if measured relative to Treasury yields like the Kroll market risk premium of 5.0%. I find it puzzling that Mr. D'Ascendis would use the historical average annual stock return from the Kroll book and then ignore Kroll's recommendation as to the appropriate equity or market risk premium.

Q. DO YOU AGREE THAT THE U.S. EQUITY RISK PREMIUM OF 5.00% IS A REASONABLE AND WELL-SUPPORTED NUMBER IN THE CURRENT CAPITALIZATION CLIMATE?

A. Yes.

Q. PLEASE PROVIDE ADDITIONAL INSIGHTS INTO APPROACH (3), 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

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

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 gas company's projected equity risk premium was determined using statistical software.[54]

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

A. There are two primary issues with Mr. D'Ascendis' PRPM.

First, it is based on the historical relationship between stock and bond returns. The errors associated with computing an expected equity risk premium using historical stock and bond returns are addressed in detail above. 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 witnesses from his firm for over ten years, and I have never seen the approach adopted by any regulatory commission. The approach is effectively a black box approach, as it cannot be duplicated without access to Mr. D'Ascendis' proprietary software.

2. Market Risk Premium Derived from Expected Market Returns

Q. PLEASE DISCUSS THE MARKET RISK PREMIUMS DERIVED FROM EXPECTED STOCK MARKET RETURNS IN APPROACHES (4) AND (5).

[54] 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.

A. As noted above, in approach (4) he uses an expected market return based on *Value Line's* projected stock-market return over the next five years and in approach (5) he calculates an expected market return on the S&P 500 by applying the DCF model to the S&P 500 using projected EPS growth rates from Bloomberg, S&P Cap IQ, and from *Value Line.* As shown in Table 11, Mr. D'Ascendis uses expected stock-market returns of 12.05% and 15.19% (average = 13.62%) for the projected market return approaches (*Value Line* Expected Return and the Expected Return by applying the DCF model to the S&P 500 using the projected EPS growth rates from *Value Line*, Bloomberg, and S&P Cap IQ). With an S&P 500 dividend yield of 1.60% and a projected risk-free rate of 4.50%, the resulting average market risk premium of 9.12%. The key issue is that this average market risk premium of 9.12% is based on an expected S&P 500 market return of 13.62% which, in turn, is based on an average projected EPS growth rate from *Value Line*, Bloomberg, and S&P Cap IQ of 12.02% for the S&P 500 companies.

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

	VL Exp. Ret.	S&P 500 DCF Exp. Ret.	Average
Dividend Yield	1.60%	1.60%	1.60%
+ Expected EPS Growth	10.45%	13.59%	12.02%
= Expected Market Return	12.05%	15.19%	13.62%
+ Risk-Free Rate	4.50%	4.50%	4.50%
= Market Risk Premium	7.55%	10.69%	9.12%

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

A. No. Mr. D'Ascendis' average market risk premium from his two projected market return approaches, as shown in Table 11, is computed using an average expected market stock return of 13.62%, minus the risk-free interest rate of 4.50%, which produces an average market-risk premium for the two approaches of 9.12%. 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 market risk-premiums studies from the past fifteen years. Historic stock and bond returns suggest a market-risk premium in the 4.40% to 6.64% range, depending on whether one uses arithmetic or geometric mean returns. There have been many studies using *ex ante* models, and their market-risk premiums results vary from as low as 2.61% to as high as 6.00%. Finally, the market-risk premiums developed from surveys of analysts, companies, financial professionals, and academics suggest lower market-risk premiums, in a range of between 3.40% to 5.70%. The bottom line is that there is no support in historic return data, surveys, academic studies, or reports from investment firms for Mr. D'Ascendis' average projected market-risk premium of 9.12%. As discussed below, the reason is that they are based on unrealistic long-term, earnings-per-share growth rates.

Q. INITIALLY, PLEASE PROVIDE ADDITIONAL INSIGHTS INTO THE EXPECTED STOCK MARKET RETURN OF 13.62%.

A. Simply put, the assumption of a 13.62% expected stock market return is excessive and unrealistic. The compounded annual return in the U.S. stock market is about 10% (9.94%)

according to Damodaran between 1928–2024.[55] Mr. D'Ascendis' CAPM results assume that return on the U.S. stock market will be almost *40 percent higher* in the future than it has been in the past. The extremely high expected stock market return, and the resulting market risk premium and equity cost rate results, is directly related to computing the expected stock market return as the sum of the adjusted dividend yield plus the expected EPS growth rate of 12.02%.

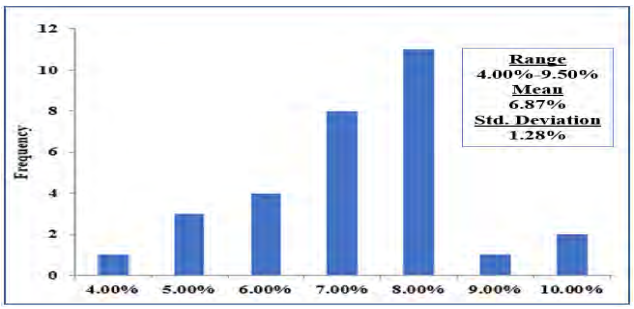
Q. IS MR. D'ASCENDIS' EXPECTED STOCK MARKET RETURN OF 13.62% REFLECTIVE OF THE STOCK MARKET RETURNS THAT INVESTMENT FIRMS TELL INVESTORS TO EXPECT?

A. No. And it's not even close. Many investment firms provide investors with their estimates of the annual stock returns that they should expect in the future. Most publish these expected returns in documents entitled "Capital Market Assumptions" and are available online at their websites. If you do an internet search for "Capital Market Assumptions," you get a long list of investment firms and their base case expected annual return assumptions for stocks, bonds, and other financial assets. In my search, I found thirty-one investment firms that published their capital market assumptions. These are listed in Exhibit JRW-8, and include many of the largest, best-known investment firms, including J.P. Morgan, BlackRock, BNY Mellon, Fidelity, Northern Trust, Vanguard, and State Street. Combined, these thirty firms manage over $50 trillion in assets under management. Figure 13 provides a histogram of the expected returns listed in Exhibit JRW-8. The average duration of the long-term forecasts is 10 years. The range of the forecasted U.S.

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

annual large cap equity returns is 4.00% to 9.50%. The mean and standard deviation of these expected returns are 6.87% and 1.28%.

Figure 13
Histogram of Investment Firm Expected Large Cap Equity Annual Returns
2023



Date Source: Exhibit JRW-8.

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

A. I have three comments: (1) These returns are below the historical average compounded annual stock market return of 9.80% cited above (more on this below); (2) the standard deviation of 1.28% is very low, which indicates that the expected returns provided by these firms are quite similar; and (3) these expected returns indicate Mr. D'Ascendis' expected stock market return of 13.62%, which he calculates with his own study applying the DCF model to the S&P 500 and using analysts projected EPS growth rates, is more than double the returns investment firms tell investors they should expect.

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

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

in, which lowers their future expected returns. Figure 14 provides Schiller's cyclically-adjusted PE ratio (CAPE) over the last one hundred-plus years. Stock prices have remained above the mean historical CAPE level of 17.22% since 2009, with a current level of 34.76. Hence, the higher valuation of the stock market leads to lower expected returns.

Figure 14
Schiller S&P 500 CAPE Ratio
2025

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

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

A. In approach (4), Mr. D'Ascendis develops a market-risk premium using *Value Line's* projected stock-market return over the next three-to-five-years. In the previously cited study by Szakmary, Conover, and Lancaster (2008), the authors also evaluated the accuracy of *Value Line's* three-to-five-year predicted annual stock return for the stock market over a thirty-year time period. SCL found that the projected annual stock returns for the Dow Jones stocks were "incredibly overoptimistic" and of no predictive value as the mean

annual projected stock return of 20% for the Dow Jones stocks was nearly double the realized annual stock return.[56]

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

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

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

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

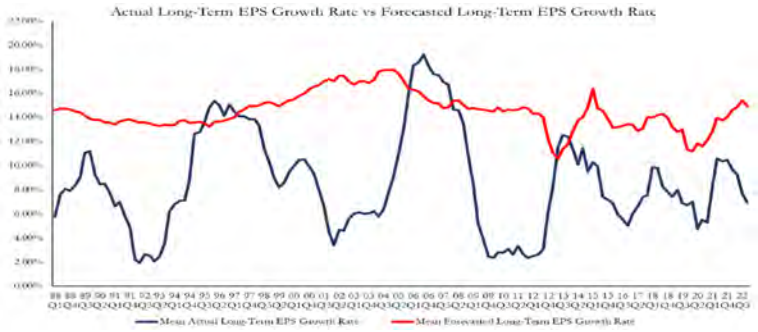
forecasts of the next single year's EPS growth.[58] The inaccuracy of analysts' growth-rate forecasts leads to an upward bias in equity cost estimates of about 300 basis points.[59]

I have also completed studies on the accuracy of analysts' projected EPS growth rates. In Figure 9 (page 52-53), 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 performed using all companies followed by I/B/E/S who have three-to-five-year EPS growth rate forecasts over the 1985 to 2023 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 15, 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.

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

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

Figure 15
Mean Forecasted vs. Actual Long-Term EPS Growth Rates
All Companies Covered by I/B/E/S
1985–2023



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

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

A. No. A number of the studies I have cited here demonstrate that the upward bias has continued despite changes in regulations and reporting requirements over the past two decades. This observation is highlighted by a 2010 McKinsey study entitled "Equity Analysts: Still Too Bullish," which involved a study of the accuracy of analysts' long-term, EPS-growth-rate forecasts and was discussed at pages 79-80 of this testimony. The authors conclude that after a decade of stricter regulation, analysts' long-term earnings forecasts continue to be excessively optimistic.

Q. IS THERE OTHER EVIDENCE THAT INDICATES THAT MR. D'ASCENDIS' PROJECTED MARKET RETURN AVERAGE RISK PREMIUM OF 9.12% 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,* BLOOMBERG, AND S&P CAP IQ 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 the average long-term EPS-growth rate of 12.02% is inconsistent with both historic and projected economic and earnings growth in the U.S for several reasons: (1) long-term EPS and economic growth is about one-half of Mr. D'Ascendis' average projected EPS growth rate of 12.02%; (2) as discussed below, long-term EPS and GDP growth are directly linked; and (3) more recent trends in GDP growth, as well as projections of GDP growth, suggest slower economic and earnings growth in the future.

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

Table 12
GDP, S&P 500 Stock Price, EPS, and DPS Growth
1960-2024

Nominal GDP	**6.43%**
S&P 500 Stock Price	**7.48%**
S&P 500 EPS	**7.05%**
S&P 500 DPS	**5.81%**
Average	**6.69%**

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, 12.02%, is at best, an outlier. His estimates suggest that companies in the U.S. would be expected to increase their growth rate of EPS in the future by more than 100% and maintain that growth indefinitely in an economy that is expected to grow at about one-third of Mr. D'Ascendis' projected growth rates.

There is a Direct Link Between Long-Term EPS and GDP Growth - The results in Exhibit JRW-9 and Table 12 show that historically there has been a close link between long-term EPS and GDP growth rates. Brad Cornell of the California Institute of Technology published a study on GDP growth, earnings growth, and equity returns. He finds that long-term EPS growth in the U.S. is directly related to GDP growth, with GDP growth providing an upward limit on EPS growth. In addition, he finds that long-term stock returns are determined by long-term earnings growth and that "real GDP growth in excess of 3 percent in the long run is highly unlikely in the developed world":

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

> real returns on U.S. common stocks to average no more than about 4–5 percent in real terms.[60]

The Trend Indicates Slower GDP Growth in the Future - The components of nominal GDP growth are real GDP growth and inflation. Annual Growth rates in nominal GDP are shown on page 2 of Exhibit JRW-9. The components of nominal GDP growth are real GDP growth and inflation. As discussed above and shown on pages 2-5 of Exhibit JRW-10, real GDP growth has gradually declined from the 5.0% to 6.0% range in the 1960s to the 2.0% to 3.0% range during recent years, with the exception of GDP growth in the Covid years of 2020-21. In addition, with the exception of the higher inflation tied to the Covid recovery in recent years, the annual growth rate as measured by the Consumer Price Index, has been in the 2.0%-3.0% range in recent years.

The graphs on pages 2, 3, and 4 of Exhibit JRW-9 provide evidence of the decline in nominal GDP as well as its components, real GDP and inflation, in recent decades. To gauge the magnitude of the decline in nominal GDP growth, Exhibit JRW-9 (page 5) and Table 13 provides the compounded GDP growth rates for 10-, 20-, 30-, 40- and 50- years. Whereas the 63 year-year compounded GDP growth rate is 6.45%, there has been a decline in nominal GDP growth over subsequent 10-year intervals. These figures suggest that nominal GDP growth in recent decades has slowed and that a growth rate in the range of 4.5%-5.0% to 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, 9.0% in 2022, and 6.1% in 2023. Page 3 of Exhibit JRW-9 shows the annual real GDP growth rate between 1961 and 2023. Real

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

GDP growth has gradually declined from the 5.0% to 6.0% range in the 1960s to the 2.0% to 3.0% range during the 2015–2019 period. Real GDP fell by 3.5% in 2020, but rebounded and grew by 5.7% in 2021, 2.0% in 2022, and 2.6% in 2023.

The second component of nominal GDP growth is inflation. Page 4 of Exhibit JRW-9 shows inflation as measured by the annual growth rate in the Consumer Price Index (CPI) from 1961 to 2023. The large increase in prices from the late 1960s to the early 1980s is readily evident. Equally evident is the rapid decline in inflation during the 1980s as inflation declined from above 10.0% to about 4.0%. 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 before slowing to 4.1% in 2023. Year-over-year inflation in 2022 jumped to 40-year highs in 2022 due to supply chain issues and the Russia-Ukraine conflict, but longer-term inflation is expected to be in the 2.0%–3.0% range.

The graphs on pages 2, 3, and 4 of Exhibit JRW-9 provide clear evidence of the decline, in recent decades, in nominal GDP as well as its components, real GDP, and inflation. To gauge the magnitude of the decline in nominal GDP growth, Table 13 provides the compounded GDP growth rates for 10-, 20-, 30-, 40- and 50- years. Whereas the 50-year compounded GDP growth rate is 6.16%, 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 4.5% 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 on page 5 of Exhibit JRW-9.

The mean 10-year nominal GDP growth forecast (as of February 2023) by economists in the recent *Survey of Financial Forecasters* is 4.40%.[61] The Energy Information Administration (EIA), in its projections used in preparing *Annual Energy Outlook*, forecasts long-term GDP growth of 4.3% for the period 2023 to 2053.[62] The Congressional Budget Office (CBO), in its forecasts for the period 2023 to 2053, projects a nominal GDP growth rate of 3.8%.[63] Finally, the Social Security Administration (SSA), in its Annual OASDI Report, provides a projection of nominal GDP from 2023 to 2100.[64] SSA's projected growth GDP growth rate over this period is 4.1%. The average projected GDP growth rate for these four forecasts is 4.15%.

[61] 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/.

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

[63] *The 2023 Long-Term Budget Outlook*, CONGRESSIONAL BUDGET OFFICE, July 15, 2023.

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

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 12.02% is almost three times the projected GDP growth.

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

A. As addressed in a study by the consulting firm McKinsey & Co., two factors drive real GDP growth over time: (1) the number of workers in the economy (employment); and (2) the productivity of those workers (usually defined as output per hour).[65] According to McKinsey, real GDP growth over the past fifty 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% to 2.1%.

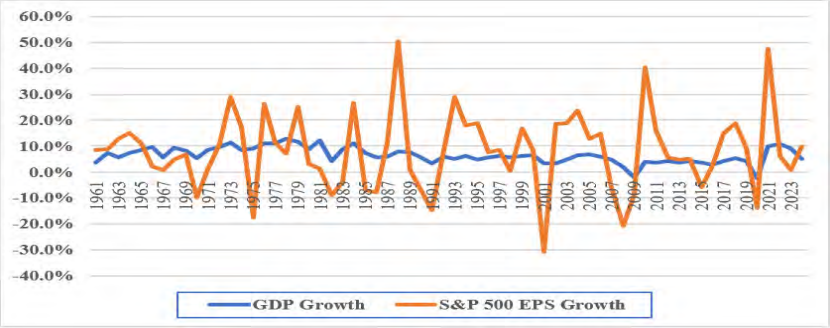
Q. OVER THE MEDIUM TO LONG RUN, IS S&P 500 EPS GROWTH LIKELY TO OUTPACE GDP GROWTH?

A. No. Figure 16 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

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

relatively short, and somewhat arbitrary, annual conventions used in these data.[66] Volatility aside, however, it is clear that over the medium to long run, S&P 500 EPS growth does not outpace GDP growth.

Figure 16
Average Annual Growth Rates
GDP and S&P 500 EPS - 1960-2024



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

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

Corporate Profits are Constrained by GDP – In a *Fortune* magazine article, Milton Friedman, the winner of the 1976 Nobel Prize in Economic Sciences, warned investors and others not to expect corporate-profit growth to sustainably exceed GDP growth, stating, "Beware of predictions that earnings can grow faster than the economy for long periods. When earnings are exceptionally high, they don't just keep booming."[67] In that same

[66] 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.

[67] 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/.

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 2024 figures, represent 6.43% of nominal GDP.

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

	2024 Value ($B)
Aggregate Net Income for S&P 500	**$1,912,184.00**
2024 Nominal U.S. GDP	**29,719,684.00**
Net Income/GDP (%)	**6.43%**

Data Sources: 2024 Net Income for S&P 500 companies
https://www.gurufocus.com/economic_indicators/5749/sp-500-net-income-ttm.
2024 Nominal GDP – https://fred.stlouisfed.org/series/GDP.

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.[68] These differences include: (a) corporate

[68] *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/.

profits are about 2/3 manufacturing driven, while GDP is 2/3 services driven; (b) consumer discretionary spending accounts for a smaller share of S&P 500 profits (15%) than of GDP (23%); (c) corporate profits are more international-trade driven, while exports minus imports tend to drag on GDP; and (d) S&P 500 EPS is 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.[69]

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' 12.02% 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 2024 aggregate net income for the S&P 500 companies and 2024 nominal GDP for the U.S. As shown in Table 14, the aggregate profit for the S&P 500 companies represented 6.43% of nominal GDP in 2024.

[69] 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.

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

	2024 Value ($B)	Growth Rate	No. of Years	2050 Value ($B)
Aggregate Net Income for S&P 500	**$1,912,184**	**12.02%**	**26**	**$36,577,537**
2024 Nominal U.S. GDP	**$29,719,684**	**4.15%**	**26**	**$85,543,166**
Net Income/GDP (%)	**6.43%**			**42.76%**

Data Sources: 2024 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 12.02%.
Nominal GDP Growth Rate – The average of the long-term projected GDP growth rates from CBO, SFF, SSA, and EIA (3.8%, 4.4%, 4.1%, and 4.3% = 4.15%).

In Table 15, I projected the aggregate net income level for the S&P 500 companies and GDP as of the year 2050. For the growth rate for the S&P 500 companies, I used Mr. D'Ascendis' average projected S&P 500 EPS growth rate of 12.02%. As a growth rate for nominal GDP, I use the average of the long-term projected GDP growth rates from CBO, SFF, SSA, and EIA (3.8%, 4.4%, 4.1%, and 4.3%, respectively), which is 4.15%. The projected 2050 level for the aggregate net income level for the S&P 500 companies is $36.58 trillion. Over the same period GDP is expected to grow to $85.54 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 6.43% of GDP in 2024 to 42.76% 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.

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%.[70]

In sum, Mr. D'Ascendis' average long-term S&P 500 EPS growth rate of 12.02% 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."[71]

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

[71] 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/.

3. Market Risk Premiums Derived from Authorized ROEs

Q. PLEASE DISCUSS MR. D'ASCENDIS' MARKET RISK PREMIUM DERIVED FROM AUTHORIZED ROES.

A. Mr. D'Ascendis also computes a market risk premium using based on a regression of authorized gas company ROEs and utility bond yields. The equity risk premium of 4.89% is the result of a regression analysis based on 836 regulatory awarded ROEs related to the yields on Moody's A2-rated public utility bonds during the period from January 1, 1980 through August 30, 2024. He adds this risk premium to the projected Aa bond rate of 5.43%.

Q. WHAT ARE THE ERRORS IN MR. D'ASCENDIS' MARKET RISK PREMIUM DERIVED FROM AUTHORIZED ROES?

A. There are several problems with this approach for calculating the risk premium.

First, Mr. D'Ascendis' risk premium is a gauge of *commission* behavior and not *investor* behavior. Capital costs are determined in the marketplace through the financial decisions of investors and are reflected in such fundamental factors as dividend yields, expected growth rates, interest rates, and investors' assessment of the risk and expected return of different investments. Regulatory commissions evaluate capital market data in setting authorized ROEs, but also consider other utility- and rate case-specific information in setting ROEs. As such, D'Ascendis' approach and results reflect other factors such as capital structure, credit ratings and other risk measures, service territory, capital expenditures, energy supply issues, rate design, investment and expense trackers, and other factors used by utility commissions in determining an appropriate ROE in addition to

capital costs. This may especially be true when the authorized ROE data includes the results of rate cases that are settled and not fully litigated.

Second, the methodology produces an inflated measure of the risk premium because it uses historic authorized ROEs and corporate bond yields, and the resulting risk premium is applied to projected Treasury Yields. Since corporate bond yields are always forecasted to increase, the resulting risk premium would be smaller if done correctly, which would be the result using projected corporate bond yields in the analysis rather than historic Treasury yields.

Third, since the stocks of gas utilities have been selling above book value for the last decade, the authorized ROEs of state utility commissions are clearly above the returns that investors require.

Fourth, the ROE derived from this approach is dependent on the authorized ROEs from state utility commissions. As discussed earlier in this testimony, Werner and Jarvis (2022), demonstrated that authorized ROEs over the past four decades have not declined in line with capital costs and therefore past authorized ROEs have overstated the actual cost of equity capital.

C. CAPM Approach

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

A. On pages 37-44 of his testimony and in Exhibit DWD-4, Mr. D'Ascendis develops an equity cost rate by using the CAPM. Mr. D'Ascendis uses both the CAPM and the so-called empirical CAPM approaches ("ECAPM"). Mr. D'Ascendis' reports CAPM and ECAPM

results of 11.69% for gas group. Mr. D'Ascendis uses a projected rate of 4.19% for the long-term Treasury bond, betas from *Value Line* and Bloomberg, and a market-risk premium of 8.63%. The market risk premium is the average of three *Value Line* and Bloomberg projected market-risk premiums which were reviewed above.[72]

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 9.87%. 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. The ECAPM is nothing more than an *ad hoc* version of the CAPM and has not been theoretically or empirically validated in refereed journals. The ECAPM provides for weights which are used to adjust the risk-free rate and market-risk premium in applying the ECAPM. Mr. D'Ascendis uses 0.25 and 0.75 factors to boost the equity risk premium measure, but provides no empirical justification for those figures.

[72] These include: (1) *Value Line's* projected stock market return over the next five years minus the yield on Aa 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.

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 9.87% using the same six approaches employed in his Risk-Premium approach. As discussed extensively on pages 88-100, the 8.63% market-risk premium is larger than published market-risk premiums, and is developed using highly unrealistic assumptions of future earnings growth and stock-market returns. The errors and erroneous assumptions in Mr. D'Ascendis' market risk premium calculations have already been covered and were discussed above at pages 62-81 of this testimony.

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

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

A. On pages 41-44 of his testimony and in Exhibit DWD-7, Mr. D'Ascendis has applied his equity cost rate approaches to a proxy group of non-price regulated companies. Mr. D'Ascendis' equity cost rate results are reported on page 2 of Exhibit JRW-7. He reports ROE results of 12.01% for unregulated companies "comparable" to his gas group. The non-price regulated group includes fifty-two companies.

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

A. These companies are listed in Exhibits DWD-7 of his testimony. This group includes such companies as Abbott Labs, Air Products, Apple, Microsoft, Lockheed, Oracle, and Pfizer. While many of these companies are large and successful, their lines of business are vastly different from the gas distribution businesses, and they do not operate in a highly regulated environment, and certainly none of these companies' product prices or profit margins are regulated. The issues with the risk premium and CAPM approached are the same as those discussed above. With respect to the DCF approach, the upward bias in the EPS growth rate forecasts of Wall Street analysts is particularly severe for non-price regulated companies such as those in this proxy group.

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

A. Yes. Figure 15 (page 94) shows that the mean analyst projected EPS growth rate for companies covered by I/B/E/S of 12.50%, was almost double the average actual achieved EPS growth rate of 6.50%. Hence, DCF estimates for non-price regulated companies using analysts' projected EPS growth rates, such as those in this group, are particularly overstated.

E. Other Factors

1. Size Adjustment

Q. PLEASE DISCUSS MR. D'ASCENDIS' COMPANY SIZE ADJUSTMENT.

A. Mr. D'Ascendis includes a size adjustment of 20 basis points to account for SWG's small size. This adjustment is based on the historical stock market returns studies as performed by Kroll. There are numerous errors in using historical market returns to compute risk premiums. These errors provide inflated estimates of expected risk premiums. Among the errors are survivorship bias (only successful companies survive – poorly managed companies do not) and unattainable return bias (the Ibbotson procedure presumes monthly portfolio rebalancing). The net result is that Ibbotson's size premiums are poor measures for risk adjustment to account for the size of a utility.

In addition, Professor Annie Wong has tested for a company size premium in utilities and concluded that, unlike industrial stocks, utility stocks do not exhibit a significant company size premium.[73] As explained by Professor Wong, there are several reasons why such a size premium would not be attributable to utilities. Utilities are regulated closely by state and federal agencies and commissions, and hence, their financial performance is monitored on an ongoing basis by both the state and federal governments.

In addition, public utilities must gain approval from government entities for common financial transactions such as the sale of securities (or the issuance of debt). Furthermore, unlike for

[73] Annie Wong, "Utility Stocks and the Size Effect: An Empirical Analysis," *Journal of the Midwest Finance Association* (1993), at 95–101.

their industrial counterparts, accounting standards and reporting are fairly standardized for public utilities.

Finally, a utility's earnings are predetermined to a certain degree through the ratemaking process in which performance is reviewed by state commissions and other stakeholders. Overall, in terms of regulation, government oversight, performance review, accounting standards, and information disclosure, utilities are much different than industrials, which could account for the lack of a company size premium.

Q. PLEASE DISCUSS THE RESEARCH ON THE COMPANY SIZE PREMIUM IN ESTIMATING THE EQUITY COST RATE.

A. As noted, there are errors in using historical market returns to compute risk premiums. With respect to the small firm premium, Richard Roll (1983) found that one-half of the historic return premium for small companies disappears once biases are eliminated, and historic returns are properly computed. The error arises from the assumption of monthly portfolio rebalancing and the serial correlation in historic small firm returns.[74]

Q. WHAT OTHER EVIDENCE CAN YOU PROVIDE REGARDING ISSUES RELATED TO THE SIZE PREMIUM?

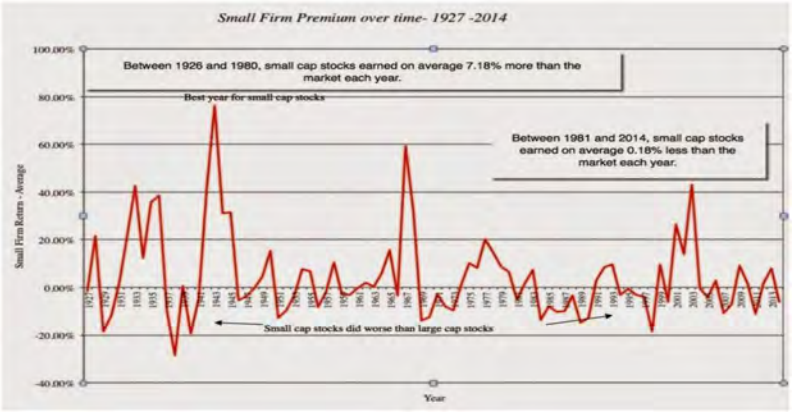
A. Professor Damodaran, a New York University valuation expert, provides a thorough analysis of the company size effect, which he terms the "small firm" or "cap premium." Figure 17 traces the small firm premium over the 1927 to 2014 time period.[75] Damodaran has studied the issue for years and makes a number of observations on the size premium or

[74] *See* Richard Roll, "On Computing Mean Returns and the Small Firm Premium," *Journal of Financial Economics* (1983), at 371–86.

[75] Damodaran, "The Small Cap Premium - Where is the Beef," *Business Valuation Review*: Winter 2015, Vol. 34, No. 4, pp. 152-157, 2015

effect: (1) the effect has largely disappeared since 1980, which is the year the Banz article was published; (2) the small firm premium tends to come and go over time; (3) the small firm premium tends to be associated with the January effect (small companies only earn abnormal returns in the first two weeks of January); (4) the small cap premium seems to actually be a microcap premium, as it disappears when companies with market capitalizations below $5 million are removed; (5) Damodaran does not find a small cap premium when he estimates a small firm required return; (6) he has never used a small cap premium when valuing small companies; and (7) he blames three factors for some analysts' continued use of a small cap premium: (i) intuition (it seems smaller companies should be riskier), (ii) inertia (individuals and institutions are slow to change and to adopt new ideas); and (iii) bias (analysts prefer higher discount rates and lower valuations). The annual small firm premium from 1926-7-2014 is shown in Figure 17.

Figure 17
The Small Firm Premium
1927-2014



Source: Aswath Damodaran, "The Small Cap Premium - Where is the beef," *Business Valuation Review*, Winter 2015, Vol. 34, No. 4, at 152–157.

2. Flotation Cost Adjustment

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

A. Mr. D'Ascendis also includes a flotation cost adjustment of 12 basis points to his equity cost rate approaches. This adjustment factor is erroneous for several reasons. First, he has not provided any evidence that the Company has paid flotation costs. The Company should not be rewarded with higher revenues (through a higher ROE) for expenses which it does not incur. In addition, it is commonly argued that a flotation cost adjustment (such as that used by the Company) is necessary to prevent the dilution of the existing shareholders. In this case, a flotation cost adjustment is justified by reference to bonds and the manner in which issuance costs are recovered by including the amortization of bond flotation costs in annual financing costs. However, this is incorrect for several reasons:

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

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

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

(4) Flotation costs, in the form of the underwriting spread, are a form of a transaction cost in the market. They represent the difference between the price paid by investors and the amount received by the issuing company. Whereas the Company believes that it should be compensated for these transaction costs, they have not accounted for other market transaction costs in determining a cost of equity for the Company. Most notably, brokerage fees that investors pay when they buy shares in the open market are

another market transaction cost. Brokerage fees increase the effective stock price paid by investors to buy shares. If the Company had included these brokerage fees or transaction costs in their DCF analysis, the higher effective stock prices paid for stocks would lead to lower dividend yields and equity cost rates. This would result in a downward adjustment to their DCF equity cost rate.

VII. SUMMARY AND CONCLUSIONS

Q. PLEASE SUMMARIZE YOUR TESTIMONY AS TO THE APPROPRIATE COST OF CAPITAL FOR SWG COMPANY.

A. In my recommendation, I have adjusted the Company's proposed capital structure, but I have still employed a capital structure that includes a higher common equity ratio and lower financial risk than the companies in the Gas Proxy Group. I am recommending a capital structure with a common equity ratio of 48.0% for both districts. This capitalization includes a common equity ratio that: (1) is consistent the current capitalization of the Company, and includes a higher common equity ratio than the Company has maintained in recent years; (2) represents the capitalization of the Company that has been used by S&P and Moody's to rate the Company's investment risk; and (3) includes a higher common equity ratio and lower financial risk than the average of the two proxy groups and SWG's parent, SWX. I am using SWG'S proposed long-term debt cost rates of 4.14% and 4.34% for both SWG's Southern California and Northern California/South Lake Tahoe Rate Jurisdiction Districts.

I have applied the Discounted Cash Flow ("DCF") Model and the ("Capital Asset Pricing Model ("CAPM")) to Mr. D'Ascendis' proxy group of publicly-held gas distribution companies ("Gas Proxy Group") as well as a proxy group of publicly-held combination electric and gas companies ("Combination Proxy Group"). D'Ascendis' Gas Proxy Group includes only six gas companies, and I believe that a proxy group of only six companies is too small of a group to provide reliable results. My analysis indicates that an equity cost rate in the range of 8.70% to 9.70% is appropriate for gas companies at this time. Given these results as well as the fact that: (1) I rely primarily on the DCF Model; (2) SWG's investment risk is a little above the average of the two proxy groups; (3) but I have employed a capital structure that has more common equity and less financial risk than the proxy groups; and (4) the Gas Proxy Group is small so I give it less weight, I conclude that a ROE in the range of 9.00% to 9.50% is appropriate for a gas company at this time. I would normally employ the midpoint of this range, but since SWG's investment risk is a little above the average of the gas group, I will use 9.50% as a ROE for SWG. My overall recommended rate of returns are 6.71% for the Southern California District and 6.82% for the Northern California/South Lake Tahoe Districts. 1This is summarized in Table 2 and Exhibit JRW-1.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes

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, Maine, Maryland, Massachusetts, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New Mexico, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, South Carolina, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, and Washington, D.C. He has also testified before the Federal Energy Regulatory Commission.

J. Randall Woolridge

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State College, PA 16801
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Academic Experience

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

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

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

Education

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

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*.

Exhibit No. JRW-1
Southwest Gas Corporation

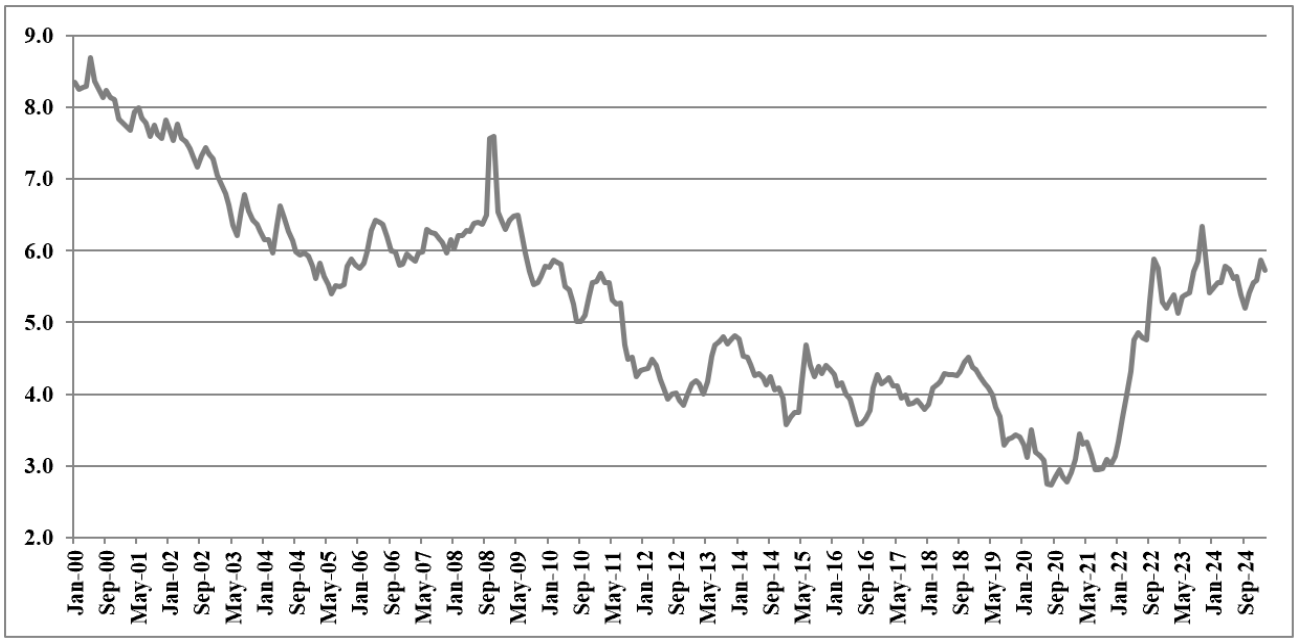
SWG's Southern California Rate Jurisdiction District

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	52.00%	4.14%	2.15%
Common Equity	48.00%	9.50%	4.56%
Total	100.00%		6.71%

SWG's Northern California and South Lake Tahoe Rate Jurisdiction District

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	52.00%	4.34%	2.26%
Common Equity	48.00%	9.50%	4.56%
Total	100.00%		6.82%

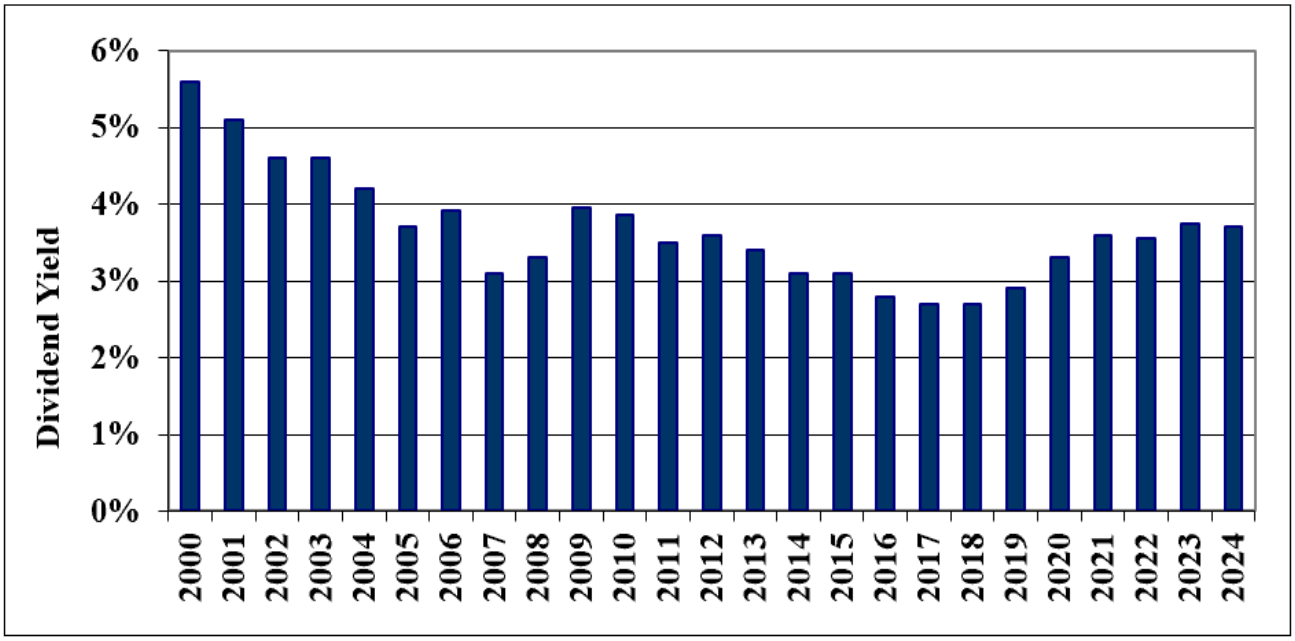
Exhibit No. JRW-2
Long-Term 'A' Rated Public Utility Bonds



Data Source: Mergent Bond Record

Exhibit No. JRW-2

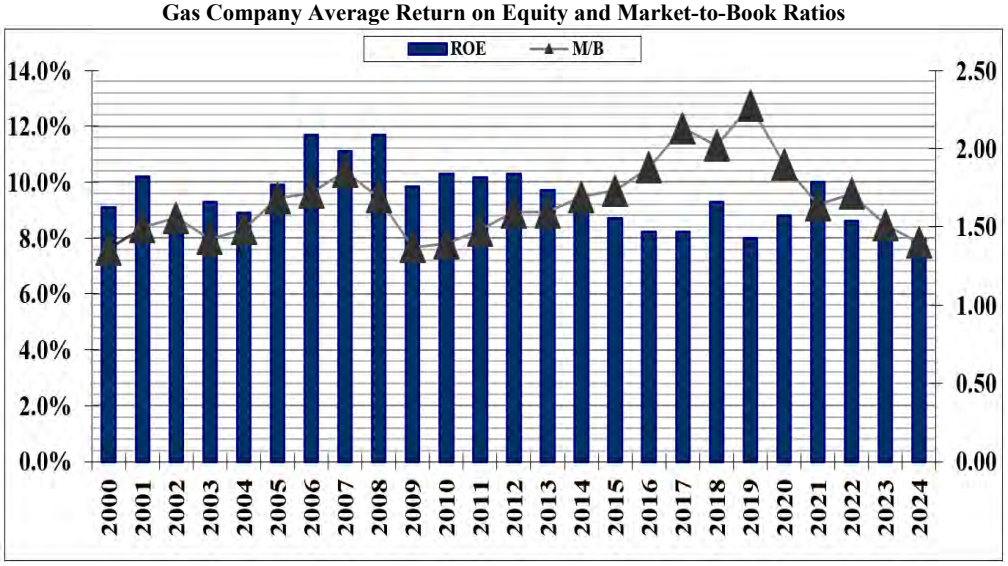
Gas Company Average Dividend Yield



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

Exhibit No. JRW-2

Gas Company Average Return on Equity and Market-to-Book Ratios



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

Exhibit No. JRW-3
Southwest Gas Corporation Company
Summary Financial Statistics for Proxy Group

Panel A
Gas Proxy Group

Company	SMBL	Operating Revenue ($bil)	Percent Elec Revenue	Percent Gas Revenue	Net Plant ($bil)	Market Cap ($bil)	S&P Issuer Credit Rating	Moody's Issuer Credit Rating	Pre-Tax Interest Coverage	Primary Service Area	Common Equity Ratio	Earned Return on Equity	Market to Book Ratio
Atmos Energy Company (NYSE-ATO)	ATO	$3.95	0%	95%	$20.32	16.97	A-	A1	7.95	10 States	59.9%	8.77	1.51
New Jersey Resources Corp. (NYSE-NJR)	NJR	$1.71	0%	39%	$5.27	4.11	NR	NR	3.19	NJ	38.0%	11.94	1.99
NiSource Inc (NYSE-NI)	NI	$5.35	35%	65%	$22.31	11.64	NR	Baa2	2.56	IN,OH,PA,KY,VA,MD,MA	35.5%	7.48	1.50
Northwest Natural Holdings (NYSE-NWN)	NWN	$1.20	0%	95%	$3.43	1.38	A-	NR	2.57	OR,WA	42.4%	7.63	1.07
ONE Gas, Inc.(NYSE-OGS)	OGS	$2.37	0%	100%	$6.16	3.34	A-	A3	3.24	OK,KS,TX	47.4%	8.64	1.21
Spire (NYSE-SR)	SR	$2.61	0%	95%	$6.56	3.25	BBB+	Baa2	2.16	MO	37.1%	7.15	1.16
Mean		$2.86	6%	82%	$10.67	$6.78	A-/BBB+	A3/Baa1	3.61		43.4%	8.60	1.40
Median		$2.49	0%	95%	$6.36	$3.72	A-/BBB+	A3/Baa1	2.88		40.2%	8.14	1.35

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

Panel B
Combination Proxy Group

Company	SMBL	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
Avista Corporation (NYSE-AVA)	AVA	$1.75	64%	22%	$5.84	2.64	BBB	Baa2	2.07	NY,CT,ME	44.8%	7.10	1.06
Black Hills Corporation (NYSE-BKH)	BKH	$2.33	35%	65%	$7.12	3.57	BBB+	Baa2	2.79	11 States	42.2%	8.63	1.11
CenterPoint Energy, Inc. (NYSE - CMP)	CNP	$8.70	44%	53%	$29.87	17.46	BBB+	Baa2	2.51	TX,IN,LA,MS,OH	34.2%	9.31	1.81
Consolidated Edison, Inc. (NYSE-ED)	ED	$14.66	67%	20%	$50.14	30.02	A-	Baa1	3.04	NY,PA	45.8%	11.97	1.42
CMS Energy Corporation (NYSE-CMS)	CMS	$7.46	68%	28%	$25.10	16.88	BBB+	Baa2	2.32	MI	31.8%	10.27	2.31
NorthWestern Corporation (NYSE-NWE)	NWE	$1.42	77%	23%	$6.04	2.97	BBB	Baa2	2.59	MT,SD,NE	49.9%	7.12	1.07
Public Service Enterprise Group Incorporated (N	PEG	$11.24	43%	57%	$38.21	30.70	BBB+	Baa2	5.54	NJ	43.1%	17.55	1.98
Sempra Energy (NYSE-SRE)	SRE	$16.72	41%	48%	$55.68	44.72	BBB+	Baa2	3.04	CA,TX	47.7%	11.50	1.56
WEC Energy Group (NYSE-WEC)	WEC	$8.89	73%	26%	$31.61	24.44	A-	Baa1	3.00	WI,IL,MN,MI	38.4%	11.23	2.08
Xcel Energy Inc. (NYSE-XEL)	XEL	$14.09	79%	20%	$52.51	32.35	BBB+	Baa1	2.48	MN,WI,ND,SD,MI	39.0%	10.33	1.84
Mean		$8.73	59%	36%	$30.21	$20.58	BBB+	Baa2	2.94		41.7%	10.50	1.62
Median		$8.79	66%	27%	$30.74	$20.95	BBB+	Baa2	2.69		42.7%	10.30	1.68

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

Atmos Energy Corporation
Comparison of Long-Term Issuer Ratings fo
Gas and Combination Proxy Group

	Moody's Long-Term Issuer Rating March 2025		Standard & Poor's Long-Term Issuer Rating March 2025	
Gas Proxy Group	**Long-Term Issuer Rating**	**Numerical Weighting**	**Long-Term Issuer Rating**	**Numerical Weighting**
Atmos Energy Corporation	A1	5.0	A-	7.0
New Jersey Resources Corporation	NR	- -	NR	- -
NiSource Inc.	Baa2	9.0	BBB+	8.0
Northwest Natural Holding Company	NR	- -	A-	7.0
ONE Gas, Inc.	A3	7.0	A-	7.0
Spire Inc.	Baa2	9.0	BBB+	8.0
Average	A3/Baa1	7.5	A-/BBB+	7.4
Combination Proxy Grou				
Avista Corporation (NYSE-AVA)	Baa2	9.0	BBB	9.0
Black Hills Corporation (NYSE-BKH)	Baa2	9.0	BBB+	8.0
CenterPoint Energy, Inc. (NYSE - CMP)	Baa2	9.0	BBB+	8.0
Consolidated Edison, Inc. (NYSE-ED)	Baa1	8.0	A-	7.0
CMS Energy Corporation (NYSE-CMS)	Baa2	9.0	BBB+	8.0
NorthWestern Corporation (NYSE-NWE	Baa2	9.0	BBB	9.0
Public Service Enterprise Group Incorpo	Baa2	9.0	BBB+	8.0
Sempra Energy (NYSE-SRE)	Baa2	9.0	BBB+	8.0
WEC Energy Group (NYSE-WEC)	Baa1	8.0	A-	7.0
Xcel Energy Inc. (NYSE-XEL)	Baa1	8.0	A-	7.0
Average	Baa2	8.7	BBB+	7.9

Date Source: S&P Cap IQ.

Numerical Assignment for
Moody's and Standard & Poor's Bond Ratings

Moody's Bond Rating	Numerical Bond Weighting		Standard & Poor's Bond Rating	Numerical Bond Weighting
Aaa	1		AAA	1
Aa1	2		AA+	2
Aa2	3		AA	3
Aa3	4		AA-	4
A1	5		A+	5
A2	6		A	6
A3	7		A-	7
Baa1	8		BBB+	8
Baa2	9		BBB	9
Baa3	10		BBB-	10
Ba1	11		BB+	11
Ba2	12		BB	12
Ba3	13		BB-	13
B1	14		B+	14
B2	15		B	15
B3	16		B-	16

Exhibit No. JRW-3
Docket No. A.24-09-001
***Value Line* Risk Metrics**

Panel A
Gas Proxy Group

Company	Beta	Financial Strength	Safety	Earnings Predictability	Stock Price Stability
Atmos Energy Company (NYSE-ATO)	0.90	A	1	100	95
New Jersey Resources Corp. (NYSE-NJR)	1.00	A	2	65	85
NiSource Inc (NYSE-NI)	0.95	A	2	70	95
Northwest Natural Gas Co. (NYSE-NWN)	0.90	A	2	20	85
ONE Gas, Inc. (NYSE-OGS)	0.85	B++	2	100	85
Spire (NYSE-SR)	0.90	B++	2	50	90
Mean	0.92	A	1.8	68	89

Data Source: *Value Line Investment Survey*, 2025.

Panel B
Combination Proxy Group

Company	Beta	Financial Strength	Safety	Earnings Predictability	Stock Price Stability
Avista Corporation (NYSE-AVA)	0.95	A	3	70	70
Black Hills Corporation (NYSE-BKH)	1.05	A	2	100	80
CenterPoint Energy, Inc. (NYSE - CMP)	1.15	A	3	60	80
CMS Energy Corporation (NYSE-CMS)	0.85	B++	2	90	95
Consolidated Edison, Inc. (NYSE-ED)	0.80	A+	1	100	90
NorthWestern Corporation (NYSE-NWE)	1.00	B++	2	95	90
Public Service Enterprise Group Incorporated	1.00	A	1	100	95
Sempra Energy (NYSE-SRE)	1.00	A	2	95	90
WEC Energy Group (NYSE-WEC)	0.90	A+	1	100	85
Xcel Energy Inc. (NYSE-XEL)	0.85	A	2	100	95
Mean	0.96	A	1.9	91	87

Data Source: *Value Line Investment Survey*, 2025.

Value Line Risk Metrics

Beta

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

Financial Strength

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

Safety Rank

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

Earnings Predictability

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

Stock Price Stability

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

Source: *Value Line Investment Analyzer* .

Exhibit No. JRW-4
Southwest Gas Corporation Company
Proposed Capital Structure and Debt Cost Rate

Panel A
SGC's Proposed Capital Structure and Debt Cost Rates

SGC's Southern California Rate Jurisdiction District

Capital Source	Capitalization Ratio	Cost Rate
Long-Term Debt	50.00%	4.14%
Common Equity	50.00%	
Total	100.00%	

GC's Northern California and South Lake Tahoe Rate Jurisdiction District

Capital Source	Capitalization Ratio	Cost Rate
Long-Term Debt	50.00%	4.34%
Common Equity	50.00%	
Total	100.00%	

Panel B
Public Advocate's Proposed Capital Structure and Debt Cost Rates

SGC's Southern California Rate Jurisdiction District

Capital Source	Capitalization Ratio	Cost Rate
Long-Term Debt	52.00%	4.14%
Common Equity	48.00%	
Total	100.00%	

GC's Northern California and South Lake Tahoe Rate Jurisdiction District

Capital Source	Capitalization Ratio	Cost Rate
Long-Term Debt	52.00%	4.34%
Common Equity	48.00%	
Total	100.00%	

Exhibit No. JRW-4
Southwest Gas Corporation Company
Quarterly Capital Structure Ratios - SWC and SWX

Panel A
SWC

	2020 FQ1	2020 FQ2	2020 FQ3	2020 FQ4	2021 FQ1	2021 FQ2	2021 FQ3	2021 FQ4	2022 FQ1	2022 FQ2	2022 FQ3	2022 FQ4	2023 FQ1	2023 FQ2	2023 FQ3	2023 FQ4	2024 FQ1	2024 FQ2	2024 FQ3	2024 FQ4
Short-Term Debt	222,000	125,000	0	57,656	292,000	566,000	525,000	525,000	500,000	225,000	225,000	225,000	450,000	0	0	0	0	0	0	0
Long-Term Debt	1,991,624	2,287,418	2,345,876	2,439,792	2,413,588	2,163,832	2,309,857	2,440,603	2,903,556	2,904,099	3,042,082	3,251,296	3,497,977	3,499,819	3,500,684	3,501,543	3,502,411	3,503,298	3,503,629	3,504,477
Common Equity	2,114,276	2,151,977	2,144,273	2,233,468	2,374,124	2,429,736	2,462,794	2,527,937	2,611,534	2,579,596	2,529,039	2,569,175	2,666,130	3,176,878	3,135,296	3,183,615	3,277,539	3,257,535	3,215,562	3,271,862
Total Capital	4,327,900	4,564,395	4,490,149	4,730,916	5,079,712	5,159,568	5,297,651	5,493,540	6,015,090	5,708,695	5,796,121	6,045,471	6,614,107	6,676,697	6,635,980	6,685,158	6,779,950	6,760,833	6,719,191	6,776,339
Total Capital (No S-T)	4,105,900	4,439,395	4,490,149	4,673,260	4,787,712	4,593,568	4,772,651	4,968,540	5,515,090	5,483,695	5,571,121	5,820,471	6,164,107	6,676,697	6,635,980	6,685,158	6,779,950	6,760,833	6,719,191	6,776,339
	2020 FQ1	2020 FQ2	2020 FQ3	2020 FQ4	2021 FQ1	2021 FQ2	2021 FQ3	2021 FQ4	2022 FQ1	2022 FQ2	2022 FQ3	2022 FQ4	2023 FQ1	2023 FQ2	2023 FQ3	2023 FQ4	2024 FQ1	2024 FQ2	2024 FQ3	2024 FQ4
Short-Term Debt	5.1%	2.7%	0.0%	1.2%	5.7%	11.0%	9.9%	9.6%	8.3%	3.9%	3.9%	3.7%	6.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Long-Term Debt	46.0%	50.1%	52.2%	51.6%	47.5%	41.9%	43.6%	44.4%	48.3%	50.9%	52.5%	53.8%	52.9%	52.4%	52.8%	52.4%	51.7%	51.8%	52.1%	51.7%
Common Equity	48.9%	47.1%	47.8%	47.2%	46.7%	47.1%	46.5%	46.0%	43.4%	45.2%	43.6%	42.5%	40.3%	47.6%	47.2%	47.6%	48.3%	48.2%	47.9%	48.3%
Total Capital	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	2020 FQ1	2020 FQ2	2020 FQ3	2020 FQ4	2021 FQ1	2021 FQ2	2021 FQ3	2021 FQ4	2022 FQ1	2022 FQ2	2022 FQ3	2022 FQ4	2023 FQ1	2023 FQ2	2023 FQ3	2023 FQ4	2024 FQ1	2024 FQ2	2024 FQ3	2024 FQ4
Long-Term Debt	48.5%	51.5%	52.2%	52.2%	50.4%	47.1%	48.4%	49.1%	52.6%	53.0%	54.6%	55.9%	56.7%	52.4%	52.8%	52.4%	51.7%	51.8%	52.1%	51.7%
Common Equity	51.5%	48.5%	47.8%	47.8%	49.6%	52.9%	51.6%	50.9%	47.4%	47.0%	45.4%	44.1%	43.3%	47.6%	47.2%	47.6%	48.3%	48.2%	47.9%	48.3%
Total Capital	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Data Source: S&P Capital IQ.

Panel B
SWX

	2020 FQ1	2020 FQ2	2020 FQ3	2020 FQ4	2021 FQ1	2021 FQ2	2021 FQ3	2021 FQ4	2022 FQ1	2022 FQ2	2022 FQ3	2022 FQ4	2023 FQ1	2023 FQ2	2023 FQ3	2023 FQ4	2024 FQ1	2024 FQ2	2024 FQ3	2024 FQ4
Short-Term Debt	326,574	229,668	98,903	158,323	377,334	637,417	569,271	2,227,367	1,765,069	1,504,023	422,485	1,613,254	509,407	57,620	99,835	701,785	686,770	142,194	693,264	738,044
Long-Term Debt	2,310,084	2,639,317	2,685,722	2,809,523	2,696,570	2,478,823	3,573,783	4,209,199	4,559,758	4,588,454	5,865,591	4,514,656	4,577,600	5,284,844	5,235,539	4,739,387	4,648,958	5,063,577	4,382,146	4,455,088
Common Equity	2,547,895	2,611,295	2,619,238	2,674,953	2,773,722	2,846,881	2,909,816	2,953,820	3,489,082	3,458,852	3,412,915	3,058,759	3,296,156	3,262,826	3,238,745	3,310,036	3,356,241	3,492,765	3,455,393	3,504,187
Total Capital	5,184,553	5,480,280	5,403,863	5,642,799	5,847,626	5,963,121	7,052,870	9,390,386	9,813,909	9,551,329	9,700,991	9,186,669	8,383,163	8,605,290	8,574,119	8,751,208	8,691,969	8,698,536	8,530,803	8,697,319
Total Capital (No S-T)	4,857,979	5,250,612	5,304,960	5,484,476	5,470,292	5,325,704	6,483,599	7,163,019	8,048,840	8,047,306	9,278,506	7,573,415	7,873,756	8,547,670	8,474,284	8,049,423	8,005,199	8,556,342	7,837,539	7,959,275
	2020 FQ1	2020 FQ2	2020 FQ3	2020 FQ4	2021 FQ1	2021 FQ2	2021 FQ3	2021 FQ4	2022 FQ1	2022 FQ2	2022 FQ3	2022 FQ4	2023 FQ1	2023 FQ2	2023 FQ3	2023 FQ4	2024 FQ1	2024 FQ2	2024 FQ3	2024 FQ4
Short-Term Debt	6.3%	4.2%	1.8%	2.8%	6.5%	10.7%	8.1%	23.7%	18.0%	15.7%	4.4%	17.6%	6.1%	0.7%	1.2%	8.0%	7.9%	1.6%	8.1%	8.5%
Long-Term Debt	44.6%	48.2%	49.7%	49.8%	46.1%	41.6%	50.7%	44.8%	46.5%	48.0%	60.5%	49.1%	54.6%	61.4%	61.1%	54.2%	53.5%	58.2%	51.4%	51.2%
Common Equity	49.1%	47.6%	48.5%	47.4%	47.4%	47.7%	41.3%	31.5%	35.6%	36.2%	35.2%	33.3%	39.3%	37.9%	37.8%	37.8%	38.6%	40.2%	40.5%	40.3%
Total Capital	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	2020 FQ1	2020 FQ2	2020 FQ3	2020 FQ4	2021 FQ1	2021 FQ2	2021 FQ3	2021 FQ4	2022 FQ1	2022 FQ2	2022 FQ3	2022 FQ4	2023 FQ1	2023 FQ2	2023 FQ3	2023 FQ4	2024 FQ1	2024 FQ2	2024 FQ3	2024 FQ4
Long-Term Debt	47.6%	50.3%	50.6%	51.2%	49.3%	46.5%	55.1%	58.8%	56.7%	57.0%	63.2%	59.6%	58.1%	61.8%	61.8%	58.9%	58.1%	59.2%	55.9%	56.0%
Common Equity	52.4%	49.7%	49.4%	48.8%	50.7%	53.5%	44.9%	41.2%	43.3%	43.0%	36.8%	40.4%	41.9%	38.2%	38.2%	41.1%	41.9%	40.8%	44.1%	44.0%
Total Capital	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Data Source: S&P Capital IQ.

Exhibit No. JRW-5

Docket No. A.24-09-001
Discounted Cash Flow Analysis

Panel A
Gas Proxy Group

Dividend Yield*	**3.70%**
Adjustment Factor	**1.0295**
Adjusted Dividend Yield	**3.81%**
Growth Rate**	**5.90%**
Equity Cost Rate***	**9.70%**

*** Page 2 of Exhibit No. JRW-5**

**** Based on data provided on pages 3, 4, 5, and 6 of Exhibit No. JRW-5**

***** DCF ROE rounded to nearest 0.05%.**

Panel B
Combination Proxy Group

Dividend Yield*	**3.50%**
Adjustment Factor	**1.0295**
Adjusted Dividend Yield	**3.60%**
Growth Rate**	**5.90%**
Equity Cost Rate***	**9.50%**

*** Page 2 of Exhibit No. JRW-5**

**** Based on data provided on pages 3, 4, 5, and 6 of Exhibit No. JRW-5**

Exhibit No. JRW-5

Southwest Gas Corporation
Monthly Dividend Yields

Panel A
Gas Proxy Group

Company	SMBL	Annual Dividend	Dividend Yield 30 Day	Dividend Yield 90 Day	Dividend Yield 180 Day
Atmos Energy Company (NYSE-ATO)	ATO	$3.48	2.4%	2.4%	2.5%
New Jersey Resources Corp. (NYSE-NJR)	NJR	$1.80	3.8%	3.8%	3.9%
NiSource Inc (NYSE-NI)	NI	$1.12	2.9%	3.0%	3.2%
Northwest Natural Holdings (NYSE-NWN)	NWN	$1.96	4.8%	4.8%	4.9%
ONE Gas, Inc.(NYSE-OGS)	OGS	$2.68	3.7%	3.7%	3.8%
Spire (NYSE-SR)	SR	$3.14	4.3%	4.5%	4.7%
Mean			3.6%	3.7%	3.8%
Median			3.8%	3.8%	3.8%

Data Sources: S&P Capital IQ, March 8, 2025.

Panel B
Combination Proxy Group

Company	SMBL	Annual Dividend	Dividend Yield 30 Day	Dividend Yield 90 Day	Dividend Yield 180 Day
Avista Corporation (NYSE-AVA)	AVA	$1.90	5.0%	5.1%	5.1%
Black Hills Corporation (NYSE-BKH)	BKH	$2.70	4.5%	4.5%	4.6%
CenterPoint Energy, Inc. (NYSE - CNP)	CNP	$0.88	2.6%	2.8%	2.9%
Consolidated Edison, Inc. (NYSE-ED)	ED	$3.40	3.5%	3.6%	3.5%
CMS Energy Corporation (NYSE-CMS)	CMS	$2.17	3.1%	3.2%	3.2%
NorthWestern Corporation (NYSE-NWE)	NWE	$2.64	4.9%	4.9%	4.9%
Public Service Enterprise Group Incorporated (NYS	PEG	$2.40	2.9%	2.8%	2.9%
Sempra Energy (NYSE-SRE)	SRE	$2.48	3.1%	2.9%	3.0%
WEC Energy Group (NYSE-WEC)	WEC	$3.57	3.5%	3.6%	3.8%
Xcel Energy Inc. (NYSE-XEL)	XEL	$2.19	3.2%	3.2%	3.4%
Mean			3.6%	3.7%	3.7%
Median			3.3%	3.4%	3.5%
			3.7%	3.6%	3.7%

Data Sources: S&P Capital IQ, March 8, 2025.

Exhibit No. JRW-5

Southwest Gas Corporation
DCF Equity Cost Growth Rate Measures
***Value Line* Historic Growth Rates**

Panel A
Gas Proxy Group

	Value Line Historical Growth					
	Past 10 Years			Past 5 Years		
Company	Earnings	Dividends	Book Value	Earnings	Dividends	Book Value
Atmos Energy Company (NYSE-ATO)	9.5	7.5	10.0	9.0	9.0	11.5
New Jersey Resources Corp. (NYSE-NJR)	5.5	7.0	7.0	5.0	7.0	5.0
NiSource Inc (NYSE-NI)	1.0		-2.0	10.5	4.5	3.5
Northwest Natural Gas Co. (NYSE-NWN)	1.0	1.0	2.0	25.0	0.5	3.5
ONE Gas, Inc. (NYSE-OGS)				6.0	8.5	4.5
Spire (NYSE-SR)	5.5	5.5	5.0	1.0	5.0	3.0
Mean	4.5	5.3	4.4	9.4	5.8	5.2
Median	5.5	6.3	5.0	7.5	6.0	4.0
Data Source: *Value Line Investment Survey.*	Average of Median Figures =			5.7		

Panel B
Combination Proxy Group

	Value Line Historic Growth					
Company	Past 10 Years			Past 5 Years		
	Earnings	Dividends	Book Value	Earnings	Dividends	Book Value
Avista Corporation (NYSE-AVA)	3.0	4.5	4.0	1.0	4.5	3.5
Black Hills Corporation (NYSE-BKH)	5.5	5.0	5.0	4.0	6.0	6.5
CenterPoint Energy, Inc. (NYSE - CNP)		-1.0	4.0	3.5	-9.5	7.0
Consolidated Edison, Inc. (NYSE-ED)	2.0	2.5	4.0	2.0	2.5	3.5
CMS Energy Corporation (NYSE-CMS)	6.0	7.0	6.5	5.5	6.5	8.0
MGE Energy, Inc. (NYSE-MGEE)	5.0	4.5	6.0	6.5	4.5	6.0
NorthWestern Corporation (NYSE-NWE)	3.5	5.5	6.0		3.5	4.0
Public Service Enterprise Group Incorporated (NYSE:PEG	3.0	4.5	3.0	4.0	4.5	1.5
Sempra Energy (NYSE-SRE)	7.5	7.0	7.0	13.5	7.0	10.0
WEC Energy Group (NYSE-WEC)	6.0	9.0	7.0	6.0	7.0	4.0
Xcel Energy Inc. (NYSE-XEL)	5.5	6.0	5.0	6.5	6.5	6.0
Mean	4.7	5.0	5.2	5.3	3.9	5.5
Median	5.3	5.0	5.0	4.8	4.5	6.0
Data Source: *Value Line Investment Survey.*	Average of Median Figures =			5.1		

Exhibit No. JRW-5

Southwest Gas Corporation
DCF Equity Cost Growth Rate Measures
***Value Line* Projected Growth Rates**

Panel A
Gas Proxy Group

Company	*Value Line* Projected Growth Est'd. '21-'23 to '27-'29			*Value Line* Sustainable Growth		
	Earnings	Dividends	Book Value	Return on Equity	Retention Rate	Internal Growth
Atmos Energy Company (NYSE-ATO)	6.0	7.0	5.0	9.0%	48.0%	4.3%
New Jersey Resources Corp. (NYSE-NJR)	5.0	5.0	4.5	14.5%	44.0%	6.4%
NiSource Inc (NYSE-NI)	9.5	4.5	5.0	10.0%	43.0%	4.3%
Northwest Natural Gas Co. (NYSE-NWN)	6.5	0.5	4.0	8.0%	42.0%	3.4%
ONE Gas, Inc. (NYSE-OGS)	4.0	2.5	6.0	7.5%	45.0%	3.4%
Spire (NYSE-SR)	4.5	4.0	2.5	9.0%	26.0%	2.3%
Mean	5.9	3.9	4.5	9.7%	41.3%	4.0%
Median	5.5	4.3	4.8	9.0%	43.5%	3.8%
Average of Median Figures =		4.8			Median =	3.8%

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

Panel B
Combination Proxy Group

Company	*Value Line* Projected Growth Est'd. '21-'23 to '27-'29			*Value Line* Sustainable Growth		
	Earnings	Dividends	Book Value	Return on Equity	Retention Rate	Internal Growth
Avista Corporation (NYSE-AVA)	5.5	4.0	2.0	8.5%	26.0%	2.2%
Black Hills Corporation (NYSE-BKH)	4.0	4.0	3.5	8.5%	38.0%	3.2%
CenterPoint Energy, Inc. (NYSE - CNP)	6.5	6.0	5.5	9.5%	49.0%	4.7%
CMS Energy Corporation (NYSE-CMS)	6.0	5.0	5.0	13.5%	40.0%	5.4%
Consolidated Edison, Inc. (NYSE-ED)	6.0	4.0	4.0	9.0%	40.0%	3.6%
NorthWestern Corporation (NYSE-NWE)	4.5	1.5	3.0	8.0%	35.0%	2.8%
Public Service Enterprise Group Incorporated (NYSE	6.0	6.0	5.5	12.5%	39.0%	4.9%
Sempra Energy (NYSE-SRE)	6.0	6.0	6.0	10.5%	48.0%	5.0%
WEC Energy Group (NYSE-WEC)	6.0	7.0	4.0	13.0%	36.0%	4.7%
Xcel Energy Inc. (NYSE-XEL)	6.5	6.0	5.5	11.0%	40.0%	4.4%
Mean	5.7	5.0	4.4	10.4%	39.1%	4.1%
Median	6.0	5.5	4.5	10.0%	39.5%	4.5%
Average of Median Figures =		5.3			Median =	4.5%

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

Exhibit No. JRW-5

Southwest Gas Corporation
DCF Equity Cost Growth Rate Measures
Analysts Projected EPS Growth Rate Estimates

Panel A
Gas Proxy Group

Company		Yahoo	Zacks	S&P Cap IQ	Mean
Atmos Energy Company (NYSE-ATO)	ATO	8.4%	7.1%	7.4%	7.7%
New Jersey Resources Corp. (NYSE-NJR)	NJR	8.1%	NA	5.9%	7.0%
NiSource Inc (NYSE-NI)	NI	9.6%	8.2%	7.9%	8.6%
Northwest Natural Gas Co. (NYSE-NWN)	NWN	6.5%	NA	6.5%	6.5%
ONE Gas, Inc. (NYSE-OGS)	OGS	NA	4.7%	2.6%	3.6%
Spire (NYSE-SR)	SR	6.9%	5.8%	6.8%	6.5%
Mean		7.9%	6.4%	6.2%	6.6%
Median		8.1%	6.5%	6.7%	6.8%

Data Source: www.https://finance.yahoo.com/, https://zacks.com/, S&P Cap IQ, March 8, 2025.

Panel B
Combination Proxy Group

Company		Yahoo	Zacks	S&P Cap IQ	Mean
Avista Corporation (NYSE-AVA)	AVA	5.5%	5.9%	6.1%	5.8%
Black Hills Corporation (NYSE-BKH)	BKH	4.8%	5.3%	5.3%	5.1%
CenterPoint Energy, Inc. (NYSE - CNP)	CNP	10.0%	7.1%	7.7%	8.3%
CMS Energy Corporation (NYSE-CMS)	CMS	8.3%	7.7%	7.3%	7.8%
Consolidated Edison, Inc. (NYSE-ED)	ED	2.1%	5.6%	5.7%	4.4%
NorthWestern Corporation (NYSE-NWE)	NWE	6.0%	6.1%	5.8%	6.0%
Public Service Enterprise Group Incorporated NYSE-PEG	PEG	2.4%	7.2%	6.6%	5.4%
Sempra Energy (NYSE-SRE)	SRE	4.6%	7.9%	7.5%	6.7%
WEC Energy Group (NYSE-WEC)	WEC	7.8%	7.6%	7.3%	7.6%
Xcel Energy Inc. (NYSE-XEL)	XEL	8.1%	6.9%	7.3%	7.5%
Mean		6.0%	6.7%	6.7%	6.5%
Median		5.8%	7.0%	6.9%	6.3%

Data Source: www.https://finance.yahoo.com/, https://zacks.com/, S&P Cap IQ, March 8, 2025.

Exhibit No. JRW-5

Southwest Gas Corporation
DCF Growth Rate Indicators

Proxy Groups

Growth Rate Indicator	Gas Proxy Group	Combination Proxy Group
Historic *Value Line* Growth in EPS, DPS, and BVPS	5.7%	5.1%
Projected *Value Line* Growth in EPS, DPS, and BVPS	4.8%	5.3%
Sustainable Growth ROE * Retention Rate	3.8%	4.5%
Projected EPS Growth from Yahoo, Zacks, and S&P Cap IQ - Mean/Median	6.6%/6.8%	6.5%/6.3%
DCF Growth Rate	5.90%	5.90%

DCF Growth Rate	Gas Proxy Group	Combination Proxy Group
Projected *Value Line* Growth Rate	4.8%	5.3%
Sustainable Growth Rate	3.8%	4.5%
Average Analysts' Projected EPS Growth Rate	6.7%	6.4%
Average Projected Growth Rate	5.1%	5.4%
Average Analysts' Projected EPS Growth Rate	6.7%	6.4%
DCF Growth Rate	5.9%	5.9%

Exhibit No. JRW-6

Docket No. A.24-09-001
Capital Asset Pricing Model

Panel A
Gas Proxy Group

Risk-Free Interest Rate	**4.60%**
Beta*	**0.82**
Ex Ante Market Risk Premium**	**5.00%**
CAPM Cost of Equity***	**8.70%**

*** See page 3 of Exhibit No. JRW-6**

**** See pages 5 and 6 of Exhibit No. JRW-6**

***** CAPM ROE rounded to nearest 0.05%.**

Panel B
Combination Proxy Group

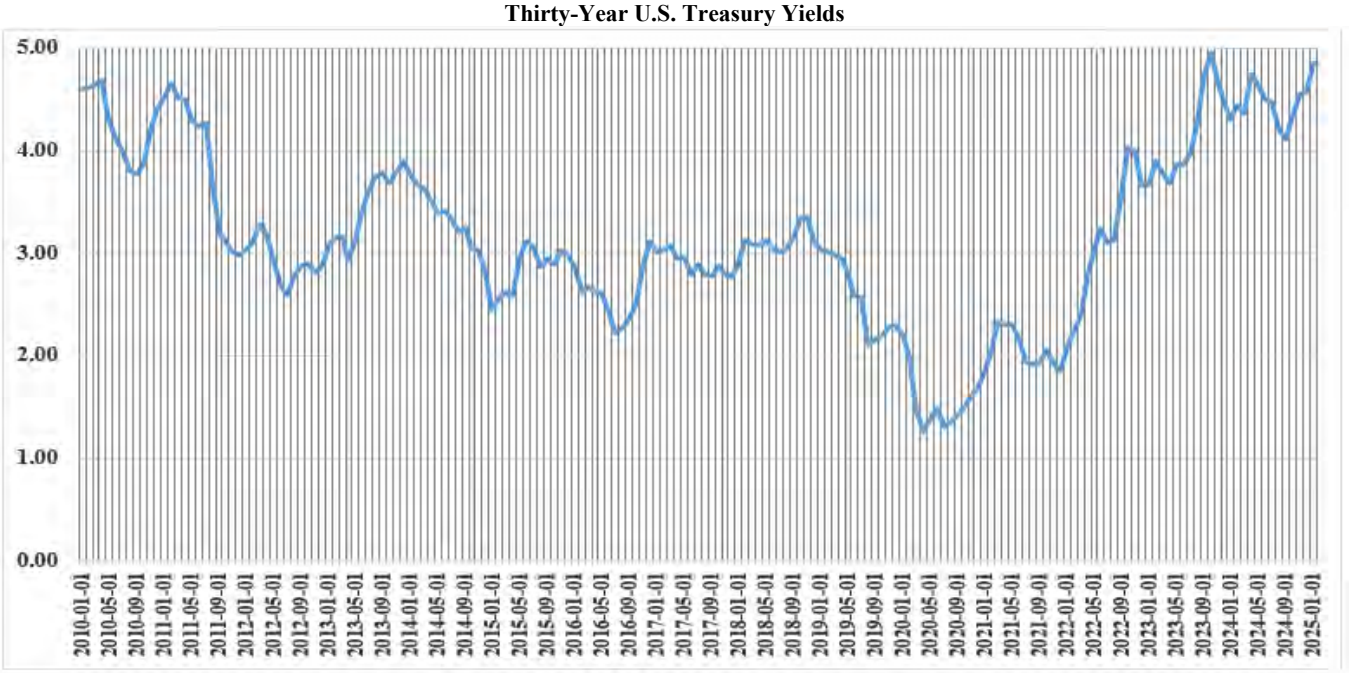
Risk-Free Interest Rate	**4.60%**
Beta*	**0.82**
Ex Ante Market Risk Premium**	**5.00%**
CAPM Cost of Equity***	**8.70%**

*** See page 3 of Exhibit No. JRW-6**

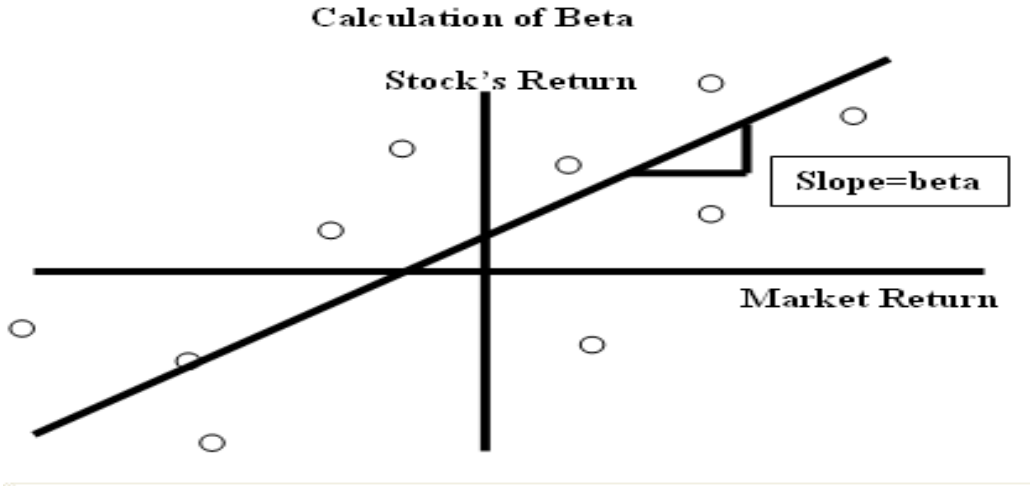
**** See pages 5 and 6 of Exhibit No. JRW-6**

Exhibit No. JRW-6

Thirty-Year U.S. Treasury Yields



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



Panel A
Gas Proxy Group

	V-Line	Cap IQ	Average
Company	**Beta**	**Adj. Beta**	**Beta**
Atmos Energy Company (NYSE-ATO)	0.90	0.81	0.85
New Jersey Resources Corp. (NYSE-NJR)	1.00	0.77	0.88
NiSource Inc (NYSE-NI)	0.95	0.69	0.82
Northwest Natural Gas Co. (NYSE-NWN)	0.90	0.74	0.82
ONE Gas, Inc. (NYSE-OGS)	0.85	0.80	0.83
Southwest Gas Company (NYSE-SWX)	0.95	0.62	0.78
Spire (NYSE-SR)	0.90	0.73	0.82
Mean	0.92	0.74	0.83
Median	0.90	0.74	0.82

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

Panel B
Combination Proxy Group

	V-Line	Cap IQ	Average
Company	**Beta**	**Adj. Beta**	**Beta**
Avista Corporation (NYSE-AVA)	0.95	0.65	0.80
Black Hills Corporation (NYSE-BKH)	1.05	0.81	0.93
CenterPoint Energy, Inc. (NYSE - CMP)	1.15	0.96	1.06
CMS Energy Corporation (NYSE-CMS)	0.85	0.59	0.72
Consolidated Edison, Inc. (NYSE-ED)	0.80	0.61	0.71
NorthWestern Corporation (NYSE-NWE)	1.00	0.67	0.83
Public Service Enterprise Group Incorporated (NYSE:	1.00	0.77	0.89
Sempra Energy (NYSE-SRE)	1.00	0.86	0.93
WEC Energy Group (NYSE-WEC)	0.85	0.65	0.75
Xcel Energy Inc. (NYSE-XEL)	0.85	0.62	0.74
Mean	0.95	0.72	0.83
Median	0.98	0.66	0.82

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

Exhibit No. 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 - 2000-2024

Category	Category	Study Authors	Publication Date	Time Period Of Study	Methodology	Return Measure	Range Low	Range High	Midpoint of Range	Mean	Median
Historical Risk	**Historical Risk Premium**										
		Ibbotson	2016	1928-2015	Historical Stock Returns - Bond Returns	Arithmetic				6.00%	
						Geometric				4.40%	
		Damodaran	2024	1928-2023	Historical Stock Returns - Bond Returns	Arithmetic				6.80%	
						Geometric				5.23%	
		Dimson, Marsh, Staunton _Credit Suisse Report	2023	1900-2022	Historical Stock Returns - Bond Returns	Arithmetic				6.40%	
						Geometric				4.60%	
		Bate	2008	1900-2007	Historical Stock Returns - Bond Returns	Geometric				4.50%	
		Shiller	2006	1926-2005	Historical Stock Returns - Bond Returns	Arithmetic				7.00%	
						Geometric				5.50%	
		Siegel	2005	1926-2005	Historical Stock Returns - Bond Returns	Arithmetic				6.10%	
						Geometric				4.60%	
		Dimson, Marsh, and Staunton	2006	1900-2005	Historical Stock Returns - Bond Returns	Arithmetic				5.50%	
		Goyal & Welch	2006	1872-2004	Historical Stock Returns - Bond Returns					4.77%	
		Median									5.50%
Ex Ante Model	**Ex Ante Models (Puzzle Research)**										
		Claus Thomas	2001	1985-1998	Abnormal Earnings Model					3.00%	
		Arnott and Bernstein	2002	1810-2001	Fundamentals - Div Yld + Growth					2.40%	
		Constantinides	2002	1872-2000	Historical Returns & Fundamentals - P/D & P/E					6.90%	
		Cornell	1999	1926-1997	Historical Returns & Fundamental GDP/Earnings		3.50%	5.50%	4.50%	4.50%	
		Easton, Taylor, et al	2002	1981-1998	Residual Income Model					5.30%	
		Fama French	2002	1951-2000	Fundamental DCF with EPS and DPS Growth		2.55%	4.32%		3.44%	
		Harris & Marston	2001	1982-1998	Fundamental DCF with Analysts' EPS Growth					7.14%	
		McKinsey	2002	1962-2002	Fundamental (P/E, D/P, & Earnings Growth)		3.50%	4.00%		3.75%	
		Siegel	2005	1802-2001	Historical Earnings Yield					2.50%	
		Grabowski	2006	1926-2005	Historical and Projected		3.50%	6.00%	4.75%	4.75%	
		Maheu & McCurdy	2006	1885-2003	Historical Excess Returns, Structural Breaks,		4.02%	5.10%	4.56%	4.56%	
		Bostock	2004	1960-2002	Bond Yields, Credit Risk, and Income Volatility		3.90%	1.30%	2.60%	2.60%	
		Bakshi & Chen	2005	1982-1998	Fundamentals - Interest Rates					7.31%	
		Donaldson, Kamstra, & Kramer	2006	1952-2004	Fundamental, Dividend yld., Returns,, & Volatility		3.00%	4.00%	3.50%	3.50%	
		Campbell	2008	1982-2007	Historical & Projections (D/P & Earnings Growth)		4.10%	5.40%		4.75%	
		Best & Byrne	2001	Projection	Fundamentals - Div Yld + Growth					2.00%	
		Fernandez	2007	Projection	Required Equity Risk Premium					4.00%	
		DeLong & Magin	2008	Projection	Earnings Yield - TIPS					3.22%	
		Siegel - Rethink ERP	2011	Projection	Real Stock Returns and Components					5.50%	
		Kroll (Duff & Phelps)	2024	Projection	Normalized with 3.5% Long-Term Treasury Yield					5.00%	
		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	2025	Projection	Equity Return of 6.70% and Long-Term Bond of 3.80%					3.90%	
		Market Risk Premia - 3-1-24	2023	Projection	Fundamental Economic and Market Factors					2.61%	
		KPMG	2024	Projection	Fundamental Economic and Market Factors					5.00%	
		Damodaran 3-1-25	2025	Projection	Fundamentals - Implied from FCF to Equity Model (Trailing 12 month, with adjusted payout)					4.12%	
		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									3.95%
Surveys	**Surveys**										
		New York Fed	2015	Five-Year	Survey of Wall Street Firms					5.70%	
		Survey of Financial Forecasters	2024	10-Year Projection	Equity Return of 7.00% and Long-Term Bond of 3.60%					3.40%	
		Duke - CFO Magazine Survey	2024	10-Year Projection	Approximately 300 CFOs Expected S&P 500 Return of 9.1% and Risk-Free Rate of 5.5%					4.60%	
		Fernandez - Academics, Analysts, and Companie	2024	Long-Term	Survey of Academics, Analysts, and Companies					5.50%	
		Median									5.05%
Building Block	**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**										**4.64%**
Median	**Median**										**4.55%**

CAPM Study

Market Risk Premium Results - 2010-2024

Category	Study Authors	Publication Date	Time Period Of Study	Methodology	Return Measure	Range Low	Range High	Midpoint of Range	Mean	Median
Historical Risk Premium										
	Ibbotson	2016	1928-2015	Historical Stock Returns - Bond Returns	Arithmetic				6.00%	
					Geometric				4.40%	
	Damodaran	2024	1928-2023	Historical Stock Returns - Bond Returns	Arithmetic				6.80%	
					Geometric				5.23%	
	Dimson, Marsh, Staunton _Credit Suisse Report	2023	1900-2022	Historical Stock Returns - Bond Returns	Arithmetic				6.40%	
					Geometric				4.60%	
	Median									5.57%
Ex Ante Models (Puzzle Research)										
	Siegel - Rethink ERP	2011	Projection	Real Stock Returns and Components					5.50%	
	Kroll (Duff & Phelps)	2024	Projection	Normalized with 3.5% Long-Term Treasury Yield					5.00%	
	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	2025	Projection	Equity Return of 6.70% and Long-Term Bond of 3.80%					3.90%	
	Market Risk Premia - 3-1-24	2023	Projection	Fundamental Economic and Market Factors					2.61%	
	KPMG	2024	Projection	Fundamental Economic and Market Factors					5.00%	
	Damodaran 3-1-25	2025	Projection	Fundamentals - Implied from FCF to Equity Model (Trailing 12 month, with adjusted payout)					4.12%	
	Median									5.00%
Surveys										
	New York Fed	2015	Five-Year	Survey of Wall Street Firms					5.70%	
	Survey of Financial Forecasters	2024	10-Year Projection	Equity Return of 7.00% and Long-Term Bond of 3.60%					3.40%	
	Duke - CFO Magazine Survey	2024	10-Year Projection	Approximately 300 CFOs Expected S&P 500 Return of 9.1% and Risk-Free Rate of 5.5%					4.60%	
	Fernandez - Academics, Analysts, and Companie	2024	Long-Term	Survey of Academics, Analysts, and Companies					5.50%	
	Median									5.05%
Building Block										
	Ibbotson and Chen	2015	Projection	Historical Supply Model (D/P & Earnings Growth)	Arithmetic			6.22%	5.21%	
					Geometric			4.20%		
	Chen - Rethink ERP	2010	20-Year Projection	Combination Supply Model (Historic and Projection)	Geometric				4.00%	
	Ilmanen - Rethink ERP	2010	Projection	Current Supply Model (D/P & Earnings Growth)	Geometric				3.00%	
	Grinold, Kroner, Siegel - Rethink ERP	2011	Projection	Current Supply Model (D/P & Earnings Growth)	Arithmetic			4.63%	4.12%	
					Geometric			3.60%		
	Median									4.06%
Mean										**4.92%**
Median										**5.03%**

CAPM Study

Kroll 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 vis
kroll.com/cost-of-capital-resources

Date	Risk-free Rate (R_f)	R_f (%)	Kroll Recommended U.S. ERP (%)	What Changed
Current Guidance:				
June 5, 2024 – UNTIL FURTHER NOTICE*	Normalized 20-year U.S. Treasury yield*	3.50*	5.00	ERP
June 8, 2023 – June 4, 2024*	Normalized 20-year U.S. Treasury yield*	3.50*	5.50	ERP
October 18, 2022 – June 7, 2023*	Normalized 20-year U.S. Treasury yield*	3.50*	6.00	ERP
June 16, 2022 – October 17, 2022*	Normalized 20-year U.S. Treasury yield*	3.50*	5.50	RF
April 7, 2022 – June 15, 2022	Normalized 20-year U.S. Treasury yield	3.00	5.50	RF
December 7, 2020 – April 6, 2022	Normalized 20-year U.S. Treasury yield	2.50	5.50	ERP
June 30, 2020 – December 6, 2020	Normalized 20-year U.S. Treasury yield	2.50	6.00	RF
March 25, 2020 – June 29, 2020	Normalized 20-year U.S. Treasury yield	3.00	6.00	ERP
December 19, 2019 – March 24, 2020	Normalized 20-year U.S. Treasury yield	3.00	5.00	ERP
September 30, 2019 – December 18, 2019	Normalized 20-year U.S. Treasury yield	3.00	5.50	R_f
December 31, 2018 – September 29, 2019	Normalized 20-year U.S. Treasury yield	3.50	5.50	ERP
September 5, 2017 – December 30, 2018	Normalized 20-year U.S. Treasury yield	3.50	5.00	ERP
November 15, 2016 – September 4, 2017	Normalized 20-year U.S. Treasury yield	3.50	5.50	R_f
January 31, 2016 – November 14, 2016	Normalized 20-year U.S. Treasury yield	4.00	5.50	ERP
December 31, 2015	Normalized 20-year U.S. Treasury yield	5.00	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	5.00	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.

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

Exhibit No. JRW-7
SWG's Rate of Return Recommendation

SWG's Southern California Rate Jurisdiction District

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	50.00%	4.14%	2.07%
Common Equity	50.00%	11.35%	5.68%
Total	100.00%		7.75%

SWG's Northern California and South Lake Tahoe Rate Jurisdiction District

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	50.00%	4.34%	2.17%
Common Equity	50.00%	11.35%	5.68%
Total	100.00%		7.85%

D'Ascendis ROE Results

Discounted Cash Flow Model (DCF)	9.99%
Risk Premium Model (RPM)	10.82%
Capital Asset Pricing Model (CAPM)	11.57%
Cost of Equity Models Applied to Comparable Risk, Non-Price Regulated Companies	12.01%
Indicated Range of Common Equity Cost Rates Before Adjustments	9.99% - 12.01%
Business Risk Adjustment	0.20%
Credit Risk Adjustment	0.15%
Flotation Cost Adjustment	0.12%
Indicated Cost of Common Equity Cost Rates After Adjustment	10.46% - 12.48%
Recommended Cost of Equity	11.35%

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

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

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

GDP and S&P 500 Growth Rates

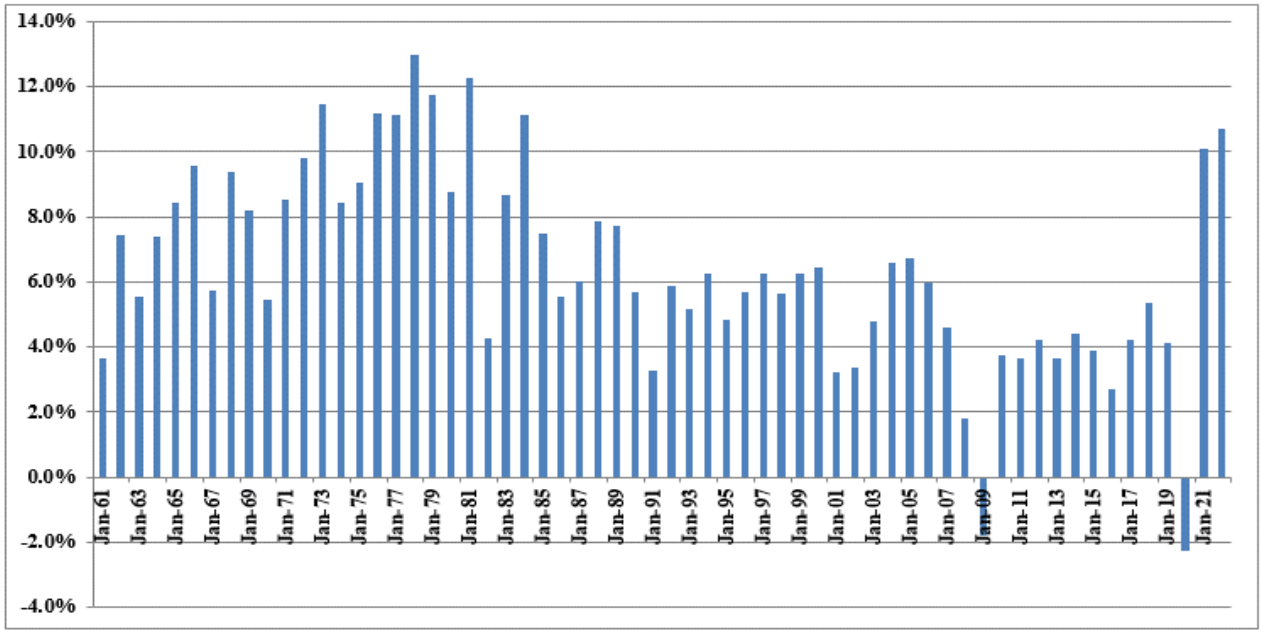
Growth Rates
GDP, S&P 500 Price, EPS, and DPS

	GDP	S&P 500	S&P 500 EPS	S&P 500 DPS	
1960	542.38	58.11	3.10	1.98	
1961	562.21	71.55	3.37	2.04	
1962	603.92	63.1	3.67	2.15	
1963	637.45	75.02	4.13	2.35	
1964	684.46	84.75	4.76	2.58	
1965	742.29	92.43	5.30	2.83	
1966	813.41	80.33	5.41	2.88	
1967	859.96	96.47	5.46	2.98	
1968	940.65	103.86	5.72	3.04	
1969	1,017.62	92.06	6.10	3.24	
1970	1,073.30	92.15	5.51	3.19	
1971	1,164.85	102.09	5.57	3.16	
1972	1,279.11	118.05	6.17	3.19	
1973	1,425.38	97.55	7.96	3.61	
1974	1,545.24	68.56	9.35	3.72	
1975	1,684.90	90.19	7.71	3.73	
1976	1,873.41	107.46	9.75	4.22	
1977	2,081.83	95.1	10.87	4.86	
1978	2,351.60	96.11	11.64	5.18	
1979	2,627.33	107.94	14.55	5.97	
1980	2,857.31	135.76	14.99	6.44	
1981	3,207.04	122.55	15.18	6.83	
1982	3,343.79	140.64	13.82	6.93	
1983	3,634.04	164.93	13.29	7.12	
1984	4,037.61	167.24	16.84	7.83	
1985	4,338.98	211.28	15.68	8.20	
1986	4,579.63	242.17	14.43	8.19	
1987	4,855.22	247.08	16.04	9.17	
1988	5,236.44	277.72	24.12	10.22	
1989	5,641.58	353.4	24.32	11.73	
1990	5,963.14	330.22	22.65	12.35	
1991	6,158.13	417.09	19.30	12.97	
1992	6,520.33	435.71	20.87	12.64	
1993	6,858.56	466.45	26.90	12.69	
1994	7,287.24	459.27	31.75	13.36	
1995	7,639.75	615.93	37.70	14.17	
1996	8,073.12	740.74	40.63	14.89	
1997	8,577.55	970.43	44.09	15.52	
1998	9,062.82	1229.23	44.27	16.20	
1999	9,631.17	1469.25	51.68	16.71	
2000	10,250.95	1320.28	56.13	16.27	
2001	10,581.93	1148.09	38.85	15.74	
2002	10,929.11	879.82	46.04	16.08	
2003	11,456.45	1111.91	54.69	17.88	
2004	12,217.20	1211.92	67.68	19.407	
2005	13,039.20	1248.29	76.45	22.38	
2006	13,815.58	1418.3	87.72	25.05	
2007	14,474.23	1468.36	82.54	27.73	
2008	14,769.86	903.25	65.39	28.05	
2009	14,478.07	1115.10	59.65	22.31	
2010	15,048.97	1257.64	83.66	23.12	
2011	15,599.73	1257.60	97.05	26.02	
2012	16,253.97	1426.19	102.47	30.44	
2013	16,843.20	1848.36	107.45	36.28	
2014	17,550.69	2058.90	113.01	39.44	
2015	18,206.02	2043.94	106.32	43.16	
2016	18,695.11	2238.83	108.86	45.03	
2017	19,479.62	2673.61	124.94	49.73	
2018	20,527.16	2506.85	148.34	53.61	
2019	21,372.58	3230.78	162.35	58.80	
2020	20,893.75	3756.07	139.76	56.70	
2021	22,997.50	4766.18	206.38	59.20	
2022	25,461.34	3839.50	219.49	68.34	
2023	27,750.00	4769.83	221.36	70.07	
2024	29,184.00	5881.63	243.32	73.40	Average
Growth Rates	**6.43**	**7.48**	**7.05**	**5.81**	**6.69**

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

Annual Nominal GDP Growth Rates

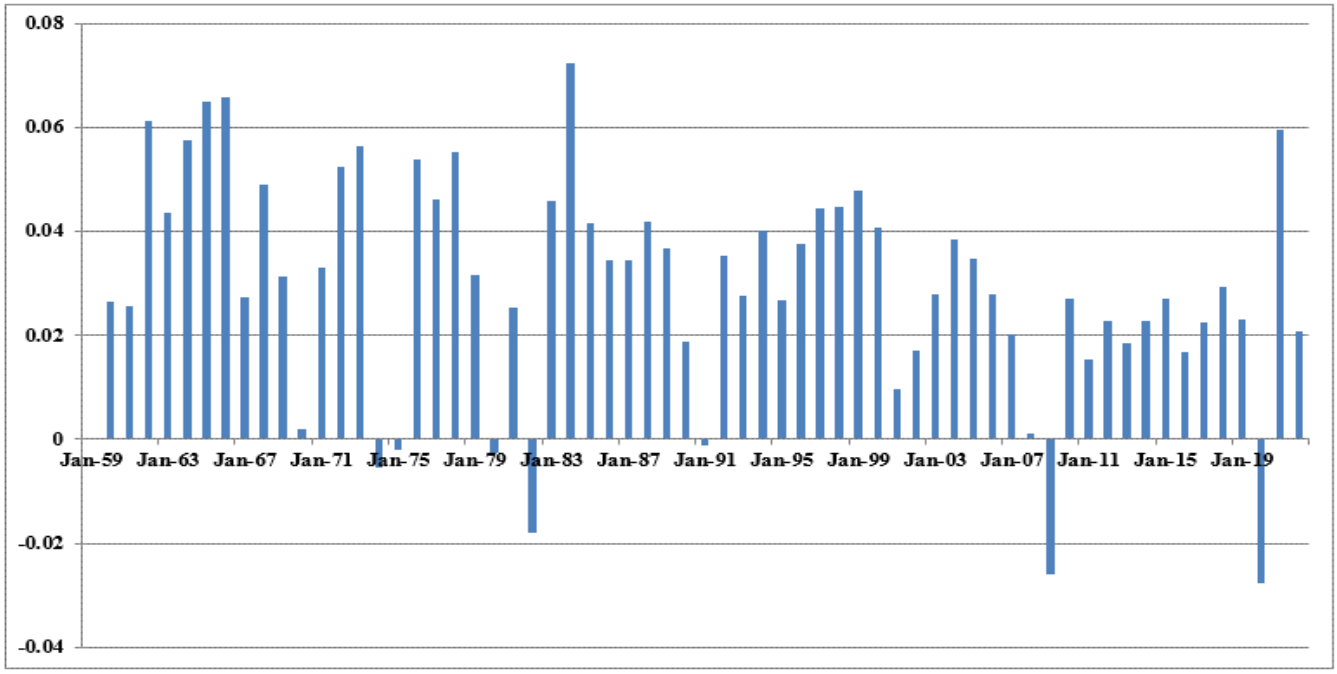
Annual Growth Rates - 1961-2022



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

Real GDP Growth Rates

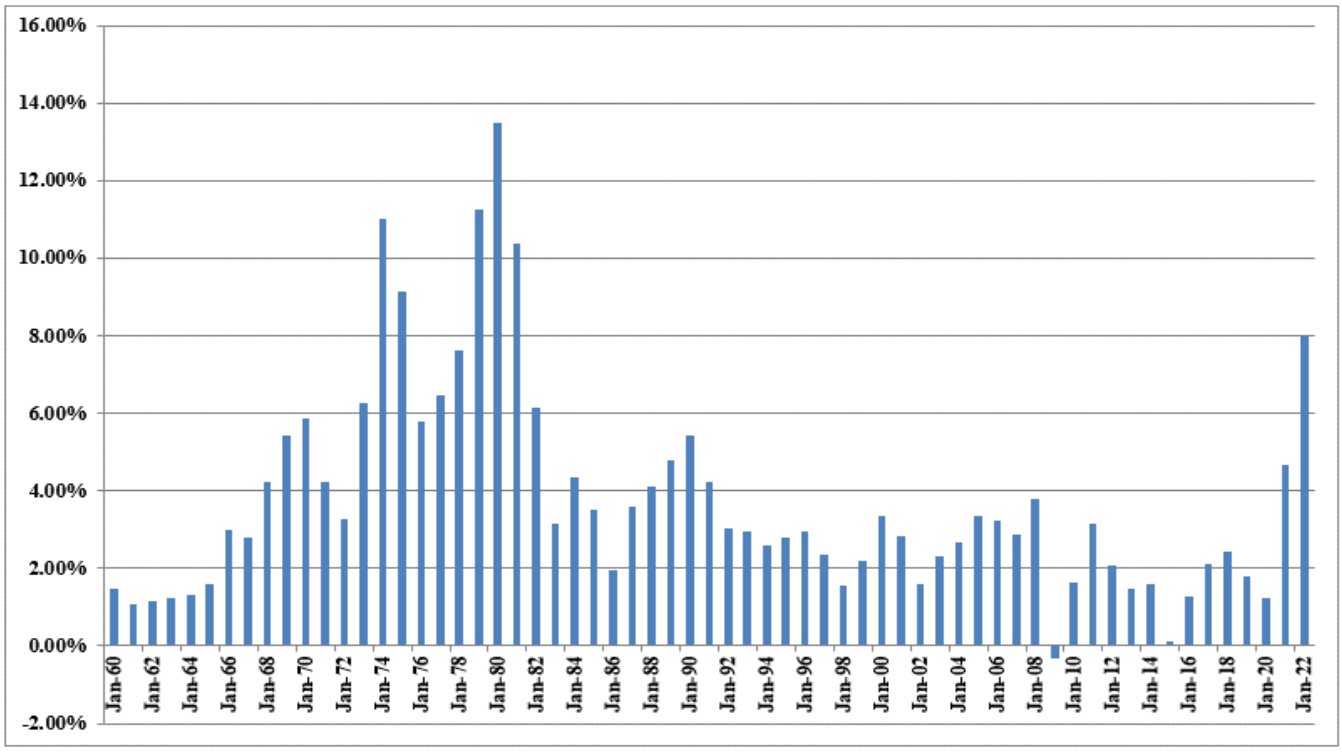
Annual Average Real GDP Growth Rates
1961-2022



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 No. JRW-9

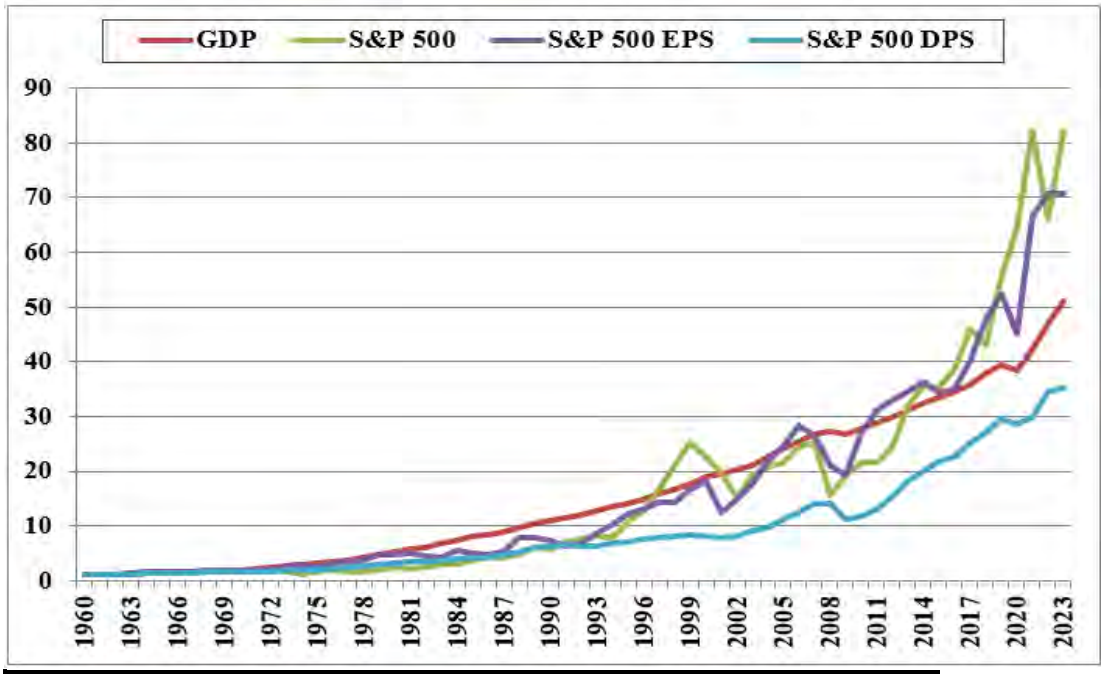
Panel B
Projected GDP Growth Rates

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

Sources:
Congressional Budget Office,The *2023 Long-Term Budget Outlook* , July 15, 2023.
U.S. Energy Information Administration, *Annual Energy Outlook 2023* , Table: Macroeconomic Indicators,
Social Security Administration, 2023 Annual Report of the Board of Trustees of the Old-Age,
Survivors, and Disability Insurance (OASDI) Program, Table VI.G4,
The 4.1% growth rate is the growth in projected GDP from 26 trillion in 2023 to $582 trillion in 2100.
https://www.philadelphiafed.org/research-and-data/real-time-center/survey-of-professional-forecasters/

GDP and S&P 500 Growth Rates

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



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