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Exhibit Number	:	
Commissioner	:	Alice Reynolds
Admin. Law Judge	:	Jonathan Lakey
Public Adv. Office Witness	:	J. Randall Woolridge, Ph. D.

PUBLIC ADVOCATES OFFICE
California Public Utilities Commission

AMENDED

REPORT
ON
CALIFORNIA ENERGY COMPANIES
COST OF CAPITAL

San Francisco, California
July 31, 2025

575114547

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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 the Public Advocates' Office ("Cal Advocates") of the California Public Utility Commission to perform a cost of capital study for the test year 2026 for Pacific Gas & Electric Company ("PG&E"), San Diego Gas & Electric Company ("SGD&E"), Southern California Edison ("SCE"), and Southern California Gas Company ("SCG"). and to evaluate the Companies' rate of return testimony in this proceeding.[1] I will refer to the Companies collectively as the "Plaintiffs" or "Companies."

Q. HOW IS YOUR TESTIMONY ORGANIZED?

A. First, I review my cost of equity recommendation for the Plaintiffs and review the primary areas of contention between the Plaintiffs' rate of return positions and my position. Second, I discuss the selection of proxy groups of electric utility companies and gas companies for estimating the market cost of equity for the Plaintiffs. Third, I discuss the capital structure proposals of the Plaintiffs. Fourth, I estimate the equity cost rate for the Plaintiffs. Finally, I critique each Companies' rate of return analysis

[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.

and testimonies. 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 categories: (1) capital structure (i.e., ratios of short-term debt, long-term debt, preferred stock and common equity); (2) cost rates for short-term debt, long-term debt, and preferred stock; and (3) cost of common equity, otherwise known as 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.

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

[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*").

represents the return investors could expect from other investments, while assuming no more and no less risk. The purpose of all 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.

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

A. The Plaintiff's cost of capital recommendations are provided in Table 1. PG&E, SCE, and SCG have all proposed capital structures with common equity ratios of 52.0%, while SDG&E has proposed a capital structure with common equity ratio of 54.0%. However, the primary area of contention between the four companies and Cal Advocates is the proposed return on common equity. With respect to the cost of equity capital, Ms. Ann E. Bulkley has proposed a ROE of 11.3% for PG&E, Mr. Joshua C. Nowak has proposed a ROE of 11.25% for SDG&E, Dr. Bente Villadsen has proposed a ROE of 11.75% for SCE, and Mr. Nowak has proposed a ROE of 11.00% for SCG. In their applications, PG&E, SDG&E, SCE, and SCG are asking for overall rates of return of 8.30%, 8.21%, 8.50%, and 8.15%, respectively.

Table 1

Plaintiff's Cost of Capital Recommendations

Panel A
Pacific Gas & Electric Company

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	47.50%	5.05%	2.40%
Preferred Stock	0.50%	5.52%	0.03%
Common Equity	52.00%	11.30%	5.88%
Total	100.00%		8.30%

Panel B
San Diego Gas & Electric Company

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	46.00%	4.62%	2.13%
Preferred Stock	0.00%	6.22%	0.00%
Common Equity	54.00%	11.25%	6.08%
Total	100.00%		8.20%

Panel C
Southern California Edison

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	43.00%	4.75%	2.04%
Preferred Stock	5.00%	6.95%	0.35%
Common Equity	52.00%	11.75%	6.11%
Total	100.00%		8.50%

Panel D
Southern California Gas Company

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	45.60%	5.02%	2.29%
Preferred Stock	2.40%	6.00%	0.14%
Common Equity	52.00%	11.00%	5.72%
Total	100.00%		8.15%

In my recommendation, I highlight that all four companies have proposed capital structures with common equity ratios that are significantly higher than the averages of the proxy groups. In addition, I have performed a capital structure study that illustrates that: (1) with the exception of SCG, the energy companies have not maintained the common equity ratios approved in the 2023 rate case; and (2) there is significant evidence of double leverage between the parent companies and the California energy companies which means that the parent holding companies have significantly more debt leverage than the operating energy companies. Consequently, I have proposed capital structures for all four

companies with common equity ratios of 50.0%. As such, I have adjusted the capital structures to be more reflective of the capital structures of other publicly held electric and gas companies. I have employed the proposed long-term debt and preferred stock cost rates proposed by the Companies. I have applied the discounted cash flow model ("DCF") and the capital asset pricing model ("CAPM") to a proxy group of publicly held electric utility companies ("Electric Proxy Group"), a proxy group of gas distribution companies ("Gas Proxy Group"), and a proxy group of combination electric and gas companies ("Combination Proxy Group"). My analysis indicates an equity cost rate in the range of 8.75% to 10.15% is appropriate for the proxy groups. Since: (1) I rely primarily on the DCF approach; (2) I give little weight to the results for the gas group due to its small number and lack of investment and credit analyst coverage, and (3) the proposed capital structures still include more equity and less financial risk than the companies in the proxy groups, I conclude that the ROE for the four energy companies is in the 9.00% to 9.75% range. Given these results, I am using midpoint of this range, 9.375%, as the base ROE for the energy companies. I have applied a risk adjustment which is based on the relative S&P and Moody's credit ratings of the proxy companies and the Plaintiffs and my ROE range of 9.0%-9.75%. As a result, my ROE recommendations are 9.75% for PG&E, 9.375% for SDG&E and SCE, and 9.25% for SCG. With my proposed capital structures and senior capital cost rates, I am recommending an overall fair rate of return or cost of capital for PG&E, SDG&E, SCE and SCG of 7.40%, 7.00%, 7.18%, and 6.62%, respectively. This recommendation is provided in Table 2 and page 1 of Exhibit JRW-1.

Table 2

Cal Advocates Primary Rate of Return Recommendations

Panel A

Pacific Gas & Electric Company

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	49.69%	5.050%	2.51%
Preferred Stock	0.31%	5.520%	0.02%
Common Equity	50.00%	9.750%	4.88%
Total	100.00%		7.40%

Panel B

San Diego Gas & Electric Company

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	50.00%	4.620%	2.31%
Preferred Stock	0.00%	0.000%	0.00%
Common Equity	50.00%	9.375%	4.69%
Total	100.00%		7.00%

Panel C

Southern California Edison

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	44.79%	4.750%	2.13%
Preferred Stock	5.21%	6.950%	0.36%
Common Equity	50.00%	9.375%	4.69%
Total	100.00%		7.18%

Panel D

Southern California Gas Company

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	47.50%	3.890%	1.85%
Preferred Stock	2.50%	6.000%	0.15%
Common Equity	50.00%	9.250%	4.63%
Total	100.00%		6.62%

If the Commission rejects my capital structure adjustment and employs the Energy Companies' recommended capital structures,[3] my base recommended ROE would then be 9.25%. As a result, my ROE recommendations are 9.625% for PG&E, 9.25% for SDG&E and SCE, and 9.125% for SCG. With the Companies proposed capital structures and senior capital cost rates, I am recommending an overall fair rate of return or cost of capital for PG&E, SCE, SDG&E and SCG of 7.43%, 7.03%, 7.20%, and 6.66%, respectively. This recommendation is provided in Table 3 and page 2 of Exhibit JRW-1.

Table 3

Cal Advocates Alternative Cost of Capital Recommendations

Panel A
Pacific Gas & Electric Company

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	47.50%	5.050%	2.40%
Preferred Stock	0.50%	5.520%	0.03%
Common Equity	52.00%	9.625%	5.01%
Total	100.00%		7.43%

Panel B
San Diego Gas & Electric Company

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	48.00%	4.620%	2.22%
Preferred Stock	0.00%	0.000%	0.00%
Common Equity	52.00%	9.250%	4.81%
Total	100.00%		7.03%

Panel C
Southern California Edison

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	43.00%	4.750%	2.04%
Preferred Stock	5.00%	6.950%	0.35%
Common Equity	52.00%	9.250%	4.81%
Total	100.00%		7.20%

Panel D
Southern California Gas Company

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	45.60%	3.890%	1.77%
Preferred Stock	2.40%	6.000%	0.14%
Common Equity	52.00%	9.125%	4.75%
Total	100.00%		6.66%

[3] The Commission in the last rate case granted capital structures with 52.0% common equity ratios. As noted above, in this case three of the companies have recommended capitalizations with 52.0% common equity ratios with the exception of SDG&E which has recommended 54.0%.

B. Primary Rate of Return Issues in This Case

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

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

1. **Capital Market Conditions** – The Companies' analyses, ROE results, and recommendations are based on assumptions of higher interest rates and capital costs. However, despite the increase in inflation and interest rates over the past two years and the financial market volatility associated with the new administration's focus on tariffs, 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 in the 2.25%-2.50% range; (2) the yield curve is once again positively sloped (which is normal); (3) authorized ROEs have not increased or decreased as much as interest rates in recent years, and so the increases in interest rates in the last two years does not mean that authorized ROEs need to increase as much; and (4) during 2025, as President Trump has introduced new economic policies including federal budget cuts and tariffs, there has been a significant increase in inflationary fears and financial market volatility, but utility stocks have proven to be relatively safe investments and have not significantly been impacted by the tariffs and federal budget cut backs in 2025.

2. **The Companies' Proposed Capital Structures Include Inflated Common Equity Ratios and Lower Financial Risk than the Three Proxy Groups**: PG&E, SCE, and SCG have proposed capital structures with common equity ratios of 52.0%, while SDG&E has proposed a capital structure with a common equity ratio of 54.0%. I highlight that all four companies have proposed capital structures with common equity ratios that are significantly higher than the averages of the proxy groups. In addition, I have performed a capital structure study that illustrates that: (1) with the exception of SCG, the companies have not maintained the common equity ratios approved in the 2023 rate case; and (2) there is significant evidence of double leverage between the parent companies and the California energy companies which means that the parent holding companies have significantly more debt leverage than the operating energy companies. Hence, I have adjusted the capital structures to be more reflective of the capital structures of other publicly held electric and gas companies. I have proposed

capital structures for all four companies with common equity ratios of 50.0%.

3. **<u>After-Tax Weighted Average Cost of Capital Approach</u>**: Witness Dr. Villadsen (SCE) employs the After-Tax Weighted Average Cost of Capital Approach ("ATWACC") approach. Using this approach, the witnesses use DCF, CAPM, and risk premium approaches to estimate an equity cost rate, and then make an upward adjustment to their estimates to account for the market value capital structures of the utility companies. Traditional regulation uses book and not market value capital structures. As such, the ATWACC approach has not been widely-adopted in public utility cases. In addition, as I note below, this market value – book value adjustment produces illogical results.

4. **<u>DCF Approach</u>**: The Witnesses and I have employed the traditional constant-growth DCF model. The Witnesses have overstated their reported DCF results primarily by relying exclusively on the overly optimistic and upwardly biased earnings per share (EPS) growth rate forecasts of Wall Street analysts and *Value Line*. I provide a detailed study of analysts' 5-year EPS growth rate forecasts for electric utility and gas distribution companies and demonstrate that these growth rate forecasts produce overly optimistic and upwardly biased estimates of utilities' actual EPS. In contrast to the Companies' approaches, in developing the DCF growth rate that I have used in my analysis, I have reviewed thirteen growth rate measures, including historical and projected growth rate measures, and have evaluated growth in dividends, book value, and earnings per share.

5. **<u>CAPM Approach</u>**: The CAPM approach requires an estimate of the risk-free interest rate, beta, and the market or risk premium. There are three issues with the Witnesses CAPM analyses: (1) they have employed the empirical CAPM ("ECAPM") version of the CAPM, which makes inappropriate adjustments to the risk-free rate and the market risk premium; (2) The witness for SCE has made an inappropriate leverage adjustment to their betas; and (3) most importantly, they employed market risk premiums that are significantly larger than: (a) indicated by historic stock and bond return data; and (b) found in the published studies and surveys of the market risk premium. The forward-looking market risk premiums are computed by (a) an expected market return by applying the DCF to the S&P 500 companies; and (b) then subtracting the risk-free interest rate. They use the overly-optimistic and upwardly-biased analysts' EPS growth rate forecasts

to compute the expected return on the S&P 500 companies in the DCF application. This produces inflated expected stock market returns and market risk premiums. In short, these forward-looking market risk premiums are excessive and include highly unrealistic assumptions about future earnings growth and stock returns.

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

6. **<u>Risk Premium Approach</u>**: 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, the Plaintiff's witnesses have estimated a risk premium by regressing the authorized ROEs for electric utility and gas distribution companies on the 30-year Treasury yield and then adding this risk premium to project 30-year Treasury yields. As I show in my critique of the Company's rate of return analysis, there are a number of empirical issues with using historical stock and bond returns to estimate an expected market risk premium. In addition, there are three primary problems using authorized ROEs to estimate a risk premium: (1) this risk premium approach is a gauge of *commission* behavior rather than *investor* behavior; (2) this approach produces an inflated measure of the risk premium because it uses historical authorized ROEs and Treasury yields, and the resulting risk premium is applied to projected Treasury yields; (3) the risk premium is inflated as a measure of investors' required risk premium since electric utility and gas distribution companies have been selling at market-to-book ratios in excess of 1.0. This indicates that the authorized rates of return have been greater than the return required by investors; and (4) The ROE derived from this approach is dependent on the authorized ROEs from state utility commissions. As discussed 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.

7. **Expected Earnings Approach** - Mr. Nowak testifies for SDG&E and SCG and also uses the Expected Earnings approach to estimate an equity cost rate for the Company. Mr. Nowak computes the expected ROE as forecasted by *Value Line* for companies in his proxy groups. As I discuss in my critique of Mr. Nowak's presentation, the so-called "Expected Earnings" approach does not measure the market cost of equity capital, is independent of most cost of capital indicators, ignores the research on the upward bias in *Value Line*'s earnings projections, and has several other empirical issues. Therefore, the Commission should ignore Mr. Nowak's "Expected Earnings" approach in determining the appropriate ROE for SDG&E and SCG.

II. CAPITAL MARKET CONDITIONS AND AUTHORIZED ROES

A. Capital Market Conditions

Q. PLEASE REVIEW TRENDS IN UTILITY CAPITAL COSTS INDICATORS.

A. Page 1 of Exhibit JRW-2 shows the yields on A-rated public utility bonds. These yields gradually declined in the past 15 years from 7.5% to the 3.0% range and then bottomed out in the 3.0% range in 2020 and 2021 due to the economic fallout from the Covid-19 pandemic. Since then, these yields have increased with interest rates in general over the 2022-25 time period and now are in the 6.00% range.

Page 2 of Exhibit JRW-2 shows the average dividend yield for electric utilities. Over the past decade these yields have primarily been in the 3.0%-3.5% range. These declined over the past 13 years, bottoming out at 3.1% in 2019. They increased to almost 4.0% in 2023 but declined to 3.6% in 2024. The average dividend yields for gas companies are also 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.

Page 3 of Exhibit JRW-2 shows the average earned ROE and market-to-book ratio for publicly held electric utilities. The average earned ROE has been in the 9.0% to 10.0% range over the past five years and the average market-to-book ratio has ranged between 1.5X and 2.0X. The average earned ROE and market-to-book ratio for the gas companies are also 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. The bottom line is that the persistence of the market-to-book ratios being above 1.0 clearly indicates that the earned ROEs for electric utilities and gas distribution companies (9.0%-10.0%) are above the equity return that investors require.

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 (2010–2025). 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% in 2023, declined to the 4.0% range in 2024, and then increased again to 5.0% after the election. In 2025, these yields declined but now are back in the 5.0% range.

Figure 1

30-Year Treasury Yields

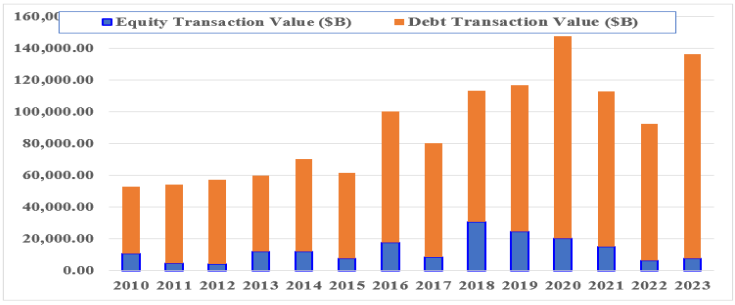
Data Source: https://fred.stlouisfed.org/series/DGS30

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 out 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 during 2022–2025. Coming out of the pandemic, real GDP growth 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. During 2022–2024, the improving economy and business activity; supply chain shortages associated with COVID shutdowns; 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 2.7% as of June, 2025.

Figure 3

Year-Over-Year Inflation Rates

2020–2025

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

In response to the higher inflation, the Federal Reserve ("Fed") 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 has strongly favored additional rate cuts leading into the January and March 2025 Fed meetings. In addition, politicians have called for the Fed to lower interest rates. However, the Fed has not bowed to market and political pressure and has 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 since mid-2022 and shows an expected inflation rate in the range of 2.25%–2.50%.

Figure 4

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

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

Q. PLEASE DISCUSS INTEREST RATES COMING INTO 2025.

A. As discussed above, the recovery of the economy pushed up inflation and interest rates during 2022–2024, but long-term inflationary expectations remained in the 2.25%–2.50% range. In 2024, the yield curve flattened as the Federal Reserve, which increased the discount rate eleven times in 2022–2023, began the process of normalizing interest rates by cutting the discount rate three times in 2024. After

the election and coming into 2025, investors were looking for the Federal Reserve to cut rates again.

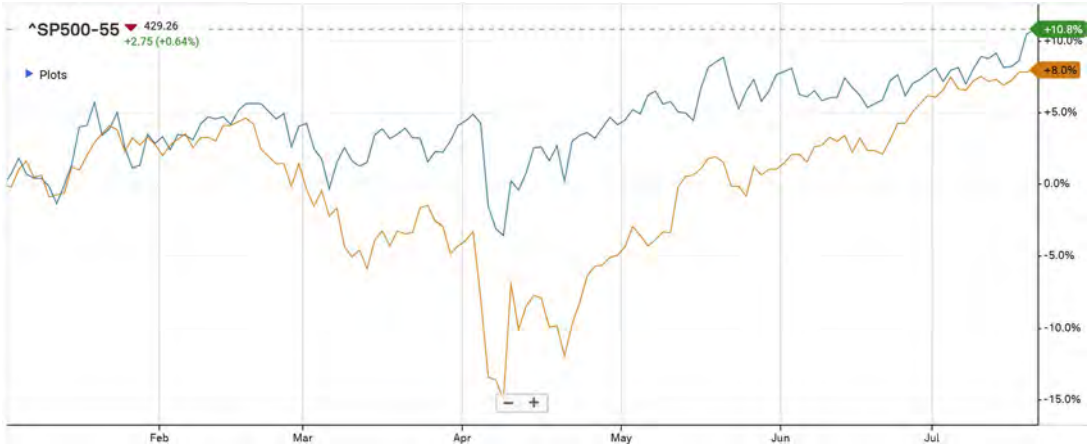
Q. PLEASE DISCUSS THE MARKETS AND THE INCREASE IN VOLATILITY SINCE PRESIDENT TRUMP TOOK OFFICE ON JANUARY 20TH.

A. Two of President Trump's priorities include significant cuts in government spending and the imposition of tariffs to offset trade deficits. These two initiatives have produced increases in inflationary fears and financial market volatility (with Wall Street's "Fear Gauge," VIX peaking at over 50.0) and about a 10% decline in the stock market. However, several factors suggest these actions have run their course at this time:

> (1) the government spending cuts and the President's tariff negotiations appear to be moving along with less market impact. The stock market has recovered from its initial losses; (2) the President and Treasury Secretary have stated that they expect that the discount rate will be cut in 2025 and interest rates will decline; (3) the Administration's actions have increased the possibility of a recession in 2025, which could result in lower interest rates; and (4) utility stocks have proven to be safe havens for investors during this period of economic uncertainty. Figure 5 shows the year-to-date performance of the S&P Utilities Index and the S&P 500. The S&P Utilities Index has traded in positive territory and above the S&P 500 all year and did not have the big 15% downturn associated with President Trump's economic initiatives. Year-to-date, the S&P utilities index has produced a 10.8% return, while the S&P 500 has recovered from its losses and is now up 8.0%. However, investors have not seen utilities being significantly impacted by the Trump Administration's imposition of government spending cuts and tariffs.

Figure 5

The S&P Utilities Index vs. the S&P 500
2025



Data Source: S&P Global Market Intelligence, S&P Cap IQ, 2025.

B. Authorized ROEs

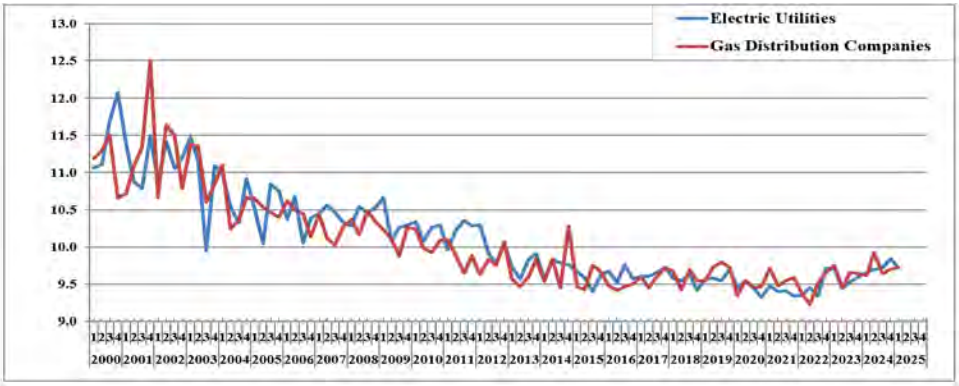
Q. PLEASE DISCUSS THE TREND IN AUTHORIZED ROES FOR GAS AND ELECTRIC COMPANIES.

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.

Figure 6

Authorized ROEs for Electric Utilities and Gas Distribution Companies

2000-2025



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

Table 4 provides the average annual authorized ROEs for electric utility and gas distribution from 2010 to 2025.[4] In 2024 and 2025, the average annual authorized ROEs for electric and gas companies have been in the 9.70% range.

Table 4
Average Annual Authorized ROEs for Electric Utilities and Gas Distribution Companies
2010–2025

	Electric	Gas		Electric	Gas
2010	10.37	10.15	2018	9.65	9.59
2011	10.29	9.92	2019	9.66	9.72
2012	10.17	9.94	2020	9.44	9.47
2013	10.03	9.68	2021	9.38	9.56
2014	9.91	9.78	2022	9.54	9.53
2015	9.78	9.6	2023	9.60	9.64
2016	9.77	9.54	2024	9.70	9.72
2017	9.74	9.72	Q1-2025	9.72	9.73

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

[4] The data and numbers discussed in this section come from 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 ratepayers.

Table 5
Average Annual 30-Year Treasury Yields and Authorized ROEs for Electric Utility 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 Electric ROE	9.60%	9.66%	9.63%	9.44%	9.38%	9.41%	-0.22%

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 Electric ROE	9.54%	0.16%	9.60%	0.06%	9.72%	0.12%	9.62%	0.21%

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

In Panel A of Table 5, I have averaged the 2018/2019 (pre-COVID period) figures and the 2020/2021 (COVID period) figures for the Treasury yields and authorized ROEs, 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 5 is that authorized ROEs for electric utility companies, despite hitting record lows in 2020–2021, 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 utility companies averaged 9.63% in 2018 and 2019, respectively, and declined to an average of 9.41% in 2020 and 2021, respectively, a decline of only 22 basis points.

Panel B of Table 5 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 utility companies increased to 9.54%, an increase of only 16 basis. Likewise, the average daily 30-year Treasury yield increased by 92 basis points to 4.03% in 2023, while authorized ROEs for electric utility companies increased by 6 basis points to 9.60%. In 2024, the average daily 30-year Treasury yield increased by 38 basis points to 4.41%, while authorized ROEs for electric utility companies increased 12 basis points to 9.72%.

In sum, the far-right column of Panel B of Table 5 shows the average authorized ROEs and 30-year Treasury yields for the COVID period (2020–2021) and the post-COVID years (2022–2024). 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 (2022–2024), the authorized ROEs for electric utility companies only increased by 21 basis points. 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. 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, electric utilities and gas distribution companies have been earning ROEs in the range of 8.0% to 10.0% in recent years. With such ROEs, electric utilities such as those in the proxy group have strong investment grade credit ratings, their stocks have been selling at well over book value, and they have been raising large amounts of capital. While my recommendation is below the average authorized ROEs for electric utilities and gas distribution companies, it reflects current market conditions for the cost of equity. 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 2022 *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]

[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.

The authors reported the following empirical results:

(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.

Q. PLEASE DISCUSS THE AUTHORIZED ROES FOR ELECTRIC UTILITY AND GAS DISTRIBUTION COMPANIES IN CALIFORNIA.

A. Table 6 shows the electric utilities and gas distribution companies in California from 2020–2025. 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.

Table 6
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	-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	-19-08-013 (Track 1	Electric	Vertically Integrated	8/19/2021	Fully Litigated	489.3	7.68	NA	NA
Southern California Edison Co.	EIX	-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	-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	-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.

In the Companies' last rate case in 2023, with an Order date of December 22, 2023, the Companies all were approved for a capital structure with a common equity ratio of 52.00%. The Approved ROEs were SCG (10.50%), SDG&E (10.65%), PG&E (10.70%) and SCE (10.75%).

III. PROXY GROUP SELECTION

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

A. To develop a fair rate of return recommendation for the Company, I have evaluated the return requirements of investors on the common stock of a proxy group of publicly held electric utility companies ("Electric Proxy Group"), a group of gas distribution companies ("Gas Proxy Group"), and a group of combination electric utility and gas distribution companies ("Combination Proxy Group").

Q. PLEASE DESCRIBE THE ELECTRIC PROXY GROUP.

A. For the Electric Proxy Group, I selected all of the electric utilities who appeared in the proxy groups of the witnesses for the electric utilities. Generally, the attributes include the following:

(1) Listed as a U.S.-based electric utility and covered by the *Value Line Investment Survey*;

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

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

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

(5) Analysts' long-term[8] EPS growth rate forecasts are available from Yahoo, S&P Cap IQ, and/or Zacks.

The Electric Proxy Group includes thirty-one companies. Summary financial statistics for the proxy group are listed in Panel A on page 1 of Exhibit JRW-3. The mean operating revenues and net plant among members of the Electric Proxy Group are $10.57 billion and $42.62 billion, respectively. The group on average receives 84% of its revenues from regulated electric operations and 13% from regulated gas operations, has a BBB+ bond rating from Standard & Poor's and a

[8] An investment grade rating from S&P and Moody's is normally considered to be BBB- and Baa3, respectively or higher.

Baa2 rating from Moody's, a current average common equity ratio of 39.60%, and an earned return on common equity of 9.31%.

Q. PLEASE DESCRIBE YOUR PROXY GROUP OF GAS DISTRIBUTION COMPANIES.

A. My Gas Proxy Group consists of eight natural gas distribution companies. The companies include Atmos Energy, Chesapeake Utilities, New Jersey Resources, NiSource, Inc. Northwest Natural Gas Company, ONE Gas, Inc., Southwest Gas, and Spire.

Summary financial statistics for the Gas Proxy Group are listed on Panel B of page 1 of Exhibit JRW-3. The mean operating revenues and net plant among members of the Gas Proxy Group are $2.87 billion and $10.46 billion, respectively. The group receives 75 percent of revenues from regulated gas operations, has an A-/BBB+ average issuer credit rating from S&P and an A3/Baa1 average issuer rating from Moody's, an average common equity ratio of 44.3%, and a mean earned return on common equity of 8.54%.

I have included the Combination Proxy Group because I do not believe that the Gas Proxy Group, which includes only eight companies, is large enough to provide reliable ROE results. A related issue is that gas companies lack investment and credit analyst coverage. To select the Combination Group, I picked companies from the Electric and Gas Proxy Groups that have at least 10% of revenues from regulated gas operations, which includes 18 companies. Panel C 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 $8.17 billion and $31.75 billion, respectively. On average, the group receives 66% of its revenues from regulated electric operations and 27% 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 41.1%;

and an average earned return on common equity of 10.04%.

Q. HOW DOES THE INVESTMENT RISK OF THE COMPANIES COMPARE TO THE TWO PROXY GROUPS?

A. I believe that bond ratings provide a good assessment of the investment risk of a company. Table 6 provides the average S&P and Moody's credit ratings for the three proxy groups as well as for PGE, SCE, SDG&E, and SCG. The average S&P and Moody's ratings for the Electric and Combination Proxy Groups are BBB+ and Baa2 and for the Gas Proxy Group, with limited coverage, is BBB+ and Baa1. The investment risk of SCG, with S&P and Moody's ratings of A- and A2, is at the low investment risk end of the proxy groups and the California energy companies. SDG&E's S&P and Moody's ratings of BBB+ and A3 indicate an investment risk level which is slightly less than the proxy groups. SCE's S&P and Moody's ratings of BBB and Baa1 suggest an investment risk level which is on par with the proxy groups. PGE's ratings of BB and Baa3 clearly indicate a higher level of risk that is at the high end of the proxy groups and the other California energy companies.

Table 7
S&P and Moody's Credit Ratings

	S&P	Moody's
Electric Proxy Group	**BBB+**	**Baa2**
Gas Proxy Group	**BBB+**	**Baa1**
Combo Proxy Group	**BBB+**	**Baa2**
PG&E	**BB**	**Baa3**
SCE	**BBB**	**Baa1**
SCG	**A-**	**A2**
SDG&E	**BBB+**	**A3**

Q. PLEASE DISCUSS YOUR INVESTMENT RISK STUDY ON PAGE 2 OF EXHIBIT JRW-3.

A. On page 2 of Exhibit JRW-3, I have assessed the riskiness of the three proxy groups using five different risk measures. These measures include beta, financial strength, safety, earnings predictability, and stock price stability. The definitions are provided on page 5 of Exhibit JRW-3. The comparisons of the risk measures include beta (0.78 vs. 0.80 vs. 0.80), financial strength (A vs. A vs A), safety (1.9 vs. 1.9 vs. 1.8), earnings predictability (86 vs. 64 vs. 91), and stock price stability (90 vs. 91 vs. 92).[9] On balance, these measures suggest that the three proxy groups are: (1) relatively similar in risk; and (2) relatively low risk overall.

IV. CAPITAL STRUCTURE RATIOS AND DEBT COST RATES

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

A. PG&E, SDG&E, SCE, and SCG have proposed capital structures and senior capital cost rates that are summarized in Panels A and B of Table 8 and in Exhibit JRW-4.

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

A. Panels A, B, and C of page 1 of Exhibit JRW-3 provides the average common equity ratios for the companies in the three proxy groups. The average common equity ratios for the three proxy groups are 39.6%, 44.3%, and 41.1%. These are the capital structure ratios for the holding companies that trade in the markets and are used to estimate an equity cost rate for the companies. These ratios indicate that the companies in the proxy groups have, on average, much lower common equity

[9] The average earnings predictability ("EP") score for the gas group of 64 is well below the average for the other two groups of 90 and 92. This relatively low figure is attributable to the low EP scores for two companies - NWN and SWX. However, given that the stock price stability are similar (90 and 95) for the two companies, it appears that the two low EP scores are not a significant risk factor for the companies in the gas group.

ratios than that proposed by the companies. As such, the companies have proposed capital structures that have much more common equity and less financial risk than the average capital structure of the companies in the proxy groups.

Table 8
Companies' Proposed Capital Structure Ratios
and Senior Capital Cost Rates

Panel A
Proposed Capital Structure Ratios

	PG&E	SDGE	SCE	SCG
Long-Term Debt	47.50%	46.00%	43.00%	45.60%
Preferred Equity	0.50%	0.00%	5.00%	2.40%
Common Equity	52.00%	54.00%	52.00%	52.00%
Total	100.00%	100.00%	100.00%	100.00%

Panel B

Proposed Senior Capital Rates

	PG&E	SDGE	SCE	SCG
Long-Term Debt	5.05%	4.62%	4.75%	5.02%
Preferred Equity	5.52%	0.00%	6.95%	6.00%

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

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

A. Yes. Short-term debt, like long-term debt, has a higher claim on the assets and earnings of the company and requires timely payment of interest and repayment of principal. Thus, in comparing the common equity ratios of the holding companies with The Companies' recommendations, it is appropriate to include short-term debt when computing the holding company common equity ratios. Additionally, the financial risk of a company is based on total debt, which includes both short-term and long-term debt.

Q. PLEASE DISCUSS THE CAPITAL STRUCTURE STUDY PROVIDED ON PAGES 3-7 OF EXHIBIT JRW-4.

A. Pages 3 of Exhibit JRW-4 provides the summary quarterly capitalization ratios for the four California energy operating companies (Panel A) and their parent holding companies (Panel B) since the last rate case (2022-25). The data are provided on pages 4-7 of the exhibit.

Two things stand out from the study:

(1) with the exception of SCG, the energy companies have not maintained the common equity ratios approved in the 2023 rate case. As noted above, the four energy companies were granted capital structures with 52.0% common equity ratios in the 2022 rate case. SCG's average quarterly common equity ratio over 2022-25 time period was 53.23%. The other three companies common equity ratios have not approached the 52.0% authorized common equity ratio; and

(2) The common equity ratios of the parent holding companies are consistently below the common equity ratios of their operating energy utilities. This provides direct evidence of double leverage between the parent companies and the California energy companies which means that the parent holding companies have significantly more debt leverage than the operating energy companies. This effectively means that the parent holding companies have used debt to finance equity in the operating subsidiary utility, which is known as double leverage.

Q. PLEASE DISCUSS THE ISSUE OF PUBLIC UTILITY HOLDING COMPANIES 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]

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

[11] *Id.* at 5.

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

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

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

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

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

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

[12] *Id.* at 1.

financial risk in the form of debt.

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

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

Q. HOW HAVE UTILITIES TYPICALLY STRUCK THIS BALANCE?

A. Due to regulation and the essential nature of its output, a regulated utility is exposed to less business risk than other companies that are not regulated. This means that a regulated electric distribution company can reasonably carry relatively more debt in its capital structure than can most unregulated companies. Thus, a utility should take appropriate advantage of its lower business risk to employ cheaper debt capital at a level that will benefit its customers through lower revenue requirements. Typically, one may see equity ratios for electric utilities range from 40% to 50%.

Q. GIVEN THAT THE COMPANIES HAVE PROPOSED EQUITY RATIOS THAT ARE HIGHER THAN THE PROXY GROUPS AS WELL AS THEIR HOLDING COMPANY PARENT COMPANIES, 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 that is comparable to that of the proxy group 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 with an unusually high equity ratio should expect to have the resulting lower risk reflected in a lower authorized return on equity. The fundamental relationship between the lower risk and the appropriate authorized return cannot be ignored without inviting financial harm to ratepayers.

Q. PLEASE COMMENT ON THE CAPITAL STRUCTURE STUDIES PERFORMED BY MR NOWAK TO JUSTIFY THE CAPITAL STRUCTURES OF SDG&E AND SCG.

A. Mr. Novak claims to support the SDG&E's and SCG's proposed capital structures in his capital structure studies.[13] The studies show that the average common equity ratios for his proxy groups are 51.14% for SDG&E and 53.16% for SCG. In Exhibit JRW-3, I report that the current average common equity ratio for the proxy groups are 39.6%, 44.3%, and 41.1%. My reported common equity ratio is lower

[13] These studies are provided in Exhibit JCN-10 in both his SDG&E and SCG testimonies.

because, as explained above, I have used the capitalizations of the holding companies (who are the actual proxy companies) and included short-term debt. Therefore, Mr. Novak's capital structure studies do not support SDG&E's and SCG's proposed capital structures with common equity ratios of 54.00% for SDG&E and 52.00% for SCG.

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

A. I will use a capital structure with a common equity ratio of 50.0%. In their last case, the approved capitalizations for the Companies included a common equity ratio of 52.0%. In this case, PGE, SCE, and SCG have requested that their capital structures once again include a 52.0% common equity ratio, while SDG&E has requested a capital structure with a common equity ratio of 54.0%. As discussed above, only SCG has actually operated with a common equity ratio as large as 52.0%. In addition, the average common equity ratios for the companies in the proxy groups are 39.6%, 44.3%, and 41.1%. As such the proposed capitalizations for the Plaintiffs include much higher common equity ratios and lower financial risk than the Companies in the three proxy groups that are used to estimate a common equity cost rate. In addition, the proposed capital structures include much more equity and less financial risk than the capital structures of the parent holding companies of the California energy companies.

In my proposed capital structures, I have adjusted the long-term debt and preferred stock (PG&E, SCE, SCG) upwards to total 50.0% and common equity down to 50.0%. These proposed capitalizations still include higher common equity ratios and less financial risk than the average capitalizations of the companies in the proxy groups. I am also accepting the senior capital cost rates proposed by the Companies. My proposed capital structures and senior capital cost rates are provided in Table 9.

Table 9

Cal Advocates Proposed Capital Structure Ratios and Senior Capital Cost Rates

Panel A
Proposed Capital Structure Ratios

	PG&E	SDGE	SCE	SCG
Long-Term Debt	49.69%	50.00%	44.79%	47.50%
Preferred Equity	0.31%	0.00%	5.21%	2.50%
Common Equity	50.00%	50.00%	50.00%	50.00%
Total	100.00%	100.00%	100.00%	100.00%

Panel B

Proposed Senior Capital Cost Rates

	PG&E	SDGE	SCE	SCG
Long-Term Debt	5.05%	4.62%	4.75%	4.75%
Preferred Equity	5.52%	0.00%	6.95%	6.00%

V. THE COST OF COMMON EQUITY CAPITAL

A. Overview

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

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

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

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

Normative economic models of a company or firm, developed under very restrictive assumptions, provide insight into the relationship between a firm's performance or profitability, capital costs, and the value of the firm. Under the economist's ideal model of perfect competition — where entry and exit are costless, products are undifferentiated, and there are increasing marginal costs of production — firms produce up to the point where price equals marginal cost. Over time, a long-run equilibrium is established where the price of the firm equals 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 an ROE in excess of its cost of equity, investors respond by valuing the firm's equity in excess of its book value.

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

> Fundamentally, the value of a company is determined by the cash flow it generates over time for its owners, and the minimum acceptable rate of return required by capital investors. This "cost of equity capital" is used to discount the expected equity cash flow, converting it to a present value. The cash flow is, in turn, produced by the interaction of a company's return on equity and the annual rate of equity growth. High return on equity (ROE) companies in low-growth markets, such as Kellogg, are prodigious generators of cash flow, while low ROE companies in high-growth markets, such as Texas Instruments, barely generate enough cash flow to finance growth.
>
> A company's ROE over time, relative to its cost of equity, also determines whether it is worth more or less than its book value. If its ROE is consistently greater than the cost of equity capital (the investor's minimum acceptable return), the business is economically profitable and its market value will exceed book value. If, however, the business earns an ROE consistently less than its cost of equity, it is economically unprofitable and its market value will be less than book value.[14]

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

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

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

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

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

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

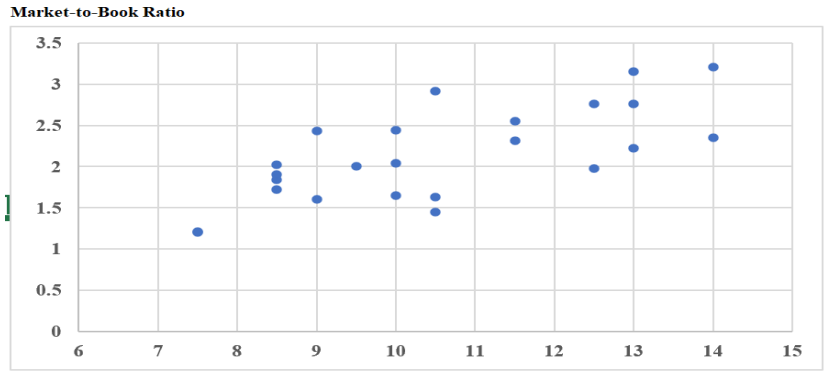
To assess the relationship by industry, as suggested above, I performed a regression study between estimated ROE and market-to-book ratios of the Electric Proxy Group companies. The results are presented in Figure 7. The average R-square is 0.61.[16] This demonstrates the strong positive relationship 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.

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

[16] R-square measures the percent of variation in one variable (e.g., market-to-book ratios) explained by another variable (e.g., expected ROE). R-squares vary between 0 and 1.0, with values closer to 1.0 indicating a higher relationship between two variables.

Figure 7

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



Adjusted R-Square = 61, N=25.
Data Source: *Value Line Investment Survey.*

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 10

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 10 provides an assessment of investment risk for 91 industries as measured by beta, which, according to modern capital market theory, is the only relevant measure of investment risk. These betas come from the *Value Line Investment Survey*. The study shows that the investment risk of utilities is low compared to other industries.[17] The average betas for electric, gas, and water utility companies

[17] 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

are 0.96, 0.94, and 0.88, respectively.[18] 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 flow. Investors discount these expected cash flows at their required rate of return that, as noted above, reflects the time value of money and the perceived riskiness of the expected future cash flows. As such, the cost of common equity is the rate at which investors discount expected cash flows associated with common stock ownership.

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

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

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average of 1.00. This is discussed in more detail in the CAPM section of the testimony.

[18] 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.

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

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

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

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

B. 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:

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

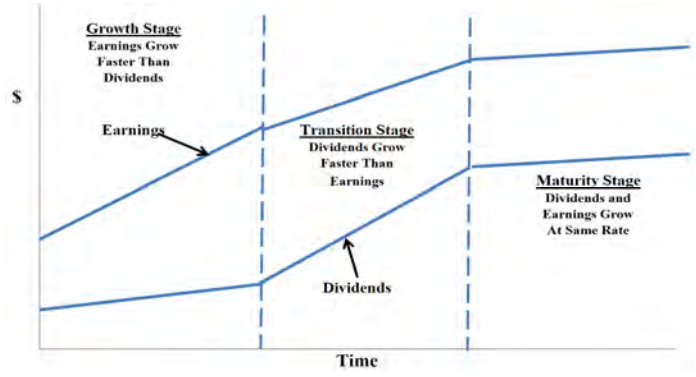
where P is the current stock price, D_1, D_2, D_n are the dividends in (respectively) year 1, 2, and in the future years n, and k is the cost of common equity.

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.[19]

In using the three-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 she or he 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:

[19] William Sharpe, Gordon Alexander, and Jeffer Bailey, *Investments*, 1995, pp. 590-1.

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

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, as monopolies, 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, in order to accurately estimate investors' expectations.

Q. WHAT DIVIDEND YIELDS HAVE YOU REVIEWED?

A. I have calculated the dividend yields for the companies in the proxy groups using the current annual dividend and the 30-day, 90-day, and 180-day average stock prices. These dividend yields are provided in Panels A, B, and C of page 2 of Exhibit JRW-5. For the Electric Proxy Group, the mean and median dividend yields using the 30-day, 90-day, and 180 day average stock prices range from 3.40% to 3.70%. Given these results, I am using the midpoint of this range, 3.55%, as the dividend yield for the Electric Proxy Group. The dividend yields for the Gas Proxy Group are shown in Panel B of page 2 of Exhibit JRW-5. The mean and median dividend yields for this group using the 30-day, 90-day, and 180 day average stock prices range from 3.40% to 3.70%. I will use the midpoint of this range, 3.45%, as the dividend yield for the Gas Proxy Group. The dividend yields for the Combination Proxy Group are shown in Panel C of page 2 of Exhibit JRW-5. The mean and median dividend yields for this group using the 30-day, 90-day, and 180 day average stock prices range from 3.30% to 3.40%. I will use the midpoint of this range, 3.35%, as the dividend yield for the Combination Proxy Group.

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

A. According to the traditional DCF model, the dividend yield term relates the dividend paid over the coming period to the current stock price. As indicated by Professor Myron Gordon, who is commonly associated with the development of the DCF model for popular use, this is obtained by: (1) multiplying the expected dividend over the coming quarter by 4, and (2) dividing this dividend by the

current stock price to determine the appropriate dividend yield for a firm that pays dividends on a quarterly basis.[20]

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, computing the dividend yield based on presumed growth over the coming quarter as opposed to the coming year can produce quite different results. 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.

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

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

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

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

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

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

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

Sustainable or internally generated growth is a function of the percentage of earnings retained within the firm (the earnings retention rate) and the rate of return earned on those earnings (the ROE). The sustainable growth rate is computed as the retention rate times the ROE. Sustainable or internal growth is significant in determining long-run earnings and, therefore, dividends. Investors recognize the importance of sustainable 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.[21] Thomson 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

[21] Yahoo finance (http://finance.yahoo.com) no longer publishes analysts summary EPS forecasts.

addition to analysts' EPS forecasts. In contrast, Thomson Reuters and Zacks provide limited EPS forecast data free-of-charge on the Internet. Zacks publishes its summary forecasts on its website (www.zacks.com). 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 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.[22] 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 three-to-five years proved to be just as accurate as using the EPS estimates from analysts' three-to-five year EPS growth-rate forecasts. In the authors' opinion, these results indicate that analysts' long-term earnings growth-rate forecasts should be used with caution as inputs for valuation and cost of capital purposes. Finally, and most significantly, it is well known that the long-term EPS growth-rate forecasts of Wall Street securities analysts are overly optimistic and upwardly biased. This has been demonstrated in a number of academic studies over the years.[23] Hence, using

[22] 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.

[23] The studies that demonstrate analysts' long-term EPS forecasts are overly-optimistic and upwardly

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 (300 basis points).[24]

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

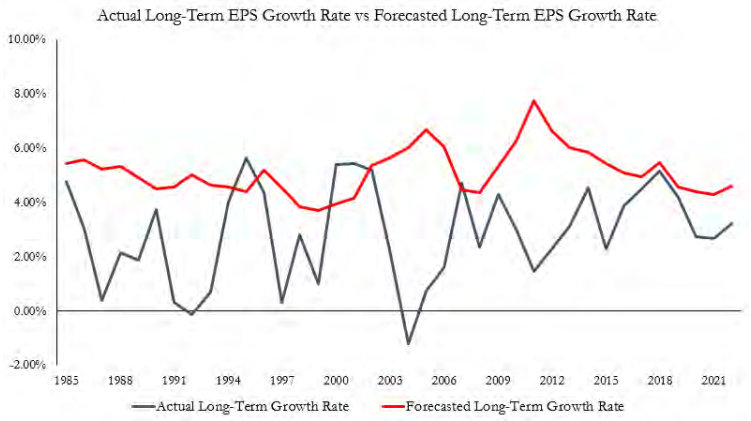
A. Yes. I have completed a study of the accuracy of analysts' EPS growth rates for electric utilities and gas distribution companies over the 1985 to 2022 time period. In the study, I used the utilities listed in the electric utilities and gas distribution companies covered by *Value Line*. I collected the three-to-five-year projected EPS growth rate from I/B/E/S for each utility and compared that growth rate to the utility's actual subsequent three-to-five-year EPS growth rate.

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).

[24] 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).

Figure 9

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



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

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

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 ("SCL") (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.[25] SCL studied the actual versus the projected ock returns, sales, profit margins, and earnings per

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

share made by *Value Line* over the 1969 to 2001 time period. *Value Line* projects variables from a three-year base period (e.g., 2012 to 2014) to a future three-year projected period (e.g., 2016 to 2018). SCL used the 65 stocks included in the Dow Jones Indexes (30 Industrials, 20 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 EPS 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 EPS and profit margins.

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

A. Yes, I do believe that investors are well aware of the bias in analysts' EPS growth-rate forecasts, and therefore, stock prices paid by investors reflect the upward bias by discounting the analysts' EPS growth-rate forecasts to a more realistic level.

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

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

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

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

EPS, DPS, and BVPS for the Electric Proxy Group, as provided in Panel A, range from 3.5% to 5.0%, with an average of the medians of 4.1%. For the Gas 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 4.3% to 8.5%, with an average of the medians of 6.0%. For the Combination Proxy Group, as shown in Panel C 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 5.5%, with an average of the medians of 4.9%.

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

A. *Value Line's* projections of EPS, DPS, and BVPS growth for the companies in the proxy groups are shown on page 4 of Exhibit JRW-5. As stated above, due to the presence of outliers, the medians are used in the analysis. For the Electric Proxy Group, as shown in Panel A of page 4 of Exhibit JRW-5, the medians range from 4.0% to 6.0%, with an average of the medians of 5.2%. The range of the medians for the Gas Proxy Group, shown in Panel B of page 4 of Exhibit JRW-5, is from 5.0% to 6.3%, with an average of the medians of 5.6%. For the Combination Proxy Group, the range of the medians, shown in Panel C of page 4 of Exhibit JRW-5, is from 4.0% to 6.0%, with an average of the medians of 5.2%.

Also provided on page 4 of Exhibit JRW-5 are the prospective sustainable growth rates for the companies in the three 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, Gas, and Combination Proxy Groups, the median prospective sustainable growth rates are 4.3%, 3.8%, and 4.6%, respectively.

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

A. 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.[26] 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 a 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, Gas, and Combination Proxy Groups are 7.0%/6.7%, 7.6%/7.6%, and 7.0%/7.0%, respectively.[27]

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 of DCF growth rate indicators for the proxy groups.

The historical growth rate indicators for the Electric Proxy Group imply a baseline growth rate of 4.1%. The average of the projected EPS, DPS, and BVPS growth rates from *Value Line* is 5.2%, and *Value Line*'s projected sustainable growth rate is 4.3%. The projected EPS growth rates of Wall Street analysts for the Electric Proxy Group are 7.00% and 6.7% (average = 6.9%) as measured by the mean and median growth rates. The overall range for the projected growth-rate indicators (ignoring historical growth) is 4.3 to 7.0%, and the average of the three projected

[26] I used to also use the analysts' EPS growth rate forecasts published by Yahoo Finance. However, Yahoo Finance ceased publishing these forecasts in 2025.

[27] 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.

growth rates is 5.4% (5.2%, 4.3, 7.0%). 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 5.4% to 7.0%. Given this range, I will use 6.1%, which is the midpoint of the range, for my DCF growth rate for the Electric Proxy Group. This growth rate figure is in the upper end of the range of historic and projected growth rates for the group.

For the Gas Proxy Group, the historical growth rate indicators suggest a growth rate of 6.0%. The average of the projected EPS, DPS, and BVPS growth rates from *Value Line* is 5.6%, and *Value Line*'s projected sustainable growth rate is 3.8%. The projected EPS growth rates of Wall Street analysts are both 7.6% (average = 7.6%) 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 7.6% and the average of the three projected growth rates (5.6%, 3.8%, 7.6%) is 5.7%. 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 5.7% to 7.6%. Given this range, I will use 6.60%, which is the midpoint of the range (5.7% to 7.6%), for my DCF growth rate for the Gas Proxy Group. As with the Electric Proxy Group, this growth rate figure is in the upper end of the range of historic and projected growth rates for the Gas Proxy Group.

The historical growth rate indicators for the Combination Proxy Group imply a baseline growth rate of 4.9%. The average of the projected EPS, DPS, and BVPS growth rates from *Value Line* is 5.2%, and *Value Line*'s projected sustainable growth rate is 4.6%. The projected EPS growth rates of Wall Street analysts for the Electric Proxy Group are 7.0% and 7.0% (average = 7.0%) as measured by the mean and median growth rates. The overall range for the projected growth-rate

indicators (ignoring historical growth) is 4.6% to 7.0%, and the average of the three projected growth rates is 5.6% (5.2%, 4.6%, 7.0%). 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 5.6% to 7.0%. Given this range, I will use 6.3%, which is the midpoint of the range, for my DCF growth rate for the Combination Proxy Group. This growth rate figure is in the upper end of the range of historic and projected growth rates for the 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 in Table 11 below.

Table 11

DCF-Derived Equity Cost Rate/ROE

	Dividend Yield	**1 + ½ Growth Adjustment**	**DCF Growth Rate**	**Equity Cost Rate**
Electric Proxy Group	**3.55%**	**1.03050**	**6.10%**	**9.75%**
Gas Proxy Group	**3.45%**	**1.03300**	**6.60%**	**10.15%**
Combination Proxy Group	**3.35%**	**1.03150**	**6.30%**	**9.75%**

The DCF result for the Electric Proxy Group is the 3.55% dividend yield, times the one and one-half growth (1+.5g) adjustment of 1.03050, plus the DCF growth rate of 6.10%, which results in an equity cost rate of 9.75%. The DCF result for the Gas Proxy Group is 10.15%, which includes a dividend yield of 3.45% times the one and one-half growth (1+.5g) adjustment factor of 1.0330, and a DCF growth rate of 6.6%. The DCF result for the Electric Proxy Group is the 3.35%

dividend yield, times the one and one-half growth (1+.5g) adjustment of 1.03150, plus the DCF growth rate of 6.30%, which results in an equity cost rate of 9.75%.

C. Capital Asset Pricing Model (CAPM)

Q. PLEASE DISCUSS THE CAPM.

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

$$k = R_f + RP$$

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

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

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

Where:

K represents the estimated rate of return on the stock;

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

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

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

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

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

Q. PLEASE DISCUSS EXHIBIT JRW-6.

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

Q. PLEASE DISCUSS THE RISK-FREE INTEREST RATE.

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

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

A. As shown on page 2 of Exhibit JRW-6, the yield on 30-year U.S. Treasury bonds has been in the 1.3% to 5.00% range over 2010–2025. The current 30-year Treasury yield is at the top end of this range, 5.00%, which I will use as my risk-free interest rate.

Q. DOES THE 5.0% RISK-FREE INTEREST RATE TAKE INTO CONSIDERATION FORECASTS OF HIGHER INTEREST RATES?

A. No. The 5.0% percent 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.

Q. PLEASE DISCUSS BETAS IN THE CAPM.

A. Beta (ß) is a measure of the systematic risk of a stock. The market (i.e., the S&P 500) has a beta of 1.0. The ß of a stock with the same price movement as the market also has a ß 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 ß 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 ß less than 1.0. Estimating a stock's ß involves running a linear regression of a stock's return on the market return. As shown on page 3 of Exhibit JRW-6, the slope of the regression line is the stock's ß. A steeper line indicates that the stock is more sensitive to the return on the overall market. This means that the stock has a higher ß and greater-than-average market risk. A less steep line indicates a lower ß and less market risk. Several online investment information services, such as Yahoo and Reuters, provide estimates of stock betas. Usually, these services report different betas for the same stock. The differences are usually due to: (1) the time period over which ß is measured; and (2) any adjustments that are made to reflect the fact that betas tend to regress to 1.0 over time.

Q. PLEASE DISCUSS THE 2020 CHANGE IN BETAS.

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

Q. DO THE UTILITY BETAS STILL REFLECT THE 2020 CHANGE?

A. Yes, but they have begun to move back to their pre-Covid 2020 levels.

Q. PLEASE PROVIDE MORE DETAILS ABOUT *VALUE LINE*'S BETAS.

A. Like many rate of return witnesses, I have traditionally used the betas as provided in the *Value Line Investment Survey*. *Value Line* defines their computation of ß as:[28]

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

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

1. *Value Line* betas are computed using weekly returns, and the volatility of utility stocks during March 2020 was impacted by using weekly and not monthly returns. Yahoo Finance uses five years of monthly returns to compute betas, and Yahoo Finance's betas for utilities are lower than *Value Line*'s.
2. *Value Line* betas are computed using the New York Stock Exchange Index as the market. While about 3,000 stocks trade on the NYSE, most technology stocks are traded on the NASDAQ or over-the-counter market and not the NYSE. Technology stocks, which make up about 25 percent of the S&P 500, tend to be more volatile. If they were traded on the NYSE, they would increase the volatility of the measure of the market and thereby lower utility betas.

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

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

The Blume adjustment procedure is:

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

For example, suppose a company has an observed past ß 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 a 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 for the proxy groups. The median betas for the Electric, Gas, and Combination Proxy Groups are 0.71, 0.77, and 0.74.

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

Q. PLEASE DISCUSS THE MARKET RISK PREMIUM.

A. The market risk premium is equal to the expected return on the stock market (e.g., the expected return on the S&P 500, $E(R_m)$ minus the risk-free rate of interest (R_f)). The market risk premium is the difference in the expected total return between investing in equities and investing in "safe" fixed-income assets, such as long-term government bonds. However, while the market risk premium is easy to define conceptually, it is difficult to measure because it requires an estimate of the expected return on the market—$E(R_m)$. As I discuss below, there are different ways to measure $E(R_m)$, and studies have come up with significantly different magnitudes for $E(R_m)$. As Merton Miller, the 1990 Nobel Prize winner in economics, indicated, $E(R_m)$ is very difficult to measure and is one of the great mysteries in finance.[30]

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

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

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

risk-averse; and (3) market conditions can change such that *ex post* historical returns are poor estimates of *ex ante* expectations.

The use of historical returns as market expectations has been criticized in numerous academic studies, which I discuss later. The general theme of these studies is that the large equity risk premium discovered in historical stock and bond returns cannot be justified by the fundamental data. These studies, which fall under the category "*ex ante* models and market data," compute *ex ante* expected returns using market data to arrive at an expected equity risk premium. These studies have also been called "puzzle research" after the famous study by Mehra and Prescott in which the authors first questioned the magnitude of historical equity risk premiums relative to fundamentals.[31]

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

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

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

[33] *Survey of Professional Forecasters*, FEDERAL RESERVE BANK OF PHILADELPHIA (March 26, 2025). https://www.richmondfed.org/research/national_economy/cfo_survey/data_and_results/2025/20250326_data_and_resultsThe Survey of Professional Forecasters was formerly conducted by the American Statistical Association (ASA) and the National Bureau of Economic Research (NBER) and was known as the ASA/NBER survey. The survey, which began in 1968, is conducted each quarter. The Federal Reserve Bank of Philadelphia, in cooperation with the NBER, assumed responsibility for the survey in June 1990.

financial analysts and companies regarding the equity risk premiums used in their investment and financial decision making.[34]

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

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

Page 5 of Exhibit JRW-6 provides a summary of the results of the market risk premium studies that I have reviewed. These include the results of: (1) the various studies of the historical risk premium, (2) *ex ante* market risk premium studies, (3) market risk premium surveys of CFOs, financial forecasters, analysts, companies, and academics, and (4) the building blocks approach to the market risk premium. There are results reported for over 30 studies, and the median market risk premium of these studies is 4.70%.

[34] Pablo Fernandez, Teresa Garcia, and Pablo Acín, SURVEY: MARKET RISK PREMIUM AND RISK-FREE RATE USED FOR 80 COUNTRIES IN 2025, IESE BUSINESS SCHOOL WORKING PAPER.

[35] *See* Richard Derrig & Elisha Orr, *Equity Risk Premium: Expectations Great and Small (Version 3.0)*, Aug.28,2003 (https://www.casact.org/sites/default/files/database/forum_04wforum_04wf001.pdf); Pablo Fernandez, EQUITY PREMIUM: HISTORICAL, EXPECTED, REQUIRED, AND IMPLIED, IESE BUSINESS SCHOOL WORKING PAPER (2007); ZHIYI SONG, THE EQUITY RISK PREMIUM: AN ANNOTATED BIBLIOGRAPHY (The CFA Institute Research (2007).

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 5.36%.

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

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

Historic Stock and Bond Returns: Historic stock and bond returns suggest a market risk premium in the 4.40% to 7.00% 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 2.83% to 6.00%.

Surveys: Market risk premiums developed from surveys of analysts, companies, financial professionals, and academics are lower, with a range from 3.00% 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 THE MOST TIMELY AND RELEVANT.

A. I will highlight several studies and surveys.

First, Pablo Fernandez conducts annual surveys of financial analysts and companies regarding the equity risk premiums used in their investment and financial decision-making.[36] His survey results are included in pages 5 and 6 of Exhibits JRW-6. The results of his 2025 survey of academics, financial analysts, and companies indicate a mean market risk premium employed by U.S. analysts and companies of 5.5%.[37] His estimated market risk premium for the U.S. has been in the 5.00% to 5.70% range in recent years.

Second, Professor Aswath Damodaran of New York University, a leading expert on valuation and the market risk premium, provides a monthly updated market risk premium based on projected S&P 500 EPS and stock-price level and long-term interest rates. His estimated market risk premium has been in the range of 4.0% to 6.0% since 2010. As shown in Figure 10 as of July 1, 2025, Damodaran's estimate of the equity risk premium was 3.94%.[38]

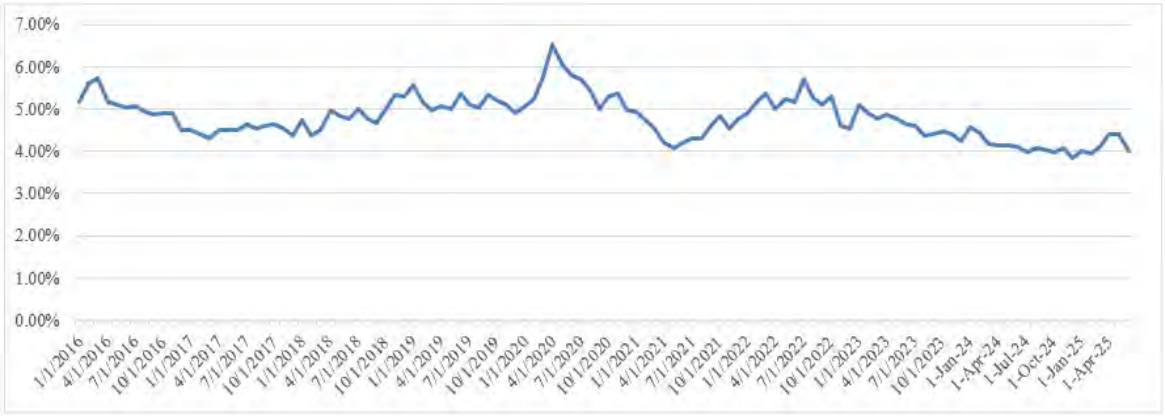
[36] Pablo Fernandez, Teresa Garcia, & Pablo Acín, *Survey: Market Risk Premium and Risk-Free Rate Used for 56 Countries in 2025, IESE Business School Working Paper* (May, 2025).

[37] *Id.* at 3.

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

Figure 10

Damodaran Implied Market Risk Premium



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

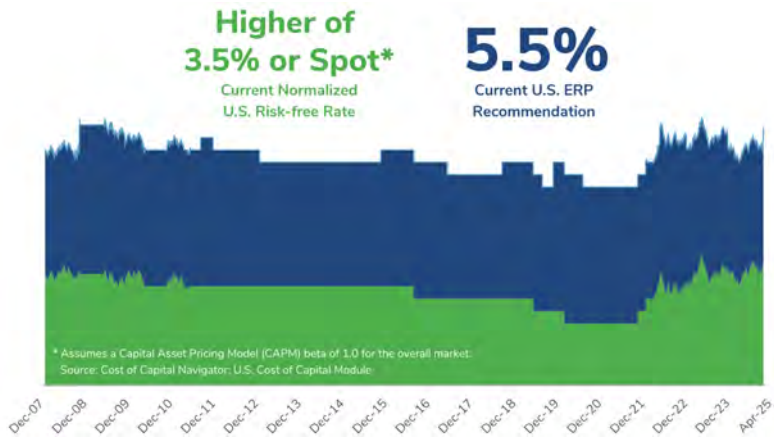
Next, as explained previously, Kroll provides recommendations for the normalized risk-free interest rate and market risk premiums to be used in calculating the cost of capital data. Its recommendations over 2008–2024 are shown in Exhibit JRW-6 page 7 and are also depicted graphically in Figure 11 below. 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 6.00% to 5.50% on June 8, 2023, and to 5.00% on June 5, 2024.[39] On April 15, 2025, citing an uncertainty in the global economy, Kroll increased their equity risk premium estimate to 5.50%.[40]

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

[40] Kroll, "Cost of Capital Inputs Updated to Reflect Heightened Uncertainty in Global Economy," April 15, 2025. https://kroll.com/jssmedia/cost-of-capital/kroll-cost-of-capital-inputs-updated-to-reflect-heightened-uncertainty-in-global-economy.pdf?_ga=2.243564870.274093763.1745334856-494230604.1745334855.

Figure 11

Kroll
Normalized Risk-Free Rate and Market Risk Premium Recommendations
2007–2025



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

Fourth, Dr. David Kelly, the Chief Global Strategist at *J.P. Morgan Asset Management*, is one of the best-known market strategists on Wall Street. His annual publication and their monthly updates, the *JP Morgan Guide to the Markets*, is a must-read guide for stockbrokers and financial professionals. In presenting their annual expectations for the markets, JP Morgan provides details about inputs and assumptions of expected market returns. In the 2025 update, JP Morgan detailed their 2025 expected long-term stock market return of 6.70%, bond yield of 3.80%, and market risk premium of 3.90%.[41]

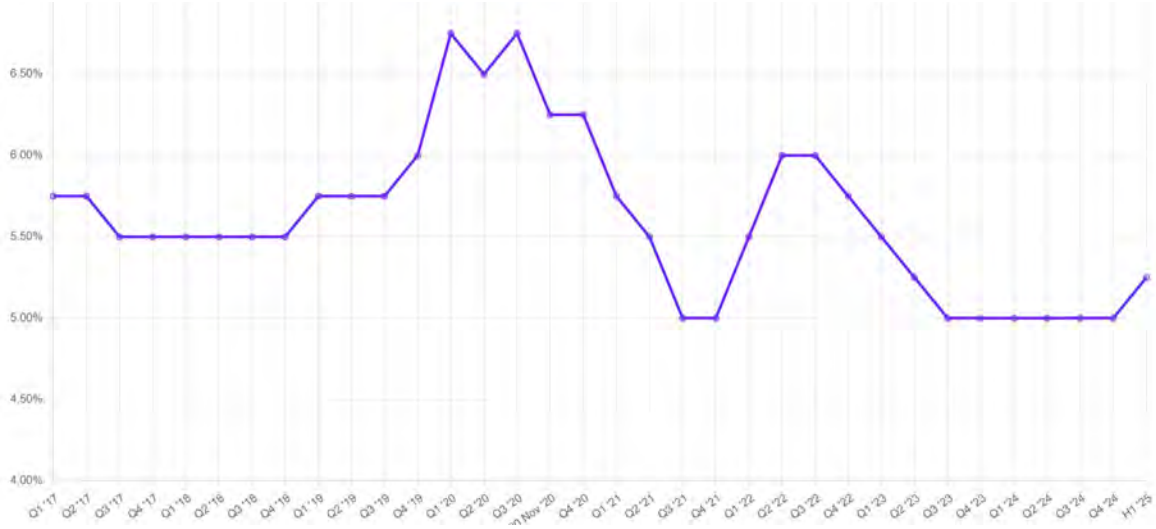
Finally, KPMG, the international accounting firm, regularly publishes an update to their market risk premium to be used in their valuation practice. KPMG's market risk premium is shown in Figure 12, which was as high as 6.75% in 2020, and was lowered to as low as 5.00% on September 30, 2021. KPMG increased its market

[41] JP Morgan, *2025 Long-Term Capital Market Assumptions*, 2025.

risk premium to 6.00% on June 30, 2022, but lowered it to 5.75% on December 31, 2022, to 5.50% on March 31, 2023, to 5.25% on June 30, 2023, and to 5.00% on September 30, 2023, and increased it to 5.25% on June 30, 2025.[42]

Figure 12

KPMG
Market Risk Premium Recommendations



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

[42] KPMG Recommends an Equity Market Risk Premium of 5.25% as of June 30, 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 in Exhibit JRW-6 page 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. I give the most weight to the market risk-premium estimates of Kroll (5.50%), KPMG (5.25%), JP Morgan (3.90%), Damodaran (3.94%), and the Fernandez (5.50%) and Duke-CFO surveys (5.20%). The average of these approaches is 4.9%. Given the recent reported market risk premiums of Kroll, Fernandez, and Duke-CFO, I believe a market risk premium in the 5.0%-5.5% is appropriate at this time. I will use the midpoint of this range, 5.25%, as my CAPM market risk premium.

Q. WHAT EQUITY COST RATES ARE INDICATED BY YOUR CAPM ANALYSIS?

A. The results of my CAPM study for the proxy groups are summarized on page 1 of Exhibit JRW-6 and in Table 12 below.

Table 12

CAPM-derived Equity Cost Rate/ROE

$$K = (R_f) + ß * [E(R_m) - (R_f)]$$

	Risk-Free Rate	Beta	Equity Risk Premium	Equity Cost Rate
Electric Proxy Group	**5.00%**	**0.71**	**5.25%**	**8.75%**
Gas Proxy Group	**5.00%**	**0.77**	**5.25%**	**9.05%**
Combination Proxy Group	**5.00%**	**0.74**	**5.25%**	**8.90%**

For the Electric Group, the risk-free rate of 5.00% plus the product of the beta of 0.71 times the equity risk premium of 5.25% results in an 8.75% equity cost rate. For the Gas Proxy Group, the risk-free rate of 5.00% plus the product of the beta of 0.77 times the equity risk premium of 5.25% results in a 9.05% equity cost rate. For the Combination Proxy Group, the risk-free rate of 5.00% plus the product of the beta of 0.74 times the equity risk premium of 5.25% results in a 8.90% equity cost rate.

D. Equity Cost Rate Summary

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

A. My DCF and CAPM analyses for the Electric Proxy Group indicate equity cost rates of 9.75% and 8.75%, respectively. The DCF and CAPM analyses for the Gas Proxy Group indicate cost rates of 10.15% and 9.05%, respectively. The DCF and CAPM analyses for the Combination Proxy Group indicate equity cost rates of 9.75% and 8.90%, respectively.

Table 13

ROEs Derived from DCF and CAPM Models

	DCF	CAPM
Electric Proxy Group	**9.75%**	**8.75%**
Gas Proxy Group	**10.15%**	**9.05%**
Combination Proxy Group	**9.75%**	**8.90%**

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

A. Given these results, I conclude that the appropriate equity cost rate for companies in the proxy groups is in the 8.75% to 10.15% range. However, as previously discussed, the gas group is small and gas companies have limited investment and

credit coverage, and so I give the results for the gas group little weight. Given these results, and since I rely primarily on the DCF model, I conclude that the appropriate equity cost rate is in the 9.00% to 9.75% range. The midpoint of this range 9.375%.

Q. WHAT ARE YOUR ROE RECOMMENDATIONS FOR THE CALIFORNIA ENERGY COMPANIES?

A. To risk-adjust my ROE recommendations, I am using the S&P and Moody's ratings for the energy companies and the proxy groups averages and my range of the DCF and CAPM ROE range (9.0%-9.75%) for the California energy companies.

Previously I discussed the investment risk of the California energy companies relative to the proxy groups. As noted, the average S&P and Moody's ratings for the Electric and Combination Proxy Groups are BBB+ and Baa2.[43] The investment risk of SCG, with S&P and Moody's ratings of A- and A2, is below the average of proxy groups and the other California energy companies. SDG&E's S&P and Moody's ratings of BBB+ and A3 indicate an investment risk level which is similar to the proxy groups, with the S&P rating equal to the groups and the Moody's rating one notch above the averages. SCE's S&P and Moody's ratings of BBB and Baa1 are one notch below (S&P) and one notch above (Moody's) the proxy group averages, which suggests an investment risk level which is equal to the proxy groups. PGE's ratings of BB and Baa3 clearly indicate a higher level of risk than the proxy groups and the other California energy companies.

[43] As noted above, the Gas Proxy Group is too small and gas companies lack investment and credit analyst coverage.

Table 14 links the S&P and Moody's issuer ratings and the range of ROE outcomes.

Table 14

ROE and S&P-Moody's Issuer Credit Ranges

ROE Range	S&P-Moody's	ROE	Energy Cos.
Low-End ROE Range	A, A1	9.000%	
		9.125%	
		9.250%	SCG
Midpoint ROE Range	BBB+, Baa2	9.375%	SDG&E, SCE
		9.500%	
		9.625%	
High-End ROE Range	BBB-, Baa3	9.750%	PG&E

Q. Please indicate why a base equity cost rate of 9.375% is appropriate for the electric operations of The Companies.

A. There are a number of reasons why an equity cost rate of 9.375% is appropriate and fair for the Company in this case:

1. My proposed capital structures have more common equity and less financial risk than the companies in the proxy groups.
2. I have employed the S&P and Moody's issuer credit ratings and my ROE range of 9.00%-9.75% to risk adjust the ROEs for the California energy companies.
3. As Table 6 shows, the electric utility and gas distribution industries are among the lowest risk industries in the U.S. as measured by beta. As such, according to CAPM, the cost of equity capital for this industry is among the lowest in the U.S.
4. On an annual basis, the average authorized ROEs for electric utility companies have been 9.54% in 2022, and 9.60% in 2023, 9.70% in 2024, and 9.72% in the first quarter of 2025, according to Regulatory Research Associates.[44] The average authorized ROEs for gas distribution companies was 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

[44] S&P Global Market Intelligence, *RRA Regulatory Focus* (2025).

have overstated the actual cost of equity capital. Accordingly, I believe my recommended ROE reflects the current capital market environment.

VI. CRITIQUE OF COMPANIES' RATE OF RETURN TESTIMONY

Q. PLEASE SUMMARIZE THE PLAINTIFF'S ROE RECOMMENDATIONS.

A. The Plaintiff's cost of capital recommendations are provided in Table 15. Additional details are provided on pages 2 and 3 of Exhibit JRW-7. As previously noted, the primary area of contention between the four companies and Cal Advocates is the proposed capital structure and the ROE. The capital structure issue was previously addressed. With respect to the ROE, Ms. Ann E. Bulkley has proposed a ROE of 11.30% for PG&E, Dr. Bente Villadsen has proposed a ROE of 11.75% for SCE. Mr. Joshua Nowak is testifying for both SDG&E and SCG and has proposed ROEs of 11.25% and 11.00% for SDG&E and SCG.

Table 15

Equity Cost Rate Results of PG&E, SDG&E, SCE, and SCG

	PG&E	SCE*	SDGE	SCG
DCF	**10.17%-10.43%**	**9.50%-12.50%**	**10.30%**	**10.24%**
CAPM	**10.48%-11.82%**	**9.50%-11.75%**	**12.15%**	**12.00%**
Risk Premium	**10.34%-10.74%**	**10.50%-10.75%**	**10.47%**	**10.39%**
EE			**11.27%**	**9.79%**
ROE Range	**10.30%-11.30%**	**10.75%-11.75%**	**10.50%-11.50%**	**10.25%-11.25%**
Recommendation	**11.30%**	**11.75%**	**11.25%**	**11.00%**

* Only for electric utility group

A. The Plaintiff's ROE Positions

1. PG&E's ROE of 11.30%

Q. **PLEASE REVIEW MS. BULKLEY'S EQUITY COST RATE APPROACHES AND RESULTS FOR PG&E.**

A. Ms. Bulkley develops a proxy group of 33 electric utility and gas distribution companies and employs DCF, CAPM, and her alternative risk premium model. Ms. Bulkley's equity cost rate estimates for PG&E are summarized in Table 15. Ms. Bulkley states that these ROE results indicate a ROE range of 10.30% to 11.30%. Given PG&E's high risk level, she recommends a ROE of 11.30% for PG&E.

In Ms. Bulkley's traditional DCF approach, the equity cost rate is the sum of the dividend yield and expected growth. Ms. Bulkley uses three dividend yield measures (30, 90, and 180 days) in the DCF models conducted. For her DCF growth rate, Ms. Bulkley has relied on the forecasted EPS growth rates of Zacks, S&P Cap IQ, and *Value Line*. Ms. Bulkley's DCF equity cost rates range from 10.17% to 10.43%. The primary error with Ms. Bulkley's DCF analysis is her exclusive use of the overly optimistic and upwardly biased EPS growth rate forecasts of Wall Street analysts and *Value Line*.

The CAPM/ECAPM approach requires an estimate of the risk-free interest rate, beta, and the equity risk premium. In her CAPM, Ms. Bulkley develops an equity cost rate by using not only the traditional CAPM, but also the so-called Empirical CAPM (ECAPM) model for her proxy group. Ms. Bulkley uses: (1) current (4.73%), near-term projected (4.64%), and long-term projected (4.30%) 30-year Treasury yields; (2) betas from *Value Line* and Bloomberg, and a 10-year average; and (3) a market risk premium of 7.42%. Based on these figures, Bulkley finds CAPM/ECAPM equity cost rates ranging from 9.50% to 11.75%. The primary errors with Bulkley's CAPM/ECAPM analyses are: (1) the use of the ECAPM version of the CAPM and (2) the expected market risk premium of 7.42%. To

compute her market risk premium, Ms. Bulkley applies the DCF to the S&P 500 and employs analysts' three-to-five-year EPS growth-rate projections as a growth rate to compute an expected market return and market risk premium. As discussed below, the EPS growth-rate projection (10.78%) used for the S&P 500 and the resulting determinations - expected market return (12.15%) and market risk premium (7.42%) - both include unrealistic assumptions regarding future economic and earnings growth and stock returns.

Ms. Bulkley also estimates an equity cost rate using that she calls the Bond Yield Plus Risk Premium ("BYRP") approach. Ms. Bulkley computes a risk premium by regressing the quarterly authorized ROEs for electric utility companies from Q1 1980 until Q1 2025 on the 30-year Treasury Yield. Ms. Bulkley then adds this risk premium to three different 30-year Treasury yields: (a) a current yield of 4.73%, (b) a near-term projected yield of 4.64%, and (c) a long-term projected yield of 4.30%. Ms. Bulkley's risk premium results are provided in Exhibit JRW-7 at 2. Ms. Bulkley reports risk premium equity cost rates ranging from 10.34% to 10.74%.

Table 16

PG&E's ROE Results

	Minimum Growth Rate	Average Growth Rate	Maximum Growth Rate
Mean Results			
30-Day Average	9.32%	10.30%	11.11%
90-Day Average	9.32%	10.31%	11.12%
180-Day Average	9.44%	10.43%	11.24%
Average	9.36%	10.35%	11.16%
Median Results			
30-Day Average			
90-Day Average	9.47%	10.17%	10.76%
180-Day Average	9.61%	10.26%	10.79%
Average	9.77%	10.35%	10.95%
CAPM			
	Current 30-day Average Treasury Bond Yield	Near-Term Blue Chip Forecast Yield	Long-Term Blue Chip Forecast Yield
Value Line Beta	11.71%	11.71%	11.69%
Bloomberg Beta	10.57%	10.55%	10.48%
Long-term Avg. Beta	10.52%	10.50%	10.43%
ECAPM			
Value Line Beta	11.82%	11.82%	11.81%
Bloomberg Beta	10.97%	10.95%	10.90%
Long-term Avg. Beta	10.93%	10.92%	10.86%
BYRP			
Electric	10.74%	10.69%	10.49%
Natural Gas	10.58%	10.53%	10.34%

There are several issues with this approach. They include: (1) This particular risk premium approach is a gauge of *commission* behavior rather than *investor* behavior; (2) This methodology produces an inflated measure of the risk premium because this approach relies on historically authorized ROEs and Treasury yields to calculate the risk premium, which is applied to projected Treasury yields; (3) This risk premium is inflated as a measure of investors' required risk premium, since electric utilities and gas distribution companies have been selling at market-to-book ratios in excess of 1.0; and (4) The ROE derived from this approach is dependent on the authorized ROEs from state utility commissions. As discussed 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.

2. SCE's ROE of 11.75%

Q. PLEASE REVIEW THE ROE APPROACHES OF DR. VILLADSEN.

A. Dr. Villadsen develops a proxy group of 26 electric utilities as well as a second proxy group of 17 natural gas and water utilities. She estimates the cost of equity using the traditional DCF, CAPM/ECAPM, and the risk premium models and employ what she calls the ATWACC approach which adjusts the ROEs from the models to reflect the market values of the proxy companies relative to SCE's book value capital structure with a common equity ratio of 52.0%. Within the ATWACC-adjusted ROE ranges, she selected a ROE recommendation based on her assessment of the risk of SCE. Dr. Villadsen employs a quarterly DCF model and uses current stock prices, a quarterly adjustment to the dividend yield, and the projected EPS growth rates from Thompson-Reuters and Yahoo. Dr. Villadsen reports DCF equity cost rates ranging from 9.50% to 12.50%. The errors with Dr. Villadsen's DCF analyses are: (1) her use of the quarterly DCF model which adjusts DCF ROEs for the quarterly payment of dividend; (2) her exclusive use of the overly optimistic and upwardly biased EPS growth rate forecasts of Wall Street analysts and *Value Line*; and (3) her leverage ATWACC adjustments to her summary DCF results to account for the differences between market values and book values of the proxy companies and SCE.

In her CAPM, Dr. Villadsen develops an equity cost rate by using not only the traditional CAPM, but also the so-called Empirical CAPM (ECAPM) model for her proxy group. Dr. Villadsen employs: (1) a projected 20-year Treasury yield of 4.37%, (2) betas from *Value Line* which she applies a Hamada adjustment to account for the differences in market and book values; and (3) a historic market risk premium of 7.17% which is based on the difference between arithmetic mean S&P 500 returns minus bond income returns over the 1926-2023 time period and a projected market risk premium of 4.44% which is based on applying the DCF model to the S&P 500 using Bloomberg's projected EPS growth rates. Based on

these figures, Dr. Villadsen reports CAPM equity cost rates ranging from 9.50% to 11.75%. The primary errors with Dr. Villadsen's CAPM/ECAPM analyses are: (1) the use of the ECAPM version of the CAPM; (2) the historic market risk premium of 7.17%; and (3) the leverage ATWACC adjustments to her summary CAPM/ECAPM results to account for the differences between market values and books values of the proxy companies and SCE.

In Dr. Villadsen's risk premium approach, she computes a risk premium by regressing the quarterly authorized ROEs for vertically-integrated electric utility companies from Q1 1990 until Q1 2025 on the 20-year Treasury Yield. Dr. Villadsen then adds this risk premium of 6.15% to her projected 20-year Treasury rate of 4.37% to get a 10.5% ROE. There are several issues with this approach. They include: (1) This risk premium approach is a gauge of *commission* behavior rather than *investor* behavior; (2) This methodology produces an inflated measure of the risk premium because this approach relies on historically authorized ROEs and Treasury yields to calculate the risk premium, which is applied to projected Treasury yields; (3) This risk premium is inflated as a measure of investors' required risk premium, since electric utilities have been selling at market-to-book ratios in excess of 1.0; (4) The ROE derived from this approach is dependent on the authorized ROEs from state utility commissions. As discussed 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; and (5) the leverage ATWACC adjustments to her summary DCF results to account for the differences between market values and books values of the proxy companies and SCE.

Table 17

SCE's ROE Results

	With PPA Imputed Debt	
	Low	High
CAPM	9.50%	11.75%
DCF	9.50%	12.50%
Risk Premium	10.50%	10.75%
Average	9.83%	11.67%
Range	9.75%	11.75%

Q. IN SUM, WHAT ARE THE ERRORS IN THE ROE APPROACHES OF DR. VILLADSEN.

A. The primary errors are: (1) the use of the ATWACC approach which adjusts the ROE results for the market value/book value; (2) in her DCF approach, her exclusive use of overly optimistic and upwardly biased analysts' projected EPS growth rate forecasts; (3) her CAPM analyses including (a) use of the ECAPM approach, (b) the Hamada-adjusted betas which includes a market value/book value adjustment; and (c) the market risk premium which includes a historic risk premium as the difference between historic stock and bond income returns in the U.S. and a forward-looking market risk premium computed by an expected market return by applying the DCF to the S&P 500 and then subtracting the risk-free interest rate; (4) the risk premium in the risk premium approach, which is computed using a regression of the historical relationship between the yields on long-term Treasury bonds and authorized ROEs for vertically-integrated electric utility companies in the U.S.

3. SDGE's ROE of 11.25% and SCG's ROE of 11.0%

Q. PLEASE REVIEW SDG&E AND SCG'S ROE APPROACHES, WHICH ARE BOTH PROVIDED BY MR. NOWAK.

A. For SDG&E, Mr. Nowak develops a proxy group of 26 electric utility companies and employs DCF, CAPM, and his alternative risk premium model. Mr. Nowak's equity cost rate estimates for SDG&E are summarized in Table 18. Mr. Nowak concludes that these ROE results indicate a ROE range of 10.50% to 11.50%. Given his assessment that SDG&E's risk level is above average, he recommends a ROE of 11.25% for SDG&E.

For SCG, Mr. Nowak develops a proxy group of 7 gas distribution companies and employs DCF, CAPM, and his alternative risk premium model. Mr. Nowak's equity cost rate estimates for SDG&E are summarized in Table 19. Mr. Nowak concludes that these ROE results indicate a ROE range of 10.25% to 11.25%. Given his assessment that SCG's risk level is above average, he recommends a ROE of 11.00% for SCG.

For both SDG&E and SCG, Mr. Nowak uses three dividend yield measures (30, 90, and 180 days) in his DCF model. For his DCF growth rate, Mr. Nowak has relied on the forecasted EPS growth rates of Zacks, S&P Cap IQ, and *Value Line*. Mr. Nowak's DCF equity cost rate estimate for SDG&E is 10.30% and for SCG is 10.24%. The primary error with Mr. Nowak's DCF analyses is his exclusive use of the overly optimistic and upwardly biased EPS growth rate forecasts of Wall Street analysts and *Value Line*. As noted, the CAPM/ECAPM approach requires an estimate of the risk-free interest rate, beta, and the equity risk premium. In his CAPM, Mr. Nowak develops an equity cost rate by using not only the traditional CAPM, but also the so-called Empirical CAPM (ECAPM) model for his proxy group. Mr. Nowak uses: (1) current (4.73%), near-term projected (4.64%), and long-term projected (4.30%) 30-year Treasury yields; (2) betas from *Value Line*;

and (3) a market risk premium of 10.43%. Based on these figures, Mr. Nowak's CAPM equity cost rate estimates for SDG&E is 11.25% and for SCG is 11.00%. The primary errors with Mr. Nowak's CAPM/ECAPM analyses are: (1) the use of the ECAPM version of the CAPM and (2) the expected market risk premium of 10.43%. To compute his market risk premium, Mr. Novak applies the DCF to the S&P 500 and employs analysts' three-to-five-year EPS growth-rate projections as a growth rate to compute an expected market return and market risk premium. As discussed below, the EPS growth-rate projection (13.76%) used for the S&P 500 and the resulting determinations - expected market return (15.16%) and market risk premium (10.43%) - both include unrealistic assumptions regarding future economic and earnings growth and stock returns.

Mr. Nowak also estimates an equity cost rate using a risk premium approach. Mr. Nowak computes a risk premium by regressing the quarterly authorized ROEs for electric utility companies (SDG&E) and gas distribution Companies (SCG) from January Q1 1992 until February 28, 2025 on the 30-year Treasury Yield. Mr. Nowak then adds these risk premiums to three different 30-year Treasury yields: (a) a current yield of 4.73%, (b) a near-term projected yield of 4.64%, and (c) a long-term projected yield of 4.30%. Mr. Nowak reports risk pre6mium equity cost rates of 10.47% for SDG&E and 10.30% for SCG. As noted above, there are several issues with this approach. They include: (1) This particular risk premium approach is a gauge of *commission* behavior rather than *investor* behavior; (2) This methodology produces an inflated measure of the risk premium because this approach relies on historically authorized ROEs and Treasury yields to calculate the risk premium, which is applied to projected Treasury yields; (3) This risk premium is inflated as a measure of investors' required risk premium, since electric utilities and gas distribution companies have been selling at market-to-book ratios in excess of 1.0; and (4) The ROE derived from this approach is dependent on the authorized ROEs from state utility commissions. As discussed 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. Finally, Mr. Nowak also estimates ROEs of 11.27% for SDG&E and 9.79% for SCG using the Expected Earnings approach. His methodology simply involves using the expected ROE for the companies in the SDG&E and SCG proxy groups as estimated by *Value Line*. As discussed below, there are numerous errors with the Expected Earnings Approach. Specifically, this approach does not measure the market cost of equity capital, is independent of most cost of capital indicators, ignores the research on the upward bias in *Value Line*'s earnings projections, and has several other empirical issues.

Table 18

SDG&E's ROE Results

	Low Mean	Mean	High Mean
Primary Analyses			
DCF Result	10.26%	10.30%	10.35%
CAPM Result	11.44%	12.15%	12.84%
Risk Premium	10.35%	10.47%	10.55%
Average		**10.97%**	
Benchmark Analysis			
Expected Earnings		11.27%	

Table 19

SCG's ROE Results

	Low Mean	Mean	High Mean
Primary Analyses			
DCF Result	10.19%	10.24%	10.33%
CAPM Result	11.27%	12.13%	12.67%
Risk Premium	10.28%	10.39%	10.46%
Average		**10.88%**	
Benchmark Analysis			
Expected Earnings		9.79%	

Q. IN SUMMARY, WHAT ARE THE ERRORS IN MR. NOWAK'S ROE ANALYSES FOR SDG&E AND SCG?

A. The errors in Mr. Nowak's equity cost rate studies for SDG&E and SCG include: (1) In his DCF approach, Mr. Nowak relies exclusively on the overly-optimistic and upwardly-biased earnings per share ("EPS"), growth-rate forecasts of Wall Street analysts and *Value Line*; (2) In his CAPM, he uses an inflated market risk premium of 10.43% which is a forward-looking market risk premium computed by an expected market return by applying the DCF to the S&P 500 and then subtracting the risk-free interest rate; (3) his risk premium approach is based on the authorized ROEs for electric utility (SDG&E) and gas distribution (SCG) companies. As noted, these ROEs reflect commission and not investor behaviors and have been shown by Werner and Jarvis (2022) to be in excess of investor return requirements or the cost of equity capital; and (4) he has also used his Expected Earnings approach which does not measure the market cost of equity capital and is independent of most cost of capital indicators.

B. The DCF Approach

Q. WHAT ARE THE ISSUES WITH THE PLAINTIFF'S DCF APPROACH?

A. The primary common issues with the Plaintiff's DCF approaches are the exclusive use of the overly optimistic and upwardly biased EPS growth rates of Wall Street analysts.

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

Q. PLEASE REVIEW THE PLAINTIFF'S DCF GROWTH RATE.

A. In their DCF models, the Plaintiff's witnesses exclusively employ the projected Earnings Per Share (EPS) growth-rate forecasts of Wall Street analysts and *Value Line* as the DCF growth rate.

Q. PLEASE DISCUSS THE WITNESSES EXCLUSIVE RELIANCE ON THE PROJECTED GROWTH RATES OF WALL STREET ANALYSTS AND *VALUE LINE.*

A. It seems highly unlikely that investors today would rely exclusively on the EPS growth rate forecasts of Wall Street analysts and ignore other growth rate measures in arriving at their expected growth rates for equity investments. As I previously indicated, the appropriate growth rate in the DCF model is the dividend growth rate, not the earnings growth rate. Hence, consideration must be given to other indicators of growth, including historical prospective dividend growth, internal growth, as well as projected earnings growth. In addition, a recent study by Lacina, Lee, and Xu (2011) has shown that analysts' long-term earnings growth rate forecasts are not more accurate at forecasting future earnings than naïve random walk forecasts of future earnings.[45] As such, the weight given to analysts' projected EPS growth rates should be limited. 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.[46] Hence, using these growth

[45] 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

[46] See references in footnotes 11-13.

rates as a DCF growth rate produces an overstated equity cost rate. A recent study by Easton and Sommers (2007) found that optimism in analysts' earnings growth rate forecasts leads to an upward bias in estimates of the cost of equity capital of almost 3.0 percentage points (300 basis points).[47] Therefore, exclusive reliance on these forecasts for a DCF growth rate results in failure of one the basic inputs in the equation. In addition, as noted above, a study by Szakmary, Conover, and Lancaster (2008) discovered that the three-to-five-year EPS growth rate forecasts of *Value Line* were significantly higher than the EPS growth rates that these companies subsequently achieved.[48]

Q. ARE WALL STREET ANALYSTS' PROJECTIONS FOR UTILITIES ALSO UPWARDLY BIASED?

A. Yes. As presented in Figure 9 (page 56) I have completed a study of the accuracy of analysts' EPS growth rates for electric utilities and gas distribution companies over the 1985 to 2021 time period. As shown in Figure 9, except for a few short-time periods, the mean forecasted EPS growth rate is consistently greater than the achieved actual EPS growth rate over the 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 electric utilities are overly optimistic and upwardly biased. Reliance on these overly optimistic and upwardly biased forecasts will surely have a negative impact on ratepayers.

Q. HAVE CHANGES IN REGULATIONS IMPACTED WALL STREET ANALYSTS' UPWARD BIAS IN PROJECTED EPS GROWTH RATES?

A. No. A number of the studies I have cited above 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

[47] Easton, P., & Sommers, G. (2007). Effect of analysts' optimism on estimates of the expected rate of return implied by earnings forecasts. *Journal of Accounting Research*, 45(5), 983–1015.

[48] 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.

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 by the Securities and Exchange Commission, analysts' long-term earnings forecasts continue to be excessively optimistic. They made the following observation:[49]

> 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.[50] The author concluded:

> **The bottom line:** Despite reforms intended to improve Wall Street research, stock analysts seem to be promoting an

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

[50] 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.

overly rosy view of profit prospects.

C. CAPM Approach

Q. WHAT ARE THE ISSUES WITH THE PLAINTIFF'S CAPM APPROACHES?

A. The primary common issue with the Plaintiff's CAPM approaches is the market risk premium. In addition, the Plaintiff's also employ the ECAPM approach and Dr. Villadsen makes a Hamada adjustment to the proxy utility betas.

1. The Validity of the ECAPM

Q. WHAT ISSUES DO YOU HAVE WITH THE PLAINTIFFS' ECAPM?

A. The Plaintiffs have also employed a variation of the CAPM which they call the "ECAPM." The ECAPM, as popularized by rate of return consultant Dr. Roger Morin, attempts to model the well-known finding of tests of the CAPM that have indicated the security market line ("SML") is not as steep as predicted by the CAPM. As such, the ECAPM is nothing more than an ad hoc version of the CAPM and has not been theoretically or empirically validated in refereed journals. The ECAPM provides for weights that are used to adjust the risk-free rate and market risk premium in applying the ECAPM. The Plaintiffs use 0.25 and 0.75 factors to boost the equity risk premium measure but provide no empirical justification for those figures.

Beyond the lack of any theoretical or empirical validation of the ECAPM, there is another error in the Plaintiffs ECAPM. 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. Because the utilities have low betas, the ECAPM approach is nothing more than a veiled attempt to produce higher forecasts of expected ROEs without any truly supporting evidence that these adjustments are justified.

2. Leverage-Adjusted Betas

Q. PLEASE DISCUSS DR. VILLADSEN'S USE OF LEVERAGE-ADJUSTED BETAS IN HER CAPM APPROACH.

A. Dr. Villadsen, on behalf of SCE, has adjusted the beta upwards for the companies in her proxy group to account for the book value/market value capitalization difference. In doing so, she has effectively made the same leverage adjustment to her betas that she made in her application of the ATWACC approach to reflect the difference between the market values and the book values of the companies in their proxy group. The errors in this leverage adjustment approach for her CAPM analysis are the same as those discussed above for their ATWACC approach.

3. Excessive Market Risk Premiums

Q. PLEASE ASSESS THE PLAINTIFF'S MARKET RISK PREMIUMs IN THEIR CAPM ANALYSES.

A. The most blatant error in Plaintiff's CAPM analyses are the magnitudes of the market (or equity) risk premiums – which produce very high ROE results. Dr. Villadsen computes a long-term market risk premium of 7.17% which is an historic risk premium computed as the difference between historic stock and bond income returns in the U.S. Depending over the 1926-2024 time period. Ms. Bulkley (PGE), and Mr. Novak (SDG&E and SCG) compute forward-looking market risk premiums computed by (a) an expected market return by applying a the DCF to the S&P 500 companies; and (b) then subtracting the risk-free interest rate in the U.S. The resulting market risk premiums are 7.42% for Ms. Bulkley (PG&E) and 10.43% for Mr. Nowak (SDG&E and SCG).

There are two errors with the market risk premium approaches employed by the Plaintiff's that inflate their market risk premium and CAPM estimates: (1) there are empirical issues with historic market risk premiums that result in overstated market risk premiums; (2) the forward-looking market risk premiums are well-above that found in the published studies and surveys of the market risk premium;

and (3) the forward-looking market risk premiums are based on highly unrealistic assumptions about future earnings growth and stock returns.

a) Historical Market Risk Premium

Q. PLEASE DISCUSS THE HISTORICAL RISK PREMIUMS.

A. Dr. Villadsen computes a historic risk premium of 7.17% as the difference between 1926-2023 arithmetic mean historic stock and bond income returns in the U.S.

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. 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.[51] This approach can produce differing results depending on several factors, including the measure of central tendency used, the time period evaluated, and the stock-market index employed. In addition, there are a myriad of empirical problems in the approach, which result in historical market returns producing inflated estimates of expected risk premiums. Among the errors are the U.S. stock market survivorship bias (the "Peso Problem"); the company survivorship bias (only successful companies survive – poor companies do not survive); the measurement of central tendency (the arithmetic versus geometric mean, where geometric means tend to better capture negative returns and thus investor loss); the historical time horizon used; the change in risk and required return over time; the downward bias in bond historical returns; and unattainable return bias (the return computation procedure presumes monthly portfolio rebalancing). The bottom line

[51] 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.

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 THE WITNESSES USE FOR HISTORICAL RETURNS IN THEIR RISK-PREMIUM APPROACH?

A. These return series are compiled and published by the investment advisory firm Kroll, former known as Duff & Phelps.

Q. IS KROLL A RESPECTED FINANCIAL FIRM?

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

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

A. In its Client Update on the equity risk premium, dated March 16, 2016, Kroll made the following statements regarding using historical returns to compute an equity risk premium ("ERP") (emphasis added):[52]

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

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

A. No.

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

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 (emphasis added):[53]

> 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.

Q. DOES KROLL PUBLISH ITS RECOMMENDED ERP?

A. Yes, Kroll publishes its estimate of the equity- or market-risk premium. Page 7 of Exhibit JRW-6 of my testimony shows Kroll's equity-risk-premium (ERP) recommendations. On April 15, 2025, citing an uncertainty in the global economy, Kroll increased their equity risk premium estimate to 5.50%.[54] I find it puzzling that the Plaintiff's would use the historical average annual stock return from the Kroll book and then ignore Kroll's recommendation as to the appropriate ERP.

[53] Duff & Phelps, Client Alert, March 16, 2016, p. 35 (emphasis supplied).

[54] Kroll, "Cost of Capital Inputs Updated to Reflect Heightened Uncertainty in Global Economy," April 15, 2025. https://kroll.com/jssmedia/cost-of-capital/kroll-cost-of-capital-inputs-updated-to-reflect-heightened-uncertainty-in-global-economy.pdf?_ga=2.243564870.274093763.1745334856-494230604.1745334855.

b) Forward-Looking Market Risk Premiums

Q. WHAT FORWARD-LOOKING MARKET RISK PREMIUMS WERE USED BY THE PLAINTIFF'S WITNESSES?

A. As noted, the Ms. Bulkley and Mr. Nowak compute a forward-looking market risk premium by (a) applying the DCF to the S&P 500 to develop an expected market return; and (b) then subtracting the risk-free interest rate. The big issue is that they use the overly optimistic and upwardly biased EPS growth rate forecasts of financial analysts as the growth factor for the S&P 500 companies. Ms. Bulkley uses a projected EPS rate of 10.78% which produces an expected S&P return of 12.15% and subtracting the current 30-year yield of 4.73% provides an expected market risk premium of 7.42%. Mr. Novak uses a projected EPS rate of 13.76% which produces an expected S&P return of 15.16% and subtracting the current 30-year yield of 4.73% provides an expected market risk premium of 10.43%. As discussed below, the EPS growth-rate projections used for the S&P 500 and the resulting determinations - expected market returns and market risk premiums - both include unrealistic assumptions regarding future economic and earnings growth and stock returns.

Q. ARE THE PLAINTIFF'S FORWARD-LOOKING MARKET RISK PREMIUMS REFLECTIVE OF THE MARKET RISK PREMIUMS FOUND IN STUDIES AND SURVEYS OF THE MARKET RISK PREMIUM?

A. No. Page 6 of Exhibit JRW-6 provides the results of over thirty market risk premiums studies from the past twenty years. These include studies of the market risk premiums that are (1) prepared by leading academic scholars; (2) produced by analyses of historic stock and bond returns; and (3) found in surveys of financial professionals. Historic stock and bond returns suggest a market risk premium in the 4.40%-7.00% range, depending on whether one uses arithmetic or geometric mean returns. There have been many studies using expected return (also called *ex ante*) models, and their market risk premiums results vary from as low as 2.83% to as high as 6.00%. Finally, the market risk premiums developed from surveys of

analysts, companies, financial professionals, and academics suggest even potentially lower market risk premiums, in a range from 3.00% to 5.70%. As such, the projected market risk premiums of 7.42% by Ms. Bulkley and 10.43% by Mr. Nowak are clearly greater than the market risk premiums discovered in studies and surveys. As such, these projections appear to be artificial attempts to inflate the ROE's earned by investors in the represented utilities.

Q. PLEASE PROVIDE MORE INSIGHT INTO MS. BULKLEY AND MR. NOWAK'S FORWARD-LOOKING MARKET RISK PREMIUMS.

A. The biggest errors in Ms. Bulkley's and Mr. Nowak's CAPM are their forward-looking market risk premiums. As noted, they both compute the forward-looking market risk premiums by applying the DCF to the S&P 500 and employed analysts' three-to-five-year earnings per share ("EPS") growth-rate projections as a growth rate to compute an expected market return and market risk premium. Both witnesses use the projected EPS growth rates from Bloomberg. In Table 20, I have averaged the figures used by Ms. Bulkley and Mr. Novak. It shows average market risk premiums of the two witnesses of 8.93% which is based on a projected average annual stock return of 13.66% and is the sum of the average dividend yield of 1.31% plus a projected S&P 500 EPS growth rate of 12.27%.

Table 20

Forward-Looking Market Risk Premiums Derived from Expected Market Returns Using Projected EPS Growth Rate

	Bulkley	Nowak	Average
Dividend Yield	1.31%	1.31%	1.31%
+ Expected EPS Growth	10.78%	13.76%	12.27%
= Expected Market Return	12.15%	15.16%	13.66%
+ Risk-Free Rate	4.73%	4.73%	4.73%
= Market Risk Premium	7.42%	10.43%	8.93%

Q. INITIALLY, PLEASE PROVIDE ADDITIONAL INSIGHTS INTO THE AVERAGE EXPECTED STOCK MARKET RETURN OF 13.66%.

A. Simply put, the assumption of a 13.66% 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] The witnesses' CAPM results assume that the return on the U.S. stock market will be about 40% higher in the future than it has been in the past! The 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 average expected EPS growth rate of 12.27%.

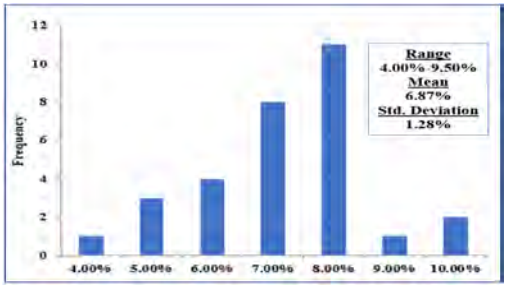
Q. IS THE AVERAGE EXPECTED STOCK MARKET RETURN OF 13.66% REFLECTIVE OF THE STOCK MARKET RETURNS THAT INVESTMENT FIRMS TELL INVESTORS TO EXPECT?

A. No. 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" which are available at their websites. If you perform 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 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 Investments, Northern Trust, Vanguard Group, and State Street. Combined, these thirty firms have more than $50 trillion in assets under management.

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

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. 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%. The Plaintiff's 15.29% expected market return is more than double this mean.

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



Date Source: Exhibit JRW-8.

Q. HOW DO ISSUES WITH *VALUE LINE* AND FINANCIAL ANALYSTS' EPS GROWTH RATE FORECASTS IMPACT THE PLAINTIFF'S CAPM?

A. The key point is that the Plaintiff's CAPM market risk premium methodology is based entirely on the concept that analyst projections of company's three-to-five-year EPS growth rates reflects investors' expected *long-term* EPS growth for those company. However, this assumption is highly unrealistic given the published research on these projections. As previously noted, numerous studies have shown that the long-term EPS growth rate forecasts of Wall Street securities analysts are overly optimistic and upwardly biased.[56] Moreover, as I discuss above, the

[56] Such studies include: R.D. Harris, *The Accuracy, Bias, and Efficiency of Analysts' Long Run Earnings Growth Forecasts*, *J. of Business Fin. & Accounting*, 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*, *J. of Fin.* 643−84 (2003); 8 Michael Lacina, B. Brian Lee, and Zhao Xu, *Advances in Business and Management Forecasting,* at 77–101 (Kenneth D. Lawrence, Ronald K. Klimberg, eds., Emerald Grp. Publ'g Ltd.

Lacina, Lee, and Xu study showed that analysts' forecasts of EPS growth over the next three-to-five years are no more accurate than their forecasts of the next single year's EPS growth (and the single year forecasts are notoriously inaccurate). The overly optimistic inaccuracy of analysts' growth rate forecasts leads to an upward bias in equity cost estimates of about 300 basis points.[57]

I have also completed studies on the accuracy of analysts' projected EPS growth rates. In Figure 9 (page 58), I demonstrated that the EPS growth rate forecasts of Wall Street analysts are upwardly biased for electric utilities and gas distribution companies. In Figure 14, 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 1985–2022 time period.

In this study, for each company with a three-to-five-year forecast, I compared the average three-to-five-year average EPS growth rate forecasts to the actual EPS growth rates achieved over the three-to-five-year time period. In Figure 14, 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. As can be seen by comparing Figures 9 and 14, the degree of upward bias for all companies, as would be expected, is larger than it is for electric and gas utility companies because utility earnings are less volatile and mor predictable.

Figure 14

2011).

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

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

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

Q. IS THE PLAINTIFF'S AVERAGE PROJECTED MARKET RISK PREMIUM OF 8.93% REFLECTIVE OF THE MARKET RISK PREMIUMS FOUND IN PUBLISHED STUDIES AND SURVEYS?

A. No. This figure is well in excess of market risk premiums: (1) found in studies of the market risk premium 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 30 market risk premium studies from the past 15 years.[58] Historic stock and bond returns suggest a market risk premium in the 4.40%–7.00% range, depending on whether one uses arithmetic or geometric mean returns. There have been many studies using expected return (also called *ex ante*) models, and their market risk premiums results vary from as low as 2.83% to as high as 6.0%. Finally, the market risk premiums developed from surveys of analysts, CFOs, financial professionals, and academics suggest even potentially lower market risk premiums, in a range from 3.00 to 5.70%. The bottom line is that there is no support in historic return data, surveys, academic studies, or reports for investment firms for a market risk

[58] *See* Woolridge, Exh. JRW-6 at 6.

premium as high as the 8.93% used by the Plaintiffs. Use of this rate and any projections based thereon should be rejected as it would result in excessive rates and which not be fair to ratepayers.

Q. IS THERE OTHER EVIDENCE THAT INDICATES THAT PLAINTIFF'S AVERAGE MARKET RISK PREMIUM IS EXCESSIVE?

A. Yes. A long-term EPS growth rate of 12.27% 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 the Plaintiff's average projected EPS growth rate of 12.27%; (2) 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 near future, during the period when the rates from this case will be effective.

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 21.

Table 21

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 Plaintiff's, 12.27%, is at best, an outlier. This estimate suggests 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 The Plaintiff' projected growth rates.

There is a Direct Link Between Long-Term EPS and GDP Growth - The results in Exhibit JRW-9 and Table 20 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.[59]

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. As discussed above and shown on pages 2-5 of Exhibit JRW-9, 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

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

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 growth as well as its components, real GDP growth and inflation, in recent decades. To gauge the magnitude of the decline in nominal GDP growth, Exhibit JRW-9 (page 5) and Table 11 provide 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 2024. Real GDP growth has gradually declined from the 5.0% to 6.0% range in the 1960s to the 2.0% to 3.0% range during the 2015–2019 period. Real GDP fell by 3.5% in 2020, but rebounded and grew by 5.7% in 2021, 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 growth as well as its components, real GDP growth, and inflation. To gauge the magnitude of the decline in nominal GDP growth, Table 22 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 22

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 2023A) by economists in the recent *Survey of Financial Forecasters* is 4.4%.[60] 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.[61] The Congressional Budget Office (CBO), in its forecasts for the period 2023 to 2053, projects a nominal GDP growth rate of 3.8%.[62] Finally, the Social Security Administration (SSA), in its Annual OASDI Report, provides a projection of nominal GDP from 2023 to 2100.[63] SSA's projected growth GDP growth rate over this period is 4.1%. The average projected GDP growth rate for these four forecasts is 4.15%.

The bottom line is that the trends and projections suggest a long-term GDP growth rate in the 4.0% to 4.5% range. As such, The Plaintiff' 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).[64] According to McKinsey, real GDP growth over the past fifty years

[60] 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/.

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

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

[63] 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.

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

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%.

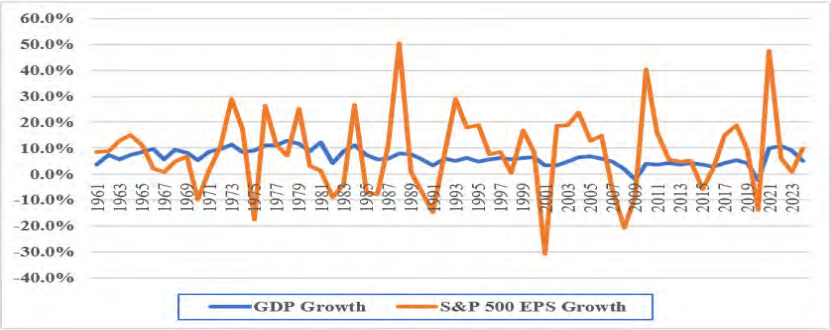
Q. OVER THE MEDIUM TO LONG RUN, IS S&P 500 EPS GROWTH LIKELY TO OUTPACE GDP GROWTH?

A. No. Figure 15 shows the average annual growth rates for GDP and the S&P 500 EPS since 1960. The one very apparent difference between the two is that the S&P 500 EPS growth rates are much more volatile than the GDP growth rates, when compared using the relatively short, and somewhat arbitrary, annual conventions used in these data.[65] Volatility aside, however, it is clear that over the medium to long run, S&P 500 EPS growth does not outpace GDP growth.

[65] Timing conventions such as years and quarters are needed for measurement and benchmarking but are somewhat arbitrary. In reality, economic growth and profit accrual occur on continuous bases. A 2014 study evaluated the timing relationship between corporate profits and nominal GDP growth. The authors found that aggregate accounting earnings growth is a leading indicator of the GDP growth with a quarter-ahead forecast horizon. *See* Yaniv Konchitchki and Panos N. Patatoukas, "Accounting Earnings and Gross Domestic Product," *Journal of Accounting and Economics* 57 (2014), pp. 76–88.

Figure 15

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."[66] In that same article, Friedman also noted that profits must move back down to their traditional share of GDP. In Table 23, I show that the aggregate net income levels for the S&P 500 companies, using 2024 figures, represent 6.43% of nominal GDP.

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

Table 23

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.[67] These differences include: (a) corporate profits are about 2/3 manufacturing driven, while GDP is 2/3 services driven; (b) consumer discretionary spending accounts for a smaller share of S&P 500 profits (15%) than of GDP (23%); (c) corporate

[67] *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 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.[68]

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 THE PLAINTIFF'S AVERAGE 12.27% 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 24. 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 23 and 24, the aggregate profit for the S&P 500 companies represented 6.43% of nominal GDP in 2024.

[68] 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 24

Projected S&P 500 Earnings and Nominal GDP

2024-2050

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	12.27%	26	$38,760,241
2024 Nominal U.S. GDP	$29,719,684	4.15%	26	$85,543,166
Net Income/GDP (%)	6.43%			45.31%

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 – the Plaintiff's average projected S&P 500 EPS growth rate of 12.27%.

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 24, 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 the Plaintiff's average projected S&P 500 EPS growth rate of 12.27%. 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 $38.76 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 The Plaintiff, 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 45.31% 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. Warren 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%.[69]

In sum, the Plaintiff 's average long-term S&P 500 EPS growth rate of 12.27% 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."[70]

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

[70] 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/.

D. Risk Premium Approach

Q. PLEASE DISCUSS PLAINTIFF'S RISK PREMIUM APPROACH.

A. The Plaintiffs develop an equity cost rate using the risk premium approach by: (1) regressing the average quarterly authorized returns on equity for vertically-integrated electric utility companies and gas companies on the thirty-year Treasury Yield; and (2) adding the chosen risk premium established in step (1) to current and projected U.S. Treasury yields.

Q. WHAT ARE THE ERRORS IN THE PLAINTIFF'S RISK PREMIUM ANALYSIS?

A. There are several problems with this approach for calculating the risk premium. First, The Plaintiff's risk premium approach is a gauge of *commission* behavior and not *investor* behavior. Capital costs that reflect investor behavior 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, Nelson's 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 Plaintiff's methodology produces an inflated measure of the risk premium because it uses historic authorized ROEs and Treasury yields, and the resulting risk premium is applied to projected Treasury Yields. Since Treasury yields are always forecasted to increase, the resulting risk premium would be smaller if done correctly, which would be the result using projected Treasury yields in the

analysis rather than historic Treasury yields.

Third, since the stocks of electric utilities and gas companies 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.

Q. HOW DOES THE PLAINTIFF'S RISK PREMIUM RESULTS COMPARE TO THE CURRENT AUTHORIZED ROES FOR ELECTRIC UTILITY COMPANIES?

A. The Plaintiff report results as high as 10.47% from the risk premium model. As noted above, the average authorized ROE for electric utility companies in Q1 2025 is 9.70%.

E. After-Tax Weighted Average Cost of Capital Approach

Q. PLEASE DISCUSS THE ATWACC APPROACH USED BY DR. VILLADSEN?

A. Dr. Villadsen employs the ATWACC approach. The approach involves adjusting their DCF result for the differences between the market value capitalizations of the proxy companies and the proposed book value capitalization of SCE with a common equity ratio of 52.0%.

Q. WHAT ARE THE ERRORS IN THE ATWACC APPROACH USED BY DR. VILLADSEN?

A. As noted, Dr. Villadsen (SCE) employs the ATWACC approach. Dr. Villadsen used DCF, CAPM, and risk premium approaches to estimate an equity cost rate and then made an upward adjustment to the estimates to account for the market

value capital structures of the utility companies. Traditional regulation uses book and not market value capital structures. As such, the ATWACC approach has not been widely-adopted in public utility cases. Dr. Villadsen claims that the ATWACC approach uses the market value capitalizations of the proxy companies to account for the risk differences between the proxy companies and the book value capitalization of SCE.

This market value – book value adjustment is erroneous for several reasons. Primarily, Dr. Villadsen claims that the ATWACC adjustment is needed because: (1) market values are greater than book values for utilities, and (2) the overall rate of return is applied to a book value capitalization in the ratemaking process. This adjustment is unwarranted for the following reasons:

(1) The market value of a firm's equity exceeds the book value of equity when the firm is expected to earn more on the book value of an investment than investors require. This relationship is described very succinctly in the Harvard Business School case study, which I quote earlier in my testimony. As such, the reason that market values exceed book values is that the company is earning a return on equity in excess of its cost of equity. Using ATWACC in the calculation simply perpetuates ROEs that are in excess of the rates required by the market. The resulting rate will exceed the market rates required by the Hope and Bluefield decisions.

(2) Despite the witnesses' contention that this represents a leverage adjustment, there is no change in leverage. The company's financial statements and fixed financial obligations remain the same. Thus, there is no need for a leverage adjustment because there is no change in leverage.

(3) Finally, financial publications and investment firms report capitalizations on a book value and not a market value basis.

Q. ARE YOU AWARE OF ANY REGULATORY COMMISSIONS THAT HAVE ADOPTED THE LEVERAGE ADJUSTMENT BASED ON MARKET VALUE VERSUS BOOK VALUE CAPITAL STRUCTURES?

A. No. I believe that the leverage adjustment has been rejected by regulatory commissions because it increases the ROEs for utilities that have high returns on common equity and decreases the ROEs for utilities that have low returns on common equity. Using this approach would reward the California utilities because they already have high returns on common equity. It would also unjustly and negatively impact California's ratepayers by producing excessively high rates.

In the graph presented in Figure 7, I show that there is a strong positive relationship between expected returns on common equity and market-to-book ratios for public utilities. Hence, in the context of the ATWACC leverage adjustment, this means that: (1) for a utility with a relatively high market-to-book ratio (e.g., 2.5) and ROE (e.g., 12.0%), the leverage adjustment will increase the estimated equity cost rate, while (2) for a utility with a relatively low market-to-book ratio (e.g., 0.5) and ROE (e.g., 5.0%), the leverage adjustment will decrease the estimated equity cost rate. Therefore, the adjustment will result in even higher market-to-book ratios for utilities with relatively high ROEs and even lower market-to-book ratios for utilities with relatively low ROEs.

F. Expected Earnings Approach

Q. PLEASE DISCUSS MR. NOWAK'S EXPECTED EARNINGS ANALYSIS.

A. Mr. Nowak also estimates equity cost rates for SDG&E and SCG using an approach he calls the Expected Earnings ("EE") approach. His methodology simply involves using the expected ROE for the companies in the proxy group as estimated by *Value Line*.

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

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

The Expected Earnings Approach Does Not Measure the Market Cost of Equity Capital – First and foremost, this is an accounting-based methodology that does not measure investor return requirements. As indicated by Professor Roger Morin, a long-time rate of return witness for utility companies, "More simply, the Comparable (Expected) Earnings standard ignores capital markets. If interest rates go up 2% for example, investor requirements and the cost of equity should increase commensurably, but if regulation is based on accounting returns, no immediate change in equity cost results."[71] As such, this method does not measure the market cost of equity capital.

Changes in ROE Ratios do not Track Capital Market Conditions - As also noted by Morin, "The denominator of accounting return, book equity, is a historical cost-based concept, which is insensitive to changes in investor return requirements. Only stock market price is sensitive to a change in investor requirements. Investors can only purchase new shares of common stock at current market prices and not at book value."[72]

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

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

[72] *Id.*

The Proxies' ROEs Reflect Earnings on Business Activities that are not Representative of SDG&E and SCG's Rate-Regulated Utility Activities - The numerators of the proxy companies' ROEs include earnings from business activities that are riskier and produce more projected earnings per dollar of book investment than does the regulated electric and gas businesses. These include earnings from unregulated businesses such as merchant generation, construction services, and other energy services.

Q. FINALLY PLEASE DISCUSS THE EXPECTED EARNINGS APPROACH IN LIGHT OF A STUDY OF *VALUE LINE* PROJECTED EARNINGS.

A. Mr. Nowak's EE approach uses *Value Line*'s adjusted forecast for proxy utility ROEs. Hence, the ROE specified by the EE approach is totally dependent on the forecast of one variable (net income/shareholder's equity) by one analyst firm (Value Line), with the same single individual authoring most of the *Value Line* reports for the various proxy companies. Neither the Commission nor other parties have assessed the accuracy of these forecasts. However, there is one study that did evaluate the *Value Line* forecasts. A study by Szakmary, Conover, and Lancaster evaluated the accuracy of *Value Line*'s three-to-five-year EPS growth rate forecasts using companies in the Dow Jones Industrial Average over a 30-year time period and found these forecasted EPS growth rates to be significantly higher than the EPS growth rates that these companies subsequently achieved.[73]

Szakmary, Conover, and Lancaster (SCL) studied the actual/realized versus the projected stock returns, sales, profit margins, and earnings per share made by *Value Line* over the 1969 to 2001 time period. *Value Line* projects variables from a three-year base period (e.g., 2012-2014) to a future three-year projected period (e.g., 2016-18). SCL used the sixty-five stocks included in the Dow Jones Indexes (30 Industrials, 20 Transports and 15 Utilities). SCL found that the projected

[73] 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.

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 in *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 termed "strikingly overoptimistic." *Value Line*'s forecasts of annual sales were higher than levels achieved, 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

The SCL results suggest that *Value Line*'s projection of return on equity is upwardly biased. As noted above, the EPS and profit margins as projected by *Value Line* over this 30-year period were termed "strikingly overoptimistic." This is because *Value line*'s projected earnings is the numerator for their calculation of return on equity (net income/book value). Therefore, the EE approach proposed by Mr. Nowak is based on an upwardly-biased measure forecasted by one analyst. Using this approach would result in rates that are excessive compared to the market and would cause harm to ratepayers.

VII. SUMMARY AND CONCLUSIONS

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

A. PG&E, SCE, and SCG have all proposed capital structures with common equity ratios of 52.0%, while SDG&E's proposed capital structure uses a common equity ratio of 54.0%. With respect to the ROE or the cost of equity capital, Ms. Ann E. Bulkley has proposed a ROE of 11.3% for PG&E, Mr. Joshua C. Nowak has proposed a ROE of 11.25% for SDG&E, Dr. Bente Villadsen has proposed a ROE of 11.75% for SCE, and Mr. Nowak has proposed a ROE of 11.00% for SCG. In

their applications, PG&E, SDG&E, SCE, and SCG are asking for overall rates of return of 8.30%, 8.21%, 8.50%, and 8.15%, respectively.

In my recommendation, I highlight that all four companies have proposed capital structures with common equity ratios that are significantly higher than the averages of the three proxy groups. Consequently, I have proposed capital structures for all four companies with common equity ratios of 50.0%. As such, I have adjusted the capital structures to be more reflective of the capital structures of other publicly held electric and gas companies. I have employed the Companies' proposed long-term debt and preferred stock cost rates. I have applied the DCF and CAPM models to proxy groups of electric utility, gas distribution, and combination electric and gas companies. My analysis indicates an equity cost rate in the range of 8.75% to 10.15% is appropriate for the proxy groups. Since: (1) I rely primarily on the DCF approach; (2) I give little weight to the results for the gas group due to its small number and lack of investment and credit analyst coverage, and (3) the proposed capital structures still include more equity and less financial risk than the companies in the proxy groups, I conclude that the ROE for the four energy companies is in the 9.00% to 9.75% range. Given these results, I am using the midpoint of this range, 9.375%, as the base ROE for the energy companies. I have applied a risk adjustment which is based on the relative S&P and Moody's credit ratings of the proxy companies and the Plaintiffs and my ROE range of 9.0%-9.75%. As a result, my ROE recommendations are 9.75% for PG&E, 9.375% for SDG&E and SCE, and 9.25% for SCG. With my proposed capital structures and senior capital cost rates, I am recommending an overall fair rate of returns or costs of capital for PG&E, SCE, SDG&E and SCG of 7.40%, 7.00%, 7.18%, and 6.62%, respectively. If the Commission rejects my capital structure adjustment and employs the Energy Companies' recommended capital structures, my base recommended ROE would then be 9.25%. As a result, my ROE recommendations are 9.625% for PG&E,

9.25% for SDG&E and SCE, and 9.125% for SCG. With the Companies proposed capital structures and senior capital cost rates, I am recommending an overall fair rate of return or cost of capital for PG&E, SCE, SDG&E and SCG of 7.43%, 7.03%, 7.20%, and 6.66%, respectively. These rates are fairer to ratepayers than those proposed by the utilities. They are also more consistent with the market return guidelines in the *Hope* and *Bluefield* decisions.

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

Office Address	Home Address
302 Business Building	120 Haymaker Circle
The Pennsylvania State University	State College, PA 16801
University Park, PA 16802	814-238-9428, 814-865-1160

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.

EXHIBITS

EXHIBIT JRW-1

Exhibit JRW-1
California Energy Cost of Capital Report
Public Advocates Primary Cost of Capital Recommendations

Panel A
Pacific Gas & Electric Company

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	49.69%	5.050%	2.51%
Preferred Stock	0.31%	5.520%	0.02%
Common Equity	50.00%	9.750%	4.88%
Total	100.00%		7.40%

Panel B
San Diego Gas & Electric Company

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	50.00%	4.620%	2.31%
Preferred Stock	0.00%	0.000%	0.00%
Common Equity	50.00%	9.375%	4.69%
Total	100.00%		7.00%

Panel C
Southern California Edison

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	44.79%	4.750%	2.13%
Preferred Stock	5.21%	6.950%	0.36%
Common Equity	50.00%	9.375%	4.69%
Total	100.00%		7.18%

Panel D
Southern California Gas Company

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	47.50%	3.890%	1.85%
Preferred Stock	2.50%	6.000%	0.15%
Common Equity	50.00%	9.250%	4.63%
Total	100.00%		6.62%

Exhibit JRW-1
California Energy Cost of Capital Report
Public Advocates Alternative Cost of Capital Recommendations

Panel A
Pacific Gas & Electric Company

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	47.50%	5.050%	2.40%
Preferred Stock	0.50%	5.520%	0.03%
Common Equity	52.00%	9.625%	5.01%
Total	100.00%		7.43%

Panel B
San Diego Gas & Electric Company

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	48.00%	4.620%	2.22%
Preferred Stock	0.00%	0.000%	0.00%
Common Equity	52.00%	9.250%	4.81%
Total	100.00%		7.03%

Panel C
Southern California Edison

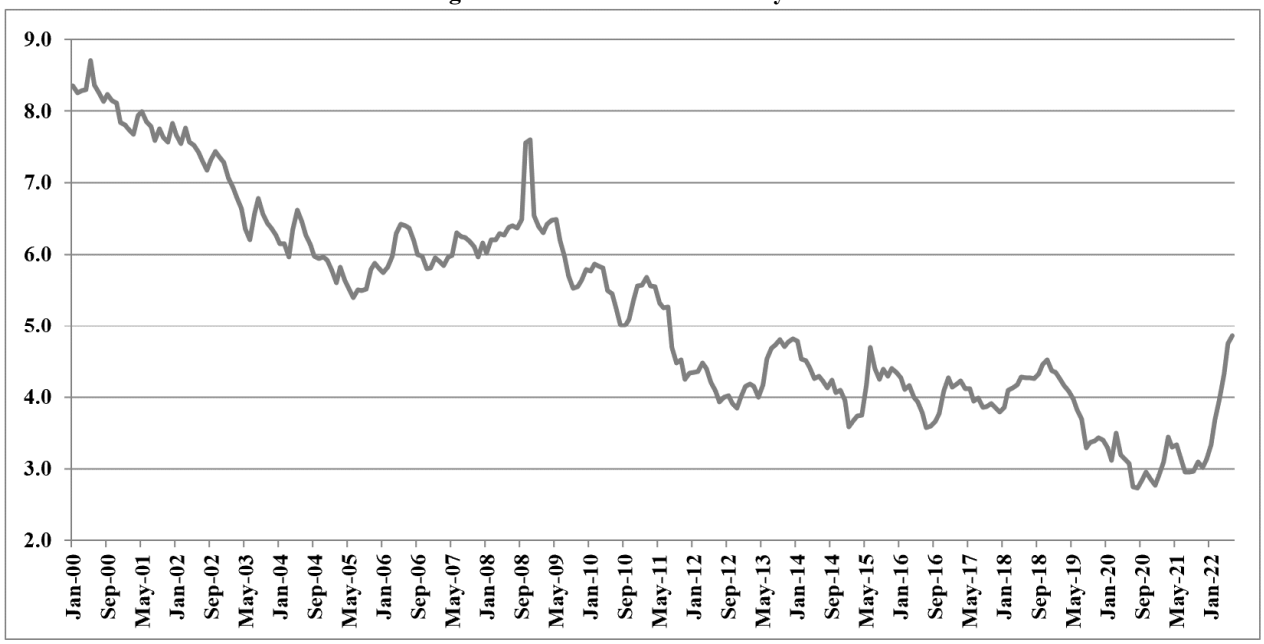
Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	43.00%	4.750%	2.04%
Preferred Stock	5.00%	6.950%	0.35%
Common Equity	52.00%	9.250%	4.81%
Total	100.00%		7.20%

Panel D
Southern California Gas Company

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	45.60%	3.890%	1.77%
Preferred Stock	2.40%	6.000%	0.14%
Common Equity	52.00%	9.125%	4.75%
Total	100.00%		6.66%

EXHIBIT JRW-2

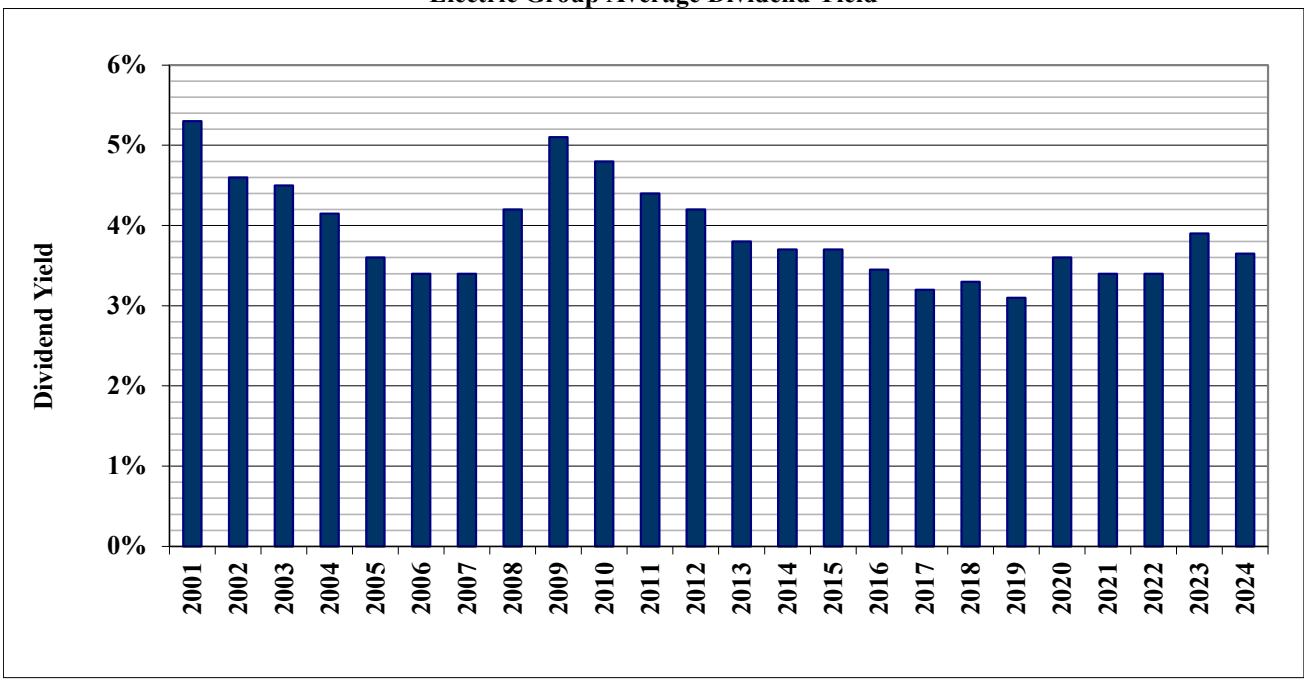
Exhibit JRW-2
Long-Term 'A' Rated Public Utility Bonds



Data Source: Mergent Bond Record

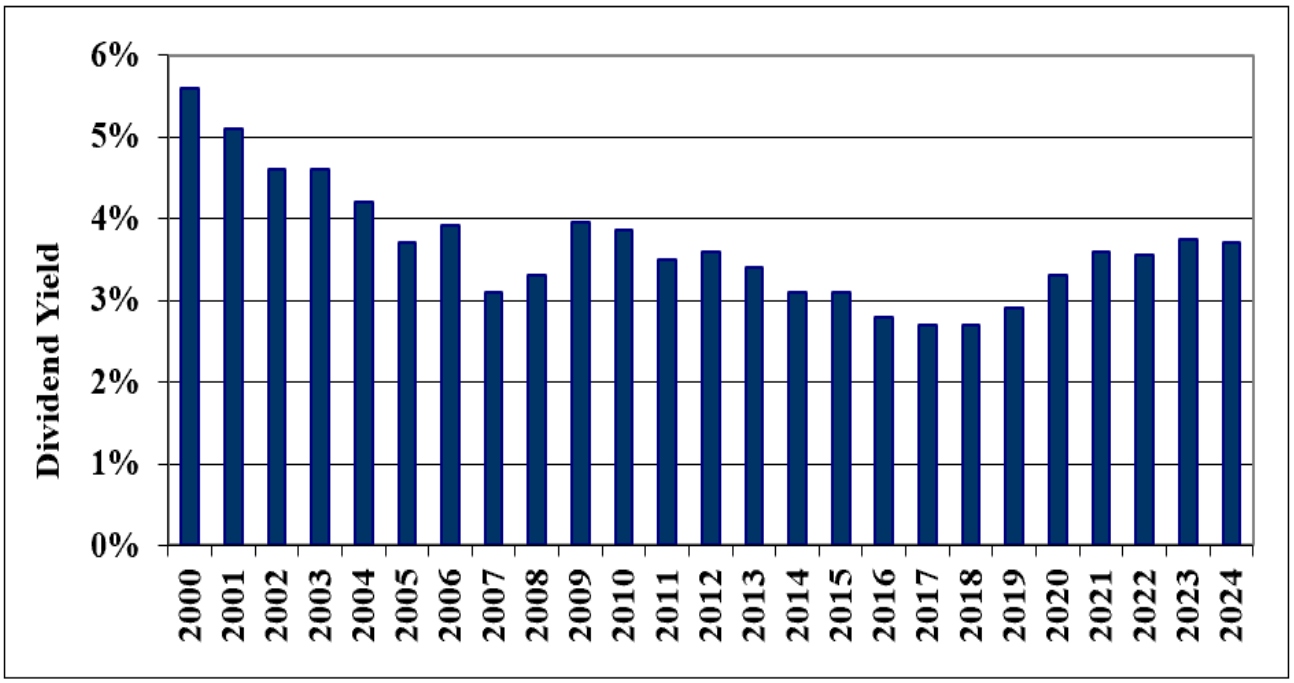
Exhibit JRW-2

Panel A
Electric Group Average Dividend Yield



Data Source: *Value Line Investment Survey.*

Panel B
Gas Distribution Company Average Dividend Yield

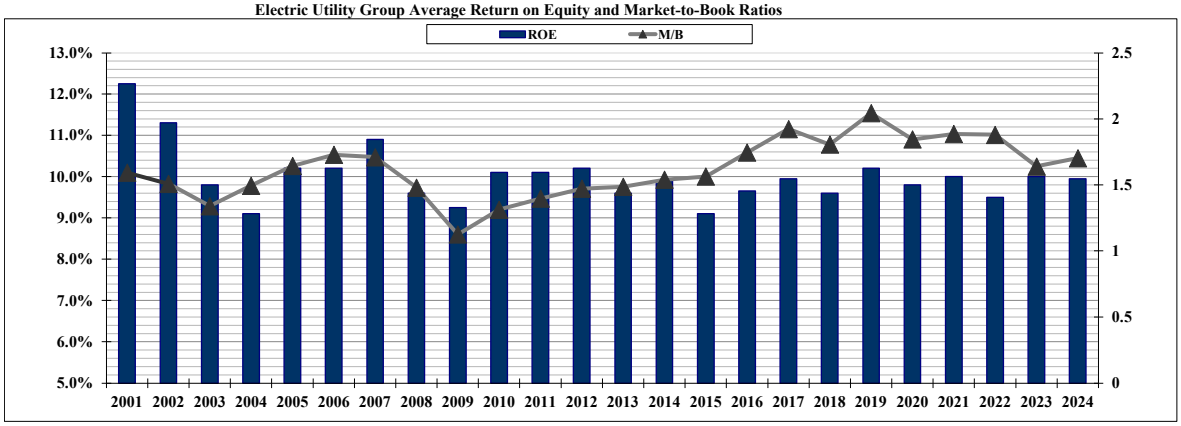


Data Source: *Value Line Investment Survey.*

Exhibit JRW-2

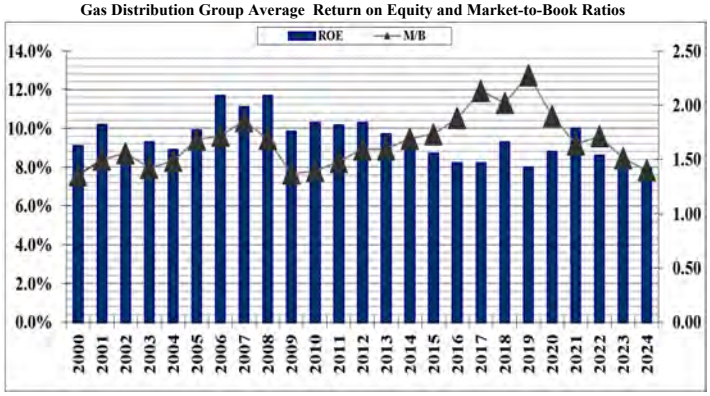
Panel A

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



Panel B

Gas Distribution Group Average Return on Equity and Market-to-Book Ratios



Data Source: *Value Line Investment Survey.*

EXHIBIT JRW-3

Exhibit JRW-3
Virginia Electric and Power Company
Summary Financial Statistics for Proxy Group

Panel A
Electric Proxy Group

Company		Operating Revenue ($bil)	Elec Revenue	Percent Reg Gas Revenue	Net Plant ($bil)	Market Cap ($bil)		S&P Issuer Credit Rating	Moody's Long Term Rating	Interest Coverage	Primary Service Area	Common Equity Ratio	Return on Equity	Market to Book Ratio	Last Filing Period
Alliant Energy Corporation (NYSE-LNT)	LNT	$3.98	85%	12%	$18.70	$15.97	LNT	BBB+	Baa2	2.07	WI,IA,IL,MN	39.7%	10.01	2.28	12/31/2024
Ameren Corporation (NYSE-AEE)	AEE	$7.32	86%	14%	$36.38	$26.22	AEE	BBB+	Baa1	2.93	IL,MO	39.2%	10.01	2.16	12/31/2024
American Electric Power Co. (NYSE-AEP)	AEP	$19.24	99%	0%	$83.00	$54.58	AEP	BBB+	Baa2	2.45	10 States	36.9%	11.39	2.03	12/31/2024
Avista Corporation (NYSE-AVA)	AVA	$1.94	70%	30%	$6.12	$3.13	AVA	BBB	Baa2	2.35	WA,OR	45.1%	7.09	1.21	12/31/2024
Black Hills Corporation (NYSE-BKH)	BKH	$2.13	40%	60%	$7.63	$4.26	BKH	BBB+	Baa2	2.88	O,SD,WY, MT,NE,IA,KS,A	44.4%	8.23	1.22	12/31/2024
CenterPoint Energy, Inc. (NYSE-CNP)	CNP	$8.64	53%	47%	$32.12	$21.77	CNP	BBB+	Baa2	2.38	TX,IN	33.7%	10.02	2.04	12/31/2024
CMS Energy Corporation (NYSE-CMS)	CMS	$7.52	67%	28%	$27.49	$21.41	CMS	BBB+	Baa2	2.45	MI	32.6%	11.23	2.67	12/31/2024
Consolidated Edison, Inc. (NYSE-ED)	ED	$15.26	76%	20%	$52.66	$34.99	ED	A-	Baa1	2.76	NY,NJ	44.1%	8.44	1.59	12/31/2024
Dominion Resources, Inc. (NYSE-D)	D	$14.46	91%	4%	$69.45	$45.75	D	BBB+	Baa2	2.45	VA,NC,SC	38.1%	6.49	1.74	12/31/2024
DTE Energy Company (NYSE-DTE)	DTE	$12.46	51%	14%	$31.08	$27.05	DTE	BBB+	Baa2	2.66	MI	33.5%	12.34	2.31	12/31/2024
Duke Energy Corporation (NYSE-DUK)	DUK	$29.93	93%	7%	$122.76	$89.17	DUK	BBB+	Baa2	2.38	NC,SC,IN,OH,KY	36.5%	9.08	1.81	12/31/2024
Edison International (NYSE-EIX)	EIX	$17.60	100%	0%	$60.31	$21.21	EIX	BBB	Baa3	2.07	CA	26.9%	7.20	1.52	12/31/2024
Entergy Corporation (NYSE-ETR)	ETR	$11.81	98%	1%	$47.85	$34.94	ETR	BBB+	Baa2	3.10	AR,LA,MS,TX	34.0%	6.95	2.31	12/31/2024
Evergy, Inc. (NYSE-EVRG)	EVRG	$5.85	100%	0%	$24.79	$15.12	EVRG	BBB+	Baa2	2.60	KS,MO	41.2%	9.00	1.52	12/31/2024
Eversource Energy (NYSE-ES)	ES	$11.90	76%	18%	$41.04	$21.53	ES	BBB+	Baa2	2.90	CT,MA,NH	34.0%	5.55	1.43	12/31/2024
Exelon Corporation (NYSE-EXC)	EXC	$23.03	93%	8%	$78.41	$43.10	EXC	A-	Baa2	2.20	PA,NJ,IL,MD	36.5%	9.34	1.60	12/31/2024
FirstEnergy Corp. (NYSE-FE)	FE	$12.94	99%	0%	$41.33	$22.07	FE	BBB	Baa3	2.18	PA,OH,NJ,MDWV,NY	33.9%	9.15	1.77	12/31/2024
IDACORP, Inc. (NYSE-IDA)	IDA	$1.82	100%	0%	$6.52	$6.07	IDA	BBB	Baa2	2.27	ID,OR	52.0%	9.27	1.82	12/31/2024
MGE Energy, Inc. (NYSE-MGEE)	MGEE	$0.66	74%	26%	$2.29	$3.24	MGEE	NR	NR	4.64	WI	60.7%	10.17	2.64	12/31/2024
NextEra Energy, Inc. (NYSE-NEE)	NEE	$24.75	99%	0%	$140.05	$144.01	NEE	A-	Baa1	3.29	FL	37.5%	9.51	2.87	12/31/2024
NorthWestern Corporation (NYSE-NWE)	NWE	$1.51	79%	21%	$6.40	$3.38	NWE	BBB	Baa2	2.48	MT,SD	48.0%	7.94	1.18	12/31/2024
OGE Energy Corp. (NYSE-OGE)	OGE	$2.92	98%	0%	$11.54	$8.87	OGE	BBB+	Baa1	2.76	OK,AR	45.5%	9.65	1.91	12/31/2024
Pinnacle West Capital Corp. (NYSE-PNW)	PNW	$5.12	100%	0%	$20.11	$10.81	PNW	BBB+	Baa2	2.64	AZ	37.9%	9.53	1.60	12/31/2024
Portland General Electric Company (NYSE-PO	POR	$3.44	100%	0%	$10.30	$4.80	POR	BBB+	A3	2.30	OR	42.3%	8.80	1.27	12/31/2024
PPL Corporation (NYSE-PPL)	PPL	$8.46	99%	1%	$33.15	$25.02	PPL	A-	Baa1	2.56	PA,KY,RI	45.3%	6.34	1.78	12/31/2024
Public Service Enterprise Gp. Inc. (NYSE-PEG	PEG	$10.29	74%	22%	$40.23	$38.99	PEG	BBB+	A3	3.16	NJ	41.3%	11.22	2.42	12/31/2024
Sempra Energy (NYSE-SRE)	SRE	$13.19	100%	0%	$62.61	$45.35	SRE	BBB+		3.13	CA,TX	44.8%	9.80	1.49	12/31/2024
Southern Company (NYSE-SO)	SO	$25.57	78%	14%	$105.87	$97.31	SO	A-	Baa1	2.80	GA,AL,MS	33.4%	11.85	2.93	12/31/2024
TXNM Energy, Inc.	TXNM	$1.97	100%	0%	$8.67	$4.54	TXNM	BBB	Baa3	2.22	NM	30.3%	10.32	1.79	12/31/2024
WEC Energy Group (NYSE-WEC)	WEC	$8.60	57%	38%	$34.68	$32.98	WEC	A-	Baa1	2.60	WI,MI,ILMN	37.8%	12.25	2.66	12/31/2024
Xcel Energy Inc. (NYSE-XEL)	XEL	$13.38	83%	17%	$57.86	$38.87	XEL	BBB+	Baa1	1.92	MN,WI,ND,SD,MI	39.2%	10.43	1.99	12/31/2024
Mean		$10.57	84%	13%	$42.62	$31.18		BBB+	Baa2	2.63		39.6%	9.31	1.92	
Median		$8.64	91%	8%	$34.68	$22.07		BBB+	Baa2	2.56		38.1%	9.51	1.81	

Data Source: Company 2024 SEC 10-K filings, S&P Capital IQ; *Value Line Investment Survey*, 2025.

Panel B
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	Last Filing Period
Atmos Energy Company (NYSE-ATO)	ATO	$4.18	0%	94%	$22.96	$23.23	ATO	A-	A2	8.33	10 States	0.60	9.01	1.82	12/31/2024
Chesapeake Utilities Corporation (NYSE-CPK)	CPK	$0.81	12%	51%	$2.75	$2.92	CPK	NR	A1	3.40	DE,MD,FL	0.48	9.00	2.10	12/31/2024
New Jersey Resources Corp. (NYSE-NJR)	NJR	$5.28	0%	57%	$25.48	$18.13	NJR	NR	NR	2.62	NJ	0.38	8.12	2.09	12/31/2024
NiSource Inc (NYSE-NI)	Ni	$1.82	36%	64%	$5.61	$4.75	Ni	BBB+	Baa2	3.69	IN,OH,PA,KY,VA,MD,MA	0.39	15.15	2.05	12/31/2024
Northwest Natural Holdings (NYSE-NWN)	NWN	$1.15	0%	93%	$3.74	$1.67	NWN	A-	NR	2.37	OR,WA	0.41	5.91	1.20	12/31/2024
ONE Gas, Inc.(NYSE-OGS)	OGS	$2.08	0%	100%	$6.66	$4.35	OGS	A-	A3	2.73	OK,KS,TX	0.48	7.59	1.40	12/31/2024
Southwest Gas Holdings, Inc. (NYSE-SWX)	SWX	$5.11	0%	49%	$9.15	$5.23	SWX	BBB-	Baa2	1.90	AZ,NV,CA	0.40	5.77	1.49	12/31/2024
Spire (NYSE-SR)	SR	$2.51	0%	94%	$7.36	$4.43	SR	BBB+	Baa2	2.56	MO	0.39	7.77	1.44	12/31/2024
Mean		$2.87	6%	75%	$10.46	$8.09		A-/BBB+	A3/Baa1	3.45		44.3%	8.54	1.70	
Median		$2.29	0%	79%	$7.01	$4.59		A-/BBB+	A3/Baa1	2.68		40.9%	7.95	1.65	

Data Source: Company 2024 SEC 10-K filings, S&P Capital IQ; *Value Line Investment Survey*, 2025.

Panel C
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	Last Filing Period
Alliant Energy Corporation (NYSE-LNT)	LNT	$3.98	85%	12%	$18.70	$15.97	LNT	BBB+	Baa2	2.07	WI,IA,IL,MN	39.7%	10.01	2.28	12/31/2024
Ameren Corporation (NYSE-AEE)	AEE	$7.32	86%	14%	$36.38	$26.22	AEE	BBB+	Baa1	2.93	IL,MO	39.2%	10.01	2.16	12/31/2024
Avista Corporation (NYSE-AVA)	AVA	$1.94	70%	30%	$6.12	$3.13	AVA	BBB	Baa2	2.35	WA,AK,OR	45.1%	7.09	1.21	12/31/2024
Black Hills Corporation (NYSE-BKH)	BKH	$2.13	40%	60%	$7.63	$4.26	BKH	BBB+	Baa2	2.88	O,SD,WY, MT,NE,IA,KS,A	44.4%	8.23	1.22	12/31/2024
CenterPoint Energy, Inc. (NYSE - CMP)	CNP	$8.64	53%	47%	$32.12	$21.77	CNP	BBB+	Baa2	2.38	TX,MN,LA,MS,IN,OH	33.7%	10.02	2.04	12/31/2024
Chesapeake Utilities Corporation (NYSE-CPK)	CPK	$0.81	51%	12%	$2.75	$2.92	CPK	NA	A1	3.40	DE,MD,FL	0.48	9.00	2.10	12/31/2024
CMS Energy Corporation (NYSE-CMS)	CMS	$7.52	67%	28%	$27.49	$21.41	CMS	BBB+	Baa2	2.45	MI	32.6%	11.23	2.67	12/31/2024
Consolidated Edison, Inc. (NYSE-ED)	ED	$15.26	76%	20%	$52.66	$34.99	ED	A-	Baa1	2.76	NY,NJ	44.1%	8.44	1.59	12/31/2024
DTE Energy Company (NYSE-DTE)	DTE	$12.46	51%	14%	$31.08	$27.05	DTE	BBB+	Baa2	2.66	MI	33.5%	12.34	2.31	12/31/2024
Eversource Energy (NYSE - ES)	ES	$11.90	76%	18%	$41.04	$21.53	ES	BBB+	Baa2	2.90	NH,MA,CT	34.0%	5.55	1.43	12/31/2024
MGE Energy, Inc. (NYSE-MGEE)	MGEE	$0.66	74%	26%	$2.29	$3.24	MGEE	NR	NR	4.64	wi	60.7%	10.17	2.64	12/31/2024
NiSource Inc (NYSE-NI)	NI	$1.82	64%	36%	$5.61	$4.75	NI	BBB+	Baa2	3.69	IN,OH,PA,KY,VA,MD,MA	0.39	15.15	2.05	12/31/2024
NorthWestern Corporation (NYSE-NWE)	NWE	$1.51	79%	21%	$6.40	$3.38	NWE	BBB	Baa2	2.48	MT,SD,NE	48.0%	7.94	1.18	12/31/2024
Public Service Enterprise Group Incorporated (	PEG	$10.29	74%	22%	$40.23	$38.99	PEG	BBB+	Baa2	3.16	NJ	41.3%	11.22	2.42	12/31/2024
Sempra Energy (NYSE-SRE)	SRE	$13.19	33%	55%	$62.61	$45.35	SRE	BBB+	Baa2	3.13	CA,TX	44.8%	9.80	1.49	12/31/2024
The Southern Company (NYSE-SO)	SO	$25.57	78%	14%	$105.87	$97.31	SO	A-	Baa1	2.80	GA,AL,MS,NJ,IL,VA,TN	33.4%	11.85	2.93	12/31/2024
WEC Energy Group (NYSE-WEC)	WEC	$8.60	57%	38%	$34.68	$32.98	WEC	A-	Baa1	2.60	WI,IL,MN,MI	37.8%	12.25	2.66	12/31/2024
Xcel Energy Inc. (NYSE-XEL)	XEL	$13.38	83%	17%	$57.86	$38.87	XEL	BBB+	Baa1	1.92	MN,WI,ND,SD,MI	39.2%	10.43	1.99	12/31/2024
Mean		$8.17	66%	27%	$31.75	$24.67		BBB+	Baa2	2.84		41.1%	10.04	2.02	
Median		$8.06	72%	21%	$31.60	$21.65		BBB+	Baa2	2.78		39.5%	10.02	2.07	

Data Source: Company 2024 SEC 10-K filings, S&P Capital IQ; *Value Line Investment Survey*, 2025.

Exhibit JRW-3

2025 California Energy Companies Cost of Capital Report

***Value Line* Risk Metrics**

Panel A
Electric Proxy Group

Company	Beta	Financial Strength	Safety	Earnings Predictability	Stock Price Stability
Alliant Energy Corporation (NYSE-LNT)	0.80	A+	1	100	100
Ameren Corporation (NYSE-AEE)	0.80	A+	1	100	100
American Electric Power Co. (NYSE-AEP)	0.70	A	1	100	90
Avista Corporation (NYSE-AVA)	0.75	A	3	70	90
Black Hills Corporation (NYSE-BKH)	0.85	A	2	100	90
CenterPoint Energy, Inc. (NYSE-CNP)	0.85	A	2	60	95
CMS Energy Corporation (NYSE-CMS)	0.70	B++	2	85	100
Consolidated Edison, Inc. (NYSE-ED)	0.65	A+	1	100	100
Dominion Resources, Inc. (NYSE-D)	0.75	A	2	70	95
DTE Energy Company (NYSE-DTE)	0.80	B++	2	70	95
Duke Energy Corporation (NYSE-DUK)	0.70	A	2	100	100
Edison International (NYSE-EIX)	0.90	B+	3	15	25
Entergy Corporation (NYSE-ETR)	0.80	A+	1	60	95
Evergy, Inc. (NYSE-EVRG)	0.75	B++	2	85	95
Eversource Energy (NYSE-ES)	0.85	A	2	100	90
Exelon Corporation (NDW-EXC)	NMF	A	3	90	NMF
FirstEnergy Corp. (NYSE-FE)	0.75	B++	3	100	80
IDACORP, Inc. (NYSE-IDA)	0.70	A	1	100	100
MGE Energy, Inc. (NYSE-MGEE)	0.80	A	2	100	90
NextEra Energy, Inc. (NYSE-NEE)	0.90	A+	2	95	75
NorthWestern Corporation (NYSE-NWE)	0.75	B++	2	95	95
OGE Energy Corp. (NYSE-OGE)	0.85	B++	2	95	95
Pinnacle West Capital Corp. (NYSE-PNW)	0.75	B++	2	80	95
Portland General Electric Company (NYSE-POR)	0.75	B++	2	85	95
PPL Corporation (NYSE-PPL)	0.90	A+	2	45	95
Public Service Enterprise Group Incorporated (NYSE -	0.90	A	1	100	95
Sempra Energy (NYSE-SRE)	0.90	B++	2	95	45
Southern Company (NYSE-SO)	0.75	A	2	90	100
TXNM Energy, Inc.	0.65	B++	2	95	85
WEC Energy Group (NYSE-WEC)	0.70	A+	1	100	100
Xcel Energy Inc. (NYSE-XEL)	0.70	A	2	100	95
Mean	0.78	A	1.9	86	90

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

Panel B
Gas Proxy Group

Company	Beta	Financial Strength	Safety	Earnings Predictability	Stock Price Stability
Atmos Energy Company (NYSE-ATO)	0.75	A	1	100	100
Chesapeake Utilities Corporation (NYSE-CPK)	0.75	A	2	100	90
New Jersey Resources Corp. (NYSE-NJR)	0.85	A	2	65	85
NiSource Inc (NYSE-NI)	0.85	A	2	70	95
Northwest Natural Holdings (NYSE-NWN)	0.80	A	2	25	90
ONE Gas, Inc.(NYSE-OGS)	0.80	A	2	100	85
Southwest Gas Holdings, Inc. (NYSE-SWX)	0.80	A	2	5	85
Spire (NYSE-SR)	0.80	B++	2	50	95
Mean	0.80	A	1.9	64	91

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

Panel C
Combination Proxy Group

Company	Beta	Financial Strength	Safety	Earnings Predictability	Stock Price Stability
Alliant Energy Corporation (NYSE-LNT)	0.80	A+	1	100	100
Ameren Corporation (NYSE-AEE)	0.80	A+	1	100	100
Avista Corporation (NYSE-AVA)	0.75	A	3	70	90
Black Hills Corporation (NYSE-BKH)	0.85	A	2	100	90
Chesapeake Utilities Corporation (NYSE-CPK)	0.95	A	2	100	85
CenterPoint Energy, Inc. (NYSE-CNP)	0.85	A	2	60	95
CMS Energy Corporation (NYSE-CMS)	0.70	B++	2	85	100
Consolidated Edison, Inc. (NYSE-ED)	0.65	A+	1	100	100
DTE Energy Company (NYSE-DTE)	0.80	B++	2	70	95
Eversource Energy (NYSE-ES)	0.85	A	2	100	90
MGE Energy, Inc. (NYSE-MGEE)	0.80	B++	3	100	80
NiSource Inc (NYSE-NI)	0.95	A	2	70	95
NorthWestern Corporation (NYSE-NWE)	0.75	B++	2	95	95
Public Service Enterprise Group Incorporated (NYSE -	0.90	A	1	100	95
Sempra Energy (NYSE-SRE)	0.90	B++	2	95	45
Southern Company (NYSE-SO)	0.75	A	2	90	100
WEC Energy Group (NYSE-WEC)	0.70	A+	1	100	100
Xcel Energy Inc. (NYSE-XEL)	0.70	A	2	100	95
Mean	0.80	A	1.8	91	92

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

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

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

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

Value Line Risk Metrics

Beta

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

Financial Strength

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

Safety Rank

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

Earnings Predictability

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

Stock Price Stability

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

Source: *Value Line Investment Analyzer* .

EXHIBIT JRW-4

Exhibit JRW-4
California Energy Cost of Capital Report
Cost of Capital

California Energy Companies Capital Structure Recommendations

Panel A
Pacific Gas & Electric Company
2026

Capital Source	Capitalization Ratio	Cost Rate
Long-Term Debt	47.70%	5.05%
Preferred Stock	0.30%	5.52%
Common Equity	52.00%	
Total	100.00%	

Panel B
San Diego Gas & Electric Company
2026

Capital Source	Capitalization Ratio	Cost Rate
Long-Term Debt	46.00%	4.62%
Preferred Stock	0.00%	0.00%
Common Equity	54.00%	
Total	100.00%	

Panel C
Southern California Edison
2026

Capital Source	Capitalization Ratio	Cost Rate
Long-Term Debt	43.00%	4.75%
Preferred Stock	5.00%	6.95%
Common Equity	52.00%	
Total	100.00%	

Panel D
Southern California Gas Company
2026

Capital Source	Capitalization Ratio	Cost Rate
Long-Term Debt	45.60%	5.02%
Preferred Stock	2.40%	6.00%
Common Equity	52.00%	
Total	100.00%	

Exhibit JRW-4
California Energy Cost of Capital Report
Cost of Capital

Cal Associates Capital Structure Recommendations

Panel A
Pacific Gas & Electric Company
2026

Capital Source	Capitalization Ratio	Cost Rate
Long-Term Debt	49.69%	5.05%
Preferred Stock	0.31%	5.52%
Common Equity	50.00%	
Total	100.00%	

Panel B
San Diego Gas & Electric Company
2026

Capital Source	Capitalization Ratio	Cost Rate
Long-Term Debt	50.00%	4.62%
Preferred Stock	0.00%	0.00%
Common Equity	50.00%	
Total	100.00%	

Panel C
Southern California Edison
2026

Capital Source	Capitalization Ratio	Cost Rate
Long-Term Debt	44.79%	4.75%
Preferred Stock	5.21%	6.95%
Common Equity	50.00%	
Total	100.00%	

Panel D
Southern California Gas Company
2026

Capital Source	Capitalization Ratio	Cost Rate
Long-Term Debt	47.50%	5.02%
Preferred Stock	2.50%	6.00%
Common Equity	50.00%	
Total	100.00%	

Exhibit JRW-4
California Energy Cost of Capital Report
Cost of Capital

California Energy Companies Capital Structures
Holding and Operating Companies

Panel A
California Energy Companies Average Quarterly Capitaliazation Ratios
2022-25

	PG&E	SCE	SDG&E	SCG
Long-Term Debt	66.99%	56.46%	50.00%	46.40%
Preferred Equity	0.28%	4.46%	0.00%	0.16%
Common Equity	32.72%	39.09%	50.00%	53.43%
Total	100.00%	100.00%	100.00%	100.00%

Data Source: S&P Cap IQ, 2025.

Panel B
California Energy Parent Companies Average Quarterly Capitaliazation Ratios
2022-25

	PG&E Energy	Edison	Sempra	Sempra
Long-Term Debt	60.52%	56.06%	49.59%	49.59%
Preferred Equity	0.34%	11.48%	1.58%	1.58%
Common Equity	39.13%	32.45%	48.83%	48.83%
Total	100.00%	100.00%	100.00%	100.00%

Data Source: S&P Cap IQ, 2025.

Exhibit JRW-4
California Energy Cost of Capital Report
Cost of Capital

Panel A
Pacific Gas & Electric Company

PG&E	2022 CQ1	2022 CQ2	2022 CQ3	2022 CQ4	2023 CQ1	2023 CQ2	2023 CQ3	2023 CQ4	2024 CQ1	2024 CQ2	2024 CQ3	2024 CQ4	2025 CQ1	Average
Short-Term Debt	10.1%	5.9%	3.9%	5.9%	6.6%	5.0%	5.6%	6.8%	4.8%	8.5%	5.5%	4.8%	7.4%	6.2%
Long-Term Debt	58.3%	65.6%	67.9%	63.9%	63.5%	64.8%	64.0%	62.7%	64.4%	61.1%	63.4%	59.8%	57.4%	62.8%
Preferred Stock	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.7%	1.7%	0.3%
Common Equity	31.7%	28.5%	28.2%	30.1%	29.9%	30.1%	30.3%	30.5%	30.7%	30.4%	31.1%	33.7%	33.5%	30.7%
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%
PG&E	2022 CQ1	2022 CQ2	2022 CQ3	2022 CQ4	2023 CQ1	2023 CQ2	2023 CQ3	2023 CQ4	2024 CQ1	2024 CQ2	2024 CQ3	2024 CQ4	2025 CQ1	Average
Long-Term Debt	64.8%	69.7%	70.7%	68.0%	67.9%	68.3%	67.8%	67.3%	67.7%	66.7%	67.1%	62.8%	62.0%	67.0%
Preferred Stock	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.8%	1.8%	0.3%
Common Equity	35.2%	30.3%	29.3%	32.0%	32.1%	31.7%	32.2%	32.7%	32.3%	33.3%	32.9%	35.4%	36.1%	32.7%
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%

Panel B
PG&E Energy

PG&E Energy	2022 CQ1	2022 CQ2	2022 CQ3	2022 CQ4	2023 CQ1	2023 CQ2	2023 CQ3	2023 CQ4	2024 CQ1	2024 CQ2	2024 CQ3	2024 CQ4	2025 CQ1	Average
Short-Term Debt	10.0%	6.3%	4.2%	5.9%	6.6%	5.0%	5.6%	6.9%	4.8%	8.5%	5.5%	4.9%	7.6%	6.3%
Long-Term Debt	51.5%	56.5%	59.5%	57.9%	57.6%	59.2%	58.5%	57.2%	59.0%	55.9%	57.6%	54.7%	52.3%	56.7%
Preferred Stock	0.4%	0.4%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%
Common Equity	38.1%	36.8%	35.9%	35.8%	35.5%	35.5%	35.6%	35.6%	35.8%	35.2%	36.5%	40.2%	39.8%	36.7%
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%
PG&E Energy	2022 CQ1	2022 CQ2	2022 CQ3	2022 CQ4	2023 CQ1	2023 CQ2	2023 CQ3	2023 CQ4	2024 CQ1	2024 CQ2	2024 CQ3	2024 CQ4	2025 CQ1	Average
Long-Term Debt	57.2%	60.3%	62.1%	61.5%	61.6%	62.3%	62.0%	61.4%	62.0%	61.1%	61.0%	57.5%	56.6%	60.5%
Preferred Stock	0.4%	0.4%	0.4%	0.4%	0.4%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%
Common Equity	42.3%	39.3%	37.5%	38.1%	38.0%	37.4%	37.7%	38.2%	37.7%	38.5%	38.7%	42.2%	43.1%	39.1%
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%

Data Source: S&P Cap IQ, 2025.

Exhibit JRW-4
California Energy Cost of Capital Report
Cost of Capital

Panel A
Southern California Edison Company

SCE	2022 CQ1	2022 CQ2	2022 CQ3	2022 CQ4	2023 CQ1	2023 CQ2	2023 CQ3	2023 CQ4	2024 CQ1	2024 CQ2	2024 CQ3	2024 CQ4	2025 CQ1	Average
Short-Term Debt	5.7%	6.4%	9.2%	7.4%	6.4%	7.8%	7.3%	6.1%	4.2%	4.5%	3.6%	3.6%	4.1%	5.9%
Long-Term Debt	52.0%	50.9%	49.3%	50.5%	52.8%	51.4%	52.0%	52.7%	56.0%	55.9%	55.9%	56.1%	55.6%	53.2%
Preferred Stock	4.2%	4.1%	4.0%	3.9%	3.8%	3.8%	3.8%	4.8%	4.7%	4.6%	4.7%	4.1%	3.9%	4.2%
Common Equity	38.1%	38.6%	37.5%	38.1%	37.0%	37.0%	36.9%	36.4%	35.1%	34.9%	35.8%	36.2%	36.4%	36.8%
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%
SCE	2022 CQ1	2022 CQ2	2022 CQ3	2022 CQ4	2023 CQ1	2023 CQ2	2023 CQ3	2023 CQ4	2024 CQ1	2024 CQ2	2024 CQ3	2024 CQ4	2025 CQ1	Average
Long-Term Debt	55.2%	54.4%	54.3%	54.6%	56.4%	55.7%	56.1%	56.1%	58.4%	58.6%	58.0%	58.2%	58.0%	56.5%
Preferred Stock	4.4%	4.4%	4.5%	4.3%	4.1%	4.1%	4.1%	5.1%	4.9%	4.9%	4.9%	4.3%	4.1%	4.5%
Common Equity	40.4%	41.3%	41.2%	41.2%	39.6%	40.2%	39.8%	38.8%	36.7%	36.6%	37.1%	37.5%	37.9%	39.1%
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%

Panel B
Edison International, Inc.

EIX	2022 CQ1	2022 CQ2	2022 CQ3	2022 CQ4	2023 CQ1	2023 CQ2	2023 CQ3	2023 CQ4	2024 CQ1	2024 CQ2	2024 CQ3	2024 CQ4	2025 CQ1	Average
Short-Term Debt	7.0%	8.7%	10.4%	9.0%	7.3%	7.4%	7.0%	6.5%	4.9%	5.4%	5.3%	5.1%	4.8%	6.8%
Long-Term Debt	48.8%	47.9%	47.2%	49.2%	52.0%	51.7%	52.3%	52.7%	55.5%	55.3%	54.5%	55.9%	56.3%	52.3%
Preferred Stock	11.3%	11.2%	11.1%	10.9%	10.7%	10.7%	10.7%	10.6%	10.5%	10.4%	10.7%	10.3%	9.8%	10.7%
Common Equity	32.8%	32.2%	31.3%	30.8%	30.0%	30.2%	30.0%	30.1%	29.1%	28.9%	29.6%	28.7%	29.1%	30.2%
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%
EIX	2022 CQ1	2022 CQ2	2022 CQ3	2022 CQ4	2023 CQ1	2023 CQ2	2023 CQ3	2023 CQ4	2024 CQ1	2024 CQ2	2024 CQ3	2024 CQ4	2025 CQ1	Average
Long-Term Debt	52.5%	52.5%	52.7%	54.1%	56.1%	55.9%	56.2%	56.4%	58.4%	58.4%	57.5%	58.9%	59.2%	56.1%
Preferred Stock	12.2%	12.2%	12.4%	12.0%	11.5%	11.5%	11.6%	11.4%	11.0%	11.0%	11.3%	10.8%	10.3%	11.5%
Common Equity	35.3%	35.3%	34.9%	33.9%	32.4%	32.6%	32.2%	32.2%	30.6%	30.5%	31.2%	30.2%	30.5%	32.5%
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%

Data Source: S&P Cap IQ, 2025.

Exhibit JRW-4
California Energy Cost of Capital Report
Cost of Capital

Panel A
San Diego Gas & Electric Company

SDG&E	2022 CQ1	2022 CQ2	2022 CQ3	2022 CQ4	2023 CQ1	2023 CQ2	2023 CQ3	2023 CQ4	2024 CQ1	2024 CQ2	2024 CQ3	2024 CQ4	2025 CQ1	Average
Short-Term Debt	0.2%	0.2%	2.7%	3.9%	4.7%	4.6%	2.3%	2.4%	0.2%	0.2%	1.8%	2.4%	0.8%	2.0%
Long-Term Debt	50.7%	50.7%	47.7%	47.2%	46.5%	46.0%	48.3%	48.5%	49.7%	49.2%	53.4%	49.2%	49.6%	49.0%
Common Equity	49.1%	49.1%	49.6%	48.9%	48.9%	49.4%	49.5%	49.1%	50.1%	50.6%	44.7%	48.4%	49.6%	49.0%
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%
SDG&E	2022 CQ1	2022 CQ2	2022 CQ3	2022 CQ4	2023 CQ1	2023 CQ2	2023 CQ3	2023 CQ4	2024 CQ1	2024 CQ2	2024 CQ3	2024 CQ4	2025 CQ1	Average
Long-Term Debt	50.8%	50.8%	49.1%	49.1%	48.8%	48.2%	49.4%	49.7%	49.8%	49.3%	54.4%	50.4%	50.0%	50.0%
Common Equity	49.2%	49.2%	50.9%	50.9%	51.2%	51.8%	50.6%	50.3%	50.2%	50.7%	45.6%	49.6%	50.0%	50.0%
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%

Panel B
Sempra Energy

SRE	2022 CQ1	2022 CQ2	2022 CQ3	2022 CQ4	2023 CQ1	2023 CQ2	2023 CQ3	2023 CQ4	2024 CQ1	2024 CQ2	2024 CQ3	2024 CQ4	2025 CQ1	Average
Short-Term Debt	4.9%	2.6%	5.3%	7.9%	7.4%	5.8%	5.0%	5.6%	3.7%	6.2%	5.3%	6.4%	6.4%	5.6%
Long-Term Debt	46.3%	46.9%	44.7%	44.5%	44.5%	47.1%	47.3%	47.2%	48.7%	46.7%	48.6%	48.0%	48.2%	46.8%
Preferred Stock	1.7%	1.7%	1.6%	1.6%	1.5%	1.5%	1.5%	1.5%	1.5%	1.4%	1.4%	1.3%	1.3%	1.5%
Common Equity	47.2%	48.8%	48.4%	46.0%	46.6%	45.6%	46.2%	45.8%	46.2%	45.6%	44.7%	44.3%	44.1%	46.1%
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%
SRE	2022 CQ1	2022 CQ2	2022 CQ3	2022 CQ4	2023 CQ1	2023 CQ2	2023 CQ3	2023 CQ4	2024 CQ1	2024 CQ2	2024 CQ3	2024 CQ4	2025 CQ1	Average
Long-Term Debt	48.6%	48.2%	47.2%	48.3%	48.0%	50.0%	49.8%	50.0%	50.6%	49.8%	51.3%	51.3%	51.5%	49.6%
Preferred Stock	1.7%	1.7%	1.7%	1.7%	1.7%	1.6%	1.6%	1.6%	1.5%	1.5%	1.5%	1.4%	1.4%	1.6%
Common Equity	49.6%	50.1%	51.1%	50.0%	50.3%	48.4%	48.6%	48.5%	47.9%	48.7%	47.2%	47.3%	47.1%	48.8%
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%

Data Source: S&P Cap IQ, 2025.

Exhibit JRW-4
California Energy Cost of Capital Report
Cost of Capital

Panel A
Southern California Gas Company

SCG	2022 CQ1	2022 CQ2	2022 CQ3	2022 CQ4	2023 CQ1	2023 CQ2	2023 CQ3	2023 CQ4	2024 CQ1	2024 CQ2	2024 CQ3	2024 CQ4	2025 CQ1	Average
Short-Term Debt	0.1%	0.1%	11.7%	8.9%	9.4%	1.8%	6.5%	9.7%	4.4%	8.2%	5.5%	8.5%	7.2%	6.3%
Long-Term Debt	48.6%	47.6%	39.4%	42.3%	40.8%	47.6%	43.5%	41.5%	44.6%	41.2%	44.5%	42.4%	41.7%	43.5%
Preferred Stock	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.2%
Common Equity	51.1%	52.1%	48.8%	48.6%	49.6%	50.4%	49.8%	48.6%	50.9%	50.5%	49.8%	49.0%	50.9%	50.0%
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%
SCG	2022 CQ1	2022 CQ2	2022 CQ3	2022 CQ4	2023 CQ1	2023 CQ2	2023 CQ3	2023 CQ4	2024 CQ1	2024 CQ2	2024 CQ3	2024 CQ4	2025 CQ1	Average
Long-Term Debt	48.6%	47.6%	44.6%	46.4%	45.1%	48.5%	46.5%	46.0%	46.6%	44.9%	47.1%	46.3%	45.0%	46.4%
Preferred Stock	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.1%	0.1%	0.1%	0.2%
Common Equity	51.2%	52.2%	55.2%	53.4%	54.8%	51.4%	53.3%	53.9%	53.3%	55.0%	52.7%	53.5%	54.9%	53.4%
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%

Panel B
Sempra Energy

SRE	2022 CQ1	2022 CQ2	2022 CQ3	2022 CQ4	2023 CQ1	2023 CQ2	2023 CQ3	2023 CQ4	2024 CQ1	2024 CQ2	2024 CQ3	2024 CQ4	2025 CQ1	Average
Short-Term Debt	4.9%	2.6%	5.3%	7.9%	7.4%	5.8%	5.0%	5.6%	3.7%	6.2%	5.3%	6.4%	6.4%	5.6%
Long-Term Debt	46.3%	46.9%	44.7%	44.5%	44.5%	47.1%	47.3%	47.2%	48.7%	46.7%	48.6%	48.0%	48.2%	46.8%
Preferred Stock	1.7%	1.7%	1.6%	1.6%	1.5%	1.5%	1.5%	1.5%	1.5%	1.4%	1.4%	1.3%	1.3%	1.5%
Common Equity	47.2%	48.8%	48.4%	46.0%	46.6%	45.6%	46.2%	45.8%	46.2%	45.6%	44.7%	44.3%	44.1%	46.1%
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%
SRE	2022 CQ1	2022 CQ2	2022 CQ3	2022 CQ4	2023 CQ1	2023 CQ2	2023 CQ3	2023 CQ4	2024 CQ1	2024 CQ2	2024 CQ3	2024 CQ4	2025 CQ1	Average
Long-Term Debt	48.6%	48.2%	47.2%	48.3%	48.0%	50.0%	49.8%	50.0%	50.6%	49.8%	51.3%	51.3%	51.5%	49.6%
Preferred Stock	1.7%	1.7%	1.7%	1.7%	1.7%	1.6%	1.6%	1.6%	1.5%	1.5%	1.5%	1.4%	1.4%	1.6%
Common Equity	49.6%	50.1%	51.1%	50.0%	50.3%	48.4%	48.6%	48.5%	47.9%	48.7%	47.2%	47.3%	47.1%	48.8%
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%

Data Source: S&P Cap IQ, 2025.

EXHIBIT JRW-5

Exhibit JRW-5

2025 California Energy Companies Cost of Capital Report
Discounted Cash Flow Analysis

Panel A
Electric Proxy Group

Dividend Yield*	3.55%
Adjustment Factor	1.0305
Adjusted Dividend Yield	3.66%
Growth Rate**	6.10%
Equity Cost Rate	9.75%

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

Panel B
Gas Proxy Group

Dividend Yield*	3.45%
Adjustment Factor	1.033
Adjusted Dividend Yield	3.56%
Growth Rate**	6.60%
Equity Cost Rate	10.15%

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

Panel C
Combination Proxy Group

Dividend Yield*	3.35%
Adjustment Factor	1.0315
Adjusted Dividend Yield	3.46%
Growth Rate**	6.30%
Equity Cost Rate	9.75%

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

Exhibit JRW-5

2025 California Energy Companies Cost of Capital Report
Monthly Dividend Yields

Panel A
Electric Proxy Group

Company		Annual Dividend	Dividend Yield 30 Day	Dividend Yield 90 Day	Dividend Yield 180 Day
Alliant Energy Corporation (NYSE-LNT)	LNT	$2.03	3.3%	3.3%	3.3%
Ameren Corporation (NYSE-AEE)	AEE	$2.84	3.0%	2.9%	3.0%
American Electric Power Co. (NYSE-AEP)	AEP	$3.72	3.6%	3.6%	3.7%
Avista Corporation (NYSE-AVA)	AVA	$1.96	5.2%	5.0%	5.1%
Black Hills Corporation (NYSE-BKH)	BKH	$2.70	4.8%	4.6%	4.6%
CenterPoint Energy, Inc. (NYSE-CNP)	CNP	$0.88	2.4%	2.4%	2.6%
CMS Energy Corporation (NYSE-CMS)	CMS	$2.17	3.1%	3.0%	3.1%
Consolidated Edison, Inc. (NYSE-ED)	ED	$3.40	3.4%	3.2%	3.4%
Dominion Energy Inc. (NYSE-D)	D	$2.67	4.8%	4.9%	4.8%
DTE Energy Company (NYSE-DTE)	DTE	$4.36	3.3%	3.2%	3.4%
Duke Energy Corporation (NYSE-DUK)	DUK	$4.18	3.6%	3.5%	3.6%
Edison International (NYSE-EIX)	EIX	$3.31	6.4%	6.0%	5.2%
Entergy Corporation (NYSE-ETR)	ETR	$2.40	2.9%	2.9%	3.0%
Evergy, Inc. (NYSE-EVRG)	EVRG	$2.67	3.9%	4.0%	4.1%
Eversource Energy (NYSE-ES)	ES	$3.01	4.7%	4.9%	4.9%
Exelon Corporation (NYSE-EXC)	EXC	$1.60	3.7%	3.6%	3.8%
FirstEnergy Corp. (NYSE-FE)	FE	$1.78	4.4%	4.4%	4.4%
IDACORP, Inc. (NYSE-IDA)	IDA	$3.44	3.0%	3.0%	3.0%
MGE Energy, Inc. (NYSE-MGEE)	MGEE	$1.80	2.0%	2.0%	1.9%
NextEra Energy, Inc. (NYSE-NEE)	NEE	$2.27	3.1%	3.2%	3.2%
NorthWestern Corporation (NYSE-NWE)	NWE	$2.64	5.1%	4.8%	4.8%
OGE Energy Corp. (NYSE-OGE)	OGE	$1.69	3.8%	3.8%	3.9%
Pinnacle West Capital Corp. (NYSE-PNW)	PNW	$3.58	4.0%	3.9%	4.0%
Portland General Electric Company (NYSE-POR)	POR	$2.10	5.1%	5.0%	4.8%
PPL Corporation (NYSE-PPL)	PPL	$1.09	3.2%	3.1%	3.2%
Public Service Enterprise Gp. Inc. (NYSE-PEG)	PEG	$2.52	3.1%	3.1%	3.0%
Sempra Energy (NYSE-SRE)	SRE	$2.60	3.4%	3.5%	3.3%
Southern Company (NYSE-SO)	SO	$2.96	3.3%	3.3%	3.4%
TXNM Energy, Inc.	TXNM	$1.63	2.9%	3.0%	3.2%
WEC Energy Group (NYSE-WEC)	WEC	$3.57	3.4%	3.4%	3.5%
Xcel Energy Inc. (NYSE-XEL)	XEL	$2.28	3.3%	3.3%	3.3%
Mean			3.7%	3.7%	3.7%
Median			3.4%	3.4%	3.4%

Data Sources: S&P Cap IQ., July 12, 2025.

Panel B
Gas Proxy Group

Company		Annual Dividend	Dividend Yield 30 Day	Dividend Yield 90 Day	Dividend Yield 180 Day
Atmos Energy Corporation (NYSE-ATO)	ATO	$3.48	2.3%	2.3%	2.3%
Chesapeake Utilities Corp. (NYSE-CPK)	CPK	$2.74	2.3%	2.2%	2.2%
New Jersey Resources Corp. (NYSE-NJR)	NJR	$1.80	4.0%	3.8%	3.8%
NiSource Inc. (NYSE-NI)	NI	$1.12	2.8%	2.9%	2.9%
Northwest Natural Gas Co. (NYSE-NWN)	NWN	$1.96	4.8%	4.7%	4.8%
One Gas, Inc. (NYSE-OGS)	OGS	$2.68	3.7%	3.6%	3.6%
Southwest Gas Corporation (NYSE-SWX)	SWX	$2.48	3.4%	3.4%	3.4%
Spire (NYSE-SR)	SR	$3.14	4.3%	4.2%	4.3%
Mean			3.4%	3.4%	3.4%
Median			3.5%	3.5%	3.5%

Data Sources: S&P Cap IQ., July 12, 2025.

Panel C
Combination Proxy Group

Company	SMBL	Annual Dividend	Dividend Yield 30 Day	Dividend Yield 90 Day	Dividend Yield 180 Day
Alliant Energy Corporation (NYSE-LNT)	LNT	$2.03	3.3%	3.3%	3.3%
Ameren Corporation (NYSE-AEE)	AEE	$2.84	3.0%	2.9%	3.0%
Avista Corporation (NYSE-AVA)	AVA	$1.96	5.2%	5.0%	5.1%
Black Hills Corporation (NYSE-BKH)	BKH	$2.70	4.8%	4.6%	4.6%
CenterPoint Energy, Inc. (NYSE - CMP)	CNP	$0.88	2.4%	2.4%	2.6%
Chesapeake Utilities Corp. (NYSE-CPK)	CPK	$2.74	2.3%	2.2%	2.2%
CMS Energy Corporation (NYSE-CMS)	CMS	$2.17	3.1%	3.0%	3.1%
Consolidated Edison, Inc. (NYSE-ED)	ED	$3.40	3.4%	3.2%	3.4%
DTE Energy Company (NYSE-DTE)	DTE	$4.36	3.3%	3.2%	3.4%
Eversource Energy (NYSE - ES)	ES	$3.01	4.7%	4.9%	4.9%
MGE Energy, Inc. (NYSE-MGEE)	MGEE	$1.80	2.0%	2.0%	1.9%
NiSource Inc. (NYSE-NI)	NI	$1.12	2.8%	2.9%	2.9%
NorthWestern Corporation (NYSE-NWE)	NWE	$2.64	5.1%	4.8%	4.8%
Public Service Enterprise Group Incorporated (NYS	PEG	$2.52	3.1%	3.1%	3.0%
Sempra Energy (NYSE-SRE)	SRE	$2.60	3.4%	3.5%	3.3%
The Southern Company (NYSE-SO)	SO	$2.96	3.3%	3.3%	3.4%
WEC Energy Group (NYSE-WEC)	WEC	$3.57	3.4%	3.4%	3.5%
Xcel Energy Inc. (NYSE-XEL)	XEL	$2.28	3.3%	3.3%	3.3%
Mean			3.4%	3.4%	3.4%
Median			3.3%	3.3%	3.3%

Data Sources: S&P Cap IQ., July 12, 2025.

Exhibit JRW-5

2025 California Energy Companies Cost of Capital Report
DCF Equity Cost Growth Rate Measures
***Value Line* Historic Growth Rates**

Panel A
Electric Proxy Group

Company		*Value Line* Historic Growth					
		Past 10 Years			Past 5 Years		
		Earnings	Dividends	Book Value	Earnings	Dividends	Book Value
Alliant Energy Corporation (NYSE-LNT)	LNT	5.5	6.5	6.0	4.5	6.0	6.0
Ameren Corporation (NYSE-AEE)	AEE	4.0	3.5	2.0	8.0	5.0	5.5
American Electric Power Co. (NYSE-AEP)	AEP	5.0	5.0	3.5	4.0	5.0	3.5
Avista Corporation (NYSE-AVA)	AVA	3.0	4.0	3.5	-1.0	4.0	3.0
Black Hills Corporation (NYSE-BKH)	BKH	4.5	5.0	4.5	2.5	5.0	5.5
CenterPoint Energy, Inc. (NYSE-CNP)	CNP	1.0	-1.0	4.0	3.5	-7.0	5.0
CMS Energy Corporation (NYSE-CMS)	CMS	6.5	6.5	7.0	6.0	6.5	8.5
Consolidated Edison, Inc. (NYSE-ED)	ED	3.0	3.0	4.0	3.0	2.5	3.0
Dominion Resources, Inc. (NYSE-D)	D		1.5	5.0	-5.5	-4.5	0.5
DTE Energy Company (NYSE-DTE)	DTE	4.0	5.5	3.0	2.5	5.5	1.5
Duke Energy Corporation (NYSE-DUK)	DUK	3.5	3.0	0.5	3.5	2.5	0.5
Edison International (NYSE-EIX)	EIX	1.0	8.0	1.5	12.5	4.5	0.5
Entergy Corporation (NYSE-ETR)	ETR	2.5	2.5	2.0	4.0	4.0	7.0
Evergy, Inc. (NYSE-EVRG)	EVRG						
Eversource Energy (NYSE-ES)	ES	6.5	6.5	3.5	6.0	6.0	3.0
Exelon Corporation (NYSE-EXC)	EXC	-0.5	-3.0	4.5	2.5	4.0	3.5
FirstEnergy Corp. (NYSE-FE)	FE		-1.0	-4.5	-0.5	0.5	10.5
IDACORP, Inc. (NYSE-IDA)	IDA	4.0	7.5	4.5	3.5	6.0	4.5
MGE Energy, Inc. (NYSE-MGEE)	MGEE	4.5	4.5	6.0	6.0	5.0	6.0
NextEra Energy, Inc. (NYSE-NEE)	NEE	9.5	11.0	8.0	12.5	11.0	5.5
NorthWestern Corporation (NYSE-NWE)	NWE	2.5	5.5	5.0	-1.0	3.0	3.5
OGE Energy Corp. (NYSE-OGE)	OGE	3.0	7.5	4.0	4.5	8.5	1.5
Pinnacle West Capital Corp. (NYSE-PNW)	PNW	2.5	4.0	4.0		4.0	3.5
Portland General Electric Company (NYSE-POR	POR	3.5	5.5	3.5	3.0	5.5	3.0
PPL Corporation (NYSE-PPL)	PPL	-9.0	-1.0		-17.0	-4.5	4.0
Public Service Enterprise Gp. Inc. (NYSE-PEG)	PEG	3.0	4.5	3.0	3.0	5.0	1.0
Sempra Energy (NYSE-SRE)	SRE	7.5	6.5	7.0	11.5	6.0	10.0
Southern Company (NYSE-SO)	SO	3.0	3.5	3.0	3.0	3.5	2.5
TXNM Energy, Inc.	TXNM	7.0	8.0	2.0	6.5	6.0	4.0
WEC Energy Group (NYSE-WEC)	WEC	6.5	10.0	7.0	7.0	6.5	3.5
Xcel Energy Inc. (NYSE-XEL)	XEL	5.5	6.5	5.5	6.0	6.5	6.0
Mean		3.7	4.6	3.9	3.6	4.1	4.2
Median		3.8	5.0	4.0	3.5	5.0	3.5
Data Source: *Value Line Investment Survey.*		Average of Median Figures =			4.1		

Panel B
Gas Proxy Group

Company		*Value Line* Historic Growth					
		Past 10 Years			Past 5 Years		
		Earnings	Dividends	Book Value	Earnings	Dividends	Book Value
Atmos Energy Company (NYSE-ATO)	ATO	9.5	7.5	10.0	9.0	9.0	11.5
Chesapeake Utilities Corporation (NYSE-CPK)	CPK	8.5	8.5	11.0	8.5	10.0	11.5
New Jersey Resources Corp. (NYSE-NJR)	NJR	5.5	7.0	7.0	5.0	7.0	5.0
NiSource Inc (NYSE-NI)	NI	1.0		-2.0	10.5	4.5	3.5
Northwest Natural Holdings (NYSE-NWN)	NWN	1.0	1.0	2.0	25.0	0.5	3.5
ONE Gas, Inc.(NYSE-OGS)	OGS	7.0	12.0	3.5	4.5	7.0	5.0
Southwest Gas Holdings, Inc. (NYSE-SWX)	SWX		6.5	4.5		3.5	2.0
Spire (NYSE-SR)	SR	5.5	5.5	5.0	1.0	5.0	3.0
Mean		5.4	6.9	5.1	9.1	5.8	5.6
Median		5.5	7.0	4.8	8.5	6.0	4.3
Data Source: *Value Line Investment Survey.*		Average of Median Figures =			6.0		

Panel C
Combination Proxy Group

Company		*Value Line* Historic Growth					
		Past 10 Years			Past 5 Years		
		Earnings	Dividends	Book Value	Earnings	Dividends	Book Value
Alliant Energy Corporation (NYSE-LNT)	LNT	5.5	6.5	6.0	4.5	6.0	6.0
Ameren Corporation (NYSE-AEE)	AEE	4.0	3.5	2.0	8.0	5.0	5.5
Avista Corporation (NYSE-AVA)	AVA	3.0	4.0	3.5	-1.0	4.0	3.0
Black Hills Corporation (NYSE-BKH)	BKH	4.5	5.0	4.5	2.5	5.0	5.5
CenterPoint Energy, Inc. (NYSE - CNP)	CNP		-1.0	4.0	3.5	-9.5	7.0
Chesapeake Utilities Corporation (NYSE-CPK)	CPK	8.5	8.5	11.0	8.5	10.0	11.5
CMS Energy Corporation (NYSE-CMS)	CMS	6.5	6.5	7.0	6.0	6.5	8.5
Consolidated Edison, Inc. (NYSE-ED)	ED	2.0	2.5	4.0	2.0	2.5	3.5
DTE Energy Company (NYSE-DTE)	DTE	4.0	5.5	3.0	2.5	5.5	1.5
Eversource Energy (NYSE - ES)	ES	6.5	7.0	4.5	5.5	6.0	4.0
MGE Energy, Inc. (NYSE-MGEE)	MGEE	4.5	4.5	6.0	6.0	5.0	6.0
NiSource Inc (NYSE-NI)	NI	1.0		-2.0	10.5	4.5	3.5
NorthWestern Corporation (NYSE-NWE)	NWE	2.5	5.5	5.0	-1.0	3.0	3.5
Public Service Enterprise Group Incorporated (N	PEG	3.0	4.5	3.0	4.0	4.5	1.5
Sempra Energy (NYSE-SRE)	SRE	7.5	6.5	7.0	11.5	6.0	10.0
The Southern Company (NYSE-SO)	SO	3.0	3.5	3.0	3.0	3.5	2.5
WEC Energy Group (NYSE-WEC)	WEC	6.5	10.0	7.0	7.0	6.5	3.5
Xcel Energy Inc. (NYSE-XEL)	XEL	5.5	6.5	5.5	6.0	6.5	6.0
Mean		4.6	5.2	4.7	4.9	4.5	5.1
Median		4.5	5.5	4.5	5.0	5.0	4.8
Data Source: *Value Line Investment Survey.*		Average of Median Figures =			4.9		

Exhibit JRW-5

2025 California Energy Companies Cost of Capital Report
DCF Equity Cost Growth Rate Measures
***Value Line* Projected Growth Rates**

Panel A
Electric Proxy Group

Company		*Value Line* Projected Growth Est'd. '22-'24 to '28-'30			*Value Line* Sustainable Growth		
		Earnings	Dividends	Book Value	Return on Equity	Retention Rate	Internal Growth
Alliant Energy Corporation (NYSE-LNT)	LNT	6.0	6.0	4.0	12.0%	38.0%	4.6%
Ameren Corporation (NYSE-AEE)	AEE	6.5	6.5	6.5	10.0%	40.0%	4.0%
American Electric Power Co. (NYSE-AEP)	AEP	6.5	5.5	6.0	11.0%	39.0%	4.3%
Avista Corporation (NYSE-AVA)	AVA	5.5	4.0	2.0	8.5%	30.0%	2.6%
Black Hills Corporation (NYSE-BKH)	BKH	3.5	3.5	3.0	8.5%	38.0%	3.2%
CenterPoint Energy, Inc. (NYSE-CNP)	CNP	6.5	6.0	5.5	10.5%	56.0%	5.9%
CMS Energy Corporation (NYSE-CMS)	CMS	5.5	4.0	3.5	16.0%	40.0%	6.4%
Consolidated Edison, Inc. (NYSE-ED)	ED	6.0	4.5	4.0	9.0%	40.0%	3.6%
Dominion Resources, Inc. (NYSE-D)	D	6.0	0.0	3.0	11.5%	37.0%	4.3%
DTE Energy Company (NYSE-DTE)	DTE	4.5	3.0	1.0	12.5%	38.0%	4.8%
Duke Energy Corporation (NYSE-DUK)	DUK	6.0	3.5	3.5	10.5%	37.0%	3.9%
Edison International (NYSE-EIX)	EIX	6.5	5.5	6.0	14.0%	37.0%	5.2%
Entergy Corporation (NYSE-ETR)	ETR	3.0	5.5	4.5	9.5%	39.0%	3.7%
Evergy, Inc. (NYSE-EVRG)	EVRG	7.5	7.0	3.5	10.0%	37.0%	3.7%
Eversource Energy (NYSE-ES)	ES	5.5	5.5	3.5	11.5%	37.0%	4.3%
Exelon Corporation (NDW-EXC)	EXC	nmf	nmf	nmf	10.0%	40.0%	4.0%
FirstEnergy Corp. (NYSE-FE)	FE	4.5	4.5	5.5	12.5%	37.0%	4.6%
IDACORP, Inc. (NYSE-IDA)	IDA	6.0	5.5	4.5	10.0%	41.0%	4.1%
MGE Energy, Inc. (NYSE-MGEE)	MGEE	7.0	6.5	5.5	10.5%	47.0%	4.9%
Nextera Energy, Inc. (NYSE-NEE)	NEE	8.5	9.5	8.0	14.0%	37.0%	5.2%
NorthWestern Corporation (NYSE-NWE)	NWE	4.5	1.5	2.5	8.0%	36.0%	2.9%
OGE Energy Corp. (NYSE-OGE)	OGE	6.5	3.0	5.5	13.0%	30.0%	3.9%
Pinnacle West Capital Corp. (NYSE-PNW)	PNW	5.0	1.5	4.0	9.0%	38.0%	3.4%
Portland General Electric Company (NYSE-POR)	POR	6.5	5.5	4.5	9.5%	35.0%	3.3%
PPL Corporation (NYSE-PPL)	PPL	7.5	-0.5	3.0	9.5%	40.0%	3.8%
Public Service Enterprise Gp. Inc. (NYSE-PEG)	PEG	7.0	6.0	5.5	12.5%	39.0%	4.9%
Sempra Energy (NYSE-SRE)	SRE	5.0	5.5	5.5	10.5%	47.0%	4.9%
Southern Company (NYSE-SO)	SO	6.5	3.5	3.5	14.5%	33.0%	4.8%
TXNM Energy, Inc.	TXNM	4.5	5.0	3.5	10.0%	45.0%	4.5%
WEC Energy Group (NYSE-WEC)	WEC	6.0	7.0	4.0	13.0%	36.0%	4.7%
Xcel Energy Inc. (NYSE-XEL)	XEL	7.0	6.5	5.5	11.0%	40.0%	4.4%
Mean		5.9	4.7	4.3	11.0%	38.8%	4.3%
Median		6.0	5.5	4.0	10.5%	38.0%	4.3%
Average of Median Figures =			5.2			Median =	4.3%

*** 'Est'd. '22-'24 to '28-'30 is the estimated growth rate from the base period 2023 to 2024 until the future period 2028 to 2030.**
Data Source: ***Value Line Investment Survey.***

Panel b
Gas Proxy Group

Company		*Value Line* Projected Growth Est'd. '22-'24 to '28-'30			*Value Line* Sustainable Growth		
		Earnings	Dividends	Book Value	Return on Equity	Retention Rate	Internal Growth
Atmos Energy Company (NYSE-ATO)	ATO	6.0	7.0	5.0	9.0%	48.0%	4.3%
Chesapeake Utilities Corporation (NYSE-CPK)	CPK	8.0	7.0	6.0	10.5%	59.0%	6.2%
New Jersey Resources Corp. (NYSE-NJR)	NJR	5.5	7.0	7.0	14.5%	44.0%	6.4%
NiSource Inc (NYSE-NI)	NI	9.5	4.5	5.0	10.0%	43.0%	4.3%
Northwest Natural Holdings (NYSE-NWN)	NWN	6.5	0.5	4.0	8.0%	42.0%	3.4%
ONE Gas, Inc.(NYSE-OGS)	OGS	4.0	2.5	6.0	7.5%	45.0%	3.4%
Southwest Gas Holdings, Inc. (NYSE-SWX)	SWX	10.0	5.5	7.5	8.5%	38.0%	3.2%
Spire (NYSE-SR)	SR	4.5	4.0	2.5	9.0%	26.0%	2.3%
Mean		6.8	4.8	5.4	9.6%	43.1%	4.2%
Median		6.3	5.0	5.5	9.0%	43.5%	3.8%
Average of Median Figures =			5.6			Median =	3.8%

*** 'Est'd. '22-'24 to '28-'30 is the estimated growth rate from the base period 2023 to 2024 until the future period 2028 to 2030.**
Data Source: *Value Line Investment Survey.*

Panel C
Combination Proxy Group

Company		*Value Line* Projected Growth Est'd. '22-'24 to '28-'30			*Value Line* Sustainable Growth		
		Earnings	Dividends	Book Value	Return on Equity	Retention Rate	Internal Growth
Alliant Energy Corporation (NYSE-LNT)	LNT	6.0	6.0	4.0	12.0%	38.0%	4.6%
Ameren Corporation (NYSE-AEE)	AEE	6.5	6.5	6.5	10.0%	40.0%	4.0%
Avista Corporation (NYSE-AVA)	AVA	5.5	4.0	2.0	8.5%	30.0%	2.6%
Black Hills Corporation (NYSE-BKH)	BKH	3.5	3.5	3.0	8.5%	38.0%	3.2%
CenterPoint Energy, Inc. (NYSE - CNP)	CNP	6.5	6.0	5.5	10.5%	51.0%	5.4%
Chesapeake Utilities Corporation (NYSE-CPK)	CPK	8.0	7.0	6.0	10.5%	59.0%	6.2%
CMS Energy Corporation (NYSE-CMS)	CMS	5.5	4.0	3.5	16.0%	40.0%	6.4%
Consolidated Edison, Inc. (NYSE-ED)	ED	6.0	4.5	4.0	9.0%	40.0%	3.6%
DTE Energy Company (NYSE-DTE)	DTE	4.5	3.0	1.0	12.5%	38.0%	4.8%
Eversource Energy (NYSE-ES)	ES	5.5	5.5	3.5	11.5%	37.0%	4.3%
MGE Energy, Inc. (NYSE-MGEE)	MGEE	7.0	6.5	5.5	10.5%	47.0%	4.9%
NiSource Inc (NYSE-NI)	NI	9.5	4.5	5.0	10.0%	43.0%	4.3%
NorthWestern Corporation (NYSE-NWE)	NWE	4.5	1.5	2.5	8.0%	35.0%	2.8%
Public Service Enterprise Gp. Inc. (NYSE-PEG)	PEG	7.0	6.0	5.5	12.5%	39.0%	4.9%
Sempra Energy (NYSE-SRE)	SRE	5.0	5.5	5.5	10.5%	47.0%	4.9%
The Southern Company (NYSE-SO)	SO	6.5	3.5	3.5	14.5%	33.0%	4.8%
WEC Energy Group (NYSE-WEC)	WEC	6.0	7.0	4.0	13.0%	36.0%	4.7%
Xcel Energy Inc. (NYSE-XEL)	XEL	7.0	6.5	5.5	11.0%	40.0%	4.4%
Mean		6.1	5.1	4.2	11.1%	40.6%	4.5%
Median		6.0	5.5	4.0	10.5%	39.5%	4.6%
Average of Median Figures =			5.2			Median =	4.6%

*** 'Est'd. '22-'24 to '28-'30 is the estimated growth rate from the base period 2023 to 2024 until the future period 2028 to 2030.**

Exhibit JRW-5

2025 California Energy Companies Cost of Capital Report
DCF Equity Cost Growth Rate Measures
Analysts Projected EPS Growth Rate Estimates

Panel A
Electric Proxy Group

Company		Zacks	S&P	Mean
Alliant Energy Corporation (NYSE-LNT)	LNT	6.6%	6.7%	6.6%
Ameren Corporation (NYSE-AEE)	AEE	7.0%	7.5%	7.2%
American Electric Power Co. (NYSE-AEP)	AEP	6.4%	6.8%	6.6%
Avista Corporation (NYSE-AVA)	AVA	6.1%	5.9%	6.0%
Black Hills Corporation (NYSE-BKH)	BKH	5.3%	5.6%	5.4%
CenterPoint Energy, Inc. (NYSE-CNP)	CNP	7.8%	8.0%	7.9%
CMS Energy Corporation (NYSE-CMS)	CMS	7.8%	7.3%	7.5%
Consolidated Edison, Inc. (NYSE-ED)	ED	5.6%	6.1%	5.8%
Dominion Resources, Inc. (NYSE-D)	D	13.6%	12.0%	12.8%
DTE Energy Company (NYSE-DTE)	DTE	7.6%	7.9%	7.7%
Duke Energy Corporation (NYSE-DUK)	DUK	6.3%	6.4%	6.3%
Edison International (NYSE-EIX)	EIX	7.1%	9.0%	8.0%
Entergy Corporation (NYSE-ETR)	ETR	9.5%	8.9%	9.2%
Evergy, Inc. (NYSE-EVRG)	EVRG	5.7%	5.7%	5.7%
Eversource Energy (NYSE-ES)	ES	5.7%	5.7%	5.7%
Exelon Corporation (NDW-EXC)	EXC	6.4%	6.4%	6.4%
FirstEnergy Corp. (NYSE-FE)	FE	6.4%	6.5%	6.5%
IDACORP, Inc. (NYSE-IDA)	IDA	8.1%	8.6%	8.3%
MGE Energy, Inc. (NYSE-MGEE)	MGEE			
Nextera Energy, Inc. (NYSE-NEE)	NEE	7.7%	7.8%	7.7%
NorthWestern Corporation (NYSE-NWE)	NWE	6.9%	5.7%	6.3%
OGE Energy Corp. (NYSE-OGE)	OGE	6.3%	6.7%	6.5%
Pinnacle West Capital Corp. (NYSE-PNW)	PNW	2.1%	5.3%	3.7%
Portland General Electric Company (NYSE-POR)	POR	3.4%	4.7%	4.0%
PPL Corporation (NYSE-PPL)	PPL	7.5%	7.3%	7.4%
Public Service Enterprise Group Incorporated (NYSE - I	PEG	7.0%	6.5%	6.7%
Sempra Energy (NYSE-SRE)	SRE	7.9%	7.6%	7.8%
Southern Company (NYSE-SO)	SO	6.6%	6.9%	6.7%
TXNM Energy, Inc.	TXNM	7.6%	7.8%	7.7%
WEC Energy Group (NYSE-WEC)	WEC	7.0%	7.1%	7.0%
Xcel Energy Inc. (NYSE-XEL)	XEL	7.5%	7.7%	7.6%
Mean		6.9%	7.1%	7.0%
Median		6.9%	6.9%	6.7%

Data Source: www.https://finance.yahoo.com/, https://zacks.com/, S&P Cap IQ, July 15, 2025.

Panel B
Gas Proxy Group

Company		Zacks	S&P Cap IQ	Mean
Atmos Energy Company (NYSE-ATO)	ATO	7.2%	7.3%	7.2%
Chesapeake Utilities Corporation (NYSE-CPK)	CPK		8.3%	8.3%
New Jersey Resources Corp. (NYSE-NJR)	NJR		7.9%	7.9%
NiSource Inc (NYSE-NI)	NI	7.9%	8.0%	7.9%
Northwest Natural Holdings (NYSE-NWN)	NWN	NA	5.8%	5.8%
ONE Gas, Inc.(NYSE-OGS)	OGS	5.6%	5.8%	5.7%
Southwest Gas Holdings, Inc. (NYSE-SWX)	SWX	10.5%	10.7%	10.6%
Spire (NYSE-SR)	SR	6.5%	8.1%	7.3%
Mean		7.5%	7.7%	7.6%
Median		7.2%	7.9%	7.6%

Data Source: www.https://finance.yahoo.com/, https://zacks.com/, S&P Cap IQ, July 15, 2025.

Panel B
Combination Proxy Group

Company		Zacks	S&P Cap IQ	Mean
Alliant Energy Corporation (NYSE-LNT)	LNT	6.6%	6.7%	6.6%
Ameren Corporation (NYSE-AEE)	AEE	7.0%	7.5%	7.2%
Avista Corporation (NYSE-AVA)	AVA	6.1%	5.9%	6.0%
Black Hills Corporation (NYSE-BKH)	BKH	5.3%	5.6%	5.4%
CenterPoint Energy, Inc. (NYSE - CNP)	CNP	7.8%	8.0%	7.9%
Chesapeake Utilities Corporation (NYSE-CPK)	CPK		8.3%	8.3%
CMS Energy Corporation (NYSE-CMS)	CMS	7.8%	7.3%	7.5%
Consolidated Edison, Inc. (NYSE-ED)	ED	5.6%	6.1%	5.8%
DTE Energy Company (NYSE-DTE)	DTE	7.6%	7.9%	7.7%
Eversource Energy (NYSE - ES)	ES	5.7%	5.7%	5.7%
MGE Energy, Inc. (NYSE-MGEE)	MGEE			
NiSource Inc (NYSE-NI)	NI	7.9%	8.0%	7.9%
NorthWestern Corporation (NYSE-NWE)	NWE	6.9%	5.7%	6.3%
Public Service Enterprise Group Incorporated NYSE-PE	PEG	7.0%	6.5%	6.7%
Sempra Energy (NYSE-SRE)	SRE	7.9%	7.6%	7.8%
The Southern Company (NYSE-SO)	SO	6.6%	6.9%	6.7%
WEC Energy Group (NYSE-WEC)	WEC	7.0%	7.1%	7.0%
Xcel Energy Inc. (NYSE-XEL)	XEL	7.5%	7.7%	7.6%
Mean		6.9%	7.0%	7.0%
Median		7.0%	7.1%	7.0%

Data Source: www.https://finance.yahoo.com/, https://zacks.com/, S&P Cap IQ, July 15, 2025.

Exhibit JRW-5

2025 California Energy Companies Cost of Capital Report
DCF Growth Rate Indicators

Growth Rate Indicator	Electric Proxy Group	Gas Proxy Group	Combo Proxy Group
Historic *Value Line* Growth in EPS, DPS, and BVPS	4.1%	6.0%	4.9%
Projected *Value Line* Growth in EPS, DPS, and BVPS	5.2%	5.6%	5.2%
Sustainable Growth ROE * Retention Rate	4.3%	3.8%	4.6%
Projected EPS Growth from Zacks and S&P Cap IQ - Mean/Median	7.0%/6.7%	7.6%/7.6%	7.0%/7.0%
DCF Growth Rate	6.10%	6.60%	6.30%

DCF Growth Rate Summary

DCF Growth Rate	Electric Proxy Group	Gas Proxy Group	Combo Proxy Group
Projected *Value Line* Growth	5.2%	5.6%	5.2%
Sustainable Growth	4.3%	3.8%	4.6%
Projected EPS Growth	6.9%	7.6%	7.0%
Projected Growth Average	5.4%	5.7%	5.6%
Projected EPS Growth	6.9%	7.6%	7.0%
DCF Growth Rate	6.1%	6.6%	6.3%

EXHIBIT JRW-6

Exhibit JRW-6

025 California Energy Companies Cost of Capital Report
Capital Asset Pricing Model

Panel A
Electric Proxy Group

Risk-Free Interest Rate	**5.00%**
Beta*	**0.71**
Ex Ante Market Risk Premium**	**5.25%**
CAPM Cost of Equity	**8.75%**

* See page 3 of Exhibit JRW-6

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

Panel B
Gas Proxy Group

Risk-Free Interest Rate	**5.00%**
Beta*	**0.77**
Ex Ante Market Risk Premium**	**5.25%**
CAPM Cost of Equity	**9.05%**

* See page 3 of Exhibit JRW-6

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

Panel C
Combination Proxy Group

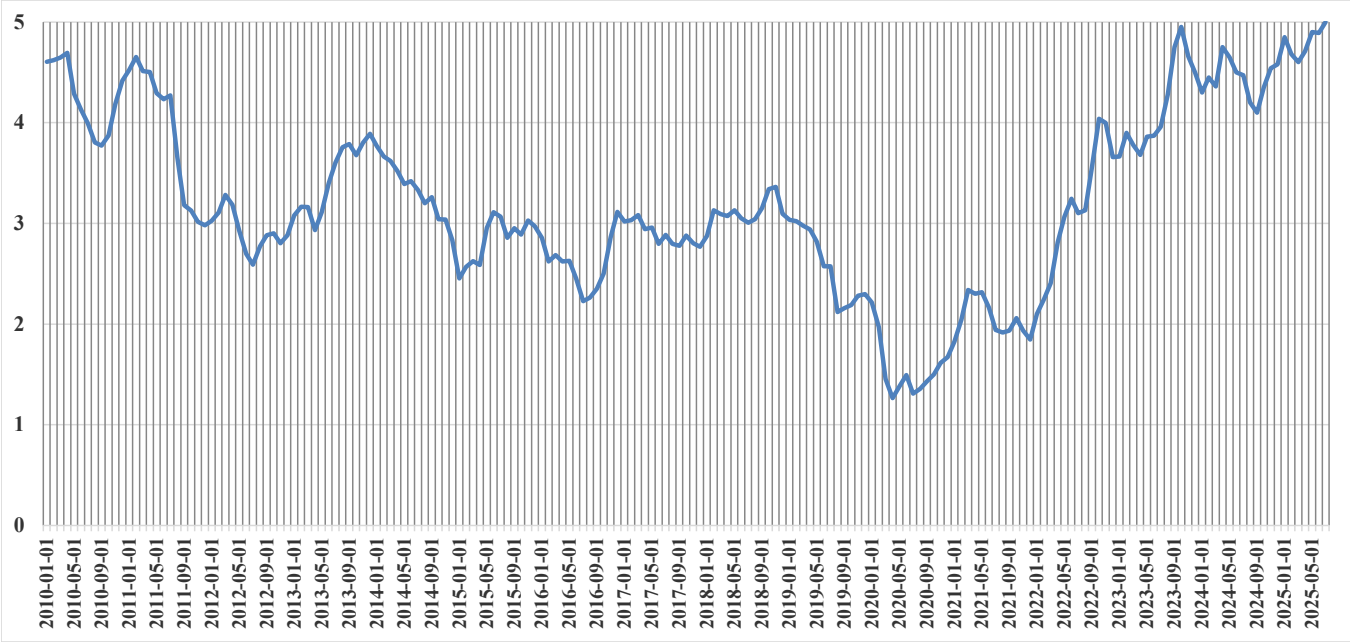
Risk-Free Interest Rate	**5.00%**
Beta*	**0.74**
Ex Ante Market Risk Premium**	**5.25%**
CAPM Cost of Equity	**8.90%**

* See page 3 of Exhibit JRW-6

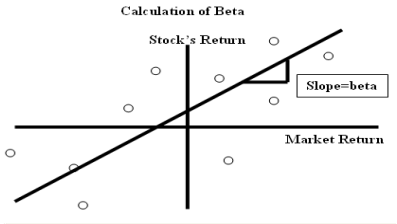
** See pages 5 and 6 of Exhibit JRW-6

Exhibit JRW-6

Thirty-Year U.S. Treasury Yields
2010-2025



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



Company	V-Line Beta	Adj. S&P Cap IQ Beta	Average Beta
Alliant Energy Corporation (NYSE-LNT)	0.80	0.71	0.75
Ameren Corporation (NYSE-AEE)	0.80	0.66	0.73
American Electric Power Co. (NYSE-AEP)	0.70	0.60	0.65
Avista Corporation (NYSE-AVA)	0.75	0.59	0.67
Black Hills Corporation (NYSE-BKH)	0.85	0.78	0.82
CenterPoint Energy, Inc. (NYSE-CNP)	0.85	0.71	0.78
CMS Energy Corporation (NYSE-CMS)	0.70	0.58	0.64
Consolidated Edison, Inc. (NYSE-ED)	0.65	0.49	0.57
Dominion Resources, Inc. (NYSE-D)	0.75	0.70	0.72
DTE Energy Company (NYSE-DTE)	0.80	0.62	0.71
Duke Energy Corporation (NYSE-DUK)	0.70	0.57	0.63
Edison International (NYSE-EIX)	0.90	0.83	0.87
Entergy Corporation (NYSE-ETR)	0.80	0.71	0.76
Evergy, Inc. (NYSE-EVRG)	0.75	0.65	0.70
Eversource Energy (NYSE-ES)	0.85	0.76	0.80
Exelon Corporation (NDW-EXC)	NMF	0.64	0.64
FirstEnergy Corp. (NYSE-FE)	0.75	0.57	0.66
IDACORP, Inc. (NYSE-IDA)	0.70	0.70	0.70
MGE Energy, Inc. (NYSE-MGEE)	0.80	0.84	0.82
NextEra Energy, Inc. (NYSE-NEE)	0.90	0.77	0.84
NorthWestern Corporation (NYSE-NWE)	0.75	0.58	0.66
OGE Energy Corp. (NYSE-OGE)	0.85	0.72	0.79
Pinnacle West Capital Corp. (NYSE-PNW)	0.75	0.61	0.68
Portland General Electric Company (NYSE-POR)	0.75	0.72	0.73
PPL Corporation (NYSE-PPL)	0.90	0.77	0.83
Public Service Enterprise Group Incorporated (NYSE	0.90	0.66	0.78
Sempra Energy (NYSE-SRE)	0.90	0.76	0.83
Southern Company (NYSE-SO)	0.75	0.58	0.66
TXNM Energy, Inc.	0.65	0.42	0.54
WEC Energy Group (NYSE-WEC)	0.70	0.61	0.66
Xcel Energy Inc. (NYSE-XEL)	0.70	0.58	0.64
Mean	0.78	0.66	0.72
Median	0.75	0.66	0.71

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

Panel B

Gas Proxy Group			
Company	V-Line Beta	Cap IQ Beta	Average Beta
Atmos Energy Company (NYSE-ATO)	0.75	0.79	0.77
Chesapeake Utilities Corporation (NYSE-CPK)	0.75	0.77	0.76
New Jersey Resources Corp. (NYSE-NJR)	0.85	0.75	0.80
NiSource Inc (NYSE-NI)	0.85	0.70	0.77
Northwest Natural Holdings (NYSE-NWN)	0.80	0.69	0.74
ONE Gas, Inc.(NYSE-OGS)	0.80	0.86	0.83
Southwest Gas Holdings, Inc. (NYSE-SWX)	0.80	0.64	0.72
Spire (NYSE-SR)	0.80	0.76	0.78
Mean	0.80	0.74	0.77
Median	0.80	0.75	0.77

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

Panel C

Combination Proxy Group			
Company	V-Line Beta	Cap IQ Beta	Cap IQ Beta
Alliant Energy Corporation (NYSE-LNT)	0.80	0.71	0.75
Ameren Corporation (NYSE-AEE)	0.80	0.66	0.73
Avista Corporation (NYSE-AVA)	0.75	0.59	0.67
Black Hills Corporation (NYSE-BKH)	0.85	0.78	0.82
Chesapeake Utilities Corporation (NYSE-CPK)	0.95	0.71	0.83
CenterPoint Energy, Inc. (NYSE-CNP)	0.85	0.77	0.81
CMS Energy Corporation (NYSE-CMS)	0.70	0.58	0.64
Consolidated Edison, Inc. (NYSE-ED)	0.65	0.49	0.57
DTE Energy Company (NYSE-DTE)	0.80	0.62	0.71
Eversource Energy (NYSE-ES)	0.85	0.76	0.80
MGE Energy, Inc. (NYSE-MGEE)	0.80	0.84	0.82
NiSource Inc (NYSE-NI)	0.95	0.70	0.82
NorthWestern Corporation (NYSE-NWE)	0.75	0.58	0.66
Public Service Enterprise Group Incorporated (NYSE	0.90	0.66	0.78
Sempra Energy (NYSE-SRE)	0.90	0.76	0.83
Southern Company (NYSE-SO)	0.75	0.58	0.66
WEC Energy Group (NYSE-WEC)	0.70	0.61	0.66
Xcel Energy Inc. (NYSE-XEL)	0.70	0.58	0.64
Mean	0.80	0.67	0.73
Median	0.80	0.66	0.74

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

Exhibit JRW-6
Risk Premium Approaches

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

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

CAPM Study

Market Risk Premium - 2000-202

Category	Study Authors	Publication Date	Time Period Of Study	Methodology	Return Measure	Range Low	Range High	Midpoint of Range	Mean	Median
Historical Risk Premiun										
	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	2025	1900-2024	Historical Stock Returns - Bond Returns	Geometric				5.10%	
	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	Geometric				4.77%	
	Median									5.37%
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 Mode					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 ERF	2011	Projection	Real Stock Returns and Components					5.50%	
	Kroll (Duff & Phelps)	2025	Projection	Normalized with 3.5% Long-Term Treasury Yield					5.50%	
	Mschchowski - VL - 2014	2014	Projection	Fundamentals - Expected Return Minus 10-Year Treasury Rate					5.50%	
	American Appraisal Quarterly ERP	2015	Projection	Fundamental Economic and Market Factors					6.00%	
	JP Morgan Asset Management	2025	Projection	Equity Return of 6.70% and Long-Term Bond of 3.80%					3.90%	
	Market Risk Premia - 3-1-25	2025	Projection	Fundamental Economic and Market Factors					2.83%	
	KPMG	2025	Projection	Fundamental Economic and Market Factors					5.25%	
	Damodaran 6-1-25	2025	Projection	Fundamentals - Implied from FCF to Equity Model (Trailing 12 month, with adjusted payou					4.01%	
	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										
	New York Fed	2015	Five-Year	Survey of Wall Street Firms					5.70%	
	Survey of Financial Forecasters	2025	10-Year Projection	Median Projected Equity Return of 7.00% and Long-Term Bond of 4.00%					3.00%	
	Duke - CFO Magazine Survey	2025	10-Year Projection	Approximately 300 CFOs Expected S&P 500 Return of 9.7% and Risk-Free Rate of 4.5%					5.20%	
	Fernandez - Academics, Analysts, and Compani	2025	Long-Term	Survey of Academics, Analysts, and Companie					5.50%	
	Median									5.35%
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 ERI	2011	Projection	Current Supply Model (D/P & Earnings Growth)	Arithmetic			4.63%	4.12%	
					Geometric			3.60%		
	Median									4.06%
Mean										**4.68%**
Median										**4.70%**

CAPM Study

Market Risk Premium Results - 2010-2025

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	2025	1928-2024	Historical Stock Returns - Bond Returns	Arithmetic				7.00%	
					Geometric				5.44%	
	Dimson, Marsh, Staunton _Credit Suisse Report	2025	1900-2024	Historical Stock Returns - Bond Returns	Geometric				5.10%	
	Median									5.59%
Ex Ante Models (Puzzle Research)										
	Siegel - Rethink ERP	2011	Projection	Real Stock Returns and Components					5.50%	
	Kroll (Duff & Phelps)	2025	Projection	Normalized with 3.5% Long-Term Treasury Yield					5.50%	
	Mschchowski - VL - 2014	2014	Projection	Fundamentals - Expected Return Minus 10-Year Treasury Rate					5.50%	
	American Appraisal Quarterly ERP	2015	Projection	Fundamental Economic and Market Factors					6.00%	
	JP Morgan Asset Management	2025	Projection	Equity Return of 6.70% and Long-Term Bond of 3.80%					3.90%	
	Market Risk Premia - 3-1-25	2025	Projection	Fundamental Economic and Market Factors					2.83%	
	KPMG	2025	Projection	Fundamental Economic and Market Factors					5.25%	
	Damodaran 7-1-25	2025	Projection	Fundamentals - Implied from FCF to Equity Model (Trailing 12 month, with adjusted payout)					3.94%	
	Median									5.38%
Surveys										
	New York Fed	2015	Five-Year	Survey of Wall Street Firms					5.70%	
	Survey of Financial Forecasters	2025	10-Year Projection	Median Projected Equity Return of 7.00% and Long-Term Bond of 4.00%					3.00%	
	Duke - CFO Magazine Survey	2025	10-Year Projection	Approximately 300 CFOs Expected S&P 500 Return of 9.7% and Risk-Free Rate of 4.5%					5.20%	
	Fernandez - Academics, Analysts, and Companie	2025	Long-Term	Survey of Academics, Analysts, and Companies					5.50%	
	Median									5.35%
Building Block										
	Ibbotson and Chen	2015	Projection	Historical Supply Model (D/P & Earnings Growth)	Arithmetic			6.22%	5.21%	
					Geometric			4.20%		
	Chen - Rethink ERP	2010	20-Year Projection	Combination Supply Model (Historic and Projection)	Geometric				4.00%	
	Ilmanen - Rethink ERP	2010	Projection	Current Supply Model (D/P & Earnings Growth)	Geometric				3.00%	
	Grinold, Kroner, Siegel - Rethink ERP	2011	Projection	Current Supply Model (D/P & Earnings Growth)	Arithmetic			4.63%	4.12%	
					Geometric			3.60%		
	Median									4.06%
Mean										**5.09%**
Median										**5.36%**

CAPM Study

Kroll Equity Risk Premium Estimates

KROLL

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

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

Date	Risk-free Rate (R_f)	R_f (%)	Kroll Recommended U.S. ERP (%)	What Changed
Current Guidance:				
April 15, 2025 – UNTIL FURTHER NOTICE*	Normalized 20-year U.S. Treasury yield*	3.50*	5.50	*ERP*
June 5, 2024 – April 14, 2025*	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	4.00	5.00	
December 31, 2014	Normalized 20-year U.S. Treasury yield	4.00	5.00	
December 31, 2013	Normalized 20-year U.S. Treasury yield	4.00	5.00	
February 28, 2013 – January 30, 2016	Normalized 20-year U.S. Treasury yield	4.00	5.00	*ERP*
December 31, 2012	Normalized 20-year U.S. Treasury yield	4.00	5.50	
January 15, 2012 – February 27, 2013	Normalized 20-year U.S. Treasury yield	4.00	5.50	*ERP*
December 31, 2011	Normalized 20-year U.S. Treasury yield	4.00	6.00	
September 30, 2011 – January 14, 2012	Normalized 20-year U.S. Treasury yield	4.00	6.00	*ERP*
July 1 2011 – September 29, 2011	Normalized 20-year U.S. Treasury yield	4.00	5.50	R_f
June 1, 2011 – June 30, 2011	Spot 20-year U.S. Treasury yield	Spot	5.50	R_f
May 1, 2011 – May 31, 2011	Normalized 20-year U.S. Treasury yield	4.00	5.50	R_f
December 31, 2010	Spot 20-year U.S. Treasury yield	Spot	5.50	
December 1, 2010 – April 30, 2011	Spot 20-year U.S. Treasury yield	Spot	5.50	R_f
June 1, 2010 – November 30, 2010	Normalized 20-year U.S. Treasury yield	4.00	5.50	R_f
December 31, 2009	Spot 20-year U.S. Treasury yield	Spot	5.50	
December 1, 2009 – May 31, 2010	Spot 20-year U.S. Treasury yield	Spot	5.50	*ERP*
June 1, 2009 – November 30, 2009	Spot 20-year U.S. Treasury yield	Spot	6.00	R_f
December 31, 2008	Normalized 20-year U.S. Treasury yield	4.50	6.00	
November 1, 2008 – May 31, 2009	Normalized 20-year U.S. Treasury yield	4.50	6.00	R_f
October 27, 2008 – October 31, 2008	Spot 20-year U.S. Treasury yield	Spot	6.00	*ERP*
January 1, 2008 – October 26, 2008	Spot 20-year U.S. Treasury yield	Spot	5.00	*Initialized*

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

"Normalized" in this context means that in months where the risk-free rate is deemed to be abnormally low, a proxy for a longer-term sustainable risk-free rate is used.

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

This and other related resources can also be found in the online Cost of Capital Navigator platform. To learn more about the Cost of Capital Navigator and other Kroll valuation and industry data products, visit kroll.com/costofcapitalnavigator.

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

EXHIBIT JRW-7

Exhibit JRW-7
California Energy Cost of Capital Report
Cost of Capital Recommendations

Panel A
Pacific Gas & Electric Company

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	47.50%	5.05%	2.40%
Preferred Stock	0.50%	5.52%	0.03%
Common Equity	52.00%	11.30%	5.88%
Total	100.00%		8.30%

Panel B
San Diego Gas & Electric Company

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	46.00%	4.62%	2.13%
Preferred Stock	0.00%	6.22%	0.00%
Common Equity	54.00%	11.25%	6.08%
Total	100.00%		8.20%

Panel C
Southern California Edison

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	43.00%	4.75%	2.04%
Preferred Stock	5.00%	6.95%	0.35%
Common Equity	52.00%	11.75%	6.11%
Total	100.00%		8.50%

Panel D
Southern California Gas Company

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	45.60%	5.02%	2.29%
Preferred Stock	2.40%	6.00%	0.14%
Common Equity	52.00%	11.00%	5.72%
Total	100.00%		8.15%

ROE Results
Panel A
Bulkley - PG&E

	Minimum Growth Rate	Average Growth Rate	Maximum Growth Rate
Mean Results			
30-Day Average	9.32%	10.30%	11.11%
90-Day Average	9.32%	10.31%	11.12%
180-Day Average	9.44%	10.43%	11.24%
Average	9.36%	10.35%	11.16%
Median Results			
30-Day Average			
90-Day Average	9.47%	10.17%	10.76%
180-Day Average	9.61%	10.26%	10.79%
Average	9.77%	10.35%	10.95%
CAPM			

	Current 30-day Average Treasury Bond Yield	Near-Term Blue Chip Forecast Yield	Long-Term Blue Chip Forecast Yield
Value Line Beta	11.71%	11.71%	11.69%
Bloomberg Beta	10.57%	10.55%	10.48%
Long-term Avg. Beta	10.52%	10.50%	10.43%
ECAPM			
Value Line Beta	11.82%	11.82%	11.81%
Bloomberg Beta	10.97%	10.95%	10.90%
Long-term Avg. Beta	10.93%	10.92%	10.86%
BYRP			
Electric	10.74%	10.69%	10.49%
Natural Gas	10.58%	10.53%	10.34%

Panel B
Villadsen - SCE

	With PPA Imputed Debt	
	Low	High
CAPM	9.50%	11.75%
DCF	9.50%	12.50%
Risk Premium	10.50%	10.75%
Average	9.83%	11.67%
Range	9.75%	11.75%

ROE Results
Panel C
Novak- SDG&E

	Low Mean	Mean	High Mean
Primary Analyses			
DCF Result	10.26%	10.30%	10.35%
CAPM Result	11.44%	12.15%	12.84%
Risk Premium	10.35%	10.47%	10.55%
Average		**10.97%**	
Benchmark Analysis			
Expected Earnings		11.27%	

Panel D
Novak - SCG

	Low Mean	Mean	High Mean
Primary Analyses			
DCF Result	10.19%	10.24%	10.33%
CAPM Result	11.27%	12.13%	12.67%
Risk Premium	10.28%	10.39%	10.46%
Average		**10.88%**	
Benchmark Analysis			
Expected Earnings		9.79%	

EXHIBIT JRW-8

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%
Total	$50,224.01	10 Years	6.87%

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

EXHIBIT JRW-9

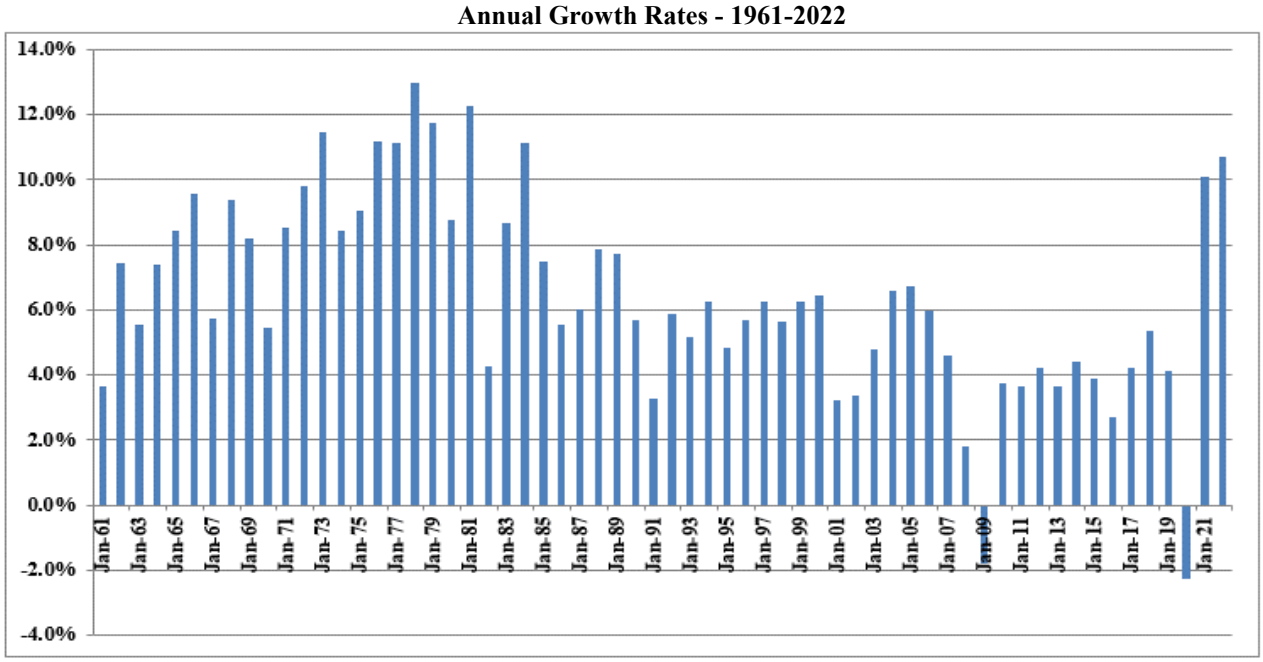
GDP and S&P 500 Growth Rates

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/

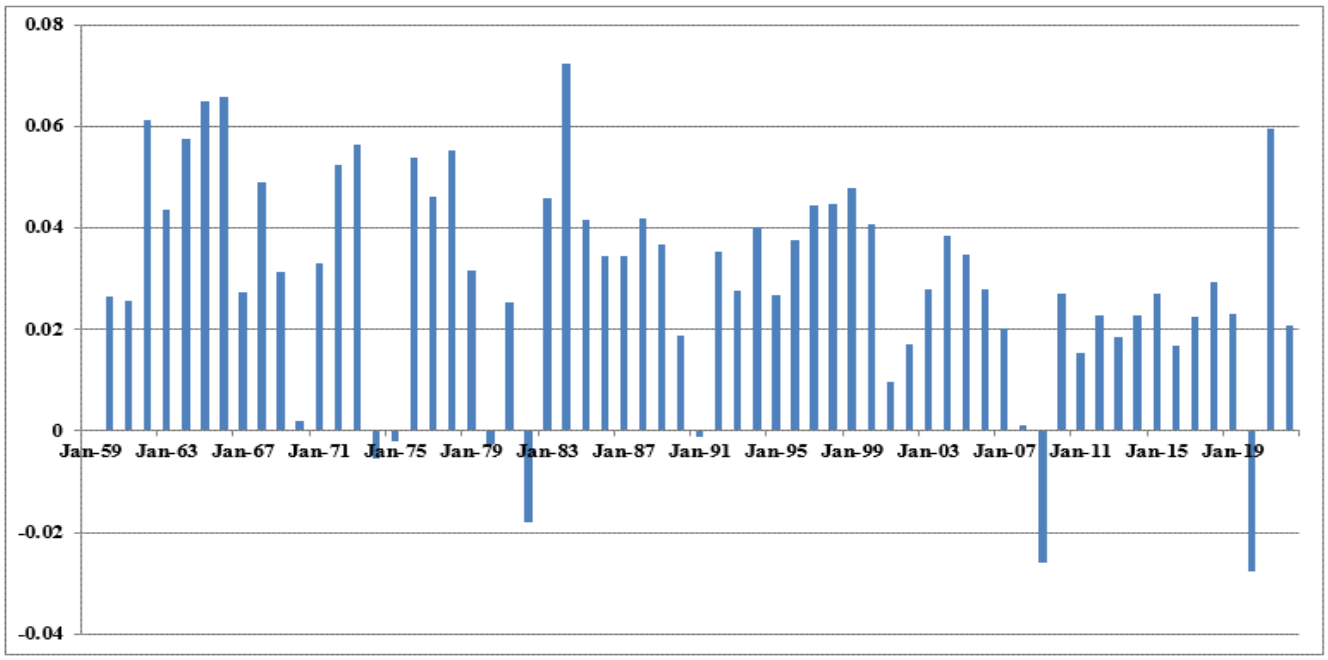
Annual Nominal GDP Growth Rates



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

Real GDP Growth Rates

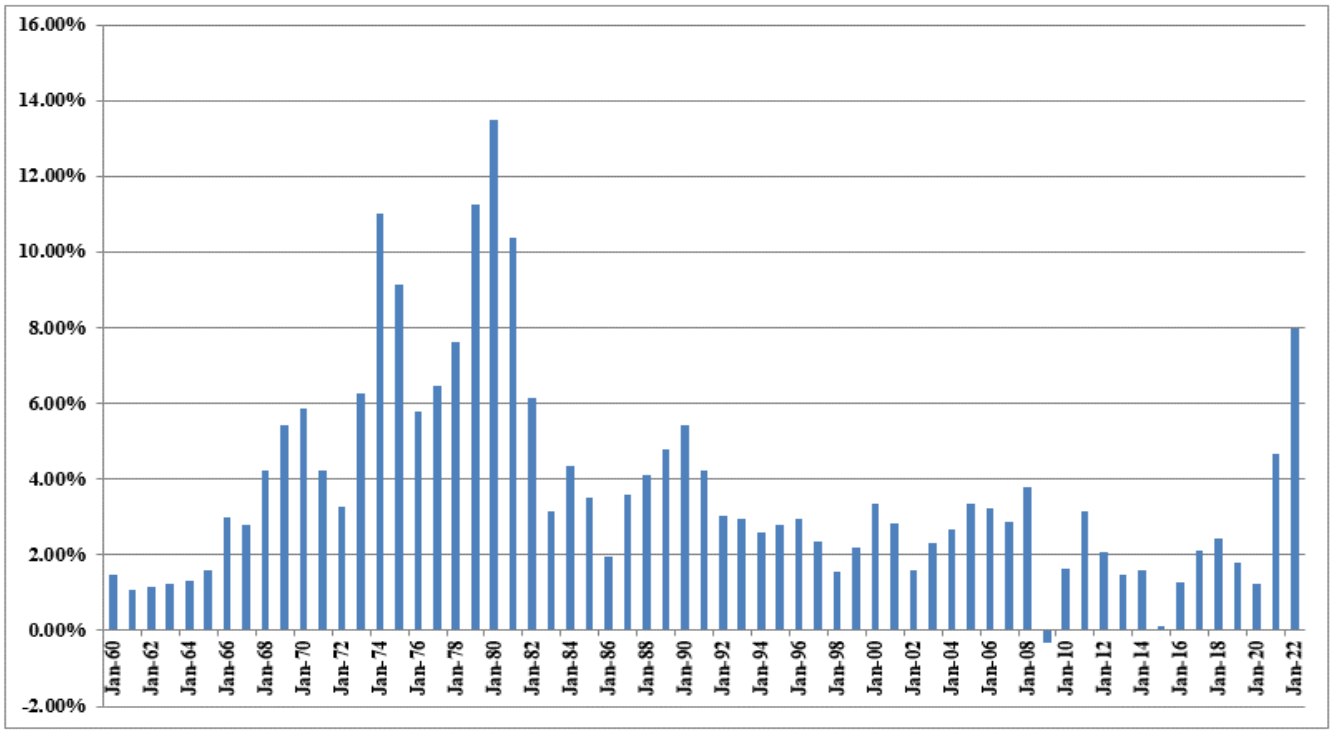
Annual Average Real GDP Growth Rates
1961-2022



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

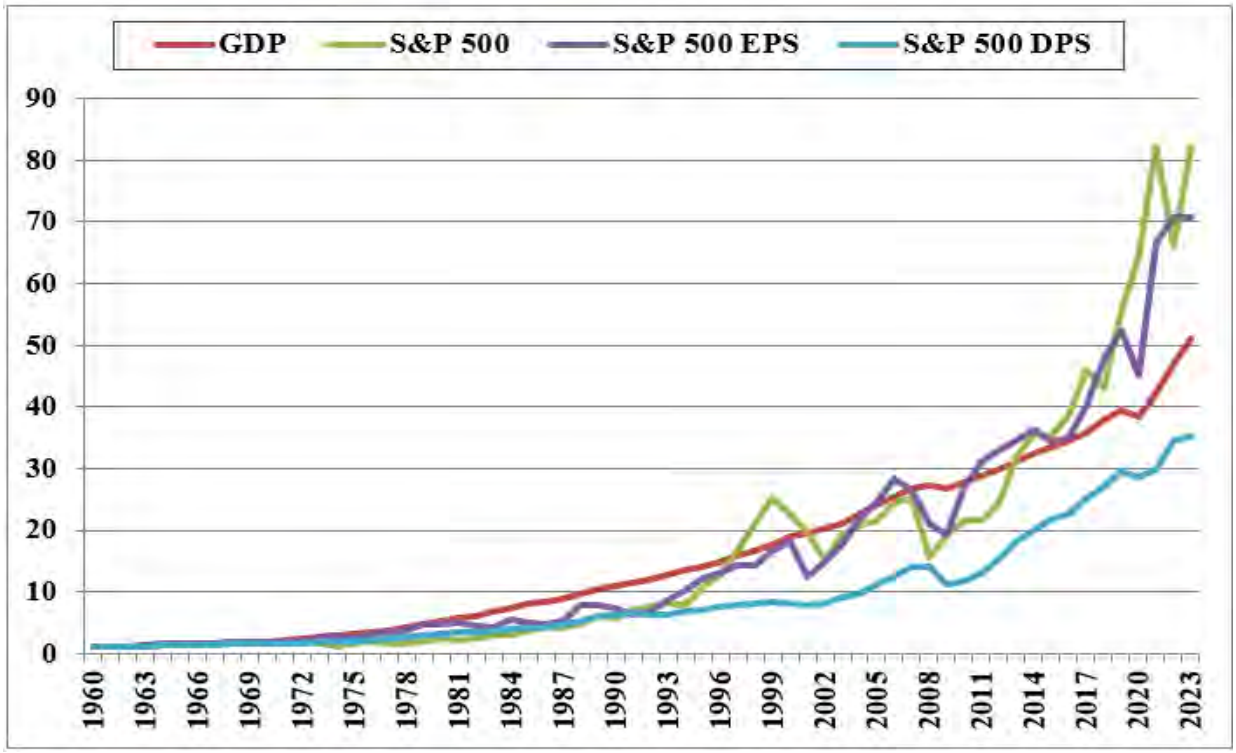
Panel B
Projected GDP Growth Rates

	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