BEFORE THE WASHINGTON

UTILITIES & TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

Complainant,

v.

PUGET SOUND ENERGY

Respondent.

Dockets UE-220066, UG-220067, and UG-210918 (*Consolidated*)

RESPONSE TESTIMONY OF J. RANDALL WOOLRIDGE ON BEHALF OF THE WASHINGTON STATE OFFICE OF ATTORNEY GENERAL PUBLIC COUNSEL

EXHIBIT JRW-1T

July 28, 2022

DOCKETS UE-220066, UG-220067, and UG-210918 (*Consolidated*)

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EXHIBITS LIST

I. INTRODUCTION

Q. Please state your full name, address, and occupation.

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

Q. On whose behalf are you testifying?

A. The Public Counsel Unit of the Washington State Attorney General's Office asked me to provide an opinion as to the overall fair rate of return or cost of capital for the regulated electric and gas utility service of Puget Sound Energy (PSE or the Company) and to evaluate PSE's rate of return testimony in this proceeding.[1]

Q. How is your testimony organized?

A. The following outlines my testimony:

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

[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.

- Fourth, I discuss the Company's recommended capital structure and debt cost rates.
- Fifth, I provide an overview of the concept of the cost of equity capital, and then estimate the equity cost rate for the Company.
- Finally, I critique PSE's rate of return analysis and testimony.

II. Summary of Recommendations

A. Overview

Q. What comprises a utility's "rate of return"?

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

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

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

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

Q. What is a utility's ROE intended to reflect?

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

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

(1) comparable to returns investors expect to earn on other investments of similar risk;

(2) sufficient to assure confidence in the company's financial integrity; and

(3) adequate to maintain and support the company's credit and to attract capital.

Accordingly, finding the appropriate ROE for a regulated utility requires determining the market-based cost of capital. The market-based cost of capital for a regulated firm represents the return investors could expect from other investments, while assuming no more and no less risk. The purpose of the economic models and formulas in cost of capital testimony, such as my testimony's Discounted Cash Flow (DCF) Model and the Capital Asset Pricing Model (CAPM), is to use market data of firms with similar risk to estimate the rate of return on equity investors require for this specific risk-class of firms, in order to set an appropriate ROE for a regulated firm.

B. Summary of Positions

Q. Please review your proposed recommendations regarding the appropriate rate of return for the company.

A. I provide PSE's proposed capital structure and debt and equity cost rates in Table 1. The Company has proposed a capital structure and cost of capital that adjusts over the three years (2023–2025) of the proposed Multi-Year Rate Plan (MYRP). The short-term and long-term capitalization ratios range from 1.90 percent to 2.40 percent and 48.10 percent

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

to 50.1 percent, and the short-term and long-term debt cost rates 1.43 percent to 3.14 percent and 5.07 percent to 5.08 percent respectively. The short-term and long-term debt cost rates include 0.02 percent for commitment, amortization, and debt reacquisition fees. The Company proposes increasing its common equity ratio from its current approved level, 48.50 percent, to 50.0 percent in 2025. The Company also proposes increasing its common equity cost rate from its current approved ROE of 9.40 percent to 9.90 percent in the years 2023 and beyond. PSE witness Ann Bulkley proposes a ROE in the range of 9.75 percent to 10.50 percent for PSE. Within this range, PSE has employed a ROE of 9.90 percent.

Table 1
Puget Sound Energy Rate of Return Recommendation

Panel A
Calendar Year 2022

Capital Source	Capitalization Ratios	Cost Rate	Weighted Cost Rate*
Short-Term Debt	1.40%	1.43%	0.04%
Long-Term Debt	50.10%	5.07%	2.56%
Common Equity	48.50%	9.40%	4.56%
Total Capital	100.00%		7.16%

Panel B
Calendar Year 2023

Capital Source	Capitalization Ratios	Cost Rate	Weighted Cost Rate*
Short-Term Debt	2.40%	1.43%	0.05%
Long-Term Debt	48.60%	5.07%	2.48%
Common Equity	49.00%	9.90%	4.85%
Total Capital	100.00%		7.39%

Panel C
Calendar Year 2024

Capital Source	Capitalization Ratios	Cost Rate	Weighted Cost Rate*
Short-Term Debt	2.40%	2.36%	0.08%
Long-Term Debt	48.10%	5.07%	2.46%
Common Equity	49.50%	9.90%	4.90%
Total Capital	100.00%		7.44%

Panel D
Calendar Year 2025

Capital Source	Capitalization Ratios	Cost Rate	Weighted Cost Rate*
Short-Term Debt	1.90%	3.14%	0.08%
Long-Term Debt	48.10%	5.08%	2.46%
Common Equity	50.00%	9.90%	4.95%
Total Capital	100.00%		7.49%

* Weighted short-term debt cost rate includes .02% of commitment and amortization fees
Weighted long-term debt cost rate includes .02% of amortization of reacquired debt.

I provide my proposed cost of capital for PSE in Table 2. I propose a capital structure for the three years of the MYRP with a common equity ratio of 48.50 percent. This common equity ratio is: (1) consistent with the Company's historic capitalization, which PSE has used to finance its operations and maintained its credit ratings; (2) consistent with the Commission's past policies on utility capitalizations; and (3) more reflective of the capital structures of proxy groups of electric, combination electric and gas, and gas distribution companies. I have maintained the short-term and long-term debt capitalization ratios consistent with the Company's proposal, but with a 48.50 percent common equity ratio. I have adopted PSE's proposed short-term and long-term debt cost rates, but have averaged the rates proposed over the three-year plan period. I have applied the DCF Model and the CAPM to a proxy group of publicly-held electric utility companies (Electric Proxy Group), the group developed by Bulkley (Bulkley Proxy Group), and a group of gas distribution companies (Gas Proxy Group). My analysis indicates a common equity cost rate in the range of 7.40 percent to 8.90 percent. Since I rely primarily on the DCF model, and given the 2022 increase in interest rates, I am employing an equity cost rate of 8.80 percent for the Company. Given my proposed capital structure and senior capital cost rates for PSE, I am recommending an overall fair rate of return or cost of capital for the Company of 6.83 percent. This is summarized in Table 2 and Exhibit JRW-3.

Q. How do your analyses and recommendations consider equity as that term is used in the multiyear rate plan statute in RCW 80.28.425(1)?

A. As discussed above, cost of capital in the regulated world is driven by the *Hope* and *Bluefield* decisions. The Court prescribed that the fair rate of return on equity should be

comparable to similar-risk returns, sufficient to assure financial integrity, adequate to maintain credit quality and to attract capital. As such, *Hope* and *Bluefield* provide guidelines as to equity for the utility and its investors. In my testimony, I provide an opinion as to the market-based cost of capital. The Company has also provided its opinion as to the market-based cost of capital, which is higher than mine and would require customers to pay higher rates. Nonetheless, I provide empirical evidence that my lower rate of return meets *Hope* and *Bluefield* standards and benefits customers with lower rates.

Table 2
Public Counsel's Rate of Return Recommendation

Capital Source	Capitalization Ratios**	Cost Rate	Weighted Cost Rate*
Short-Term Debt	1.66%	2.09%	0.03%
Long-Term Debt	49.84%	5.07%	2.53%
Common Equity	48.50%	8.80%	4.27%
Total Capitalization	100.00%		6.83%

* Weighted short-term debt cost rate includes .02% of commttment and amortization fees
Weighted long-term debt cost rate includes .02% of amortization of reacquired debt.

C. Primary Rate of Return Issues in this Case

Q. Please describe the primary rate of return issues in this case.

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

1. **PSE's Assessment of Capital Market Conditions**: Bulkley's analyses, ROE results, and recommendations are based on assumptions of higher interest rates and capital costs. However, despite the 2022 increase in yields, interest rates and capital costs remain at historically low levels.

2. **PSE Proposal for Capital Structure**: The Company proposes a capital structure

with a common equity ratio that increases to 50.0 percent over the MYRP. I propose a capital structure for the three years of the MYRP with a common equity ratio of 48.50 percent. This common equity ratio is: (1) consistent with the Company's historic capitalization, which PSE has used to finance its operations and maintained its credit ratings; (2) consistent with the Commission past policies on utility capitalizations; and (3) more reflective of the capital structures of proxy groups of electric, combination electric and gas, and gas distribution companies.

3. **PSE's Investment Risk is Similar to Other Electric Utility Companies**: PSE's Standard & Poor (S&P) and Moody's issuer credit ratings of BBB and Baa1 are similar to the averages of the proxy groups, which indicates that its investment risk is similar to other electric and gas utilities.

4. **Overstated Results in PSE's DCF Equity Cost Rate**: Bulkley and I both employ the traditional constant-growth DCF model. However, Bulkley overstates reported DCF results in two ways: (1) by exclusively using the overly optimistic and upwardly biased earnings per share (EPS) growth rate forecasts of Wall Street analysts and *Value Line*; and (2) by claiming that the DCF results underestimate the market-determined cost of equity capital due to high utility stock valuations and low dividend yields. By contrast, to develop the DCF growth rate I use in my analysis I reviewed 13 growth rate measures, including historical and projected growth rate measures, and have evaluated growth in dividends, book value, and earnings per share.

5. **Inappropriate Adjustments and Assumptions in PSE's CAPM Approach**: The CAPM approach requires an estimate of the risk-free interest rate, the beta,

and the market or equity risk premium. Two problems arise from Bulkley's CAPM analysis: (1) employing the Empirical CAPM (ECAPM) version of the CAPM makes inappropriate adjustments to the risk-free rate and the market risk premium; and (2) more significantly, computing a market risk premium of 11.00 percent. This 11.00 percent market risk premium is much larger (1) than historic stock and bond return data indicate, and (2) than published studies and surveys of the market risk premium find. In addition, I demonstrate that Bulkley bases the 11.00 percent market risk premium on unrealistic assumptions of future economic and earnings growth and stock returns. To compute that market risk premium of 11.00 percent, Bulkley applies the DCF to the S&P 500 and to employed analysts' three-to-five-year EPS growth-rate projections as a growth rate to compute an expected market return and market risk premium. As I demonstrate later in my testimony, the EPS growth-rate projection (11.31 percent) used for the S&P 500 and the resulting expected market return (12.97 percent) and market risk premium (11.0 percent) both include unrealistic assumptions regarding future economic and earnings growth and stock returns.

As I highlight in my testimony, it is common to use three procedures in estimating a market risk premium – historic returns, surveys, and expected return models. I use a market risk premium of 5.50 percent, 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 5.50 percent figure reflects the market risk premiums: (1) that leading finance scholars determined in recent academic studies; (2) that

leading investment banks and management consulting firms employ; and (3) that surveys of companies, financial forecasters, financial analysts, and corporate CFOs contain.

6. **Inflated Results from PSE's Alternative Risk Premium Model**: Bulkley also estimates an equity cost rate using an alternative risk premium model, calling it the Bond Yield Risk Premium approach. Bulkley computes this risk premium using a regression of the historical relationship between the yields on long-term Treasury bonds and authorized ROEs for vertically-integrated electric utility companies. Bulkley computes the estimated ROE as the projected risk-free rate plus the risk premium. I discuss several issues with this approach in more depth later, but its two primary problems are that: (1) this particular risk premium approach is a gauge of *commission* behavior rather than *investor* behavior; and (2) this methodology produces an inflated measure of the risk premium because this approach uses historical authorized ROEs and Treasury yields, and the resulting risk premium is applied to projected Treasury yields. Finally, this risk premium is inflated as a measure of investors' required risk premium, since electric utility 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 investors require.

7. **Limitations in PSE's Expected Earnings Approach**: Bulkley also uses the Expected Earnings approach to estimate an equity cost rate for the Company, computing the expected ROE as forecasted by *Value Line* for the Company's proxy group of electric and gas utilities. As I discuss in my critique of the Bulkley

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 Bulkley's "Expected Earnings" approach in determining the appropriate ROE for PSE.

8. **Other Issues**: Bulkley also considers two other factors to arrive at an ROE recommendation: regulatory risk and PSE's capital expenditures. As I discuss in my testimony, credit rating agencies consider these factors when rating PSE's bonds, so these already are accounted for in assessing PSE's risk.

III. CAPITAL MARKET CONDITIONS AND AUTHORIZED ROE

A. Assessment of Market Conditions

Q. Please provide a summary of the utility capital market indicators in Exhibit JRW-4.

A. Page 1 of Exhibit JRW-4 shows the yields on A-rated public utility bonds. These yields have declined gradually in the past decade from 7.5 percent to the range of 3.0 percent. These yields bottomed out in the 3.0 percent range in 2020 and 2021. They increased with interest rates in general in 2022, and now are in the 4.75 percent range.

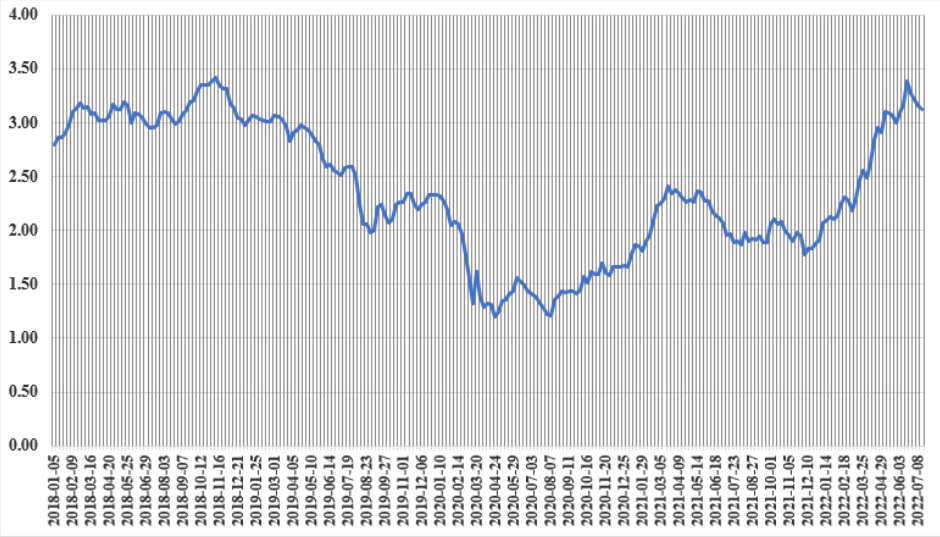
For publicly held gas utilities, Panel A of page 2 of Exhibit JRW-4 shows the average dividend yield. These yields declined over the past decade, bottoming out at 3.1 percent in 2019. They increased to 3.6 percent in 2020 but declined again to 3.40 percent in 2022. Panel B of page 2 of Exhibit JRW-4 shows the average dividend yield for gas companies. These yields declined over the last decade, bottoming out at 2.7 percent in 2017. They have increased since that time, and were in the 3.5 percent range as of 2021.

For publicly held electric utilities, Panel A of page 3 of Exhibit JRW-4 shows the average earned ROE and market-to-book ratio. The average earned ROE has been in the 9.0 percent to 10.0 percent range over the past five years. The average market-to-book ratio increased over the decade, peaking at 2.0X in 2019, and declined to 1.75X range in 2020 and 2021. Panel B of page 3 of Exhibit JRW-4 shows the average earned ROE and market-to-book ratio for gas distribution companies. The average ROE for gas companies has been in the range of 8.0 percent–9.0 percent in recent years, while the average market-to-book ratio reached 2.25X in 2019, but decreased to the 1.50X range as of the end of 2021.

Q. Please review interest rate movements in recent years.

A. Figure 1 shows 30-year Treasury yields over the past three years (2019 to 2022). These yields were in the 3.0 percent range at the end of 2018. These yields declined to the 2.25 percent range in 2019 due primarily to slow economic growth and low inflation. In 2020, with the COVID-19 pandemic, 30-year Treasury yields declined to record low levels in February, declining about 100 basis points to the 1.25 percent range. They began their recovery in the summer of 2020 and increased to about 2.50 percent in the first quarter of 2021. Yields then fell to below 2.0 percent in the fourth quarter of 2021, but have increased again to the 3.25 percent range in 2022 with the uptick in inflation. Despite this recovery, these rates remain at historically low levels.

Figure 1
30-Year Treasury Yields



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

Q. Have utilities taken advantage of the lower bond yields to raise capital?

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

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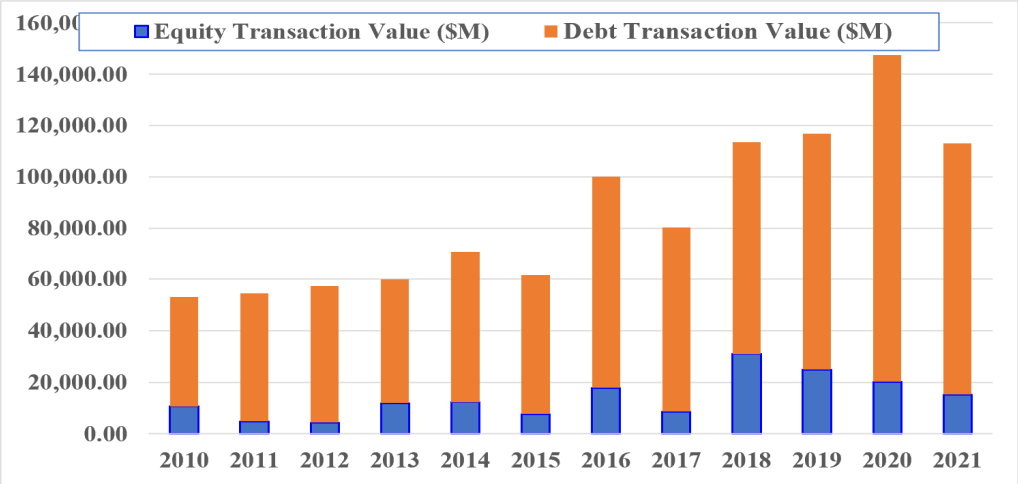
Figure 2
Debt and Equity Capital Raised by Public Utilities
2010–2021



Data source: S&P Global Market Intelligence, S&P Cap IQ, 2022.

Q. Please discuss the increase in interest rates in 2022.

A. Several factors have led to higher interest rates in 2022, including an improving economy and higher inflation. Real gross domestic product (GDP) growth increased 5.7 percent in 2021, compared to a decline of 3.4 percent in 2020. This recovery led to greater business activity, higher levels of business and consumer spending, and record increases in housing prices. Unemployment, which was 6.7 percent in 2020, has declined to 3.6 percent in 2022. The recovery in the economy puts upward pressure on interest rates by increasing the demand for capital. In addition, and as reported extensively in the financial press, inflation has picked up significantly over the past year, putting additional pressure on interest rates. The high inflation reported in the past year reflects three factors: (1) the recovering economy, as I discuss above; (2) production shutdowns during the pandemic leading to supply chain shortages as the global economy has recovered; and (3) the war in Ukraine leading to higher energy and gasoline prices worldwide.

In response to higher inflation, the Federal Reserve increased the discount rate by

25 basis points in March and 75 basis points in June, and many expect it to increase the discount rate several more times in 2022. However, the Federal Reserve's actions on the discount rate directly affect only short-term rates. Long-term rates remain more a function of expected economic growth and expected inflation.

One conundrum is that while the government is reporting annual year-over-year inflation rates as high as 8.5 percent, the 30-year Treasury yield is still only about 3.25 percent. One can see investors' inflation expectations by looking at the difference between yields on ordinary Treasuries and the yields on inflation-protected Treasuries, known as TIPS. Panel A of Figure 3 shows the expected inflation rate over the next five years. One can see the big increase over the past year, with an expected inflation rate of 2.54 percent over the next five years. Panels B and C of Figure 3 shows the inflation rate investors expect over the next 10 and 30 years, 2.33 percent and 2.54 percent respectively. When the expected inflation rate is higher over five years than over 10 and 30 years, as is now the case, it is known as a bond-market inversion and reflects that, despite a short-term expectation of higher inflation, the long-term inflation rate is still 2.50 percent.[3]

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[3] Paul J. Davies, *Rare Bond-Market Inversion Signals Short-Lived Boost to Inflation*, The Wall St. J., Feb. 25, 2021.

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

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

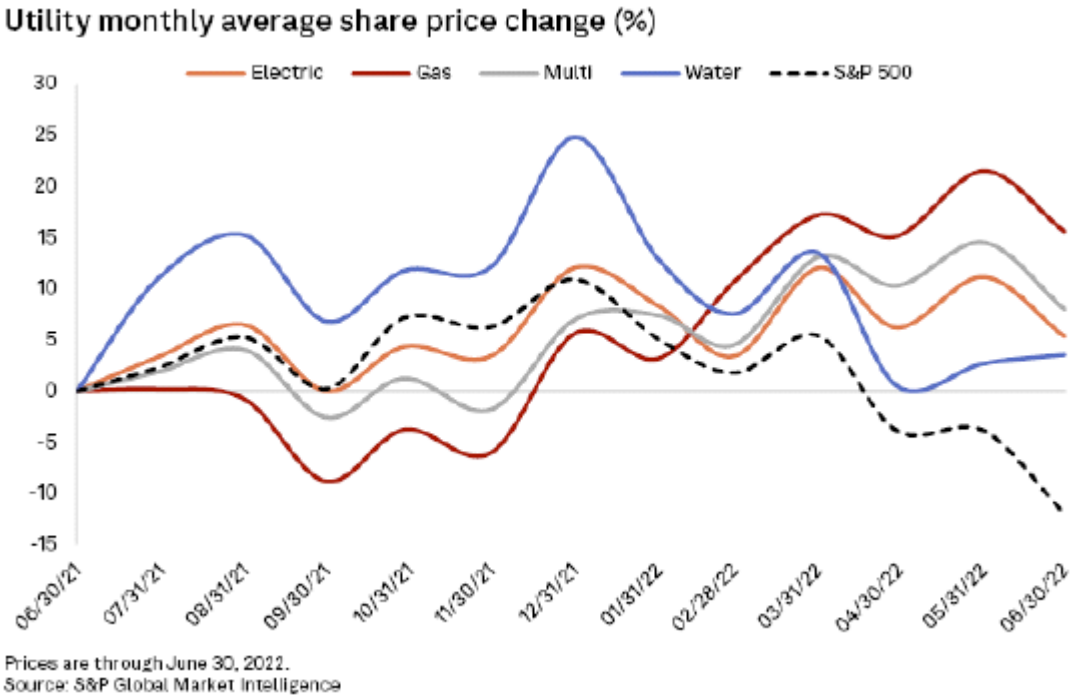
Panel C
30-Year Treasury Yields Minus 30-Year Treasury TIPS

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

Q. How have utility stocks performed in 2022?

A. The higher inflation and interest rates combined with the potential of an economic recession to hit the stock market negatively. The S&P 500 is down about 20 percent in 2022. However, utility stocks have held up very well. A recent S&P Capital IQ study highlighted the monthly average stock performance of electric, gas, multi-utility, and water utilities relative to the S&P 500 in 2022, as Figure 4 shows. While the S&P 500 was down nearly 20 percent in the first half of 2022, utility stocks were positive. Accordingly, utility stocks have performed quite well in this economic environment compared to the overall stock market.

Figure 4
The Dow Jones Utility Average vs. the S&P 500
2022



Source: Jason Lehman, "Amid historic broad-market sell-off in H1, utilities maintain premium valuation," S&P Capital IQ, July 7, 2022.

Q. Please summarize your assessment of the current capital market situation.

A. The U.S. economy declined nearly 20 percent in the first half of 2020, rebounded significantly in 2021, and has continued the rebound in 2022. This rebound has seen big increases in consumer and business spending, lower unemployment, and higher housing prices. The rebounding economy has put pressure on prices, further exacerbated by post-COVID supply chain issues and higher energy prices brought on by the Russia-Ukraine conflict. Nonetheless, interest rates and capital costs remain at historic low levels; utilities have taken advantage of the low yields to raise record amounts of capital; and utility stock prices held up quite well compared to the overall stock market, which is down about 20 percent. The big economic concern appears to be reported inflation. However, as I note above, the yields on TIPS suggest that, while investors expect short-term inflation to be about 3.0 percent, their longer-term inflation expectations are low, closer to 2.50 percent.

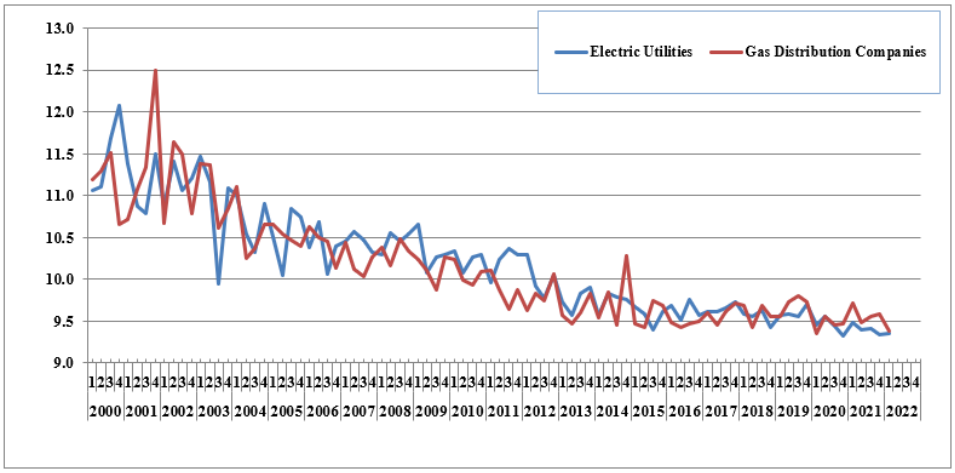
B. Authorized ROEs

Q. Please discuss the trend in authorized ROEs for electric and gas companies.

A. In Figure 5, I graph quarterly authorized ROEs for electric and gas companies from 2000 to 2021. Over the years, as interest rates have come down, authorized ROEs for electric utility and gas distribution companies have slowly declined to reflect a low-capital-cost environment. In 2020 and 2021, authorized ROEs for utilities hit an all-time low. On an annual basis, average ROEs authorized for electric utilities were an average of 10.01 percent in 2012, 9.8 percent in 2013, 9.76 percent in 2014, 9.58 percent in 2015, 9.60 percent in 2016, 9.68 percent in 2017, 9.56 percent in 2018, 9.65 percent in of 2019, 9.44 percent in 2020, 9.38 percent in 2021, and 9.35 percent in the first quarter of 2022,

according to Regulatory Research Associates.[4] On an annual basis, the ROEs authorized for gas distribution companies were 9.94 percent in 2012, 9.68 percent in 2013, 9.78 percent in 2014, 9.60 percent in 2015, 9.50 percent in 2016, 9.72 percent in 2017, 9.59 percent in 2018, 9.71 percent in 2019, 9.46 percent in 2020, 9.56 percent in 2021, and 9.38 percent in the first quarter of 2022, again per Regulatory Research Associates.

Figure 5
Authorized ROEs for Electric Utilities and Gas Distribution Companies
2000–2022



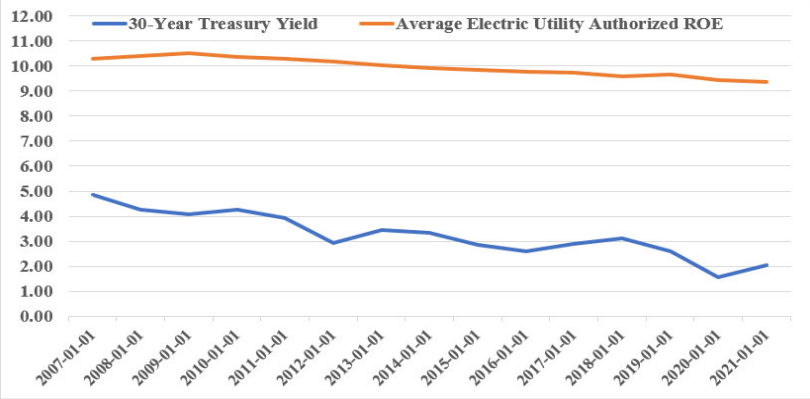
Q. Do the higher interest rates in 2022 mean authorized ROEs have increased significantly?

A. No, not necessarily. As I note above, authorized ROEs for utilities reached record low levels in 2020 and 2021 due to record low interest rates and capital costs. However, utility ROEs did not decline to the extent interest rates did over these two years. Figure 6 and Table 3 show the average annual 30-year Treasury yields and authorized ROEs for electric utilities and gas distribution companies. A key observation from Figure 6 and Table 3 is that authorized ROEs for electric utilities and gas distribution companies,

[4] Lisa Fontanella et al., *RRA Regulatory Focus: Major Energy Rate Case Decision in the US January-March 2022, Quarterly Update on Decide Rate Cases,* at 4 (S&P Glob. Mrkt. Intel., May 5,2022).

despite hitting record lows in 2020–21, did not decline nearly as much as interest rates. The average daily 30-year Treasury yield declined from 3.11 percent in 2018 to 1.56 percent in 2020, a decrease of 155 basis points. However, the average authorized ROE for electric utilities declined only from 9.60 percent in 2018 and 9.66 percent in 2019, to 9.44 percent in 2020 and 9.38 percent in 2021. This means authorized electric ROEs declined by about 20 basis points, but the 30-year Treasury yield decreased by over 150 basis points. Likewise, the average authorized ROE for gas distribution companies declined from 9.60 percent in 2018 and 9.71 percent in 2019, to 9.46 percent in 2020 and 9.56 percent in 2021. This means utility authorized gas ROEs declined by 10–15 basis points, but the 30-year Treasury yield decreased by over 150 basis points.

Figure 6
Authorized ROEs for Electric Utilities and 30-Year Treasury Yields
2007–2021



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Authorized ROEs for Gas Distribution Companies and 30-Year Treasury Yield
2007–2021

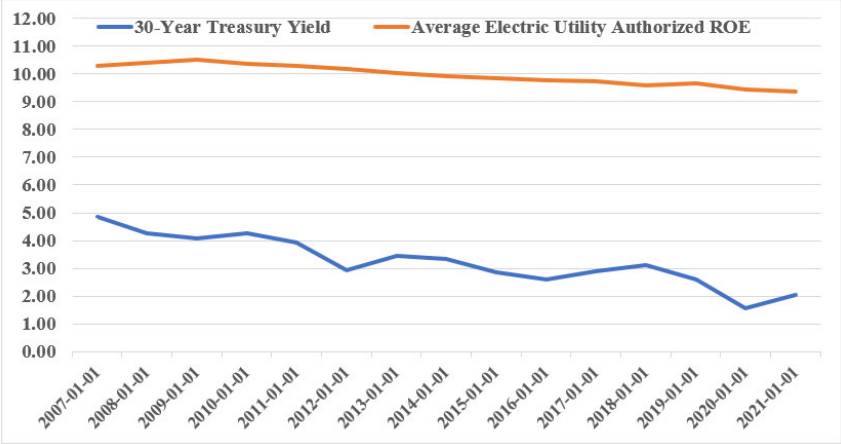


Table 3
Average Annual 30-Year Treasury Yields and Authorized ROEs
for Electric Utility and Gas Distribution Companies
2018–2021

	2018	2019	2020	2021
30-Year Treasury Yield	3.11%	2.58%	1.56%	2.06%
Average Electric ROE	9.60%	9.66%	9.44%	9.38%
Average Gas ROE	9.59%	9.71%	9.46%	9.56%

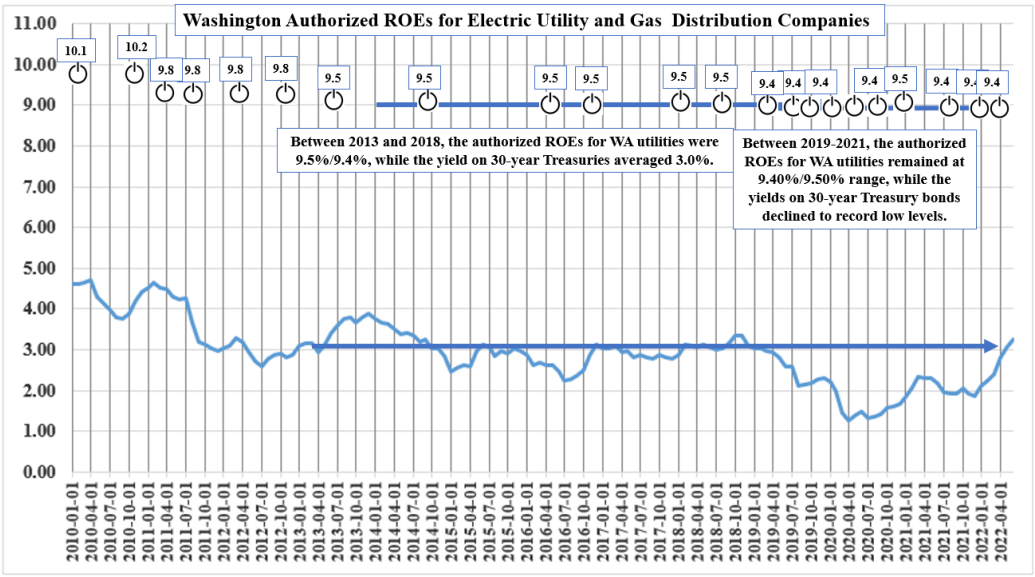
Q. Please discuss the authorized ROEs for electric utility and gas distribution companies in Washington.

A. Figure 7 shows the authorized ROEs in Washington for electric utility and gas distribution companies and 30-year Treasury yields since 2010. Between 2013 and 2018, authorized ROEs in Washington were in the 9.4 percent to 9.5 percent range, while the 30-year Treasury yield averaged 3.0 percent. Table 4 shows Washington ROEs.

In 2019, the yield on 30-year Treasury bonds declined about 100 basis points to 2.25 percent, then declined another 100 basis points in 2020 due to COVID-19 to 1.25 percent, its record low. As I discuss above, these yields have increased about 150 basis points in 2022 and now are back in the 3.25 percent range.

Meanwhile, despite the low interest rates in 2020 and 2021, the authorized ROEs in Washington remained in that 9.4 percent to 9.5 percent range. The bottom line is that Washington authorized ROEs did not decline in 2020 and 2021 to reflect the record low interest rates.

Figure 7
Washington Authorized ROEs and 30-Year Treasury Yields
2010–2022



Data Sources: Washington ROEs - S&P Global Market Intelligence, RRA *Regulatory Focus*, 2022.
Thirty-Year Treasury Yields - https://fred.stlouisfed.org/series/DGS30.

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Table 4
Washington Authorized ROEs and Common Equity Ratios
2010–2022

Company	Docket No.	Service	Order Date	Decision Type	ROE	CE Ratio
Puget Sound Energy Inc.	D-UE-090704	Electric	4/2/2010	Fully Litigated	10.10	46.00
Puget Sound Energy Inc.	D-UG-090705	Natural Gas	4/2/2010	Fully Litigated	10.10	46.00
Avista Corp.	D-UE-100467	Electric	11/19/2010	Settled	10.20	46.50
Avista Corp.	D-UG-100468	Natural Gas	11/19/2010	Settled	10.20	46.50
Puget Sound Energy Inc.	D-UG 101644	Natural Gas	3/15/2011	Settled	NA	NA
PacifiCorp	D-UE-100749	Electric	3/25/2011	Fully Litigated	9.80	49.10
Avista Corp.	D-UE-110876	Electric	12/16/2011	Settled	NA	NA
Avista Corp.	D-UG-110877	Natural Gas	12/16/2011	Settled	NA	NA
PacifiCorp	D-UE-111190	Electric	3/30/2012	Settled	NA	NA
Puget Sound Energy Inc.	D-UE-111048	Electric	5/7/2012	Fully Litigated	9.80	48.00
Puget Sound Energy Inc.	D-UG-111049	Natural Gas	5/7/2012	Fully Litigated	9.80	48.00
Avista Corp.	D-UE-120436	Electric	12/26/2012	Settled	9.80	47.00
Avista Corp.	D-UG-120437	Natural Gas	12/26/2012	Settled	9.80	47.00
Puget Sound Energy Inc.	D-UE-130137	Electric	6/25/2013	Settled	9.80	48.00
Puget Sound Energy Inc.	D-UG-130138	Natural Gas	6/25/2013	Settled	9.80	48.00
PacifiCorp	D-UE-130043	Electric	12/4/2013	Fully Litigated	9.50	49.10
Avista Corp.	D-UE-140188	Electric	11/25/2014	Settled	NA	NA
Avista Corp.	D-UG-140189	Natural Gas	11/25/2014	Settled	NA	NA
Avista Corp.	D-UE-150204	Electric	1/6/2016	Settled	9.50	48.50
Avista Corp.	D-UG-150205	Natural Gas	1/6/2016	Settled	9.50	48.50
Cascade Natural Gas Corp.	D-UG-152286	Natural Gas	7/7/2016	Settled	NA	NA
PacifiCorp	D-UE-152253	Electric	9/1/2016	Fully Litigated	9.50	49.10
Avista Corp.	D-UE-160228	Electric	12/15/2016	Fully Litigated	NA	NA
Avista Corp.	D-UG-160229	Natural Gas	12/15/2016	Fully Litigated	NA	NA
Puget Sound Energy Inc.	D-UE-170033	Electric	12/5/2017	Settled	9.50	48.50
Puget Sound Energy Inc.	D-UG-170034	Natural Gas	12/5/2017	Settled	9.50	48.50
Avista Corp.	D-UE-170485	Electric	4/26/2018	Fully Litigated	9.50	48.50
Avista Corp.	D-UG-170486	Natural Gas	4/26/2018	Fully Litigated	9.50	48.50
Cascade Natural Gas Corp.	D-UG-170929	Natural Gas	7/20/2018	Settled	9.40	49.00
Puget Sound Energy Inc.	D-UE-180899	Electric	2/21/2019	Settled	NA	NA
Puget Sound Energy Inc.	D-UG-180900	Natural Gas	2/21/2019	Settled	NA	NA
Northwest Natural Gas Co.	D-UG-181053	Natural Gas	10/21/2019	Settled	9.40	49.00
Cascade Natural Gas Corp.	D-UG-190210	Natural Gas	2/3/2020	Settled	9.40	49.10
Avista Corp.	D-UE-190334	Electric	3/25/2020	Settled	9.40	48.50
Avista Corp.	D-UG-190335	Natural Gas	3/25/2020	Settled	9.40	48.50
Puget Sound Energy Inc.	D-UE-190529	Electric	7/8/2020	Fully Litigated	9.40	48.50
Puget Sound Energy Inc.	D-UG-190530	Natural Gas	7/8/2020	Fully Litigated	9.40	48.50
PacifiCorp	D-UE-191024	Electric	12/14/2020	Settled	9.50	49.10
Cascade Natural Gas Corp.	D-UG-200568	Natural Gas	5/18/2021	Fully Litigated	9.40	49.10
Avista Corp.	D-UE-200900	Electric	9/27/2021	Settled	9.40	48.50
Avista Corp.	D-UG-200901	Natural Gas	9/27/2021	Settled	9.40	48.50
Northwest Natural Gas Co.	D-UG-200994	Natural Gas	10/21/2021	Settled	NA	NA

Q. Do you believe that your ROE recommendation meets *Hope* and *Bluefield* standards?

A. Yes, I do. As I note previously, according to the *Hope* and *Bluefield* decisions, returns on capital should be: (1) comparable to returns investors expect to earn on other investments of similar risk; (2) sufficient to assure confidence in the company's financial integrity; and (3) adequate to maintain and support the company's credit and to attract capital.[5] As page 3 of Exhibit JRW-4 shows, in recent years electric utilities and gas distribution

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

companies have been earning ROEs in the range of 8.0 percent to 10.0 percent. With such an ROE, electric utilities such as those in the proxy group have strong investment grade credit ratings, their stocks sell well over book value, and they raise abundant amounts of capital. While my recommendation is a little below the average authorized ROE for electric utility and gas distribution companies, it reflects the actual low levels of interest rates and capital costs in the current market. Therefore, I believe that my ROE recommendation meets the criteria *Hope* and *Bluefield* established.

IV. PROXY GROUP SELECTION

Q. Please describe your approach to developing a fair rate of return recommendation for the Company.

A. To develop a fair rate of return recommendation for the Company, I evaluated the return requirements of investors on the common stock of a proxy group of publicly-held electric utility companies (Electric Proxy Group). I also employed the group developed by Bulkley (Bulkley Proxy Group), as well as a group of gas distribution companies (Gas Proxy Group).

Q. Please describe your proxy group of electric companies.

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

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

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

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

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

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

acquisition; and

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

The Electric Proxy Group includes 24 companies. Exhibit JRW-5 lists summary financial statistics for the proxy group, showing median operating revenues and net plant among members of the Electric Proxy Group of $5.99 billion and $21.63 billion respectively. The group on average receives 83 percent of its revenues from regulated electric operations, has a BBB+ bond rating from S&P's and a Baa1 rating from Moody's, has a current average common equity ratio of 41.70 percent, and has an earned return on common equity of 9.68 percent.

Q. Please describe the Bulkley proxy group.

A. Bulkley's group is smaller (13 utilities) and includes combination electric and gas utility companies. Panel B of page one of Exhibit JRW-5 provides summary financial statistics for the Bulkley proxy group, showing median operating revenues and net plant of $4.90 billion and $17.92 billion respectively. The group on average receives 70 percent of its revenues from regulated electric operations and 22 percent from regulated gas operations, has a BBB+ bond rating from S&P's and a Baa1/Baa2 rating from Moody's, has an average common equity ratio of 39.4 percent, and has an earned return on common equity of 9.68 percent.

Q. Please describe your proxy group of gas distribution companies.

A. My Gas Proxy Group consists of nine natural gas distribution companies: Atmos Energy, Chesapeake Utilities, New Jersey Resources, NiSource, Northwest Natural Gas Company, ONE Gas, South Jersey Industries, Southwest Gas, and Spire.

Panel C of page one of Exhibit JRW-5 lists summary financial statistics for the Gas Proxy Group, showing median operating revenues and net plant of $2.16 billion and $5.22 billion respectively. The group on average receives 69 percent of revenues from regulated gas operations, has a BBB+ average issuer credit rating from S&P, has an average common equity ratio of 38.6 percent, and has a median earned return on common equity of 8.45 percent.

Q. How does the investment risk of the Company compare to that of your proxy groups?

A. I believe bond ratings provide a good assessment of a company's investment risk. PSE's issuer credit rating is BBB according to S&P and Baa1 according to Moody's. As I show in Table 5, PSE's Moody's credit rating is as good as or better than the Electric (Baa1), Bulkley (Baa1/Baa2), and Gas Proxy Groups (Baa2). PSE's S&P issuer credit rating is one notch below that of the Electric, Bulkley, and Gas Proxy Groups (BBB vs. BBB+). However, S&P and Moody's highlight how the debt of PSE's parent company Puget Energy constrains its credit ratings: Puget Energy's S&P and Moody's credit ratings are BBB- and Baa3.

Table 5
S&P and Moody's Credit Ratings

	S&P Issuer Credit	Moody's Long-Term Credit Rating
PSE	**BBB**	**Baa1**
Puget Energy	**BBB-**	**Baa3**
Electric Proxy Group	**BBB+**	**Baa1**
Bulkley Proxy Group	**BBB+**	**Baa1/Baa2**
Gas Proxy Group	**BBB+**	**Baa1**

Q. Please provide additional insights into how credit rating agencies view PSE.

A. Moody's noted that PSE maintains a credit supportive relationship with the WUTC, which helps provide it a stable and predictable cash flow. The Moody's report also addressed the passage of the Clean Energy Transformation Act in 2019.[6] Specifically, Moody's made note of the following:[7]

> **Credit positive regulatory mechanisms provide good cost recovery and financial support**
> PSE has historically maintained a credit supportive relationship with the WUTC. Following the expiration of the utility's four-year rate plan in 2017, its regulatory process was characterized by some contention. However, we believe Washington's recently passed clean energy bill will provide more regulatory clarity and result in credit positive outcomes for the utility going forward.
>
> In May 2019, Washington passed a new clean energy bill, targeting 100% carbon-free electricity supply by 2045. The bill provides regulatory tools for utilities to recover carbon transition costs and clarifies the WUTC's authority to consider and implement performance and incentive-based regulation, multi-year rate plans, and other flexible regulatory mechanisms. It also allows for accelerated depreciation of coal plants and the ability to earn a return on certain PPAs.
>
> These credit positive attributes of the clean energy bill enhance existing credit supportive cost recovery mechanisms which include decoupling, expedited rate filings (ERF), an electric conservation rider, electric property tax tracker and purchased gas adjustment, among others. The decoupling mechanism in particular is credit supportive since it helps PSE to have greater fixed cost recovery in both its electric and gas segments, even in a declining sales volume environment, and includes electric fixed production energy costs.

In its credit analysis update, Moody's also provides its current and 12- to 18-month forward view of PSE's regulatory environment, ability to recover costs and earn returns, diversification, and financial strength. As Table 6 shows, this analysis grades PSE primarily as an A rated utility.

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6 RCW 19.405.
7 Moody's Investor Serv., *Puget Sound Energy: Update to Credit Analysis* (Aug. 29, 2019).

Table 6
Moody's Rating Methodology and Scorecard for PSE

Rating Factors
Puget Sound Energy, Inc.

Regulated Electric and Gas Utilities Industry Scorecard [1][2]	Current LTM 6/30/2019		Moody's 12-18 Month Forward View As of Date Published [3]	
Factor 1 : Regulatory Framework (25%)	**Measure**	**Score**	**Measure**	**Score**
a) Legislative and Judicial Underpinnings of the Regulatory Framework	A	A	A	A
b) Consistency and Predictability of Regulation	A	A	A	A
Factor 2 : Ability to Recover Costs and Earn Returns (25%)				
a) Timeliness of Recovery of Operating and Capital Costs	A	A	A	A
b) Sufficiency of Rates and Returns	Baa	Baa	Baa	Baa
Factor 3 : Diversification (10%)				
a) Market Position	Baa	Baa	Baa	Baa
b) Generation and Fuel Diversity	A	A	A	A
Factor 4 : Financial Strength (40%)				
a) CFO pre-WC + Interest / Interest (3 Year Avg)	5.0x	A	5.1x - 5.5x	A
b) CFO pre-WC / Debt (3 Year Avg)	22.4%	A	20% - 24%	A
c) CFO pre-WC – Dividends / Debt (3 Year Avg)	17.6%	A	15% - 19%	A
d) Debt / Capitalization (3 Year Avg)	46.6%	Baa	42% - 46%	A
Rating:				
Scorecard-Indicated Outcome Before Notching Adjustment		A3		A3
HoldCo Structural Subordination Notching				
a) Scorecard-Indicated Outcome		A3		A3
b) Actual Rating Assigned		Baa1		Baa1

[1] All ratios are based on 'Adjusted' financial data and incorporate Moody's Global Standard Adjustments for Non-Financial Corporations
[2] As of 6/30/2019(L)
[3] This represents Moody's forward view; not the view of the issuer; and unless noted in the text, does not incorporate significant acquisitions and divestitures
Source: Moody's Financial Metrics

Moody's Investor Service, *Puget Sound Energy: Update to Credit Analysis*, (Aug. 29, 2019). Provided in Exh. JRW-6 (Puget Sound Energy's response to WUTC Staff Data Request No. 13, Attach. D at 7).

Q. What do you conclude about the riskiness of PSE relative to the proxy groups?

A. I believe the investment risk of PSE is in line with the proxy groups.

Q. Please discuss the risk analysis you performed on page two of Exhibit JRW-5.

A. On page two of Exhibit JRW-5, I use five different risk measures to assess the riskiness of the three proxy groups: Beta, Financial Strength, Safety, Earnings Predictability, and Stock Price Stability. These risk measures indicate the two proxy groups are similar in risk. The comparisons of the risk measures include Beta (0.85 vs. 0.85 vs. 0.85), Financial Strength (A vs. A vs. A) Safety (1.7 vs. 1.6 vs. 2.0), Earnings Predictability (84 vs. 85 vs. 68), and Stock Price Stability (90 vs. 92 vs. 86). Overall, these measures suggest that the investment risk of the three groups (1) is very low and (2) is similar to each other.

V. CAPITAL STRUCTURE RATIOS AND DEBT COST RATES

Q. What are PSE's recommended capital structure and senior capital cost rates for ratemaking purposes?

A. Table 1 and page 2 of Exhibit JRW-3 provide PSE's proposed capital structure and debt cost rates. The Company proposes a capital structure and cost of capital that would adjust over the three years (2023–2025) of the MYRP. The short-term and long-term capitalization ratios range from 1.90 percent to 2.40 percent and 48.10 percent to 50.1 percent, and the short-term and long-term debt cost rates from 1.43 percent to 3.14 percent and 5.07 percent to 5.08 percent, respectively. The short- and long-term debt cost rates include 0.02 percent for commitment, amortization, and debt reacquisition fees. The Company proposes increasing its common equity ratio from its current approved level, 48.50 percent to 50.0 percent in 2025. The Company also proposes increasing its common equity cost rate from its current approved ROE, 9.40 percent to 9.90 percent in the years 2023 and beyond. Bulkley proposes an ROE in the range of 9.75 percent to 10.50 percent for PSE. Within this range, PSE employs a ROE of 9.90 percent. Panels A–F of page 2 of Exhibit JRW-3 summarize this.

Q. Please discuss the capital structures of the companies in the proxy groups.

A. Page 1 of Exhibit JRW-5 provides the average common equity ratios for the companies in the three proxy groups. As of December 31, 2021, the average common equity ratios for the Electric, Bulkley, and Gas Proxy Groups were 41.7 percent, 39.4 percent, and 38.6 percent respectively. These ratios indicate that PSE's proposed capital structures, with common equity ratios of 48.50 percent to 50.0 percent, are well above the averages of the proxy groups. That means the proposed capital structure includes more common equity and less

financial risk, but higher cost, than do the proxy groups.

Q. Please discuss the capital structures of the companies in the proxy groups.

A. I propose my cost of capital for PSE in Panel F of page 2 of Exhibit JRW-3. I propose a capital structure for the three years of the MYRP with a common equity ratio of 48.50 percent. This common equity ratio is: (1) consistent with the Company's historic capitalization, which PSE has used to finance its operations and maintained its credit ratings; (2) consistent with the Commission past policies on utility capitalizations; and (3) more reflective of the capital structures of proxy groups of electric, combination electric and gas, and gas distribution companies. I maintain the short-term and long-term debt capitalization ratios consistent with the Company's proposal, but with a 48.50 percent common equity ratio. I adopt PSE's proposed short- and long-term debt cost rates, but I average the rates proposed over the three-year plan period.

VI. THE COST OF COMMON EQUITY CAPITAL

C. Overview

Q. Why must we establish an overall cost of capital or fair rate of return for a public utility?

A. In a competitive industry, the market for goods and services determines the return on a firm's common equity capital. Most public utilities are monopolies due to the capital requirements to construct utility infrastructure and provide utility services and the economic benefit to society from avoiding duplication of these services. Because monopoly utilities lack competition and offer essential services, it is not appropriate to permit them 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.

Economists develop normative economic models of a company or firm using very restrictive assumptions, and these models provide insight into the relationship between a firm's performance or profitability, capital costs, and value. Under the economist's ideal model of perfect competition, where entry and exit would be costless, products are undifferentiated, and with increasing marginal costs of production, firms produce up to the point where price equals marginal cost. Over time, a long-run equilibrium develops where price of the firm equals average cost, including the firm's capital costs. In equilibrium, total revenues equal total costs, and because capital costs represent investors' required return on the firm's capital, actual returns equal required returns, and the market value must equal the book value of the firm's securities.

In a competitive market, firms can gain advantage thanks 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, thereby earning accounting profits greater than those required to cover capital costs. When such profits are in excess of those required by investors, or when a firm earns a return on equity in excess of its cost of equity, investors respond by valuing the firm's equity in excess of its book value.

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

> 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. [8]

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

[8] James M. McTaggart, Commentary, *The Ultimate Poison Pill: Closing the Value Gap*, Spring 1986, at 3.

Q. Please provide additional insights into the relationship between ROE and market-to-book ratios.

A. A classic Harvard Business School case study titled "Note on Value Drivers" discusses this relationship. On page 2 of that case study, the author describes the relationship very succinctly: [9]

> 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.

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 using the Electric Proxy Group companies. I used *Value Line*'s projected estimated ROE and current market-to-book ratio data. I present the results on page 1 of Exhibit JRW-7. The average R-square is 0.58,[10] which demonstrates the strong positive relationship for public utilities between ROEs and market-to-book ratios. Given that the market-to-book ratios have been above 1.0 for a number of years, this also establishes that utilities have been earning ROEs above the cost of equity capital for many years.

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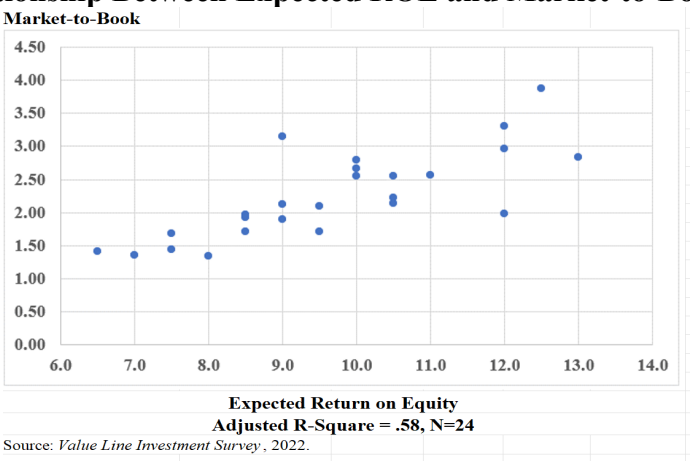
[9] Benjamin C. Esty, *Note on Value Drivers* (Harvard Bus. Sch. 1997) (Background Note 297-082).

[10] 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 8
The Relationship Between Expected ROE and Market-to-Book Ratios



Source: *Value Line Investment Survey*, 2022.

Q. What factors determine investors' expected or required rate of return on equity?

A. The expected or required rate of return on common stock is a function of both market-wide and company-specific factors. The most important market factor is the time value of money, which the level of interest rates in the economy indicates. Common-stock investor requirements generally increase and decrease with like changes in interest rates. The perceived risk of a firm is the predominant factor influencing investor return requirements on a company-specific basis. A firm's investment risk often separates 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 and their regulated status, public utilities face less business risk than other, non-regulated businesses. Their relatively low 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.

Exhibit JRW-7 provides an assessment of investment risk for 93 industries as measured by beta, which modern capital market theory holds is the only relevant measure of investment risk. These betas are from the *Value Line Investment Survey*. The study demonstrates the investment risk of utilities compared to other industries is low. The average betas for electric, gas, and water utility companies are 0.89, 0.89, and 0.79, respectively.[11] As such, the cost of equity for utilities is 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 normally flow from historical or book values, so it is possible to determine them with great accuracy. However, it is difficult to determine the cost of common-equity capital, so it is best to estimate those instead using market data and informed judgment. This return requirement of the stockholder should be commensurate with the return requirement on investments in other enterprises having comparable risks.

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

[11] The beta for the *Value Line* electric utilities is the simple average of *Value Line*'s Electric East (0.89), Central (0.89), and West (0.90) group betas.

Q. How can the expected or required rate of return on common equity capital be determined?

A. Economists developed models to ascertain the cost of common-equity capital for a firm. Because they have developed each using restrictive economic assumptions, it is important to use judgment in selecting appropriate financial valuation models to estimate a firm's cost of common-equity-capital, in determining the data inputs for these models, and in interpreting the models' results. All these decisions must take into consideration the firm involved as well as current economic and financial market conditions.

Q. How do you estimate the cost of equity capital for the Company?

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

Q. Please explain why you believe that the CAPM provides a less reliable indicator of equity cost rates.

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

B. Discounted Cash Flow 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, stockholder 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 the firm reinvests earnings not paid out in the form of dividends to provide for future growth in earnings and dividends. The rate at which investors discount future dividends, which reflects the timing and riskiness of their 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 is 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 the three-stage DCF or dividend discount model (DDM). I present the stages in a three-stage DCF model in Exhibit JRW-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.

1. **Growth stage**: This stage features rapidly expanding sales, high profit margins, and abnormally high growth in earnings per share. Because of highly profitable expected investment opportunities, the payout ratio is low. The unusually high earnings attract competitors, 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.

The three-stage model to estimate a firm's cost-of-equity capital projects dividends 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 holds 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 they 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 following presents a simplification of the DCF model:

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

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 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. These economics include the relative stability of the utility business, the maturity of the demand for public utility services, and the regulated status of public utilities (especially the fact that their returns on investment are effectively set through the ratemaking process). The DCF valuation procedure appropriate 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, applying the DCF model to estimate equity cost rates entails estimating investors' expected dividend growth rate, a task that requires subtlety.

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

Q. What dividend yields have you reviewed?

A. I calculated the dividend yields for the companies in the proxy group using the current annual dividend and the 30-day, 90-day, and 180-day average stock prices. I provide these dividend yields in Panel A of page two in Exhibit JRW-9. Due to the updated market conditions in 2022, I calculated the dividend yields using the 30-day and 90-day average stock prices.

For the Electric Proxy Group, the mean and median dividend yields using the 30-day and 90-day average stock prices are 3.20 percent. Given these results, I am using 3.20 percent as the dividend yield for the Electric Proxy Group. I show the dividend yields for the Bulkley Proxy Group in Panel B of page two of Exhibit JRW-9. The mean and median dividend yields range from 2.70 percent to 2.90 percent using the 30-day and 90-day average stock prices. Given these results, I use 2.80 percent as the dividend yield for the Bulkley Proxy Group. I show the dividend yields for the Gas Proxy Group in Panel C of page two of Exhibit JRW-9. The average of the mean and median dividend

yields is 2.9 percent using the 30-day and 90-day average stock prices.

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. Professor Myron Gordon, associated with the development of the DCF model for popular use, suggested obtaining this by: (1) multiplying the expected dividend over the coming quarter by four, 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.[12]

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 become complicated, because firms tend to announce changes in dividends at different times during the year. As such, the dividend yield computed based on presumed growth over the coming quarter as opposed to the coming year can differ widely. 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. This is the approach employed by the Federal Energy Regulatory Commission (FERC).[13] I compute the DCF equity cost rate (K) 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.

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[12] Direct Testimony of Myron J. Gordon and Lawrence I. Gould at 62, *Pet. for Modification of Prescribed Rate of Return*, Docket No. 79-05 (F.C.C. Apr. 1980).

[13] *Transcon. Gas Pipe Line Corp.*, 84 FERC ¶ 61,084 (F.E.R.C. 1998) (Opinion No. 414-A).

A. Debate exists as to the proper methodology to employ in estimating the DCF model's growth component, which represents investors' expectation of the long-term dividend growth rate. Presumably, to assess long-term potential investors use some combination of historical and/or projected growth rates for earnings and dividends per share and for internal or book-value growth.

Q. What growth data have you reviewed for the proxy groups?

A. I analyzed several measures of growth for companies in the proxy groups. I reviewed *Value Line's* historical and projected growth rate estimates for earnings per share (EPS), dividends per share (DPS), and book value per share (BVPS). In addition, I utilized the average EPS growth-rate forecasts of Wall Street analysts as provided by Yahoo, Zacks, and S&P Cap IQ. These services solicit five-year earnings growth-rate projections from securities analysts, and compile and publish the means and medians of these forecasts. Finally, I 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 presumably are an important ingredient in forming expectations concerning future growth. However, one must be cautious using historical growth numbers as measures of investors' expectations. In some cases, past growth may not reflect future growth potential. Also, employing a single growth rate number (for example, for five or 10 years) is unlikely to accurately measure investors' expectations, due to the sensitivity of a single growth rate figure to fluctuations in individual firm performance and overall

economic fluctuations (i.e., business cycles). However, one must appraise the context for employing the growth rate. 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 reach the best estimate of the cost of common equity capital using the conventional DCF model, one must look to long-term growth rate expectations.

Internally generated growth is a function of the percentage of earnings retained within the firm (the earnings retention rate) and the rate of return earned on those earnings (the return on equity). To compute the internal growth rate, one multiplies the retention rate times the return on equity. Internal growth is significant in determining long-run earnings, and therefore dividends. Investors recognize the importance of internally generated growth and pay premiums for stocks of companies that retain earnings and earn high returns on internal investments.

Q. Please discuss the services that provide analysts' EPS forecasts.

A. Several different investment information services collect and publish analysts' EPS forecasts for companies, including Institutional Brokers Estimate System (I/B/E/S), Bloomberg, FactSet, S&P Cap IQ, Zacks, First Call, and Reuters, among others. Thompson Reuters publishes analysts' EPS forecasts under different product names, including I/B/E/S, First Call, and Reuters. Bloomberg, FactSet, S&P Cap IQ, and Zacks each publish their own set of analysts' EPS forecasts for companies. These services do not reveal (1) the analysts whom they solicit for forecasts or (2) the identity of the analysts who actually provide the EPS forecasts in the compilations the services publish.

I/B/E/S, Bloomberg, FactSet, S&P Cap IQ, and First Call are fee-based services.

These usually provide detailed reports and other data in addition to analysts' EPS forecasts. In contrast, Thompson Reuters and Zacks provide limited EPS forecast data free on the Internet. Yahoo! Finance (http://finance.yahoo.com) lists Thompson Reuters as the source of its summary EPS forecasts. Zacks (www.zacks.com) publishes its summary forecasts on its website. Zacks estimates also are available on other websites, such as MSN.money (http://money.msn.com).

Q. Why do you not rely exclusively on the EPS forecasts of Wall Street analysts in arriving at a DCF growth rate for the proxy group?

A. Several issues arise when attempting to use the EPS growth rate forecasts of Wall Street analysts as DCF growth rates. First, the appropriate growth rate in the DCF model is the dividend growth rate, not the earnings growth rate. Nonetheless, over the very long term, dividend and earnings will have to grow at a similar growth rate. Therefore, it is important to consider other indicators of growth, including prospective dividend growth, internal growth, and 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 no more accurate at forecasting future earnings than naïve random walk forecasts of future earnings.[14] Employing data over a 20-year period, these authors demonstrate that using the most recent year's actual EPS figure to forecast EPS in the next three to five years proved to be just as accurate as using the EPS estimates from analysts' three- to five-year EPS growth-rate forecasts. In the authors' opinion, these results suggest using analysts' long-term earnings growth-rate forecasts

[14] 8 Michael Lacina, B. Brian Lee & Zhao Xu, *Advances in Business and Management Forecasting,* at 77–101 (Kenneth D. Lawrence, Ronald K. Klimberg eds., Emerald Grp. Publ'g Ltd., 2011).

only with caution as inputs for valuation and cost-of-capital purposes.

Finally, and most significantly, Wall Street securities analysts are well-known for creating long-term EPS growth-rate forecasts that are overly optimistic and upwardly biased. A number of academic studies demonstrated this.[15] Accordingly, using these growth rates as a DCF growth rate would 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 of almost 3.0 percentage points in estimates of the cost of equity capital.[16]

Q. Are analysts' projected EPS growth rates for utilities likewise overly optimistic and upwardly biased?

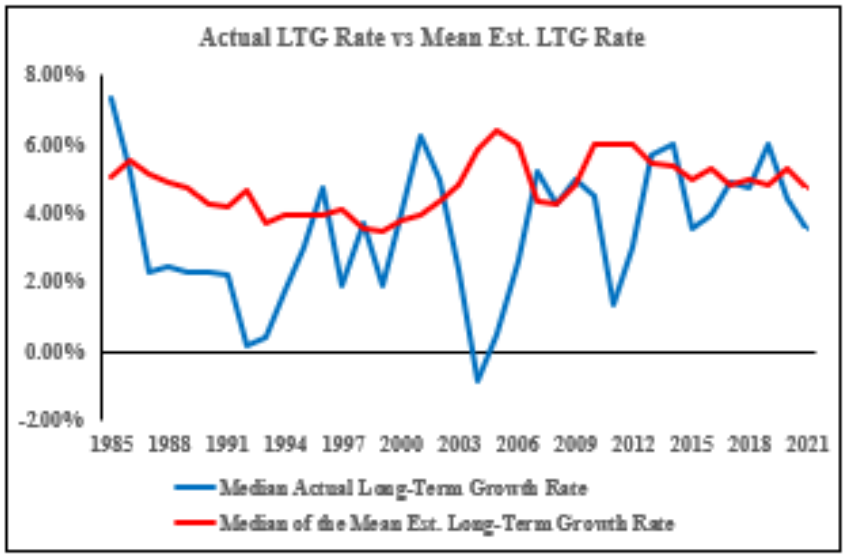
A. Yes. I have studied of the accuracy of analysts' EPS growth rates for utilities over the 1985–2020 time-period. I used the utilities *Value Line* lists in the East, West, and Central Electric Utilities sectors as well as natural gas distribution companies the Natural Gas Utility industry lists. I collected the three- to five-year projected EPS growth rate from I/B/E/S for each utility, and compared that growth rate to the utility's actual subsequent three- to five-year EPS growth rate. As I show in Figure 9, the mean forecasted EPS growth rate (depicted in the red line in Figure 9) is consistently greater than the achieved

[15] The studies that demonstrate analysts' long-term EPS forecasts are overly-optimistic and upwardly biased include: R.D. Harris, The *Accuracy, Bias, and Efficiency of Analysts' Long Run Earnings Growth Forecasts*, J. of Bus. Fin. & Acct. 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. 643−684 (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., 2011); and Marc H. Goedhart, Rishi Raj, and Abhishek Saxena, *Equity Analysts, Still Too Bullish*, McKinsey on Fin. 14–17 (Spring 2010).

[16] 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).

actual EPS growth rate over each time period, with the exceptions being brief periods in the 1994–96 and 2000–2002, 2006–07, 2014–15, and 2018–19 time frames. 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 and natural gas companies are overly optimistic and upwardly-biased.

Figure 9
Mean Forecasted vs. Actual Long-Term EPS Growth Rates
Electric Utilities and Gas Distribution Companies
1985-2021



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

Q. Are the projected EPS growth rates of *Value Line* also overly optimistic and upwardly biased?

A. Yes. A 2008 study by Szakmary, Conover, and Lancaster (SCL) evaluated the accuracy of *Value Line*'s three-to-five-year EPS growth rate forecasts using companies in the Dow Jones Industrial Average over a 30-year time period and found these forecasted EPS growth rates significantly higher than the EPS growth rates these companies subsequently

achieved.[17]

SCL studied predicted versus projected stock returns, sales, profit margins, and earnings per share that *Value Line* made from1969 to 2001. *Value Line* projects variables from a three-year base period (e.g., 2019–2021) to a future three-year projected period (e.g., 2025–27). SCL used the 65 stocks in the Dow Jones Indexes (30 Industrials, 20 Transports and 15 Utilities). SCL found 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 percent for the Dow Jones stocks in *Value Line*'s forecasts was nearly double the realized annual stock return. The authors also termed *Value Line*'s forecasts of earnings per share and profit margins "strikingly overoptimistic." *Value Line*'s forecasts of annual sales were higher than achieved levels, though not statistically significantly. SCL attributed *Value Line*'s overly optimistic projected annual stock returns to its upwardly-biased forecasts of earnings per share and profit margins.

Q. In your opinion, do stock prices reflect the upward bias in the EPS growth rate forecast?

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

Q. How does that affect the use of these forecasts in a DCF equity cost rate study?

A. According to the DCF model, the equity cost rate is a function of the dividend yield and expected growth rate. Since this bias is well known, stock prices and dividend yields reflect this bias. However, in the DCF model, the growth rate needs adjustment

[17] Andrew C. Szakmary, C. Mitchell Conover, & Carol Lancaster, *An Examination of Value Line's Long-Term Projections*, J. of Banking & Fin. 820–833 (2008).

downward from the projected EPS growth rate to reflect the upward bias.

Q. Please discuss the historical growth of the companies in the proxy groups, as provided by *Value Line.*

A. Page three of Exhibit JRW-9 provides the five- and 10-year historical growth rates for EPS, DPS, and BVPS for the companies in the three proxy groups, as published in the *Value Line Investment Survey.* The median historical growth measures for EPS, DPS, and BVPS for the Electric Proxy Group, as provided in Panel A, range from 4.0 percent to 5.5 percent, with an average of the medians of 4.8 percent. For the Bulkley Proxy Group, as Panel B of page three of Exhibit JRW-9 shows the historical growth measures in EPS, DPS, and BVPS, as measured by the medians, range from 4.5 percent to 5.8 percent, with an average of the medians of 5.2 percent. The median historical growth measures for EPS, DPS, and BVPS for the Gas Proxy Group, as I provide in Panel C, range from 4.0 percent to 6.8 percent, with an average of the medians of 5.3 percent.

Q. Please summarize *Value Line's* projected growth rates for the companies in the proxy groups.

A. Page four of Exhibit JRW-10 shows *Value Line's* projections of EPS, DPS, and BVPS growth for the companies in the proxy groups. As I state above, due to the presence of outliers the analysis uses the medians. For the Electric Proxy Group, Panel A of page four of Exhibit JRW-9 shows the medians range from 4.0 percent to 6.0 percent, with an average of the medians of 5.2 percent. The range of the medians for the Bulkley Proxy Group, shown in Panel B of page four of Exhibit JRW-9, is from 4.5 percent to 6.0 percent, with an average of the medians of 5.4 percent. The range of the medians for the Gas Proxy Group, shown in Panel C of page four of Exhibit JRW-10, is from 5.0 percent

to 7.5 percent, with an average of the medians of 6.2 percent.[18]

Page four of Exhibit JRW-9 provides the prospective sustainable growth rates for the companies in the proxy groups, as *Value Line*'s average projected retention rate and return on shareholders' equity measure them. As I note above, sustainable growth significantly and primarily drives long-run earnings growth. For the Electric, Bulkley and Gas Proxy Groups, the median prospective sustainable growth rates are 4.0 percent, 4.1 percent, and 4.7 percent respectively.

Q. Please assess growth for the proxy groups as measured by analysts' forecasts of expected five-year EPS growth.

A. Yahoo, Zacks, and S&P Cap IQ collect, summarize, and publish Wall Street analysts' long-term EPS growth rate forecasts for the companies in the proxy groups. I provide these forecasts for the companies in the proxy groups on page five of Exhibit JRW-9. I have reported both the mean and median growth rates for the groups. Since there is considerable overlap in analyst coverage between the three services, and since not all 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. The mean/median of analysts' projected EPS growth rates for the Electric, Bulkley, and Gas Proxy Groups are 5.5 percent/6.0 percent, 6.2 percent/6.0 percent, and 6.0 percent/5.7 percent respectively.[19]

[18] I give less weight to the projected *Value Line* growth rates due to the unique methodology used to measure growth. *Value Line* projects from a three-year historic base period to a three-year future period. Value Line's projected growth rates for gas companies are somewhat higher than Yahoo Finance and Zacks growth rates due to abnormally low earnings for several companies in the three-year historic period. The issue for gas companies also pronounced for this group due to the small number of gas companies in the group.

[19] 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.

Q. Please summarize your analysis of the historical and prospective growth of the proxy groups.

A. Page six of Exhibit JRW-9 shows the summary DCF growth rate indicators for the proxy groups.The historical growth rate indicators for my Electric Proxy Group imply a baseline growth rate of 4.8 percent. The average of the projected EPS, DPS, and BVPS growth rates from *Value Line* is 5.2 percent, and *Value Line*'s projected sustainable growth rate is 4.0 percent. Wall Street analysts project EPS growth rates measured by the mean and median growth rates by for the Electric Proxy Group of 5.5 percent and 6.0 percent. The overall range for the projected growth rate indicators (ignoring historical growth) is 4.0 percent to 6.0 percent. Giving primary weight to the projected EPS growth rate of Wall Street analysts, I believe the appropriate projected growth rate to be 5.50 percent. This growth rate figure is in the upper end of the range of historic and projected growth rates for the Electric Proxy Group.

For the Bulkley Proxy Group, the historical growth rate indicators point to a growth rate of 5.2 percent. The average of the projected EPS, DPS, and BVPS growth rates from *Value Line* is 5.4 percent, and *Value Line*'s projected sustainable growth rate is 4.1 percent. The projected EPS growth rates of Wall Street analysts are 6.2 percent and 6.0 percent as measured by the mean and median growth rates. The overall range for the projected growth rate indicators is 4.1 percent to 6.2 percent. Giving primary weight to the projected EPS growth rate of Wall Street analysts, I believe that the appropriate projected growth rate is 6.0 percent for the Bulkley Group. This growth rate figure is in the upper end of the range of historic and projected growth rates for the Bulkley Proxy Group.

The historical growth rate indicators for my Gas Proxy Group indicate a baseline growth rate of 5.3 percent. The average of the projected EPS, DPS, and BVPS growth rates from *Value Line* is 6.2 percent, and *Value Line*'s projected sustainable growth rate is 4.7 percent. The projected EPS growth rates of Wall Street analysts for the Gas Proxy Group are 6.0 percent and 5.7 percent as measured by the mean and median growth rates. The overall range for the projected growth rate indicators (ignoring historical growth) is 4.7 percent to 6.2 percent. Giving primary weight to the projected EPS growth rate of Wall Street analysts, I believe that the appropriate projected growth rate is in the range of 5.50 percent to 6.0 percent. I will use the midpoint of the range, 5.75 percent, as the DCF growth rate for the Gas Proxy Group. This growth rate figure is in the upper end of the range of historic and projected growth rates for the group.

Q. Based on the above analysis, what are your indicated common equity cost rates from the DCF model for the proxy groups?

A. I summarize my DCF-derived equity cost rates for the groups on page 1 of Exhibit JRW-9and in Table 7 below.

Table 7
DCF-derived Equity Cost Rate/ROE

	Dividend Yield	1 + ½ Growth Adjustment	DCF Growth Rate	Equity Cost Rate
Electric Proxy Group	**3.20%**	**1.02750**	**5.50%**	**8.80%**
Bulkley Proxy Group	**2.80%**	**1.03000**	**6.00%**	**8.90%**
Gas Proxy Group	**2.90%**	**1.02875**	**5.75%**	**8.75%**

The DCF result for the Electric Proxy Group is the 3.20 percent dividend yield, times the one-and-one-half growth adjustment of 1.02750, plus the DCF growth rate of 5.50 percent, which results in an equity cost rate of 8.80 percent. The result for the

Bulkley Proxy Group is 8.90 percent, which includes a dividend yield of 2.80 percent, an adjustment factor of 1.0300, and a DCF growth rate of 6.00 percent. For the Gas Proxy Group, the DCF result Group is the 2.90 percent dividend yield, times the one-and-one-half growth adjustment of 1.02875, plus the DCF growth rate of 5.75 percent, which results in an equity cost rate of 8.75 percent.

C. Capital Asset Pricing Model

Q. Please discuss the Capital Asset Pricing Model (CAPM).

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

$$k = R_f + RP$$

where R_f is normally the yield on long-term U.S. Treasury securities. The approach measures risk premiums in different ways. CAPM is a theory of the risk and expected returns of common stocks. In CAPM, two types of risk are associated with a stock: firm-specific risk or unsystematic risk; and market or systematic risk, measured by a firm's beta. The only risk for which investors receive a return 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 investing in risky stocks; and
Beta—(ß) is a measure of the systematic risk of an asset.

Using CAPM to estimate the required return or cost of equity 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 these inputs to measure—it is represented by the yield on long-term U.S. Treasury bonds. ß, the measure of systematic risk, is a little more difficult to measure because there are different opinions about what adjustments, if any, should be made to historical betas due to their tendency to regress to 1.0 over time. And finally, the most 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-10.

A. Exhibit JRW-10 provides the summary results for my CAPM study. Page 1 shows the results, and its following pages contain 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 page 2 of Exhibit JRW-10 shows, the yield on 30-year U.S. Treasury bonds has been in the 1.3 percent to 4.75 percent range over the 2010–2022 time-period. The current 30-year Treasury yield of 3.0 percent is near the middle of this range. Given the recent range of yields, I am using 3.0 percent as the risk-free rate, or R_f, in my CAPM. This rate is consistent with Duff & Phelps, who are also using 3.0 percent as a normalized risk-free

interest rate (*see* page 7 of Exhibit JRW-10).[20]

Q. Does the 3.0 percent risk-free interest rate take into consideration forecasts of higher interest rates?

A. No, it does not. As I stated before, forecasts of higher interest rates have been notoriously wrong for a decade. My 3.0 percent risk-free interest rate takes into account the range of interest rates in the past and effectively synchronizes the risk-free rate with the market risk premium. The risk-free rate and the market risk premium are interrelated in that the market risk premium is developed in relation to the risk-free rate. As discussed below, my market risk premium stems from results of many studies and surveys published over time. Therefore, my risk-free interest rate of 3.0 percent is effectively a normalized risk-free rate of interest.

Q. Please discuss Betas in CAPM.

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

As page 3 of Exhibit JRW-10 shows, 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

[20] Duff & Phelps (Kroll), *Cost of Capital Research Center*, https://www.kroll.com/en/insights/publications/cost-of-capital (last visited July 12, 2022).

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 to reflect that over time betas tend to regress to 1.0.

Q. Please discuss the change in betas in 2020.

A. Traditionally, I have used the betas as provided in the *Value Line Investment Survey*. As discussed above, the betas for utilities recently increased significantly due to the volatility of utility stocks during the stock market meltdown associated with the novel coronavirus in March of 2020. *Value Line* computes betas 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.

Q. Given this discussion, what Betas are you using in your CAPM?

A. As page 3 of Exhibit JRW-10 shows, the median *Value Line* betas for the Electric, Bulkley, and Gas Proxy Groups are 0.85, 0.85, and 0.80. At present, I will continue to use *Value Line* betas in my CAPM, an approach I believe to be conservative.

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, its measurement is difficult because it requires estimating the expected return on the market—$E(R_m)$. As I discuss below, different ways exist 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 remains one of the great mysteries in finance.[21]

Q. Please discuss the alternative approaches to estimating the market risk premium.

A. Page 4 of Exhibit JRW-10 highlights the primary approaches to, and issues that attend, estimating the expected market risk premium. The traditional method 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). We often call this type of historical evaluation of stock and bond returns the "Ibbotson approach" after Professor Roger Ibbotson, who popularized this method of using historical financial market returns as measures of expected returns. However, this historical evaluation of returns can be a problem because: (1) *ex post* returns are not the same as *ex ante* expectations; (2) market risk premiums can change over time, increasing when investors become more risk-averse and decreasing when investors become less risk-averse; and (3) market conditions can change such that *ex post* historical returns are poor estimates of *ex ante* expectations.

Numerous academic studies I discuss later have criticized the use of historical returns as market expectations. The general theme of these studies is that the fundamental

[21] Merton Miller, *The History of Finance: An Eyewitness Account*, J. Applied Corp. Fin. 3 (2000).

data cannot justify the large equity risk premium discovered in historical stock and bond returns. 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. We sometimes call these studies "puzzle research," after the famous study by Mehra and Prescott that first questioned the magnitude of historical equity risk premiums relative to fundamentals.[22]

In addition, a number of surveys of financial professionals exist regarding the market risk premium, as well as several surveys academics have published on the equity risk premium. Duke University has published a quarterly CFO Survey for over 10 years.[23] The Federal Reserve Bank of Philadelphia published its annual *Survey of Professional Forecasters* for almost half a century, which also includes questions regarding expected stock and bond returns.[24] In addition, Pablo Fernandez conducts annual surveys of financial analysts and companies regarding the equity risk premiums they use in their investment and financial decision-making.[25]

Q. Please discuss the alternative approaches to estimating the market risk premium.

A. Derrig and Orr, Fernandez, and Song completed the most comprehensive reviews of the

[22] Rajnish Mehra & Edward C. Prescott, *The Equity Premium: A Puzzle*, J. Monetary Econ. 145 (1985).
[23] *The CFO Survey*, Duke Univ. (Mar. 30, 2022), https://www.richmondfed.org/cfosurvey.
[24] *Survey of Professional Forecasters*, Federal Reserve Bank of Philadelphia (Feb. 14, 2022), https://www.philadelphiafed.org/-/media/frbp/assets/surveys-and-data/survey-of-professional-forecasters/2020/spfq120.pdf?la=en. The *Survey of Professional Forecasters* was formerly conducted by the American Statistical Association (ASA) and the National Bureau of Economic Research (NBER) and was known as the ASA/NBER survey. The survey, which began in 1968, is conducted each quarter. The Federal Reserve Bank of Philadelphia, in cooperation with the NBER, assumed responsibility for the survey in June 1990.
[25] Pablo Fernandez, Sophia Bañuls, & Javier Acín, *Survey: Market Risk Premium and Risk-Free Rate Used for 88 Countries in 2020* (IESE Bus. Sch. June 7, 2021).

research on the market risk premium.[26] 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 and summarized the major studies of the market risk premium. Song provided an annotated bibliography and highlighted the alternative approaches to estimating the market risk premium.

Page 5 of Exhibit JRW-10 provides a summary of the results of the primary risk premium studies Derrig and Orr reviewed, as well as other more recent studies of the market risk premium. In developing page 5 of Exhibit JRW-10, I categorized the types of studies discussed on page 4 of Exhibit JRW-10. I also included the results of studies of the "building blocks" approach to estimating the equity risk premium. The building blocks approach is a hybrid approach employing elements of both historical and *ex ante* models.

Q. Please provide a summary of the market risk premium studies.

A. Page 5 of Exhibit JRW-10 provides a summary of the results of the market risk premium studies I reviewed. These include the results of: (1) 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. I report results for over 30 studies, and the

[26] *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 Bus. Sch. 2007); Zhiyi Song, *The Equity Risk Premium: An Annotated Bibliography* (The CFA Instit. Research Foundation, 2007).

median market risk premium of these studies is 4.83 percent.

Q. Please highlight the results of the more recent risk premium studies and surveys.

A. The studies cited on page 5 of Exhibit JRW-10 include every market risk premium study and survey I could identify published over the past 20 years that provided a market risk premium estimate. Many of these studies date from before the financial crisis that began in 2008. In addition, some of these studies date from 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) 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 reconstructed page 5 of Exhibit JRW-10 on page 6 of Exhibit JRW-10; however, I eliminated all studies dated before January 2, 2010. The median market risk premium estimate for this subset of studies is 5.16 percent.

Q. Please summarize the market risk premium studies and surveys.

A. As noted above, three approaches exist to estimating market risk premium: historic stock and bond returns, *ex ante* or expected returns models, and surveys. I summarize the studies on page 6 of Exhibit JRW-10 as follows:

Historic Stock and Bond Returns: Historic stock and bond returns suggest a market risk premium in the 4.40 percent to 6.71 percent range, depending on whether one uses arithmetic or geometric mean returns.

***Ex Ante* Models**: Market risk-premium studies that use expected or *ex ante* return models indicate a market risk premium in the range of 3.47 percent to 6.00 percent.

Surveys: Market risk premiums developed from surveys of analysts, companies, financial professionals, and academics are lower, with a range from 3.88 percent to 5.70

percent.

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

Q. Please highlight the *ex ante* market risk premium studies and surveys that you believe are most timely and relevant.

A. I will highlight several studies/surveys.

Pablo Fernandez conducts annual surveys of financial analysts and companies regarding the equity risk premiums they use in investment and financial decision-making.[27] I include his survey results on pages 5 and 6 of Exhibit JRW-10. The results of his 2021 survey of academics, financial analysts, and companies, which included 4,000 responses, indicated a mean market risk premium employed by U.S. analysts and companies of 5.50 percent.[28] His estimated market risk premium for the U.S. has been in the 5.00 percent to 5.60 percent range in recent years.

Professor Aswath Damodaran of New York University, a leading expert on valuation and the market risk premium, provides a monthly updated market risk premium based on projected S&P 500 EPS and stock-price level and long-term interest rates. His estimated market risk premium, shown graphically in Figure 9, below, has primarily been in the range of 4.0 percent to 6.0 percent since 2010. As of March 1, 2022, his estimate of the implied market risk premium was 5.37 percent.[29]

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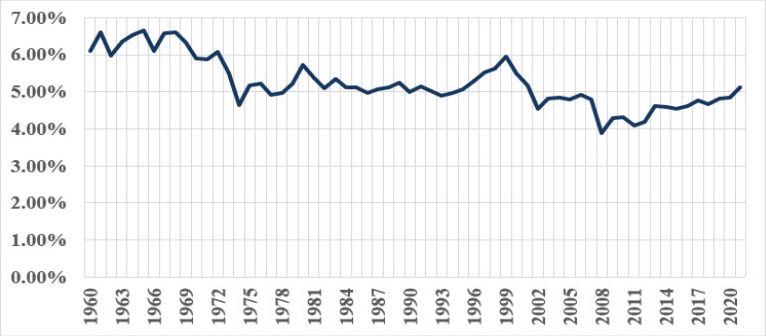
[27] Pablo Fernandez, Sofia Bañuls, and Pablo Acín, *Survey: Market Risk Premium and Risk-Free Rate Used for 88 Countries in 2020* (IESE Bus. Sch. 2021).

[28] *Id.* at 3.

[29] Aswath Damodaran, *Damodaran Online*, N.Y. Univ., http://pages.stern.nyu.edu/~adamodar/ (last visited July 12, 2022).

Figure 10
Damodaran Market Risk Premium,
1960–2021



Source: Aswath Damodaran, Damodaran Online, N.Y. Univ., http://pages.stern.nyu.edu/~adamodar/.

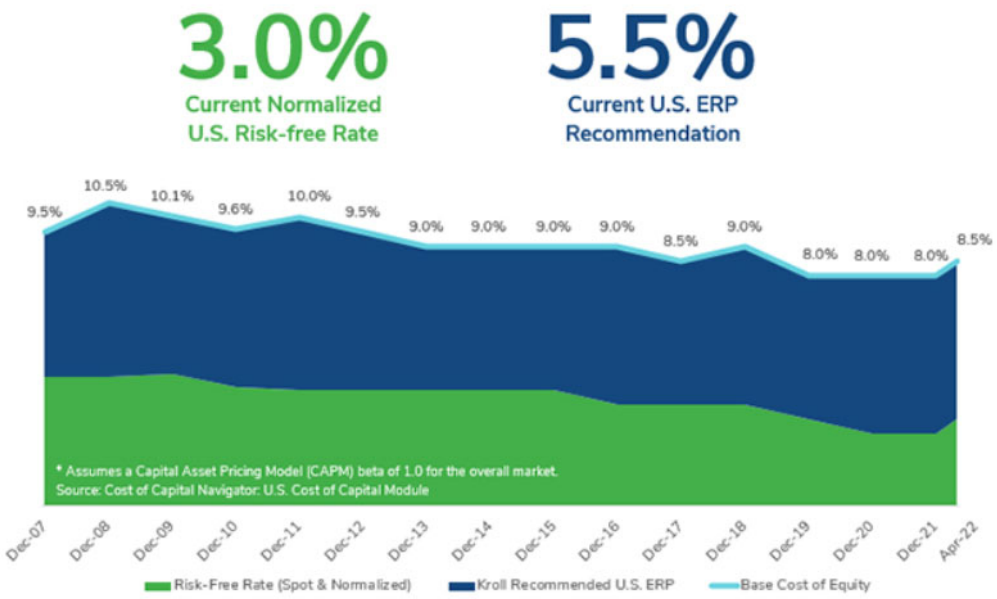
Duff & Phelps, an investment advisory firm, provides recommendations for normalized risk-free interest rate and market risk premiums to use in calculating the cost-of-capital data. Its recommendations over the 2008–2021 time-periods are shown on page 7 of Exhibit JRW-10 and appear graphically in Figure 11. Over the past decade, Duff & Phelps' recommended normalized risk-free interest rates have been in the 2.50 percent to 4.00 percent range, and market risk premiums have been in the 5.0 percent to 6.0 percent range. In early 2020, in the wake of the emergence of the novel coronavirus, Duff & Phelps decreased its recommended normalized risk-free interest rate from 3.0 percent to 2.50 percent and increased its market risk premium from 5.00 percent to 6.00 percent. Subsequently, on December 9, 2020, Duff & Phelps reduced its recommended market risk premium to 5.50 percent.[30]

Finally, KPMG, the international accounting firm, regularly publishes an update to their market risk premium that they use in their valuation practice. KPMG's market

[30] Carla Nunes & James P. Harrington, *Duff & Phelps Recommended U.S. Equity Risk Premium Decreased from 6.0% to 5.5%, Effective December 9, 2020*, Cost of Capital Res. Ctr., Kroll, Dec. 10, 2020.

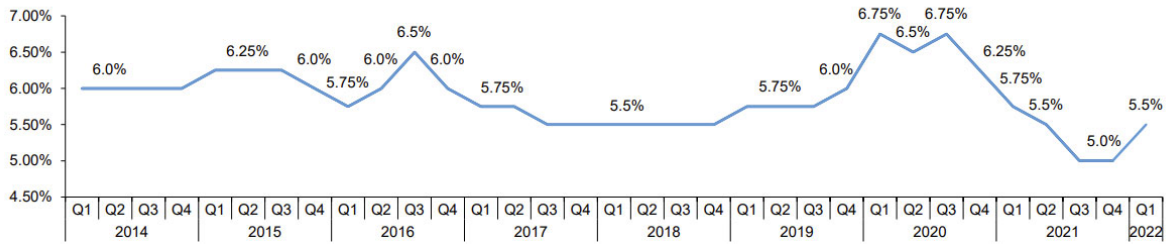
risk premium was as high as 6.75 percent in 2020, then lowered on March 31, 2021 to 5.75 percent; on June 30, 2021 to 5.50 percent; and on September 30, 2021 to 5.00 percent. On March 31, 2022, KPMG increased its equity risk premium to 5.50 percent.[31]

Figure 11
Duff & Phelps
Normalized Risk-Free Rate and Market Risk Premium Recommendations
2007–2021



Source: https://www.duffandphelps.com/insights/publications/cost-of-capital

Figure 12
KPMG
Market Risk Premium Recommendations
2013–2022



[31] KPMG Corporate Finance NL recommends an MRP of 5.5 percent as per 31 March 2022, Source: https://indialogue.io/clients/reports/public/5d9da61986db2894649a7ef2/5d9da63386db2894649a7ef5

Q. Given these results, what market risk premium are you using in your CAPM?

A. The studies on page 6 of Exhibit JRW-10 and, more importantly, the more timely and relevant studies just cited suggest that the appropriate market risk premium in the U.S. is in the 4.0 percent to 6.0 percent range. I will use an expected market risk premium of 5.50 percent, which is the upper end of the range. I give most weight to the market risk-premium estimates of Duff & Phelps, KPMG, the Fernandez survey, and Damodaran. This is a conservatively high estimate of the market risk premium considering the many studies and surveys of the market risk premium.

Q. What equity cost rates does your CAPM analysis indicate?

A. I summarize the results of my CAPM study for the proxy groups on page 1 of Exhibit JRW-10 and in Table 8 below.

Table 8
CAPM-derived Equity Cost Rate/ROE
$K = (R_f) + ß * [E(R_m) - (R_f)]$

	Risk-Free Rate	Beta	Market Risk Premium	Equity Cost Rate
Electric Proxy Group	**3.00%**	**0.85**	**5.50%**	**7.70%**
Bulkley Proxy Group	**3.00%**	**0.85**	**5.50%**	**7.70%**
Gas Proxy Group	**3.00%**	**0.80**	**5.50%**	**7.40%**

For the Electric and Bulkley Proxy Groups, the risk-free rate of 3.00 percent plus the product of the beta of 0.85 times the equity risk premium of 5.50 percent results in a 7.70 percent equity cost rate. For the Gas Proxy Group, the risk-free rate of 3.00 percent plus the product of the beta of 0.80 times the equity risk premium of 5.50 percent results in a 7.40 percent equity cost rate.

D. Equity Cost Rate Summary

Q. Please summarize the results of your equity cost rate studies.

A. My DCF analyses for the Electric, Bulkley, and Gas Proxy Groups indicate equity cost rates are 8.45 percent, 8.35 percent, and 8.95 percent, respectively. The CAPM equity cost rates for the Electric, Bulkley, and Gas Proxy Groups are 6.9 percent, 6.9 percent, and 7.5 percent.

Table 9
ROEs Derived from DCF and CAPM Models

	DCF	CAPM
Electric Proxy Group	**8.80%**	**7.70%**
Bulkley Proxy Group	**8.90%**	**7.70%**
Gas Proxy Group	**8.75%**	**7.40%**

Q. Given these results, what is your estimated equity cost rate for the groups?

A. Given these results, I conclude that the appropriate equity cost rate for companies in the Electric, Bulkley, and Gas Proxy Groups is in the 7.40 percent to 8.90 percent range. Because I give primary weight to the DCF results and the 2022 increase in interest rates, I will use an equity cost rate of 8.80 percent for PSE.

Q. Please indicate why an equity cost rate of 8.80 percent is appropriate for the electric and gas operations of PSE.

A. A number of reasons support an equity cost rate of 8.80 percent as appropriate and fair for PSE:

1. I have employed a capital structure that has more equity and less financial risk than the average of the proxy groups;

2. As Exhibit JRW-4 shows, capital costs for utilities, as indicated by long-term bond yields, are still at historically low levels, despite the 2022 increase

in rates.

3. As Exhibit JRW-7 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. While the overall stock market is down about 20 percent in 2022, public utility stocks are down only about two percent. Hence, utility stocks have performed relatively well in the face of higher inflation and interest rates.

5. My ROE recommendation of 8.80 percent is at the top end of my equity cost rate range of 7.40 percent to 8.90 percent. As indicated, this is (1) because I rely primarily on the DCF model, and (2) due to the 2022 increase in interest rates.

6. On an annual basis, the average authorized ROEs for electric utilities have been an average of 10.01 percent in 2012, 9.8 percent in 2013, 9.76 percent in 2014, 9.58 percent in 2015, 9.60 percent in 2016, 9.68 percent in 2017, 9.56 percent in 2018, 9.65 percent in of 2019, 9.44 percent in 2020, 9.38 percent in 2021, and 9.35 percent in the first quarter of 2022, according to Regulatory Research Associates.[32] On an annual basis, the authorized ROEs for gas distribution companies have been 9.94 percent in 2012, 9.68 percent in 2013, 9.78 percent in 2014, 9.60 percent in 2015, 9.50 percent in 2016, 9.72 percent in 2017, 9.59 percent in 2018, 9.71 percent in 2019, 9.46 percent in 2020, 9.56 percent in

[32] Lisa Fontanella et al., *RRA Regulatory Focus: Major Energy Rate Case Decision in the US January-March 2022, Quarterly Update on Decide Rate Cases* (S&P Glob. Mrkt. Intel., May 5, 2022).

2021, and 9.38 percent in the first quarter of 2022, again according to Regulatory Research Associates. As I discuss above, authorized ROEs have lagged behind capital market cost rates. Accordingly, I believe my recommended ROE reflects our present historically low capital cost rates, which state utility regulatory commissions are finally recognizing as the norm.

Q. Do you believe that your 8.80 percent ROE recommendations meet the *Hope* and *Bluefield* standards?

A. Yes, I do. As I previously noted, according to the *Hope* and *Bluefield* decisions, returns on capital should be: (1) comparable to returns investors expect to earn on other investments of similar risk, (2) sufficient to assure confidence in the company's financial integrity, and (3) adequate to maintain and support the company's credit and to attract capital. As page 3 of Exhibit JRW-4 shows, electric utility and gas distribution companies have been earning in the 8.0 percent to 10.0 percent range in recent years. While my recommendation is below the average authorized ROEs for electric utility and gas distribution companies, it reflects the downward trend in authorized and earned ROEs of utilities.

Q. Please discuss your recommendation in light of a Moody's publication.

A. Moody's published an article on utility ROEs and credit quality. In the article, Moody's recognizes that authorized ROEs for electric and gas companies are declining due to lower interest rates. [33]

> The credit profiles of US regulated utilities will remain intact over the next few years despite our expectation that regulators will continue to trim the sector's profitability by lowering its authorized returns on equity (ROE).

[33] Jim Hempstead, et al., *Lower Authorized Equity Returns Will Not Hurt Near-Term Credit Profiles,* Moody's Inv. Serv. at 1 (Mar. 10, 2015).

> Persistently low interest rates and a comprehensive suite of cost recovery mechanisms ensure a low business risk profile for utilities, prompting regulators to scrutinize their profitability, which is defined as the ratio of net income to book equity. We view cash flow measures as a more important rating driver than authorized ROEs, and we note that regulators can lower authorized ROEs without hurting cash flow, for instance by targeting depreciation, or through special rate structures.

Moody's indicates that with the lower authorized ROEs, electric and gas companies are earning ROEs of 9.0 percent to 10.0 percent, but that this is not impairing their credit profiles and is not deterring them from raising record amounts of capital. With respect to authorized ROEs, Moody's recognizes that utilities and regulatory commissions are having trouble justifying higher ROEs in the face of lower interest rates and cost recovery mechanisms.[34]

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

Overall, this article lends additional support to the emergent prevailing belief that lower authorized ROEs are unlikely to hurt the financial integrity of utilities or their ability to attract capital.

Q. Are utilities able to attract capital with the lower ROEs?

A. Yes. As Figure 2 shows, utilities have raised over $100 billion a year in capital in each of the past three years, despite the lower ROEs.

[34] *Id*. at 2.

VII. CRITIQUE OF PSE'S RATE OF RETURN TESTIMONY

Q. Please summarize the Company's cost of capital recommendation.

A. The Company has proposed a capital structure and cost of capital that adjusts over the years (2023–2025) of the proposed MYRP. The short-term and long-term capitalization ratios range from 1.90 percent to 2.40 percent and 48.10 percent to 50.1 percent and the short-term and long-term debt cost rates 1.43 percent to 3.14 percent and 5.07 percent to 5.08 percent, respectively. The short-term and long-term debt cost rates include 0.02 percent for commitment, amortization, and debt reacquisition fees. The Company has proposed increasing its common equity ratio from its current approved level, 48.50 percent to 50.0 percent in 2025. The Company has also proposed increasing its common equity cost rate from its current approved ROE, 9.40 percent to 9.90 percent in the years 2023 and beyond. PSE witness Bulkley has proposed an ROE in the range of 9.75 percent to 10.50 percent for PSE. Within this range, PSE has employed a ROE of 9.90 percent. I summarize these recommendations on page 1 of Exhibit JRW-11.

Q. What are the areas of disagreement in estimating the rate of return or cost of capital in this proceeding?

A. As I discuss above, the primary issues related to the Company's rate of return include the following: (1) Capital Structure; (2) capital market conditions; (3) PSE's investment risk, (4) DCF Approach; (5) CAPM Approach; (6) the alternative risk premium model; (7) Expected Earnings Approach; and (8) Other Factors including the Company's capital expenditures and regulator risk.

The capital structure, capital market conditions, and PSE's investment risk, are factors I discuss above. I address the remaining items below.

Q. Please review Bulkley's equity cost rate approaches and results.

A. Bulkley developed a proxy group of electric utilities companies and employs DCF, CAPM, an alternative risk premium model, and expected earnings equity cost rate approaches. Bulkley's equity cost rate estimates for PSE are summarized on page 2 Exhibit JRW-11. Based on these figures, Bulkley concludes that the appropriate equity cost rate is 10.5 percent for PSE's gas distribution operations.

E. DCF Approach

Q. Please summarize Bulkley's DCF estimates.

A. On pages 41–45 of testimony and in Exhibit AEB-4, Bulkley develops an equity cost rate by applying the DCF model to the gas group. Bulkley's DCF results are summarized on page 2 of Exhibit JRW-11. In the traditional DCF approach, the equity cost rate is the sum of the dividend yield and expected growth. Bulkley uses three dividend yield measures (30, 90, and 180 days) in the DCF models conducted. In the constant-growth DCF models, Bulkley has relied on the forecasted EPS growth rates of Zacks, Yahoo Finance, and *Value Line*.

Q. What are the errors in Bulkley's DCF analyses?

A. The primary issues in Bulkley's DCF analyses are: (1) selective elimination of low-end DCF results; (2) exclusive use of the overly optimistic and upwardly biased EPS growth rate forecasts of Wall Street analysts and *Value Line*; and (3) claiming that the DCF results underestimate the market-determined cost of equity capital due to high utility stock valuations and low dividend yields.

1. The Asymmetric Elimination of Low End DCF Results

Q. How has Bulkley eliminated low-end DCF results?

A. Bulkley has eliminated all DCF results below 7.0 percent as being too low. In this case, this does not materially impact Bulkley's DCF results. However, it does highlight another issue with Bulkley's DCF study. Whereas Bulkley claims that 7.0 percent is a filter to identify an extreme low-end outlier, Bulkley does not believe that there should be a filter to identify an extreme high-end outlier. In other words, Bulkley can identify an individual ROE that is too low, but there are no individual ROEs that are too high. This results in an asymmetric approach to identify outliers—throwing out the low ones but not the high ones.

2. Analysts' EPS Growth Rate Forecasts

Q. Please discuss Bulkley's exclusive reliance on the projected growth rates of Wall Street analysts and Value Line.

A. It is 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.[35] Accordingly, the weight given to analysts' projected EPS growth rates should be limited. And finally, and most significantly, it is well-known that the long-term EPS growth rate forecasts of Wall Street

[35] 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. 2011).

securities analysts are overly optimistic and upwardly biased.[36] Therefore, using these growth 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.[37] Thus, 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*'s to be significantly higher than the EPS growth rates that these companies subsequently achieved.[38]

Q. Have changes in regulations impacting Wall Street analysts and their research impacted the upward bias in their projected EPS growth rates?

A. No. A number of studies I cite above demonstrate the upward bias has continued despite changes in regulations and reporting requirements over the past two decades. This observation is supported further by a 2010 McKinsey study entitled "Equity Analysts: Still Too Bullish," which involved a study of the accuracy of analysts' long-term EPS growth rate forecasts. The authors conclude that, after a decade of stricter regulation, analysts' long-term earnings forecasts continue to be excessively optimistic. They made the following observation:[39]

> 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

[36] *See supra* note 15 at 44.
[37] Peter D. Easton, & Gregory A. Sommers, *Effect of Analysts' Optimism on Estimates of the Expected Rate of Return Implied by Earnings Forecasts*, J. of Accounting Research, 45, 983–1015 (2007).
[38] Andrew C. Szakmary, C. Michelle Conover, & Carol Lancaster, *An Examination of Value Line's Long-Term Projections*, 32 J. of Banking & Fin. 820–33 (2008).
[39] Marc H. Goedhart, Rishi Raj, and Abhishek Saxena, *Equity Analysts, Still Too Bullish*, McKinsey on Fin., 14–17, (Spring 2010) (emphasis added).

> 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.[40] The author concluded:

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

3. Claim that the DCF Model Understates the Cost of Equity Capital

Q. Please discuss Bulkley's claim that the DCF model understates the cost of equity capital.

A. On page 26–28 of testimony, Bulkley claims that using current utility stock valuations and low dividend yields will underestimate the market-determined ROE using the DCF model.

Q. What is your response to this claim?

A. Bulkley's claim is totally without merit. Bulkley is saying that utility stocks are overvalued and that their stock prices will decline in the future (and therefore their

[40] 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.

dividend yield will increase). Hence, Bulkley presumes to know more than investors in the stock market. Actually, if Bulkley believes that utility stock prices will decline in the future, the forecast should be for negative returns, which is not Bulkley presents here.

F. CAPM Approach

Q. Please discuss Bulkley's CAPM.

A. On pages 45–51 of testimony and in Exhibit AEB- 5, Bulkley develops an equity cost rate by applying the CAPM model to her gas proxy group. Bulkley's DCF results are summarized on page 2 of Exhibit JRW-11. Bulkley develops an equity cost rate by using not only the traditional CAPM, but also the so-called Empirical CAPM (ECAPM) model for her gas proxy group. The ECAPM is a variant of the traditional CAPM. The CAPM/ECAPM approach requires an estimate of the risk-free interest rate, Beta, and the equity risk premium. Bulkley uses: (1) current (1.97 percent), near-term projected (2.46 percent), and long-term projected (3.40 percent) 30-year Treasury yields; (2) betas from *Value Line* and Bloomberg, and a 10-year average; and (3) a market risk premium of 11.00 percent. Based on these figures, Bulkley finds CAPM/ECAPM equity cost rates ranging from 9.55 percent to 13.26 percent.

Q. What are the errors in Bulkley's CAPM analysis?

A. 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 11.00 percent.

1. ECAPM Approach

Q. What issues do you have with Bulkley's use of the ECAPM?

A. In addition to CAPM, Bulkley has employed a variation of CAPM called "ECAPM." 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 CAPM. Accordingly, ECAPM is an alternative version of the CAPM. However, the ECAPM has not been theoretically or empirically validated in refereed journals. ECAPM provides for weights that are used to adjust the risk-free rate and market risk premium in applying ECAPM. Bulkley uses 0.25 and 0.75 factors to boost the equity risk premium measure, but provides no empirical justification for those figures.

Beyond the lack of any theoretical or empirical validation of ECAPM, there are two errors in Bulkley's version of ECAPM: (1) I am not aware of any tests of the CAPM that use adjusted betas such as those used by Bulkley; and (2) adjusted betas, which were previously discussed, address the empirical issues with CAPM. Specifically, the beta adjustment (1) increases the beta and resulting expected return for low beta (beta,1.0) stocks, and (2) decreases the beta and resulting expected return for high beta (beta>1.0) stocks. Hence, adjusting betas in this manner provides higher returns for stocks with betas less than 1.0, and lower returns for stocks with betas more than 1.0, which is consistent with the empirical studies of the CAPM.

2. Market Risk Premium

Q. Please assess Bulkley's market risk premium derived from applying the DCF model to the S&P 500 using *Value Line* EPS growth rates.

A. The most blatant error in Bulkley's CAPM analysis is the magnitude of the market (or equity) risk premium, which is then used to produce very high ROE results, as high as 13.26 percent. Bulkley develops an expected market risk premium by: (1) applying the DCF model to the S&P 500 to get an expected market return; and (2) subtracting the risk-free rate

of interest. As shown in Table 10, Bulkley's estimated market return of 12.97 percent for the S&P 500 equals the sum of the dividend yield of 1.58 percent and expected EPS growth rate of 11.31 percent. The expected EPS growth rate is the average of the expected EPS growth rates from S&P. The primary error in this approach is Bulkley's expected DCF growth rate. As previously discussed, the expected EPS growth rates of Wall Street analysts are upwardly biased. In addition, as explained below, the projected growth rate is inconsistent with actual economic and earnings growth rates in the U.S.

Table 10
Bulkley CAPM Market Risk Premium

Dividend Yield	**1.58%**
+ Expected EPS Growth	**11.31%**
= Expected Market Return	**12.97%**
+ Risk-Free Rate	**1.97%**
= Market Risk Premium	**11.00%**

Q. Initially, please provide additional insights into the expected stock market return of 12.97 percent.

A. Simply put, the assumption of a 12.97 percent expected stock market return is excessive and unrealistic. The compounded annual return in the U.S. stock market is about 10 percent (9.97 percent between 1928–2021according to Damodaran).[41] Bulkley's CAPM results assume that return on the U.S. stock market will be more than **30 percent higher** in the future than it has been in the past. The extremely high expected stock market return, and the resulting market risk premium and equity cost rate results, is directly related to computing the expected stock market return as the sum of the adjusted dividend

[41] Aswath Damodaran, *Damodaran Online*, N.Y. Univ., http://pages.stern.nyu.edu/~adamodar/ (last visited July 20, 2022).

yield plus the expected EPS growth rate of 11.31 percent.

Q. How do issues with analysts' EPS growth rate forecasts impact Bulkley's CAPM?

A. The key point is that Bulkley's CAPM market risk premium methodology is based entirely on the concept that analyst projections of companies' three-to-five EPS growth rates reflect investors' expected *long-term* EPS growth for those companies. However, this 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.[42] Moreover, as I discuss above, the Lacina, Lee, and Xu study showed that analysts' forecasts of EPS growth over the next three-to-five years earnings are no more accurate than their forecasts of the next single year's EPS growth (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 estimated at about 300 basis points.[43]

Q. Is Bulkley's market risk premium of 11.00 percent 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 market risk premiums by leading academic scholars, (2) produced by analyses of historic stock

[42] 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. 2011).

[43] 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).

and bond returns, and (3) found in surveys of financial professionals. Page 6 of Exhibit JRW-10 provides the results of over 30 market risk premiums studies from the past 15 years.[44] Historic stock and bond returns suggest a market risk premium in the 4.40–6.71 percent 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 3.47 percent to as high as 6.0 percent. 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 3.88 percent to 5.70 percent. 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 premium as high as the 11.00 percent used by Bulkley, which is derived from only one source—*Value Line Investment Survey*.

Q. Is there other evidence that indicates that Bulkley's market risk premium developed using analysts' projected EPS growth rates is excessive?

A. Yes. A long-term EPS growth rate of 11.31 percent 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 Bulkley's projected EPS growth rate of 11.31percent; (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 EPS and GDP Growth Have Been in the 6 Percent–7 Percent

[44] *See* Woolridge, Exh. JRW-10 at 6.

Range: In Exhibit JRW-12, 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-12, and a summary is shown in Table 11.[45]

Table 11
GDP, S&P 500 Stock Price, EPS, and DPS Growth
1960-Present

Nominal GDP	**6.17%**
S&P 500 Stock Price	**7.07%**
S&P 500 EPS	**6.42%**
S&P 500 DPS	**5.65%**
Average	**6.33%**

The results show that the historical long-run growth rates for GDP, S&P EPS, and S&P DPS are in the 6 percent to 7 percent range. By comparison, Bulkley's long-run growth rate projection of 11.31 percent is at best overstated. This estimate suggests that companies in the U.S. would be expected to: (1) increase their growth rate of EPS by almost 100 percent in the future and (2) maintain that growth indefinitely in an economy that is expected to grow at about one-third of her projected growth rates.

There is a Direct Link Between Long-Term EPS and GDP Growth: The results in Exhibit JRW-12 and Table 11 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. Cornell 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, the study finds that long-term stock returns are determined by long-term earnings growth. Cornell

[45] *See* Woolridge, Exh. JRW-12 at 1.

concludes with the following observations:[46]

> 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.

Annual Growth rates in nominal GDP are shown on page 2 of Exhibit JRW-12. 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 percent in 2020, before rebounding and growing by 10.0 percent in 2021. The components of nominal GDP growth are real GDP growth and inflation. Page 3 of Exhibit JRW-12 shows the annual real GDP growth rate between 1961 to 2021. Real GDP growth has gradually declined from the 5.0 percent to 6.0 percent range in the 1960s to the 2.0 percent to 3.0 percent range during the 2015–2019 period. Real GDP fell by 3.5 percent in 2020, but rebounded and grew by 5.7 percent in 2021.

The second component of nominal GDP growth is inflation. Page 4 of Exhibit JRW-12 shows inflation as measured by the annual growth rate in the Consumer Price Index (CPI) from 1961 to 2021. 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 percent to about four percent. Since that time, inflation has gradually declined and was in the 2.0 percent range or below from 2015 to

[46] Bradford Cornell, *Economic Growth and Equity Investing*, Fin. Analysts J. at 63 (Jan.-Feb. 2010).

2020. Prices increased in 2021 with the rebounding economy, and increased by 4.7 percent. As previously discussed, inflation has 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 percent range.

The graphs on pages 2, 3, and 4 of Exhibit JRW-12 provide clear evidence of the decline, in recent decades, in nominal GDP as well as its components, real GDP, and inflation. To gauge the magnitude of the decline in nominal GDP growth, Table 12 provides the compounded GDP growth rates for 10-, 20-, 30-, 40- and 50- years. Whereas the 50-year compounded GDP growth rate is 6.28 percent, there has been a monotonic and significant decline in nominal GDP growth over subsequent 10-year intervals. These figures strongly suggest that nominal GDP growth in recent decades has slowed and that a figure in the range of 4.0 percent to 5.0 percent is more appropriate today for the U.S. economy.

Table 12
Historical Nominal GDP Growth Rates

10-Year Average	**3.96%**
20-Year Average	**3.96%**
30-Year Average	**4.49%**
40-Year Average	**5.05%**
50-Year Average	**6.15%**

Long-Term GDP Projections also Indicate Slower GDP Growth in the Future: A lower range is also consistent with long-term GDP forecasts. There are several forecasts of annual GDP growth that are available from economists and government agencies. These are listed in Panel B of on page 5 of Exhibit JRW-12. The mean 10-year nominal GDP growth forecast (as of February 2022) by economists in the recent *Survey of*

Financial Forecasters is 4.70 percent.[47] The federal Energy Information Administration (EIA), in its projections used in preparing *Annual Energy Outlook*, forecasts long-term GDP growth of 4.5 percent for the period 2020 to 2050.[48] The Congressional Budget Office (CBO), in its forecasts for the period 2020 to 2030, projects a nominal GDP growth rate of 4.0 percent.[49] Finally, the Social Security Administration (SSA), in its Annual OASDI Report, provides a projection of nominal GDP from 2020 to 2095.[50] SSA's projected growth GDP growth rate over this period is 4.2 percent. Overall, these forecasts suggest long-term GDP growth rate in the 4.0 percent to 4.5 percent range.

The bottom line is that the trends and projections suggest a long-term GDP growth rate in the 4.0 percent to 4.5 percent range. As such, Bulkley's average projected EPS growth rate of 11.31 percent is almost three times projected GDP growth.

Q. What fundamental factors have led to the decline in prospective GDP growth?

A. As addressed in a study by the consulting firm McKinsey & Co., two factors drive real GDP growth over time: (a) the number of workers in the economy (employment); and (2) the productivity of those workers (usually defined as output per hour).[51] According to McKinsey, population and productivity growth drove real GDP growth over the past 50 years, at compound annual rates of 1.7 percent and 1.8 percent, respectively.

However, global economic growth is projected to slow significantly in the years

[47] *Survey of Professional Forecasters*, Fed. Reserve Bank of Philadelphia, https://www.philadelphiafed.org/research-and-data/real-time-center/survey-of-professional-forecasters/ (last visited on July 20, 2022).
[48] U.S. Energy Info. Admin., *Annual Energy Outlook 2021*, Table: Macroeconomic Indicators (2021).
[49] Congressional Budget Office, *The 2021 Long-Term Budget Outlook* (July 15, 2021).
[50] Soc. Sec. Admin., *2021 Annual Report of the Board of Trustees of the Old-Age, Survivors, and Disability Insurance (OASDI) Program*, Table VI.G4 (July 1, 2021). The 4.2 percent growth rate is the growth in projected GDP from 2020 to 2095.
[51] James Manyika, et al., *Can Long-Term Growth be Saved*?, McKinsey Global Instit. (Jan. 1, 2015), https://www.mckinsey.com/featured-insights/employment-and-growth/can-long-term-global-growth-be-saved.

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 percent over the next 50 years. They conclude that even if productivity remains at the rapid rate of the past 50 years of 1.8 percent, real GDP growth will fall by 40 percent to 2.1 percent.

Q. Over the medium to long run, is S&P 500 EPS growth likely to outpace GDP growth?

A. No. Figure 13 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.[52] Volatility aside, however, it is clear that over the medium to long run, S&P 500 EPS growth does not outpace GDP growth.

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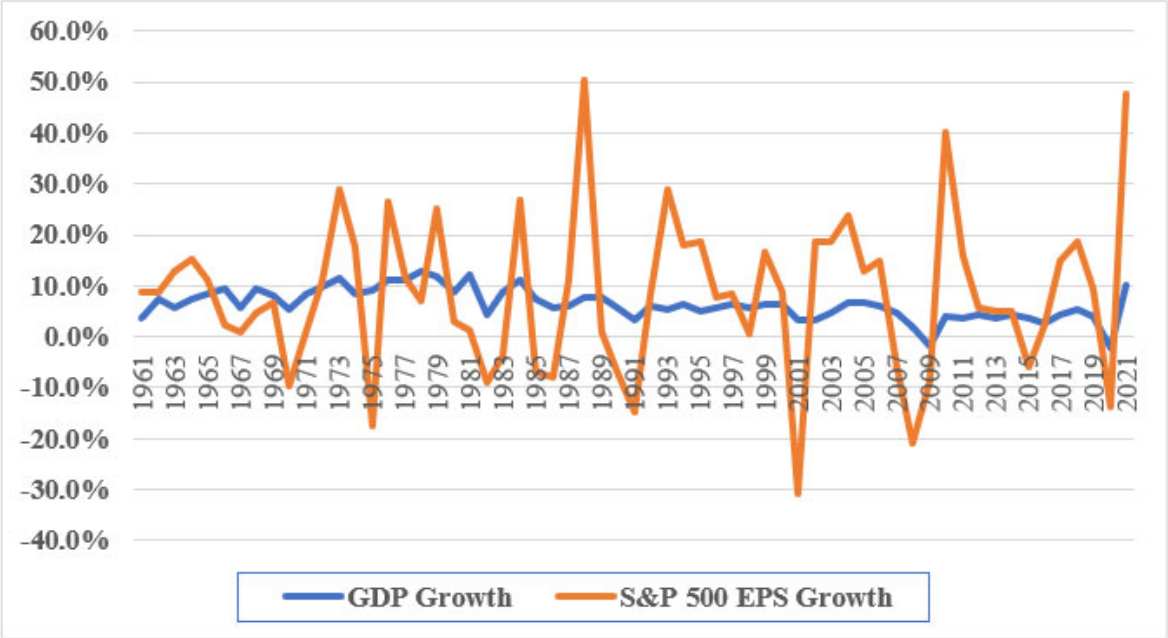
[52] Timing conventions such as years and quarters are needed for measurement and benchmarking but are somewhat arbitrary. In reality, economic growth and profit accrual occur on continuous bases. A 2014 study evaluated the timing relationship between corporate profits and nominal GDP growth. The authors 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*, 57 J. of Accounting and Economics 76–88 (2014).

Figure 13
Average Annual Growth Rates
GDP and S&P 500 EPS
1960-2021



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

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

GDP Constrains Corporate Profits: In a *Fortune* magazine article, Milton Friedman, 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."[53] In that same article, Friedman also noted that profits must move back down to their traditional share of GDP. In Table 13, I show that the aggregate net income levels for the S&P 500

[53] 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/.

companies, using 2021 figures, represent 6.22 percent of nominal GDP.

Table 13
S&P 500 Aggregate Net Income as a Percent of GDP

	2021 Value ($B)
Aggregate Net Income for S&P 500	$1,430.79
2021 Nominal U.S. GDP	$22,997.50
Net Income/GDP (%)	6.22%

Data Sources: 2021 Net Income for S&P 500 companies – *Value Line* (March 3, 2022).
2021 Nominal GDP – Moody's - https://www.economy.com/united-states/nominal-gross-domestic-product.

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, and the cut in corporate tax rates 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.[54] 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

[54] *See* the following studies: Burt White and Jeff Buchbinder, *The S&P and GDP are not the Same Thing*, LPL Fin. (Nov. 4, 2014, 11:31 AM), 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. 19, 2018, 1:04 PM), 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, 1:26 PM), http://fortune.com/2017/07/27/profits-economic-growth/.

profits (15 percent) than of GDP (23 percent); (c) corporate profits are more international-trade driven, while exports minus imports tend to drag on GDP; and (d) S&P 500 EPS is affected not just by corporate profits but also by share buybacks on the positive side (fewer shares boost EPS), and by share dilution on the negative side (new shares dilute EPS). While these differences may seem significant, it must be remembered that the Income Approach to measure GDP includes corporate profits (in addition to employee compensation and taxes on production and imports) and therefore effectively accounts for the first three factors.[55]

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 evidence that Bulkley's S&P 500 EPS growth rate of 11.31 percent is not realistic.

A. Beyond my previous discussion, I have performed the following analysis of S&P 500 EPS and GDP growth in Table 14. Specifically, I started with the 2021 aggregate net income for the S&P 500 companies and 2021 nominal GDP for the U.S. As shown in Table 14, the aggregate profit for the S&P 500 companies represented 6.22 percent of nominal GDP in 2021. In Table 14, I then projected the aggregate net income level for the S&P 500 companies and GDP as of the year 2050. For the growth rate for the S&P 500 companies, I used Bulkley's average projected S&P 500 EPS growth rate of 12.52 percent. As a growth rate for nominal GDP, I used the average of the long-term projected

[55] 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.

GDP growth rates from SFF, CBO, SSA, and EIA (4.7 percent, 4.0 percent, 4.2 percent, and 4.5 percent, respectively), which is 4.35 percent. The projected 2050 level for the aggregate net income level for the S&P 500 companies is $35.61 trillion. Over the same period, GDP is expected to grow to $82.50 trillion. As such, if the aggregate net income for the S&P 500 grows in accordance with the growth rate used by Bulkley, 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 6.22 percent of GDP in 2021 to 43.17 percent of GDP in 2050. It is totally unrealistic for the net income of the S&P 500 to become such a large component of GDP.

Table 14
Projected S&P 500 Earnings and Nominal GDP
2021-2050
S&P 500 Aggregate Net Income as a Percent of GDP

	2021 Value ($B)	Growth Rate	No. of Years	2050 Value ($B)
Aggregate Net Income for S&P 500	$1,430.79	11.31%	30	$ 35,612.46
2021 Nominal U.S. GDP	$22,997.50	4.35%	30	$ 82,500.06
Net Income/GDP (%)	6.22%			43.17%

Data Sources: 2021 Aggregate Net Income for S&P 500 companies – *Value Line* (Mar. 3, 2022). 2021 Nominal GDP – Moody's - https://www.economy.com/united-states/nominal-gross-domestic-product. S&P 500 EPS Growth Rate - Bulkley's average projected S&P 500 EPS growth rate of 11.31 percent.

Nominal GDP Growth Rate – The average of the long-term projected GDP growth rates from SFF, CBO, SSA, and EIA (4.7 percent, 4.0 percent, 4.2 percent, and 4.5 percent).

Q. Please provide a summary assessment of 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,

Warren Buffet made the following observation:[56]

> 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%.

In sum, Bulkley's average long-term S&P 500 EPS growth rate of 11.31 percent is grossly overstated and has little (if any) basis in economic reality. In the end, the 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 five percent, due to the big gains in the technology sector. But Siegel 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."[57]

G. Alternative Risk Premium Approach

Q. Please review Bulkley's alternative risk premium.

A. On pages 52–56 of testimony and in Exhibit AEB-8, Bulkley estimates an equity cost rate using a risk premium model. Using the quarterly authorized ROEs for electric utility and gas distribution companies from Q1 1992 until Q4 2021, Bulkley develops an equity cost rate by regressing the authorized returns on equity for electric utility and gas distribution companies on the 30-year Treasury Yield. Bulkley then adds the risk premium established

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

[57] Shaun Tully, *Corporate Profits Are Soaring. Here's Why It Can't Last*, Fortune (Dec. 7, 2017, 3:30 AM), http://fortune.com/2017/12/07/corporate-earnings-profit-boom-end/.

by regressing the authorized returns on equity to each of her three different 30-year Treasury yields: (a) a current yield of 1.97 percent, (b) a near-term projected yield of 2.46 percent, and (c) a long-term projected yield of 3.40 percent. Bulkley's risk premium results are provided in page 2 of Exhibit JRW-11. Bulkley reports risk premium equity cost rates ranging from 9.37 percent to 10.13 percent.

Q. What are the errors in Bulkley's Bond Yield Plus Risk Premium (BYRP) analysis?

A. There are several problems with this approach for calculating the risk premium. First, the 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 to use projected Treasury yields in the analysis rather than historic ones.

Second, Bulkley's risk premium approach is a gauge of *commission* behavior and not *investor* behavior. Capital costs are determined in the marketplace through the financial decisions of investors and are reflected in such fundamental factors as dividend yields, expected growth rates, interest rates, and investors' assessment of the risk and expected return of different investments. Regulatory commissions evaluate capital market data in setting authorized ROEs, but also consider other utility- and rate case-specific information in setting ROEs. As such, Bulkley'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.

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

Q. How do Bulkley's risk premium results compare to the current authorized ROEs for electric utilities?

A. Bulkley reports results as high as 10.13 percent from her risk premium model. As noted above, the current authorized ROEs for electric utility and gas distribution companies in 2022 are between 9.30 and 9.40 percent.

H. Expected Earnings Approach

Q. Please discuss Bulkley's expected earnings analysis.

A. On pages 56–58 of testimony and in Exhibit AEB-9, Bulkley estimates and equity cost rates of 11.19 percent using an approach Bulkley calls the Expected Earnings approach. Bulkley's 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 Bulkley's Expected Earnings approach.

A. There are several significant issues with this so-called Expected Earnings approach. Accordingly, I strongly suggest that the Commission ignore this approach in setting an ROE for PSE. These issues include:

The Expected Earnings Approach Does Not Measure the Market Cost of Equity Capital: First, 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 two percent 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."[58] Therefore, 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.[59]

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.

The Proxies' ROEs Reflect Earnings on Business Activities that are not Representative of PSE'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 gas business. These include earnings from unregulated businesses, such as competitive retail commodity sales, 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. Bulkley's Expected Earnings approach uses *Value Line*'s adjusted forecast for proxy

[58] Roger Morin, *New Regulatory Finance* at 293 (2006).
[59] *Id.*

utility ROEs. Hence, the ROE specified by the Expected Earnings approach is 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, a study by Szakmary, Conover, and Lancaster (SCL) evaluated the accuracy of *Value Line*'s three-to-five-year EPS growth rate forecasts using companies in the Dow Jones Industrial Average over a 30-year time period and found these forecasted EPS growth rates to be significantly higher than the EPS growth rates that these companies subsequently achieved.[60]

SCL studied the predicted versus the projected stock returns, sales, profit margins, and earnings per share made by *Value Line* over the 1969 to 2001 time-period. *Value Line* projects variables from a three-year base period (e.g., 2012–2014) to a future three-year projected period (e.g., 2016–18). 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 percent for the Dow Jones' stocks *Value Line*'s forecasts was nearly double the realized annual stock return.[61] 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 achieved levels, but not statistically significant. SCL concluded that the overly

[60] Andrew C. Szakmary, C. Mitchell Conover, & Carol Lancaster. *An Examination of Value Line's Long-Term Projections*, J. of Banking & Fin. 820–833 (2008).
[61] *Id.* at 825.

optimistic projected annual stock returns were attributable to *Value Line*'s upwardly biased forecasts of earnings per share and profit margins.[62]

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 Expected Earnings approach proposed by Bulkley is based on an upwardly biased measure forecasted by one analyst.

VIII. SUMMARY AND CONCLUSIONS

Q. Please summarize your testimony on the appropriate cost of capital for PSE.

A. I have reviewed the Company's proposed cost of capital for PSE. With respect to capital structure, the Company has proposed increasing its common equity ratio to 50.0 percent over the three years of its MYRP. I have proposed a capital structure for the MYRP with a common equity ratio of 48.50 percent. This common equity ratio is: (1) consistent with the Company's historic capitalization, which PSE has used to finance its operations and maintained its credit ratings; (2) consistent with the Commission's past policies on utility capitalizations; and (3) more reflective of the capital structures of proxy groups of electric, combination electric and gas, and gas distribution companies. I have adopted PSE's proposed short-term and long-term debt cost rates, but have averaged the rates proposed over the three-year plan period.

I have applied the Discounted Cash Flow Model (DCF) and the Capital Asset

[62] *Id.*

Pricing Model (CAPM) to a proxy group of publicly-held electric utility companies (Electric Proxy Group), the group developed by Bulkley (Bulkley Proxy Group), and a group of gas distribution companies (Gas Proxy Group). My analysis indicates a common equity cost rate in the range of 7.40 percent to 8.90 percent. Since I rely primarily on the DCF model, and given the 2022 increase in interest rates, I am employing an equity cost rate of 8.80 percent for the Company. With my proposed capital structure and senior capital cost rates for PSE, I am recommending an overall fair rate of return or cost of capital of 6.83 percent for PSE. I summarize this in Table 2 and Exhibit JRW-3.

Q. Does this conclude your testimony?

A. Yes.