Before the

State Corporation Commission of Kansas

IN THE MATTER OF THE APPLICATION	**)**	
OF KANSAS GAS SERVICE, A DIVISION	**)**	
OF ONE GAS, INC. FOR ADJUSTMENT OF	**)**	**Docket No. 24-KGSG-610-RTS**
ITS NATURAL GAS RATES IN THE STATE	**)**	
OF KANSAS	**)**	

Kansas Gas Service

Docket No. 24-KGSG-610-RTS

Testimony and Exhibits of

J. Randall Woolridge, Ph. D.
For the Citizens' Utility Ratepayer Board

July 1, 2024

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

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

I. SUBJECT OF TESTIMONY AND SUMMARY OF RECOMMENDATIONS

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

A. I have been asked by the Citizens' Utility Ratepayer Board ("CURB") to provide an opinion as to the overall fair rate of return or cost of capital for the Kansas jurisdictional gas utility operations of Kansas Gas Service ("KGS" or "the Company") and to evaluate the company'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.

[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.

- Third, I discuss the selection of proxy groups for estimating the cost of equity capital for the Company.
- Fourth, I discuss the Company's recommended capital structure and debt cost rates.
- 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 the Company's rate of return analysis and testimony.

A. Overview

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

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

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

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

States Supreme Court established the guiding principles for determining an appropriate level of profitability for regulated public utilities in two cases: (1) *Hope* and (2) *Bluefield*.[2] In those cases, the Court recognized that the fair rate of return on equity should be: (1) comparable to returns investors expect to earn on other investments of similar risk; (2) sufficient to assure confidence in the company's financial integrity; and (3) adequate to maintain and support the company's credit and to attract capital.[3]

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

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

A. KGS has proposed a capital structure consisting of 40.42% long-term debt and 59.58% common equity. The Company has proposed a long-term debt cost rate of 4.399%. The

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

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

Company's witness, Dr. Bruce M. Fairchild, has recommended a common equity cost rate of 10.25% for the Company. As shown in Table 1, KGS has proposed an overall rate of return of 7.88.

Table 1
KGS' Rate of Return Recommendation

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	40.42%	4.40%	1.78%
Common Equity	59.58%	10.25%	6.11%
Total	100.00%		7.88%

In my recommendation, I have adjusted the Company's proposed capital structure, but I have still employed a capital structure that includes a higher common equity ratio and lower financial risk than the companies in the Gas Proxy Group. I have applied the Discounted Cash Flow Model ("DCF") and the Capital Asset Pricing Model ("CAPM") to Dr. Fairchild's Gas Proxy Group as well as a proxy group of publicly-held, combination electric and gas companies ("Combination Proxy Group"). Dr. Fairchild's Gas Proxy Group includes seven gas companies, and I believe that a proxy group of only seven companies is a small proxy group which could produce variable results. My analysis indicates that an equity cost rate in the range of 8.50% to 9.65% is appropriate for the Company. Given these results as well as the fact that I rely primarily on the DCF model, I conclude that a ROE in the range of 9.00% to 9.50% is appropriate for a gas company at this time. I am employing the midpoint of this range, 9.25%, as a ROE for KGS. This seems especially fair since: (1) the Company's investment risk is slightly below the proxy groups; and (2) I have employed a capital structure that has more common equity and less financial risk than the average of the

proxy groups. With my proposed capital structure and debt cost rates, I am recommending an overall fair rate of return or cost of capital of 6.94% for KGS. This recommendation is provided in Table 2 and Exhibit JRW-2.

Table 2
CURB's Rate of Return Recommendation

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	47.55%	4.40%	2.09%
Common Equity	52.45%	9.25%	4.85%
Total	100.00%		6.94%

B. Primary Rate of Return Issues in this Case

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

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

1. **KGS' Assessment of Capital Market Conditions**: Dr. Fairchild's analyses, ROE results, and recommendations suggest that higher interest rates and capital costs are on the horizon. However, despite the increase in inflation and interest rates over the past two years, several factors suggest the equity cost rate for utilities has not risen significantly. To support this contention, I show that: (1) despite the higher inflation of the past two years, long-term inflation expectations are about 2.25%; (2) the yield curve is currently inverted – which suggests that investors expect yields to decline and that a recession in the next year is very likely, which would also put downward pressure on interest rates;

and (3) while authorized ROEs for utilities hit all-time lows in 2020 and 2021, these ROEs did not decline nearly as much as interest rates during those years. Hence, now that interest rates have increased, authorized ROEs have not increased at the same magnitude.

2. **Capital Structure** – The Company has proposed a capital structure with a common equity ratio of 59.58%. This includes a higher common equity ratio and lower financial risk than the average common equity ratio of the companies in the Gas Proxy Group. Consequently, I have proposed a capital structure with a common equity ratio of 55.00% which was the average authorized common equity ratio for gas distribution companies in 2023.

3. **Gas Proxy Group** – Dr. Fairchild's Gas Proxy Group consists of seven gas companies, and I do not believe that a proxy group of only seven companies can produce reliable results. As a result, I have also employed the Combination Proxy Group. This is a group of eleven combination electric and gas companies that receive at least 20% of their operating revenues from regulated gas operations.

4. **KGS' Investment Risk is Slightly Below the Average of the Gas and Combination Proxy Groups** – KGS' S&P and Moody's issuer credit ratings are A- and A3. The Gas Proxy Group has average S&P and Moody's issuer credit ratings of A- and A3/BBB+ and the Combination Proxy Group has average S&P and Moody's issuer credit ratings of BBB+ and Baa2. These

suggest that KGS' investment risk is slightly below the average of the two groups.

5. **DCF Approach** – Dr. Fairchild and I both employ the traditional constant-growth DCF model. Dr. Fairchild evaluates a number of historical and forecasted growth rates for his proxy group, and, after selectively eliminating results, he concludes that the appropriate range of growth rates is 5.50% to 6.50% which produce DCF ROEs of 9.50% to 10.50%. There are two major errors in Dr. Fairchild's DCF analysis: (1) his DCF growth rate range of 5.50% to 6.50% is not substantiated by the growth rate parameters he has reviewed; and (2) he has failed to recognize that the growth rate forecasts of Wall Street analysts and *Value Line* are overly optimistic and upwardly biased.

To develop the DCF growth rate I use in my analysis I reviewed thirteen growth-rate measures, including historical and projected growth-rate measures, and have evaluated growth in dividends, book value, and earnings per share.

6. **CAPM Approach**: The CAPM approach requires an estimate of the risk-free interest rate, the beta, and the market or equity risk premium. Dr. Fairchild estimates both a historical and projected CAPM, and reports equity cost rate estimates of 11.39% and 11.84% for the Company. In his historical CAPM, he uses a risk-free rate of 4.26%, betas from *Value Line*, a market risk premium of 7.17%, and a size premium of 0.93%. In his projected CAPM, he uses a projected risk-free rate of 4.26%, betas from *Value Line*, a market risk premium of 7.69%, and a size premium of 0.93%.

The material flaws in both Dr. Fairchild's historical and projected CAPM are his market-risk and size premiums. His historical CAPM is based on historical stock and bond-income returns. With respect to the historical market-risk premium, I highlight that there are a number of empirical issues with using historical stock and bond returns to estimate an expected market risk premium.

With respect to the projected market risk premium, Dr. Fairchild projected an expected annual stock market by applying the DCF model to the S&P 500, and then subtracted the risk-free interest rate. The major issue here is that Dr. Fairchild's projected stock-market return is based on highly unrealistic assumptions about future earnings and economic growth and the resulting stock returns.

First, my analysis shows that Dr. Fairchild's expected stock market return of 11.95% is almost double the average annual stock return (6.80%) that investment firms tell investors to expect over the next ten years.

Second, as I demonstrate later in my testimony, the EPS growth-rate projection (10.10%) Dr. Fairchild used for the S&P 500 and the resulting expected market return (11.95%) and market-risk premium (7.69%) includes unrealistic assumptions regarding future economic and earnings growth and stock returns. On this point, Dr. Fairchild makes the assumption that the companies in the S&P 500 can grow their earnings, on average, at 10.10%, which is more than double the long-term projected growth rate of the economy

as measured by GDP.

With respect to the size adjustment, I highlight a study by Professor Suzie Wong who found that a size adjustment is not appropriate for public utilities. Professor Wong attributes the lack of a size premium for public utilities to the differences between utilities and industrial/retail firms in terms of regulation, government oversight, performance review, accounting standards, and information disclosure. I also cite the research of NYU valuation guru Aswath Damodaran who posits that the size premium has disappeared in the markets.

As I highlight in my testimony, there are three commonly used approaches for estimating a market-risk premium—historic returns, surveys, and expected return models. I have used a market-risk premium of 5.00%, which: (1) factors in all three approaches to estimate a market premium; and (2) employs the results of many studies of the market-risk premium. As I note, the 5.00% figure reflects the market-risk premiums: (1) determined in recent academic studies by leading finance scholars; (2) employed by leading investment banks and management consulting firms; and (3) found in surveys of companies, financial forecasters, financial analysts, and corporate CFOs.

4. **Risk Premium Approach**: The equity cost rate using the risk-premium model is the sum of the base interest-rate yield plus a risk premium. Dr. Fairchild computes this risk premium using a regression of the historical relationship between the yields on long-term utility bond yields and authorized ROEs for

gas distribution companies and estimate a ROE by adding this risk premium to the projected risk-free rate. I discuss several issues with this approach in more depth later, but the primary problems with this approach are: (1) this particular risk premium approach is a gauge of *commission* behavior rather than *investor* behavior; (2) the risk premium in this approach is inflated as a measure of investors' required risk premium, since gas distribution companies have been selling at market-to-book ratios in excess of 1.0 which indicates the gas companies are earning ROEs that are above their cost of common equity capital; and (3) the ROE is dependent on the authorized ROEs from state utility commissions, and the Werner and Jarvis study (2022), which is discussed below, demonstrated that authorized ROEs over the past four decades have overstated the actual cost of equity capital because they have not declined in line with capital costs.

5. **<u>Comparable Earnings Approach</u> –** Dr. Fairchild also estimates an equity cost rate for the Company using the Comparable Earnings approach. In this approach, he computes the equity cost rate as the average of *Value Line*'s projected ROE for the companies in his proxy group. He reports an equity cost rate of 9.30% in 2024 and 2025 and 10.1% for 2027–2029.

There are errors with his Comparable Earnings methodology: (1) it does not measure the market cost of equity capital; (2) it is independent of most cost of capital indicators; and (3) it has several other empirical defects. In addition, a study by Szakmary, Conover, and Lancaster evaluated the accuracy of *Value*

Line's projected stock returns, sales, profit margins, and earnings per share over the 1969 to 2001 time period. Importantly, Szakmary, Conover, and Lancaster found that *Value Line*'s forecasts of earnings per share and profit margins were "strikingly overoptimistic."[4]

II. CAPITAL MARKET CONDITIONS AND AUTHORIZED ROES

A. Capital Market Conditions

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

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

The average dividend yields for gas companies are shown on page 2 of Exhibit JRW-2. For the gas companies, yields have declined from the 4.0% range a decade ago to 2.75% in 2018, but have increased since that time and are now in the 3.50% range. The average earned ROE and market-to-book ratio for the gas companies are shown on page 3 of Exhibit JRW-2. The average ROE for gas companies was 10.0% a decade ago but declined to around 8.0% in 2019 and then increased to the 9%-10%

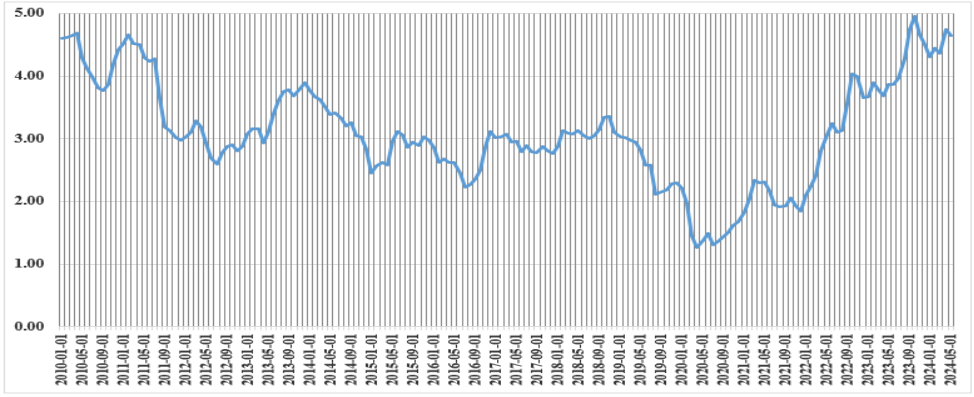
[4] Szakmary, A., Conover, C., & Lancaster, C., *An Examination of* Value Line*'s Long-Term Projections*, J. BANKING & FIN., May 2008, at 820–33.

range in 2021. These earned returns declined to the 8.50% range in 2022–2023. Over the past decade, the gas companies' average market-to-book ratio increased from 1.40X, peaked at 2.25X in 2019, but has declined to 1.50X range in 2021–2023.

Q. PLEASE REVIEW INTEREST RATE MOVEMENTS IN RECENT YEARS.

A. Figure 1, below, shows 30-year Treasury yields over the past 15 years (2010 to 2024). These yields were in the 3.0% range at the end of 2018. They declined to the 2.25% range in 2019 due primarily to slow economic growth and low inflation. In 2020, with the advent of the COVID-19 pandemic in February of that year, 30-year Treasury yields declined to record low levels, dropping about 100 basis points to settle in the 1.25% range. They began their recovery in the Summer of 2020 and increased to the 2.00% - 2.50% range in 2021. They increased significantly in 2022 and 2023 with the improving economy and higher inflation. In 2023, these yields increased from the 3.50% range and peaked at about 5.00% in the fourth quarter. In 2024, these yields have since deceased and currently are in the 4.50% range.

Figure 1
30-Year Treasury Yields

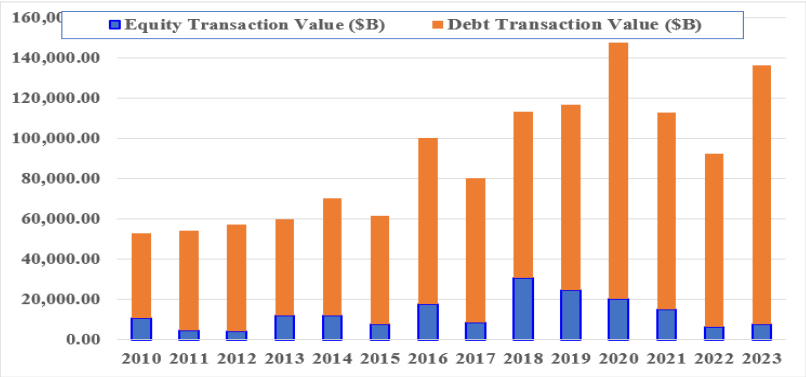


Data Source: https://fred.stlouisfed.org/series/DGS30.

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

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

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



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

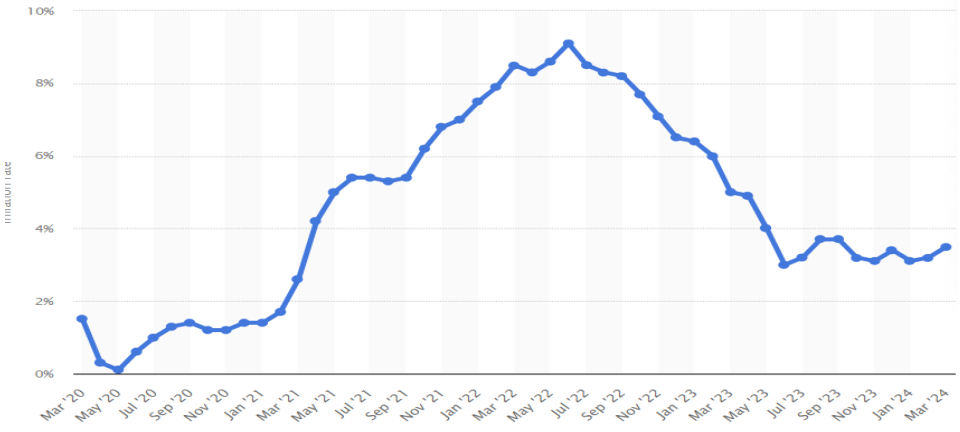
Q. PLEASE DISCUSS THE INCREASE IN INTEREST RATES SINCE THE BEGINNING OF 2022.

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

recovery in the economy puts upward pressure on interest rates by increasing the demand for capital.

In addition, as reported extensively in the financial press, inflation picked up significantly in 2022, putting additional pressure on interest rates. Reported year-over-year inflation has been as high as 9.20% in 2022. Year-over-year inflation declined since that time and is at 3.30% as of May 2024. The high inflation reported in the past two years primarily reflects three factors: (1) the recovering and growing U.S. economy; (2) the production shutdowns during the pandemic, which led to supply chain shortages as the global economy has recovered; and (3) the war in Ukraine, which has led to higher energy and gasoline prices worldwide.

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



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

In response to the higher inflation, in 2022 the Federal Reserve increased the discount rate by 25 basis points in March; 50 basis points in May; and 75 basis points in June, July, September, and November; 50 basis points in December. For 2023, the discount rate increased by 25 basis points in February, March, May, and July. Since the last rate

increase, the Federal Reserve has held the discount rate steady while monitoring economic activity, with the expectation that once inflation falls to the target 2.0% range, the Federal Reserve will begin cutting the discount rate.

Investors' inflation expectations can be seen by looking at the difference between yields on ordinary Treasuries and the yields on inflation-protected Treasuries, known as TIPS. Figure 4 shows the expected inflation rate over the next five, ten, and thirty years. One can see that the expected inflation rate has declined since 2022 and is now at an expected inflation rate of 2.25% over the next five years. The expected inflation rates over the next ten and thirty years are also in the 2.25% range. The bottom line is that the expected long-term inflation rate is around 2.25%.

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

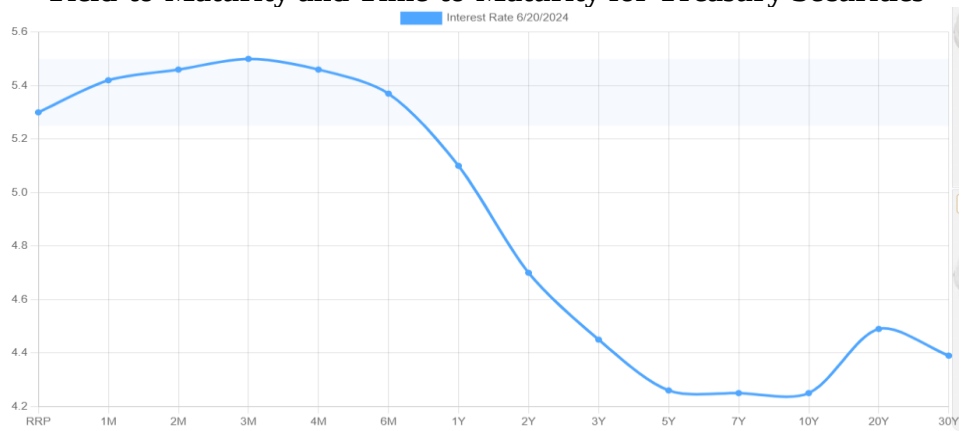
Data source: https://fred.stlouisfed.org/.

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

A. No. As discussed above, the current inflationary environment has pushed up interest rates over the past year. Also, as noted above, the Federal Reserve has responded with a series of discount rate increases, intended to slow the economy and cool down inflation, which would lower interest rates. Figure 5 shows the yield curve, which plots

the yield-to-maturity and time-to-maturity for Treasury securities. The yield curve is usually upward sloping because investors require higher returns to commit capital for longer periods of time. Currently, the yield curve is said to be "inverted," which means that the yields on shorter-term maturity securities are higher than the yields on longer-term securities. This means that investors do not expect interest rates to remain where they are and expect them to decline.

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



Source: https://www.ustreasuryyieldcurve.com/ - 6-20-24.

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

years, a recession followed. In addition, one can see that interest rates, as indicated by the 30-year Treasury yield in Figure 6, decline during recessions. Since the yield curve is currently inverted, a recession and lower interest rates are likely to follow.

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

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

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

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

Utilities took advantage of the low yields in 2020 and 2021 to raise record amounts of capital, but the big economic issue has been reported inflation and interest rates. However, while year-over-year inflation has remained above the 2.0% target, the yields on TIPS suggest that longer-term inflationary expectations are still about 2.25%. In addition, as I noted above, with an inverted yield curve, the prospect of a recession is likely, which would lead to lower interest rates.

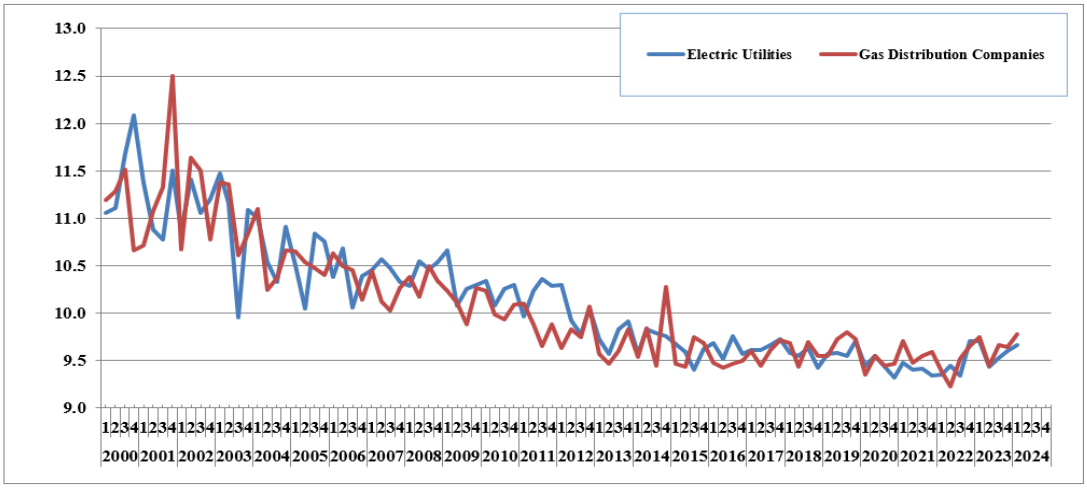
B. Authorized ROEs

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

A. In 2020 and 2021, authorized ROEs for utilities hit an all-time low as the low interest rate and capital cost environment put downward pressure on authorized ROEs.[5] Figure 7 reflects the authorized ROEs for electric utility and gas distribution companies from 2000–2024. The authorized ROEs have trended down with interest rates and capital costs in the past fifteen years. The average ROE authorized for gas distribution companies was 9.47% in 2020, 9.56% in 2021, 9.53% in 2022, 9.64% in 2023, and 9.78% in the first quarter of 2024.

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

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



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

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

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

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

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

A. Not necessarily. As noted above, authorized ROEs for utilities reached record low levels in 2020 and 2021 due to the record low interest rates and capital costs. However,

authorized utility ROEs never declined to the same extent that interest rates declined in these two years. Table 4 shows the average annual 30-year Treasury yields and authorized ROEs for gas distribution companies from 2018 to 2023. In Table 4, I have averaged the 2018–2019 (pre-COVID period) figures and the 2020–2021 (COVID period) figures for the Treasury yields and ROEs, and then compared the pre-COVID and COVID period ROEs and yields to those in 2022–2023 (post-COVID period). A key observation from Table 4 is that authorized ROEs for gas distribution companies, despite hitting record lows in 2020–2021, did not decline nearly as much as interest rates. The daily 30-year Treasury yield averaged 2.85% in 2018 and 2019, versus 1.81% in 2020 and 2021, a decrease of 104 basis points. However, the authorized ROE for gas distribution companies averaged 9.65% in 2018 and 2019, respectively, and declined to an average of 9.51% in 2020 and 2021, respectively, a decline of only 14 basis points. In 2022, the average daily 30-year Treasury yield increased by 105 basis points to 3.11%, while authorized ROEs for gas distribution companies actually decreased by -0.03% to 9.53% from its 2021 average of 9.56%. Likewise, the average daily 30-year Treasury yield increased by 92 basis points to 4.03% in 2023, while authorized ROEs for gas distribution companies increased by 0.11% to 9.64%.

Table 4
Average Annual 30-Year Treasury Yields and Authorized ROEs
for Gas Distribution Companies
2018–2023

	2018 Average	2019 Average	2018-19 Average	2020 Average	2021 Average	2020-21 Average	2020-21 Avg. Minus 2018-19 Avg.	2022 Average	2022 Avg. Minus 2021 Avg.	2023 Average	2023 Avg. Minus 2022 Avg.
30-Year Treasury Yield	3.11%	2.58%	2.85%	1.56%	2.06%	1.81%	-1.04%	3.11%	1.05%	4.03%	0.92%
Average Gas ROE	9.59%	9.71%	9.65%	9.46%	9.56%	9.51%	-0.14%	9.53%	-0.03%	9.64%	0.11%

Q. PLEASE REVIEW THE AUTHORIZED ROES FOR KANSAS.

A. Table 5 shows the electric utilities and gas distribution companies in Kansas from 2010–2024. These authorized ROEs ranged between 9.10%–9.30% for the five years prior to the pandemic. Since that time, rate cases in Kansas were settlements with no specified ROE or capital structure.

Table 5
Kansas Authorized ROEs
2010–2024

Company	TKR	Docket	Service	Type	Date	Decision	Rate Increase	ROE	CE Ratio
Evergy Kansas Central Inc.	EVRG	09-WSEE-925-RTS (W	Electric	Vertically Integrated	1/27/2010	Settled	8.6	10.40	50.13
Evergy Kansas South	EVRG	9-WSEE-925-RTS (KG	Electric	Vertically Integrated	1/27/2010	Settled	8.6	10.40	50.13
Evergy Metro Inc	EVRG	D-10-KCPE-415-RTS	Electric	Vertically Integrated	11/22/2010	Fully Litigated	21.8	10.00	49.66
Evergy Metro Inc	EVRG	D-12-KCPE-764-RTS	Electric	Vertically Integrated	12/13/2012	Fully Litigated	33.2	9.50	51.82
Evergy Kansas Central Inc.	EVRG	D-13-WSEE-629-RTS	Electric	Vertically Integrated	11/21/2013	Settled	30.7	10.00	52.63
Atmos Energy Corp.	ATO	D-14-ATMG-320-RTS	Gas	Distribution	9/4/2014	Settled	4.3	9.10	53.00
Evergy Metro Inc	EVRG	D-15-KCPE-116-RTS	Electric	Vertically Integrated	9/10/2015	Fully Litigated	40.1	9.30	50.48
Evergy Kansas Central Inc.	EVRG	D-18-WSEE-328-RTS	Electric	Vertically Integrated	9/27/2018	Settled	(50.3)	9.30	51.24
Evergy Metro Inc	EVRG	D-18-KCPE-480-RTS	Electric	Vertically Integrated	12/13/2018	Settled	(3.9)	9.30	49.09
Atmos Energy Corp.	ATO	D-19-ATMG-525-RTS	Gas	Distribution	2/24/2020	Fully Litigated	3.1	9.10	56.32
Black Hills Kansas Gas	BKH	D-21-BHCG-418-RTS	atural Ga	Distribution	12/30/2021	Settled	6.6	NA	NA
Empire District Electric	AQN	D-21-EPDE-444-RTS	Electric	Vertically Integrated	5/26/2022	Settled	(0.6)	NA	NA
Atmos Energy Corp.	ATO	D-23-ATMG-359-RTS	atural Ga	Distribution	5/9/2023	Settled	5.7	NA	NA
Evergy Kansas Central	EVRG	EKCE-775-RTS (EKC/	Electric	Vertically Integrated	11/21/2023	Settled	148.8	NA	NA
Evergy Metro Inc	EVRG	23-EKCE-775-RTS (E	Electric	Vertically Integrated	11/21/2023	Settled	(22.0)	NA	NA

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

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

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

As shown on page 3 of Exhibit JRW-2, gas distribution companies have been earning ROEs in the range of 8.0% to 10.0% in recent years. With these ROEs, gas distribution companies such as those in the proxy group have strong investment-grade credit ratings, their stocks have been selling well over book value, and they have been raising abundant amounts of capital. While my recommendation is slightly below the average authorized ROEs for gas distribution companies, the Werner and Jarvis (2022) study, which is discussed below, concluded that, over the past four decades, authorized ROEs have not declined in line with capital costs over time and therefore past authorized ROEs have overstated the actual cost of equity capital. Hence, the Commission should not be concerned that my recommended ROE is below other authorized ROEs. Therefore, I believe that my recommendation meets the criteria established in *Hope* and *Bluefield*.

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

A. The *Wall Street Journal* article, entitled "Utilities Have a High-Wire Act Ahead," discussed the issues utilities face today to meet the needs of their primary stakeholders — customers and investors.[6] [7] The article also highlights current utility rate issues in

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

[7] Most of this discussion deals with electric utilities, which dominate the utility industry. However, the

the context of a recent study on rate of return regulation. Werner and Jarvis (2022) evaluated the authorized ROEs in 3,500 electric and gas rate case decisions in the U.S. from 1980–2021. They compared the allowed rate of return on equity to a number of capital cost benchmarks (government and corporate bonds, CAPM equity cost rate estimates, and US. authorized ROEs) and focused on three questions: (1) To what extent are utilities being allowed to earn excess returns on equity by their regulators? (2) How has this return on equity affected utilities' capital investment decisions? and (3) What impact has this had on the costs paid by consumers?[8]

The authors reported the following empirical results:

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

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

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

(4) An extra 1.0% of allowed return on equity causes a utility's capital rate base to expand by an extra 5% on average. This supports the Averch-Johnson effect that utilities have the incentive to overinvest in capital projects if they are earning an outsized return on those investments;

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

discussion is still relevant here because utility ratemaking is not done in a vacuum, and in most states commissions sets rates for all public utilities – electric, gas, and water.

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

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

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

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

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

III. PROXY GROUP SELECTION

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

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

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

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

A. In Panel A of page 1 of Exhibit JRW-3, I list the summary financial statistics for the Gas Proxy Group. The mean operating revenues and net plant among members of the Gas Proxy Group are $2.56 billion and $9.50 billion, respectively. On average, the group receives 77% of revenues from regulated gas operations; has average issuer credit ratings from S&P and Moody's of A- and A3/Baa1; has an average common equity ratio of 43.1%; and an average earned return on common equity of 8.57%.

Q. PLEASE DESCRIBE YOUR COMBINATION PROXY GROUP.

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

(1) Receives at least 20% of revenues from regulated gas distribution operations as reported in its SEC Form 10-K Report;

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

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

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

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

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

The Combination Proxy Group includes eleven companies. Panel B of Page 1 of Exhibit JRW-3 provides summary financial statistics for the proxy group, showing

mean operating revenues and net plant among members of the Combination Proxy Group of $7.99 billion and $27.66 billion respectively. On average, the group receives 59% of its revenues from regulated electric operations and 36% from regulated gas operations; has a BBB+ bond rating from S&P and a Baa2 rating from Moody's; has a current average common equity ratio of 43.3%; and an average earned return on common equity of 10.51%.

Q. WHAT ROLE DO BOND RATINGS PLAY IN THE INVESTMENT COMMUNITY?

A. I believe that bond ratings provide a good independent assessment of the investment risk of a company.

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

A. KGS' S&P and Moody's issuer credit ratings are A- and A3. The Gas Proxy Group has average S&P and Moody's issuer credit ratings of A- and A3/BBB+ and the Combination Proxy Group has average S&P and Moody's issuer credit ratings of BBB+ and Baa2. Since KGS' Moody's issuer credit ratings is marginally better than the averages of the two proxy groups, KGS' investment risk is slightly below the averages of the two proxy groups.

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

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

Strength, Safety, Earnings Predictability, and Stock Price Stability. These risk measures suggest that the two proxy groups are similar in risk. The comparisons of the risk measures for the Gas and Combination Proxy Groups include Beta (0.89 vs. 0.93), Financial Strength (A vs. A) Safety (1.9 vs. 2.2), Earnings Predictability (69 vs. 91), and Stock Price Stability (89 vs. 86). Whereas the Beta, Safety, and Stock Price Stability measures suggest the risk of the gas group is below the combination group, the Earnings Predictability measure indicates the gas group is riskier than the combination group. On balance, I conclude that the *Value Line* risk metrics suggest two groups are similar in risk.

IV. CAPITAL STRUCTURE RATIOS AND DEBT COST RATES

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

A. KGS has proposed a capital structure consisting of 40.42% long-term debt and 59.58% common equity. The Company has proposed a long-term debt cost rate of 4.399%.

Q. HOW DOES THE COMPANY'S PROPOSED CAPITALIZATION COMPARE TO THE CAPITALIZATION OF THE PROXY GROUP?

A. Panel A of Exhibit JRW-3 provides the average capitalization ratios for the companies in the two proxy groups. The average common equity ratios for the Gas and Combination Proxy Groups are 43.9% and 43.3% common equity. These ratios indicate that the companies in the two groups have, on average, much lower common equity ratios than

that proposed by KGS. As such, KGS has proposed a capital structure that has more common equity and less financial risk than the average capital structure of the companies in the proxy groups.

Q. WHAT WAS THE AVERAGE COMMON EQUITY RATIO IN GAS COMPANY RATE CASES IN 2023?

A. The average common equity ratio approved for gas companies by state regulatory commissions in 2023 was 52.45%.[10]

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

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

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

A. Yes. Short-term debt, like long-term debt, has a higher claim on the assets and earnings of the company and requires timely payment of interest and repayment of principal. Thus, in comparing the common equity ratios of the holding companies with KGS'

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

recommendation, it is appropriate to include short-term debt when computing the holding company common equity ratios. Additionally, the financial risk of a company is based on total debt, which includes both short-term and long-term debt.

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

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

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

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

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

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

Q. HOW HAVE UTILITIES TYPICALLY STRUCK THIS BALANCE?

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

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

A. When a regulated gas utility's actual capital structure contains a high equity ratio, the

regulator's options are: (1) to impute a more reasonable capital structure and to reflect the imputed capital structure in revenue requirements; or (2) to recognize the downward impact that an unusually high equity ratio will have on the financial risk of a utility and authorize a lower common equity cost rate than that for the proxy group.

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

A. I am adopting a capital structure with a common equity ratio of 52.45%, which was the average common equity ratio approved by state commissions for gas distribution companies in 2023 My proposed capital structure still has more equity (52.45%) than the average common equity ratio of the gas group as of December 31, 2023 (43.5%).

V. THE COST OF COMMON EQUITY CAPITAL

A. Overview

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

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

consumers and, at the same time, sufficient to meet the operating and capital costs of the utility, *i.e.*, provide an adequate return on capital to attract investors.

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

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

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

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

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

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

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

> it is economically unprofitable and its market value will be less than book value. [11]

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

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

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

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

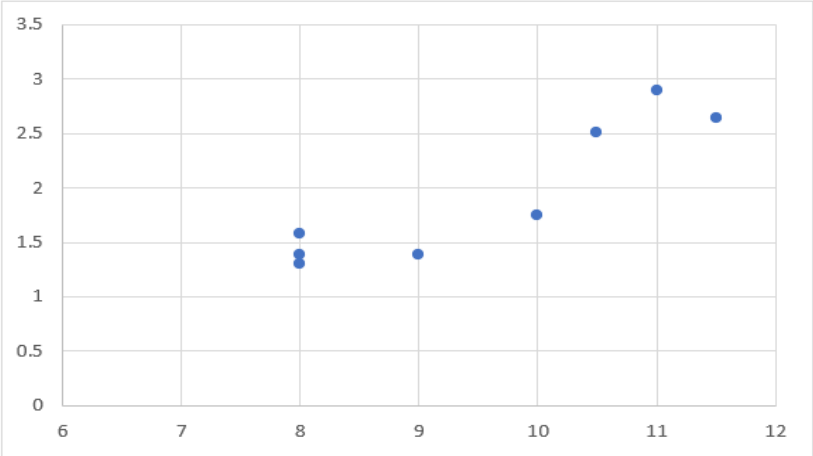
Profitability	*Value*
If ROE > K	*then Market/Book > 1*
If ROE = K	*then Market/Book =1*
If ROE < K	*then Market/Book< 1* [12]

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

[12] Benjamin Esty, "Note on Value Drivers," Harvard Business School, Case No. 9-297-082, April 7, 1997.

To assess the relationship by industry, as suggested above, I performed a regression study between estimated ROE and market-to-book ratios of the companies in the proxy group. The results are presented in Figure 8. The average R-square is 0.83.[13] This demonstrates the strong positive relationship between ROEs and market-to-book ratios for public utilities. Given that the market-to-book ratios have been above 1.0 for a number of years, this also demonstrates that utilities have been earning ROEs above the cost of equity capital for many years.

Figure 8
The Relationship Between Expected ROE and Market-to-Book Ratios
Gas Distribution Companies



R Square = 0.83, N=8.

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

A. The expected or required rate of return on common stock is a function of market-wide as well as company-specific factors. The most important market factor is the time value

[13] 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.

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

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

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

Table 6 provides an assessment of investment risk for 93 industries as measured by beta, which, according to modern capital market theory, is the only relevant measure of investment risk. These betas come from the *Value Line Investment Survey*. *See* Table 5, below. The study shows that the investment risk of utilities is low compared to other industries.[14] The average betas for electric, gas, and water utility companies are 0.90,

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

0.88, and 0.82, respectively.[15] As such, the cost of equity for utilities is the lowest of all industries in the U.S., based on modern capital market theory.

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

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

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

* Industry averages for 92 industries using *Value Line*'s database of 1,700 companies - Updated 1-13-24.

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

Q. WHAT IS THE COST OF COMMON EQUITY CAPITAL?

price movement, such as that of a regulated public utility, is less risky than the market and has a beta less than 1.0.

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

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

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

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

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

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

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

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

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

B. Discounted Cash Flow Approach

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

A. According to the DCF model, the current stock price is equal to the discounted value of all future dividends that investors expect to receive from investment in the firm. As

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

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

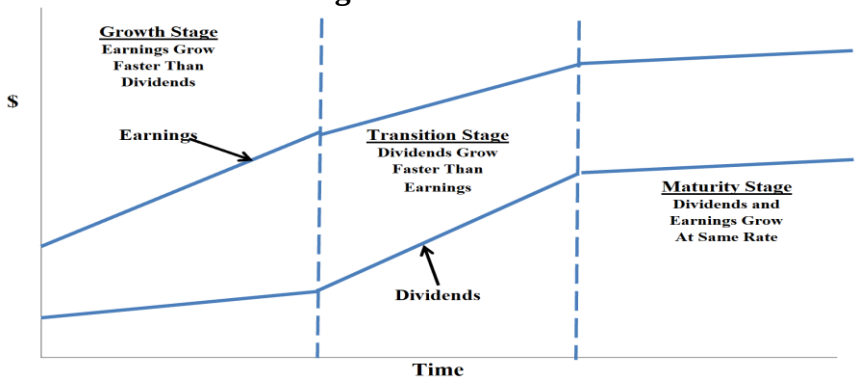
where P is the current stock price, D_1, D_2, D_n are the dividends in (respectively) year 1, 2, and in the future years n, and k is the cost of common equity.

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

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

profitability of its internal investments, which, in turn, is largely a function of the life cycle of the product or service.

Figure 9
The Three-Stage Dividend Discount Model



1. **Growth stage**: Characterized by rapidly expanding sales, high profit margins, and an abnormally high growth in earnings per share. Because of highly profitable expected investment opportunities, the payout ratio is low. Competitors are attracted by the unusually high earnings, leading to a decline in the growth rate.
2. **Transition stage**: In later years, increased competition reduces profit margins and earnings growth slows. With fewer new investment opportunities, the company begins to pay out a larger percentage of earnings.
3. **Maturity (steady-state) stage**: Eventually, the company reaches a position where its new investment opportunities offer, on average, only slightly more attractive ROEs. At that time, its earnings growth rate, payout ratio, and ROE stabilize for the remainder of its life. As I will explain below, the constant-growth DCF model is appropriate when a firm is in the maturity stage of the life cycle.

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

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

A. Present value is the concept that an amount of money today is worth more than that same amount in the future. In other words, money received in the future is not worth

as much as an equal amount of money received today. Present value tells an investor how much he or he would need in today's dollars to earn a specific amount in the future.

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

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

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

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

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

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

A. Yes. The economics of the public utility business indicate that the industry is in the steady-state or constant-growth stage of a three-stage DCF. The economics include the relative stability of the utility business, the maturity of the demand for public utility services, and the regulated status of public utilities (especially the fact that their returns on investment are effectively set through the ratemaking process). The DCF valuation

procedure for companies in this stage is the constant-growth DCF. In the constant-growth version of the DCF model, the current dividend payment and stock price are directly observable. However, the primary problem and controversy in applying the DCF model to estimate equity-cost rates entails estimating investors' expected dividend growth rate.

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

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

Q. WHAT DIVIDEND YIELDS HAVE YOU REVIEWED?

A. I have calculated the dividend yields for the companies in the proxy groups using the current annual dividend and the 30-day, 90-day, and 180-day average stock prices. The dividend yields for the Gas Proxy Group are provided in Panel A of page 2 of Exhibit JRW-6. For the group, the average of the mean and median dividend yields using the 30-day, 90-day, and 180-day average stock prices range is 3.90%, which I am using as the dividend yield for the Gas Proxy Group. The dividend yields for the Combination

Proxy Group are provided in Panel B of page 2 of Exhibit JRW-6. For the group, the average of the mean and median dividend yields using the 30-day, 90-day, and 180-day average stock prices range is 3.7%, which I am using as the dividend yield for the Combination Proxy Group.

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

A. According to the traditional DCF model, the dividend yield term relates to the dividend yield over the coming period. As indicated by Professor Myron Gordon, who is commonly associated with the development of the DCF model for popular use, this is obtained by: (1) multiplying the expected dividend over the coming quarter by 4, and (2) dividing this dividend by the current stock price to determine the appropriate dividend yield for a firm that pays dividends on a quarterly basis.[16]

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

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

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

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

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

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

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

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

A. I have analyzed 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 also assessed prospective growth as measured by prospective earnings retention rates and earned returns on common equity.

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

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

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

A. A company's internal (or "organic") growth occurs when a business expands its own operations rather than relying on takeovers and mergers. A company can grow organically through various means, for example, it can increase existing production capacity through investment in new capital and technology, or it can develop and launch new products.

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

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

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

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

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

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

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

Second, a study by Lacina, Lee, and Xu (2011) has shown that analysts' three-to-five year EPS growth-rate forecasts are not more accurate at forecasting future earnings than naïve random walk forecasts of future earnings.[17] Employing data over a twenty-year period, these authors demonstrate that using the most recent year's actual EPS figure to forecast EPS in the next 3–5 years proved to be just as accurate as using

[17] M. Lacina, B. Lee & Z. Xu, *Advances in Business and Management Forecasting (Vol. 8)*, Kenneth D. Lawrence, Ronald K. Klimberg (ed.), Emerald Group Publishing Limited, pp. 77-101. According to random walk theory in this context, annual changes in earnings are normally distributed and are independent of each other. Therefore, the theory presumes the past movement or trend of earnings cannot be used to predict its future earnings.

the EPS estimates from analysts' three-to-five year EPS growth-rate forecasts. In the opinion of the study's authors, these results indicated that analysts' long-term earnings growth-rate forecasts should be used with caution as inputs for valuation and cost-of-capital purposes.

Finally, and most significantly, numerous academic studies have shown that the long-term EPS growth-rate forecasts of Wall Street securities analysts are overly optimistic and upwardly biased.[18] Hence, using these growth rates as a DCF growth rate will provide an overstated equity cost rate. On this issue, a study by Easton and Sommers (2007) found that optimism in analysts' growth rate forecasts leads to an upward bias in estimates of the cost of equity capital of almost 3.0 percentage points.[19]

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

A. Yes. I have completed a study of the accuracy of analysts' EPS growth rates for electric utilities and gas distribution companies over the 1985 to 2023 time period. In the study,

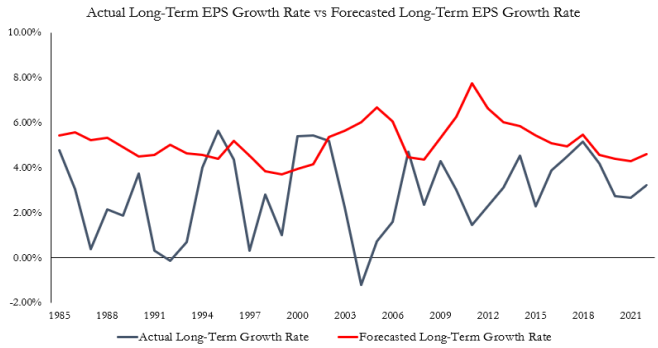
[18] The studies that demonstrate analysts' long-term EPS forecasts are overly-optimistic and upwardly biased include: R.D. Harris, "The Accuracy, Bias, and Efficiency of Analysts' Long Run Earnings Growth Forecasts," *Journal of Business Finance & Accounting*, pp. 725-55 (June/July 1999); P. DeChow, A. Hutton, and R. Sloan, "The Relation Between Analysts' Forecasts of Long-Term Earnings Growth and Stock Price Performance Following Equity Offerings," *Contemporary Accounting Research* (2000)*;* K. Chan, L., Karceski, J., & Lakonishok, J., "The Level and Persistence of Growth Rates," *Journal of Finance,* pp. 643−684, (2003); M. Lacina, B. Lee, and Z. Xu, *Advances in Business and Management Forecasting (Vol. 8),* Kenneth D. Lawrence, Ronald K. Klimberg (ed.), Emerald Group Publishing Limited, pp.77-101; and Marc H. Goedhart, Rishi Raj, and Abhishek Saxena, "Equity Analysts, Still Too Bullish," *McKinsey on Finance,* pp. 14-17, (Spring 2010).

[19] 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).

I used the utilities listed in the electric utilities and gas distribution companies covered by *Value Line*.

I collected the three-to-five-year projected EPS growth rate from I/B/E/S for each utility and compared that growth rate to the utility's actual subsequent three-to-five-year EPS growth rate. As shown in Figure 10, the mean forecasted EPS growth rate (depicted in the red line in Figure 10) is consistently greater than the achieved actual EPS growth rate over the time period, with the exception of short periods. Over the entire period, the mean forecasted EPS growth rate is more than 200 basis points above the actual EPS growth rate. As such, the projected EPS growth rates for electric and gas utilities are overly optimistic and upwardly based.

Figure 10
Mean Forecasted vs. Actual Long-Term EPS Growth Rates
Electric Utilities and Gas Distribution Companies
1985–2023



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

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

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

growth rates to be significantly higher than the EPS growth rates that these companies subsequently achieved.[20]

Szakmary, Conover, and Lancaster ("SCL") studied the predicted versus the projected stock returns, sales, profit margins, and earnings per share made by *Value Line* over the 1969 to 2001 time period. *Value Line* projects variables from a three-year base period (e.g., 2012 to 2014) to a future three-year projected period (e.g., 2016 to 2018). SCL used the 65 stocks included in the Dow Jones Indexes (30 Industrials, 20 Transports and 15 Utilities).

SCL found that the projected annual stock returns for the Dow Jones stocks were "incredibly overoptimistic" and of no predictive value. The mean annual stock return of 20% for the Dow Jones stocks' *Value Line*'s forecasts was nearly double the realized annual stock return.

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

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

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

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

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

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

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

A. Panel A of page 3 of Exhibit JRW-5 provides the 5- and 10-year historical growth rates for EPS, DPS, and BVPS for the companies in the Gas Proxy Group, as published in the *Value Line Investment Survey*. The median historical growth measures for EPS, DPS, and BVPS for the Gas Proxy Group range from 5.0% to 6.5%, with an average of the medians of 5.7%. Panel B of page 3 of Exhibit JRW-5 provides the *Value Line* 5- and 10-year historical growth rates for EPS, DPS, and BVPS for the companies in the Combination Proxy Group. The median historical growth measures for EPS, DPS, and BVPS for the Combination Proxy Group range from 4.5% to 6.0%, with an average of the medians of 5.2%.

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

A. *Value Line's* projections of EPS, DPS, and BVPS growth for the companies in the proxy groups are shown on page 4 of Exhibit JRW-5. Due to the presence of outliers, I relied on the medians in the analysis. For the Gas Proxy Group, as shown on in Panel A of page 4 of Exhibit JRW-5, the medians range from 4.5% to 6.5 %, with an average of the medians of 5.2%.[21] For the Combination Proxy Group, as shown on in Panel B of page 4 of Exhibit JRW-5, the medians range from 4.5% to 6.0%, with an average of the medians of 5.0%.

Also provided on page 4 of Exhibit JRW-5 are the prospective sustainable growth rates for the companies in the proxy groups as measured by *Value Line*'s average projected retention rate and return on shareholders' equity. As noted above, sustainable growth is a significant and a primary driver of long-run earnings growth. For the Gas and Combination Proxy Groups, the median prospective sustainable growth rates are 5.0% and 4.7%.

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

A. Yahoo, Zacks, and S&P Cap IQ collect, summarize, and publish Wall Street analysts' long-term EPS growth rate forecasts for the companies in the proxy group. These forecasts are provided for the companies in the proxy groups on page 5 of Exhibit JRW-5. I have reported both the mean and median growth rates for the group. Since there is

[21] It should be noted that *Value Line* uses a different approach in estimating projected growth. *Value Line* does not project growth from today, but *Value Line* projects growth from a three-year base period – 2020-2022 – to a projected three-year period for the period 2026-2028. Using this approach, the three-year based period can have a significant impact on the *Value L*ine growth rate if this base period includes years with abnormally high or low earnings. Therefore, I evaluate these growth rates separately from analysts EPS growth rates.

considerable overlap in analyst coverage between the two services, and not all of the companies have forecasts from the different services, I have averaged the expected five-year EPS growth rates from the two services for each company to arrive at an expected EPS growth rate for each company. As shown in Panel A of page 5 of Exhibit JRW-6, the mean/median of analysts' projected EPS growth rates for the Proxy Group are 5.9%/6.0%. The mean/median of analysts' projected EPS growth rates for the Combination Proxy Group, as shown in Panel B of page 5 of Exhibit JRW-6, are 6.0%/6.2%.

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

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

The historical growth rate indicators for the Gas Proxy Group imply a baseline growth rate of 5.7%. The average of the projected EPS, DPS, and BVPS growth rates from *Value Line* is 5.2%, and *Value Line*'s projected sustainable growth rate is 5.0%. The mean/median projected EPS growth rates of Wall Street analysts for the Proxy Group are 5.9%/6.0% (average = 5.95%) as measured by the mean and median growth rates. The overall range for the projected growth-rate indicators (ignoring historical growth) is 5.00% to 5.95% and the average of the three projected growth rates is 5.35% (5.20%, 5.00%, 5.95%). Giving primary weight to the projected growth rates of Wall Street analysts and *Value Line*, but recognizing the upward bias nature of these forecasts, I believe that the appropriate projected growth rate is the range of 5.35% to

5.95%. Given this range, I will use 5.65%, which is the midpoint of the range, for my DCF growth rate for the Gas Proxy Group. This growth rate figure is in the upper end of the range of historic and projected growth rates for the Gas Proxy Group.

For the Combination Proxy Group, the historical growth rate indicators suggest a growth rate of 5.20%. The average of the projected EPS, DPS, and BVPS growth rates from *Value Line* is 5.00%, and *Value Line*'s projected sustainable growth rate is 4.7%. The projected EPS growth rates of Wall Street analysts are 6.00% and 6.20% (average = 6.1%) as measured by the mean and median growth rates. The overall range for the projected growth-rate indicators (ignoring historical growth) is 4.70% to 6.10% and the average of the three projected growth rates is 5.25% (5.00%, 4.70%, 6.10%). Again, giving primary weight to the projected EPS growth rate of Wall Street analysts but recognizing the upward bias nature of these forecasts, I believe that the appropriate DCF growth rate range is 5.25% to 6.10%. Given this range, I will use 5.70%, which is the midpoint of the range, for my DCF growth rate for the Combination Proxy Group. As with the Gas Proxy Group, this growth rate figure is in the upper end of the range of historic and projected growth rates for the Combination Proxy Group.

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

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

Table 7
DCF-derived Equity Cost Rate/ROE

	Dividend Yield	1 + ½ Growth Adjustment	DCF Growth Rate	Equity Cost Rate
Gas Proxy Group	**3.90%**	**1.02825**	**5.65%**	**9.65%**
Combination Proxy Group	**3.70%**	**1.02850**	**5.70%**	**9.50%**

The result for the Gas Proxy Group is the 3.90% dividend yield, times the one and one-half growth adjustment of 1.0825, plus the DCF growth rate of 5.65%, which results in an equity cost rate of 9.65%. The result for the Combination Proxy Group is the 3.70% dividend yield, times the one and one-half growth adjustment of 1.02850, plus the DCF growth rate of 5.70%, which results in an equity cost rate of 9.50%.

C. Capital Asset Pricing Model

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

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

$$k = R_f + RP$$

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

which is measured by a firm's beta. Investors only receive a return for bearing 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.

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

Q. PLEASE DISCUSS EXHIBIT JRW-6.

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

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

A. As shown on page 2 of Exhibit JRW-6, the yield on 30-year U.S. Treasury bonds has been in the 1.3% to 5.00% range over the 2010–2024 time period. The current 30-year Treasury yield is above the average of this range. Kroll, a division of the investment firm Duff & Phelps, recommends using a normalized risk-free interest rate.[22] Currently, Kroll is recommending a normalized risk-free interest rate of 3.50% or, if the spot 20-year Treasury yield is above 3.50%, Kroll recommends using the spot 20-year Treasury yield.

However, they have also noted these yields are distorted currently. "We are aware of lack of liquidity issues in the U.S. Treasury market for the 20-year maturity, which is causing some distortion in the 20-year yield relative to that observed for 10- and 30-year maturities." The illiquidity and resulting yield distortion has also been highlighted in the financial press.[23] As shown in Figure 5 (page 16), the yield curve is currently inverted with a yield "hump" at the 20-year mark. The current 30-year Treasury yields are in the 4.50% range. Given the recent range of yields, and recognizing the "hump," I am using 4.50% as the risk-free rate, or R_f, in my CAPM.

Q. DOES THE 4.50% RISK-FREE INTEREST RATE TAKE INTO CONSIDERATION FORECASTS OF HIGHER INTEREST RATES?

A. No. The 4.50% 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

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

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

premium. The risk-free rate and the market risk premium are interrelated in that the market risk premium is developed in relation to the risk-free rate. As discussed below, my market risk premium is based on the results of many studies and surveys that have been published over time.

Q. PLEASE DISCUSS BETAS IN THE CAPM.

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

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

Q. PLEASE DISCUSS THE 2020 CHANGE IN BETAS.

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

Value Line defines their computation of beta as:[24]

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

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

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

2. *Value Line* betas are computed using the New York Stock Exchange Index as the market. While about 3,000 stocks trade on the NYSE, most technology stocks are

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

traded on the NASDAQ or over-the-counter market and not the NYSE. Technology stocks, which make up about 25 percent of the S&P 500, tend to be more volatile. If they were traded on the NYSE, they would increase the volatility of the measure of the market and thereby lower utility betas.

3. Major vendors of CAPM betas such as Merrill Lynch, *Value Line*, and Bloomberg publish adjusted betas. The so-called Blume adjustment cited by *Value Line* adjusts betas calculated using historical returns data to reflect the tendency of stock betas to regress toward 1.0 over time, which means that the betas of typical low beta stocks tend to increase toward 1.0, and the betas of typical high beta stocks tend to decrease toward 1.0.[25]

The Blume adjustment procedure is:

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

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

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

Blume offered two reasons for betas to regress toward 1.0. First, he suggested it may be a by-product of management's efforts to keep the level of firm's systematic risk close to that of the market. He also speculated that it results from management's efforts to diversify through investment projects.

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

A. In the past, I have used *Value Line* betas exclusively. However, given the discussion above, I am also using betas published by S&P Capital IQ. S&P Capital IQ computes

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

betas over a five-year period using monthly returns and the S&P 500 as the market return. S&P Capital IQ does not use the Blume adjustment, but I have included that adjustment in my analysis. As shown on page 3 of Exhibit JRW-6, I have averaged the *Value Line* betas and my adjusted S&P Capital IQ for the proxy groups. The median betas for the Gas and Combination Proxy Groups are 0.81 and 0.80.

Q. PLEASE DISCUSS THE MARKET RISK PREMIUM.

A. The market risk premium is equal to the expected return on the stock market (e.g., the expected return on the S&P 500, $E(R_m)$ minus the risk-free rate of interest (R_f)). The market risk premium is the difference in the expected total return between investing in equities and investing in "safe" fixed-income assets, such as long-term government bonds. However, while the market risk premium is easy to define conceptually, it is difficult to measure because it requires an estimate of the expected return on the market—$E(R_m)$. As I discuss below, there are different ways to measure $E(R_m)$, and studies have come up with significantly different magnitudes for $E(R_m)$. As Merton Miller, the 1990 Nobel Prize winner in economics, indicated, $E(R_m)$ is very difficult to measure and is one of the great mysteries in finance.[26]

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

A. Page 4 of Exhibit JRW-6 highlights the primary approaches to, and issues in, estimating the expected market risk premium. The traditional way to measure the market risk premium was to use the difference between historical average stock and bond returns.

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

In this case, historical stock and bond returns, also called *ex post* returns, were used as the measures of the market's expected return (known as the *ex ante* or forward-looking expected return). This type of historical evaluation of stock and bond returns is often called the "Ibbotson approach" after Professor Roger Ibbotson, who popularized this method of using historical financial market returns as measures of expected returns. However, this historical evaluation of returns can be a problem because: (1) *ex post* returns are not the same as *ex ante* expectations; (2) market risk premiums can change over time, increasing when investors become more risk-averse and decreasing when investors become less risk-averse; and (3) market conditions can change such that *ex post* historical returns are poor estimates of *ex ante* expectations.

The use of historical returns as market expectations has been criticized in numerous academic studies, which I discuss later. The general theme of these studies is that the large equity risk premium discovered in historical stock and bond returns cannot be justified by the fundamental data. These studies, which fall under the category "*ex ante* models and market data," compute *ex ante* expected returns using market data to arrive at an expected equity risk premium. These studies have also been called "puzzle research" after the famous study by Mehra and Prescott in which the authors first questioned the magnitude of historical equity risk premiums relative to fundamentals.[27]

In addition, there are a number of surveys of financial professionals regarding the market risk premium, as well as several published surveys of academics on the

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

equity risk premium. Duke University has published a CFO Survey on a quarterly basis for over 10 years.[28] Questions regarding expected stock and bond returns are also included in the Federal Reserve Bank of Philadelphia's annual survey of financial forecasters, which is published as the *Survey of Professional Forecasters*.[29] This survey of professional economists has been published for almost 50 years. In addition, Pablo Fernandez conducts annual surveys of financial analysts and companies regarding the equity risk premiums used in their investment and financial decision making.[30]

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

A. Derrig and Orr, Fernandez, and Song completed the most comprehensive reviews of the research on the market risk premium.[31] 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

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

[29] *Survey of Professional Forecasters*, FEDERAL RESERVE BANK OF PHILADELPHIA (Feb. 10, 2023), https://www.philadelphiafed.org/-/media/frbp/assets/surveys-and-data/survey-of-professional-forecasters/2020/spfq120.pdf?la=en. The Survey of Professional Forecasters was formerly conducted by the American Statistical Association (ASA) and the National Bureau of Economic Research (NBER) and was known as the ASA/NBER survey. The survey, which began in 1968, is conducted each quarter. The Federal Reserve Bank of Philadelphia, in cooperation with the NBER, assumed responsibility for the survey in June 1990.

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

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

market risk premium. Fernandez examined four alternative measures of the market risk premium – historical, expected, required, and implied. He also reviewed the major studies of the market risk premium and presented the summary market risk premium results. Song provided an annotated bibliography and highlighted the alternative approaches to estimating the market risk premium.

Page 5 of Exhibit JRW-6 provides a summary of the results of the market risk premium studies that I have reviewed. These include the results of: (1) the various studies of the historical risk premium, (2) *ex ante* market risk premium studies, (3) market risk premium surveys of CFOs, financial forecasters, analysts, companies, and academics, and (4) the building blocks approach to the market risk premium. There are results reported for over 30 studies, and the median market risk premium of these studies is 4.56%.

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

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

reconstructed page 5 of Exhibit JRW-6 on page 6 of Exhibit JRW-6; however, I have eliminated all studies dated before January 2, 2010. The median market risk premium estimate for this subset of studies is 5.03%.

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

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

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

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

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

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

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

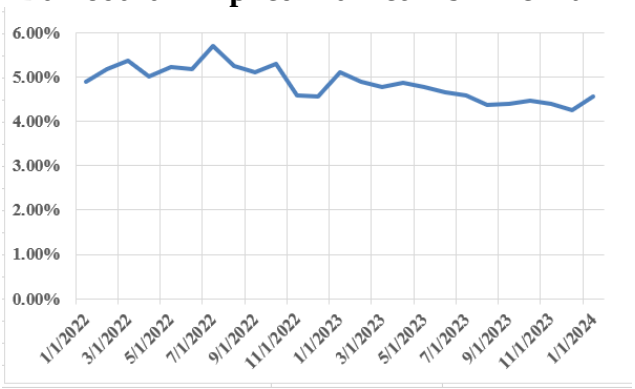
A. I will highlight several studies and surveys.

First, Pablo Fernandez conducts annual surveys of financial analysts and companies regarding the equity risk premiums used in their investment and financial

decision-making.[32] His survey results are included in Exhibits JRW-6-5 and JRW-6-6. The results of his 2024 survey of academics, financial analysts, and companies, which included 4,000 responses, indicated a mean market risk premium employed by U.S. analysts and companies of 5.5%.[33] His estimated market risk premium for the U.S. has been in the 5.00% to 5.70% range in recent years.

Second, Professor Aswath Damodaran of New York University, a leading expert on valuation and the market risk premium, provides a monthly updated market risk premium based on projected S&P 500 EPS and stock-price level and long-term interest rates. His estimated market risk premium has been in the range of 4.0% to 6.0% since 2010. As shown in Figure 11 as of June 1, 2024, Damodaran's estimate of the equity risk premium was 4.12%.[34]

Figure 11
Damodaran Implied Market Risk Premium



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

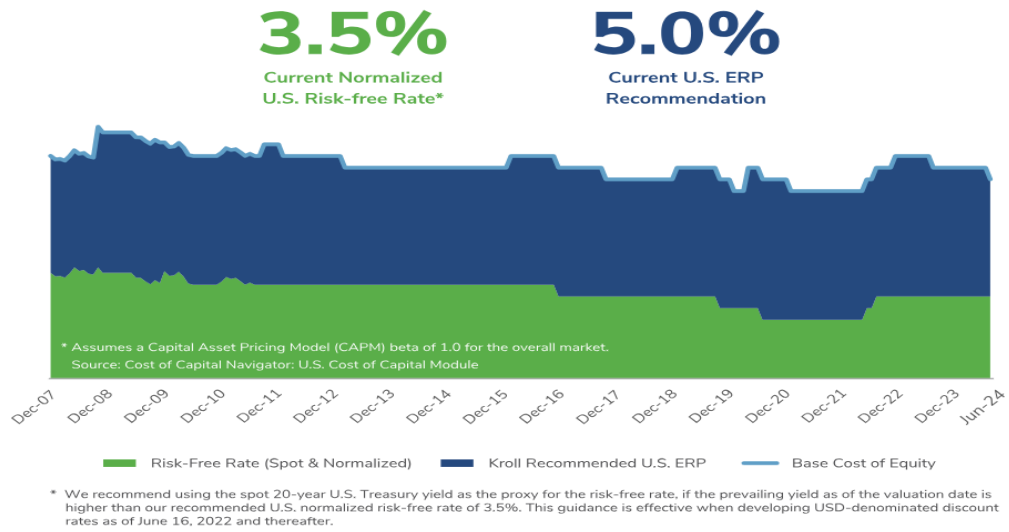
[32] Pablo Fernandez, Teresa Garcia, & Pablo Acín, *Survey: Market Risk Premium and Risk-Free Rate Used for 80 Countries in 2024, IESE Business School Working Paper* (March 2024).

[33] *Id.* at 3.

[34] Aswath Damodaran, *Damodaran Online*, N.Y. Univ., http://pages.stern.nyu.edu/~adamodar/. (On August 12, 2023, Professor Damodaran appeared on CNBC to discuss the equity risk premium. *See* CNBC Television, *Equity Risk Premium is Core to Understanding Long-Term Market Returns, says NYU Aswath Damodaran*, YouTube https://www.youtube.com/watch?v=VPkQ7_3Sf1E.

Next, as explained previously, Kroll provides recommendations for the normalized risk-free interest rate and market risk premiums to be used in calculating the cost of capital data. Its recommendations over the 2008 to 2024 period are shown in Exhibit JRW-6-7 and are also depicted graphically in Figure 12 below. Over the past decade, Kroll's recommended normalized risk-free interest rates have been in the 2.50% to 4.50% range and market risk premiums have been in the 5.0% to 6.0% range. Most recently, Kroll reduced its market risk premium from 6.00% to 5.50% on June 8, 2023, and to 5.00% on June 5, 2024.[35]

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



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

Fourth, Dr. David Kelly, the Chief Global Strategist at *J.P. Morgan Asset Management*, is one of the best-known market strategists on Wall Street. His annual

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

publication and their monthly updates, the *JP Morgan Guide to the Markets*, is a must-read guide for stockbrokers and financial professionals. In presenting their annual expectations for the markets, JP Morgan provides details about inputs and assumptions of expected market returns. In the 2023 update, JP Morgan detailed their 2023 expected long-term stock market return of 7.90%, bond yield of 3.50%, and resulting market risk premium of 4.40%.[36]

Figure 13
KPMG
Market Risk Premium Recommendations
2020–2024

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

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

[36] JP Morgan, *2023 Long-Term Capital Market Assumptions*, 70 (2023).

2022, to 5.50% on March 31, 2023, to 5.25% on June 30, 2023, and to 5.00% on September 30, 2023.[37]

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

A. The studies in Exhibit JRW-6-6 and, more importantly, the more timely and relevant studies cited in the previous section, suggest that the appropriate market risk premium in the U.S. is in the 4.0% to 6.0% range. In the last year, as interest rates have increased, estimates of the market risk premium have declined. I give most weight to the market risk-premium estimates of Kroll, KPMG, JP Morgan, Damodaran, and the Fernandez and Duke-CFO surveys. Given the recent estimates, I believe a market risk premium of 5.00% is appropriate at this time.

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

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

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

	Risk-Free Rate	Beta	Equity Risk Premium	Equity Cost Rate
Gas Proxy Group	**4.50%**	**0.81**	**5.00%**	**8.55%**
Combination Proxy Group	**4.50%**	**0.80**	**5.00%**	**8.50%**

For the Gas Proxy Group, the risk-free rate of 4.50% plus the product of the beta of

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

0.81 times the equity risk premium of 5.00% results in an 8.55% equity cost rate. For the Combination Proxy Group, the risk-free rate of 4.50% plus the product of the beta of 0.80 times the equity risk premium of 5.00% results in an 8.50% equity cost rate.

D. Equity Cost Rate Summary

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

A. My DCF and CAPM analyses for the proxy group are provided in Table 9.

Table 9
ROEs Derived from DCF and CAPM Models

	DCF	CAPM
Gas Proxy Group	**9.65%**	**8.55%**
Combination Proxy Group	**9.50%**	**8.50%**

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

A. My analysis indicates an equity cost rate in the range of 8.50% to 9.65% is appropriate for the Company. Given these results as well as the fact that I rely primarily on the DCF model, I conclude that a ROE in the range of 9.00% to 9.50% is appropriate for a gas company at this time. I am employing the midpoint of this range, 9.25%, an ROE for KGS. This seems especially fair since: (1) the Company's investment risk is slightly below the proxy groups; and (2) I have employed a capital structure that has more common equity and less financial risk than the average of the proxy groups.

Q. PLEASE INDICATE WHY AN EQUITY COST RATE OF 9.25% IS APPROPRIATE FOR KGS.

A. There are a few reasons why an equity cost rate of 9.25% is appropriate and fair for the Company in this case:

1. As shown in Table 5, the gas distribution industry is among the lowest risk industries in the U.S. as measured by beta. As such, the cost of equity capital for this industry is amongst the lowest in the U.S., according to the CAPM.

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

3. I have employed a capital structure with a common equity ratio that is much higher and has lower financial risk than the average of the proxy groups.

4. The authorized ROEs for gas distribution companies was 9.47% in 2020, 9.56% in 2021, 9.53% in 2022, and 9.64% in 2023.[38] While interest rates have increased coming out of the pandemic, which led to record low authorized ROEs for utilities, I show that authorized ROEs for utilities never declined as much as interest rates in 2020 and 2021. In addition, the previously-discussed Werner and Jarvis (2022) study concluded that, over the past four decades, authorized ROEs have not declined in line with capital costs over time and therefore past authorized ROEs have overstated the actual cost of equity capital. Hence, the Commission should not be concerned that my recommended ROE is below other authorized ROEs.

[38] *S*&P Global Market Intelligence, RRA *Regulatory Focus*, 2021.

VI. CRITIQUE OF KGS' RATE OF RETURN TESTIMONY

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

A. I provide KGS' proposed capital structure and debt and equity cost rates in Table 1. The Company has proposed a capital structure consisting of 40.42% long-term debt and 59.58% common equity. The Company has proposed a long-term debt rate of 4.3993%. KGS witness Dr. Bruce. Fairchild has proposed a ROE of 10.25%. With these parameters, KGS has recommended an overall rate of return range of 7.88%.

Q. PLEASE REVIEW DR. FAIRCHILD'S EQUITY COST RATE APPROACHES AND RESULTS.

A. Dr. Fairchild has developed a proxy group of gas distribution companies and employs DCF, CAPM, risk premium, and Comparable Earnings equity cost rate models. Based on these figures, he supports KGS' equity-cost rate of 10.25%.

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

A. As I discuss above, the primary issues related to the Company's rate of return include the following: (1) capital market conditions, (2) proxy group, (3) capital structure, (4) DCF Approach, (5) CAPM Approach, (6) the risk premium model, and (7) the Comparable Earnings approach. The capital market conditions, proxy group, and capital structure issues were previously discussed. I address the remaining items below.

A. DCF Approach

Q. PLEASE SUMMARIZE DR. FAIRCHILD'S DCF ESTIMATES.

A. On pages 15–19 of his testimony and in Schedules BHF-1–BHF-4, Dr. Fairchild develops an equity cost rate by applying the DCF model to his gas group. In the traditional DCF approach, the equity cost rate is the sum of the dividend yield and expected growth. Dr. Fairchild evaluates a number of historical and forecasted growth rates for his proxy group and concludes that the appropriate range is 5.5% to 6.5%, after selectively eliminating some results. Combined with his adjusted DCF dividend yield of 4.00%, he finds a DCF equity cost rate of 9.50% to 10.50%.

Q. WHAT ARE THE ERRORS IN DR. FAIRCHILD'S DCF ANALYSES?

A. The primary error in Dr. Fairchild's DCF study is that he has he failed to recognize that the growth rate forecasts of Wall Street analysts and *Value Line* are overly optimistic and upwardly biased.

1. <u>The Upward Bias in Analysts' EPS Growth-Rate Forecasts</u>

Q. PLEASE REVIEW DR. FAIRCHILD'S DCF GROWTH RATE.

A. In his constant-growth DCF model, Dr. Fairchild's DCF growth rate employs the projected EPS growth-rate forecasts of Wall Street analysts as compiled by LSEG (I/B/E/S), Yahoo Finance, Zack's, and *Value Line.*

Q. WHAT IS THE EFFECT OF DR. FAIRCHILD EXCESSIVE RELIANCE ON THE PROJECTED GROWTH RATES OF WALL STREET ANALYSTS AND *VALUE LINE*?

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

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

Finally, not only are those forecasts inaccurate, but they are also overly optimistic and upwardly biased. I have provided a full discussion of this issue on pages 47–50 of this testimony and report on a study I conducted in Figure 10. Using the electric utilities and gas-distribution companies covered by *Value Line*, this study demonstrates that the mean forecasted EPS growth rates are consistently greater than the achieved actual EPS growth rates over the 1985–2022 time period. Over the entire period, the mean forecasted EPS growth rate is over 200 basis points above the actual EPS growth rate. As such, the projected EPS growth rates for utilities are overly optimistic and upwardly based. Hence, exclusively using these growth rates to create a DCF growth rate produces an overstated equity-cost rate. In addition. I also highlighted a study by Szakmary, Conover, and Lancaster (2008) who evaluated the

accuracy of *Value Line*'s three-to-five-year EPS growth rate forecasts using companies in the Dow Jones Industrial Average over a thirty-year time period and found these forecasted EPS growth rates to be significantly higher than the EPS growth rates that these companies subsequently achieved.[39]

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 reviewed the accuracy of analysts' long-term EPS growth rate forecasts. The authors concluded that, after a decade of stricter regulation, analysts' long-term earnings forecasts continue to be excessively optimistic. They made the following observation:[40]

> Alas, a recently completed update of our work only reinforces this view—despite a series of rules and regulations, dating to the last decade, that were intended to improve the quality of the analysts' long-term earnings forecasts, restore investor confidence in them, and prevent conflicts of interest. For executives, many of whom go to great lengths to satisfy Wall Street's expectations in their financial reporting and long-term strategic moves, this is a cautionary tale worth remembering. This pattern confirms our earlier findings that analysts typically lag behind events in revising their forecasts to reflect new economic conditions. When economic growth accelerates, the size of the forecast error declines; when economic growth slows, it increases. So as

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

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

> 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.[41] The author concluded there:

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

B. CAPM Approach

Q. PLEASE DISCUSS DR. FAIRCHILD'S CAPM.

A. On pages 29–34 of his testimony and in Schedule BHF-5, Dr. Fairchild develops an equity cost rate by using the CAPM. The CAPM approach requires an estimate of the risk-free interest rate, the beta, and the market or equity risk premium. Dr. Fairchild estimates both a historical and projected CAPM and reports equity cost rate estimates of 10.20% and 10.40% without the size adjustment and 11.40% and 11.80% with the size adjustment for the Company. In his historical CAPM, he uses a risk-free rate of 4.26%, betas from *Value Line*, a market risk premium of 7.17%, and a size premium of

[41] 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.

0.93%. In his projected CAPM, he uses a projected risk-free rate of 4.26%, betas from *Value Line*, a market risk premium of 7.69%, and a size premium of 0.93%.

Q. WHAT ARE THE ERRORS IN DR. FAIRCHILD'S CAPM ANALYSIS?

A. The more material flaws in both Dr. Fairchild's historical and projected CAPMs are his market risk and size premiums. His historical CAPM is based on historical stock and bond income returns. With respect to the historical market-risk premium, I highlight that there are a number of empirical issues with using *historical* stock and bond returns to estimate an *expected* market risk premium. With respect to the projected market risk premium, Dr. Fairchild projected an expected annual stock market return by applying the DCF model to the S&P 500, and then subtracting the risk-free interest rate. The major issue here is that Dr. Fairchild's projected stock market return is based on highly unrealistic assumptions about future earnings and economic growth and the resulting stock returns.

1. <u>Historical CAPM</u>

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

A. As indicated, Dr. Fairchild's historical CAPM uses a market risk premium of 7.17% which is the difference between arithmetic mean stock and bond income returns over the 1926–2022 time period. A major issue with this approach is that it is well-known

and well-studied that using historical returns to measure an *ex ante* equity risk premium is erroneous and overstates the true market or equity risk premium.[42] This approach can produce differing results depending on several factors, including the measure of central tendency used, the time period evaluated, and the stock-market index employed.

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

Q. WHAT SOURCE DID DR. FAIRCHILD USE FOR HISTORICAL RETURNS IN HIS HISTORICAL CAPM?

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

A. The historical stock and bond returns are published by Kroll, a subsidiary of the investment advisory firm Duff & Phelps.

Q. IS DUFF & PHELPS A RESPECTED FINANCIAL FIRM?

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

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

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

> In estimating the conditional ERP, valuation analysts cannot simply use the long-term historical ERP, without further analysis. A better alternative would be to examine approaches that are sensitive to the current economic conditions. As previously discussed, Duff & Phelps employs a multi-faceted analysis to estimate the conditional ERP that takes into account a broad range of economic information and multiple ERP estimation methodologies to arrive at its recommendation.[43]

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

A. No.

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

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

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

> ERP is a forward-looking concept. It is an expectation as of the valuation date for which no market quotes are directly observable. While an analyst can observe premiums realized over time by referring to historical data (i.e., realized return approach or ex post approach), such realized premium data do not represent the ERP expected in prior periods, nor do they represent the current ERP estimate. Rather, realized premiums represent, at best, only a sample from prior periods of what may have then been the expected ERP. To the extent that realized premiums on the average equate to expected premiums in prior periods, such samples may be representative of current expectations. But to the extent that prior events that are not expected to recur caused realized returns to differ from prior expectations, such samples should be adjusted to remove the effects of these nonrecurring events. Such adjustments are needed to improve the predictive power of the sample.[44]

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

A. Yes. In fact, on the same site (https://www.kroll.com/en/insights/publications/cost-of-capital) that Kroll sells their annual valuation handbook used by Dr. Fairchild, Kroll publishes its recommended estimate of the equity- or market-risk premium. Page 7 of Exhibit JRW-6 of my testimony shows Kroll's equity-risk-premium recommendations.[45] As noted above, Kroll is currently recommending an equity of market risk premium of 5.0%. This is over 200 basis points below Dr. Fairchild's historic market risk premium of 7.17%. I find it puzzling that Dr. Fairchild would use

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

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

the historical average annual stock return from Kroll and then ignore Kroll's recommendation as to the appropriate equity or market risk premium.

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

A. Yes.

2. Projected CAPM

Q. PLEASE DISCUSS DR. FAIRCHILD'S PROJECTED MARKET RISK PREMIUM.

A. With respect to the projected market risk premium of 7.69%, Dr. Fairchild projected an expected annual stock market by applying the DCF model to the S&P 500, and then subtracting the risk-free interest rate. This is shown in Table 10. Dr. Fairchild computes an expected S&P 500 annual return of 11.95% which is the sum of an adjusted dividend yield of 1.85% and an EPS growth rate of 10.10%. He then subtracts the risk-free rate of 4.26% to get a market risk premium of 7.69%. The major issue here is that Dr. Fairchild's projected stock market return is based on highly unrealistic assumptions about future earnings and economic growth and the resulting stock returns.

Table 10
Projected CAPM Market Risk Premium

Adjusted Dividend Yield	1.85%
+ Expected EPS Growth	10.10%
= Expected Market Return	11.95%
+ Risk-Free Rate	4.26%
= Market Risk Premium	7.69%

Q. PLEASE PROVIDE ADDITIONAL INSIGHTS INTO THE EXPECTED STOCK MARKET RETURN OF 11.95%.

A. Simply put, the assumption of an 11.95% expected stock market return is excessive and unrealistic. The compounded annual return in the U.S. stock market is about 10% (9.80% according to Damodaran from between 1928–2023).[46] Dr. Fairchild's CAPM results assume that return on the U.S. stock market will be more than 20 percent higher in the future than it has been in the past. The high expected stock market return, and the resulting market risk premium and equity cost rate results, is directly related to computing the expected stock market return as the sum of the adjusted dividend yield plus the expected EPS growth rate of 10.10%.

Q. IS DR. FAIRCHILD'S MARKET RISK PREMIUM REFLECTIVE OF PUBLISHED MARKET RISK PREMIUMS?

A. No. Dr. Fairchild's projected market risk premium of 7.93% is in excess of market risk premiums: (1) found in studies of the market risk premiums by leading academic scholars; (2) produced by analyses of historic stock and bond returns; and (3) found in surveys of financial professionals.

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

Page 6 of Exhibit JRW-6 provides the results of over thirty (30) market risk-premiums studies from the past fifteen years. Historic stock and bond returns suggest a market-risk premium in the 4.40% to 6.64% range, depending on whether one uses arithmetic or geometric mean returns. There have been many studies using *ex ante* models, and their market-risk premiums results vary from as low as 3.32% to as high as 6.00%.

Finally, the market-risk premiums developed from surveys of analysts, companies, financial professionals, and academics suggest lower market-risk premiums, in a range of 3.15% to 5.70%.

The bottom line is that there is no support in historic return data, surveys, academic studies, or reports from investment firms for Dr. Fairchild's projected market-risk premium of 7.93%. As discussed below, the reason is that they are based on unrealistic long-term, earnings-per-share growth rates,

Q. IS DR. FAIRCHILD'S PROJECTED STOCK MARKET RETURN OF 11.95% REFLECTIVE OF THE STOCK MARKET RETURNS THAT INVESTMENT FIRMS TELL INVESTORS TO EXPECT?

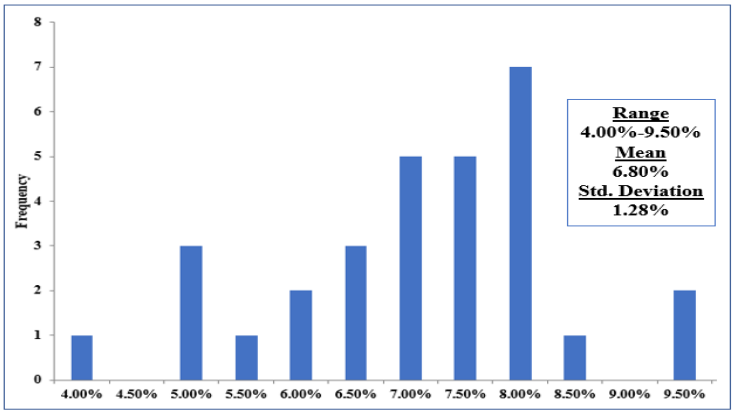
A. No. Many investment firms provide investors with their estimates of the annual stock returns that they should expect in the future. Most publish these expected returns in documents entitled "Capital Market Assumptions" and are available online at their websites. If you Google 'Capital Market Assumptions,' you get a long list of investment firms and their base case expected annual return assumptions for stocks,

bonds, and other financial assets.

In my search, I found thirty-one investment firms that published their capital market assumptions. These are listed in Exhibit JRW-8, and include many of the largest, best-known investment firms, including J.P. Morgan, BlackRock, BNY Mellon, Fidelity, Northern Trust, Vanguard, and State Street. Combined, these thirty firms manage almost $50 trillion in assets under management.

Figure 14 provides a histogram of the expected returns listed in Exhibit JRW-8. The average duration of the long-term forecasts is 10 years. The range of the forecasted U.S. annual large cap equity returns is 4.00% to 9.50%. The mean and standard deviation of these expected returns are 6.80% and 1.28%.

Figure 14
Histogram of Investment Firm Expected Large Cap Equity Annual Returns
2023



Data Source: Exhibit JRW-8.

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

A. I have three comments: (1) These returns are below the historical average compounded annual stock market return of 9.80% cited above (more on this below); (2) the standard

deviation of 1.28% is very low, which indicates that the expected returns provided by these firms are quite similar, especially compared to historical stock market returns that have an annual standard deviation of about 20.0; and (3) these expected returns indicate Dr. Fairchild's expected stock market return of 11.95%, which he calculates with his own study applying the DCF model to the S&P 500 and using analysts projected EPS growth rates, is about double the returns investment firms tell investors they should expect.

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

A. The biggest factor is that the valuation of the overall stock market is high relative to historical standards. When stock prices are high, investors have to pay higher prices to buy in, which lowers their future expected returns. Figure 15 provides Schiller's cyclically-adjusted PE ratio (CAPE) over the last 100+ years. Stocks prices have remained above the mean historical CAPE level of 17.02% since 2009, with a current level of 28.80. Hence, the higher valuation of the stock market leads to lower expected returns.

Figure 15
Schiller S&P 500 CAPE Ratio
2023

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

Q. PLEASE, ONCE AGAIN, ADDRESS THE ISSUES WITH ANALYSTS' EPS GROWTH-RATE FORECASTS.

A. The key point is that Dr. Fairchild's projected market risk premium approach is based on the concept that analyst projections of companies' three-to-five year EPS growth rates reflect investors expected *long-term* EPS growth for those companies. However, this is erroneous given the research on these projections. Numerous studies have shown that the long-term, EPS-growth-rate forecasts of Wall Street securities analysts are overly optimistic and upwardly biased.[47] Moreover, a 2011 study showed that analysts' forecasts of EPS growth over the next three-to-five years' earnings are no more

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

accurate than their forecasts of the next single year's EPS growth.[48] The inaccuracy of analysts' growth-rate forecasts leads to an upward bias in equity cost estimates of approximately 300 basis points.[49]

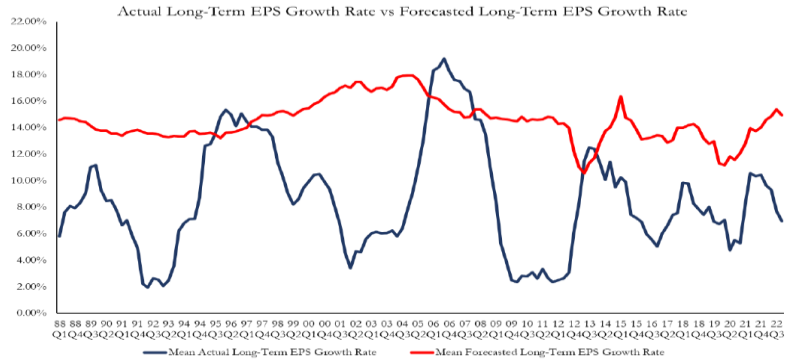
I have also completed studies on the accuracy of analysts' projected EPS growth rates. In Figure 10 (page 50), I demonstrated that the EPS growth rate forecasts of Wall Street analysts are upwardly biased for electric utilities and gas distribution companies. In Figure 16, I provide the results of a study I performed using all companies followed by I/B/E/S who have three-to-five-year EPS growth rate forecasts over the 1985 to 2022 time period.

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

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

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

Figure 17
Mean Forecasted vs. Actual Long-Term EPS Growth Rates
All Companies Covered by I/B/E/S
1985–2022



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

Q. IS THERE OTHER EVIDENCE THAT INDICATES THAT DR. FAIRCHILD'S PROJECTED EPS GROWTH RATE OF 10.10% IS EXCESSIVE?

A. Yes. A long-term EPS growth rate of 10.10% 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 Dr. Fairchild's projected EPS growth rate of 10.10%; (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 rates have been in the 6%-7% Range: I performed a study of the growth in nominal GDP, S&P 500 stock-price appreciation, and S&P 500 EPS and DPS growth since 1960. The results are provided on page 1 of Exhibit JRW-9, and a summary is shown in Table 11.

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

Nominal GDP	**6.45%**
S&P 500 Stock Price	**7.25%**
S&P 500 EPS	**7.00%**
S&P 500 DPS	**5.81%**
Average	**6.63%**

The results show that the historical long-run growth rates for GDP, S&P EPS, and S&P DPS are in the 6% to 7% range. By comparison, the average EPS growth rate used by Dr. Fairchild, 10.10%, is excessive. These estimates suggest that companies in the U.S. would be expected to increase their growth rate of EPS in the future by almost 100% and maintain that growth indefinitely in an economy that is expected to grow at about one-third of Dr. Fairchild's projected growth rates.

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

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

> world. In light of ongoing dilution in earnings per share, this finding implies that investors should anticipate real returns on U.S. common stocks to average no more than about 4–5 percent in real terms.[50]

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

The second component of nominal GDP growth is inflation. Page 4 of Exhibit JRW-9 shows inflation as measured by the annual growth rate in the Consumer Price Index ("CPI") from 1961 to 2023. The large increase in prices from the late 1960s to the early 1980s is readily evident. Equally evident is the rapid decline in inflation during the 1980s as inflation dropped from above 10.0% to about 4.0%. Since that time, inflation has gradually declined and was in the 2.0% range or below from 2015 to 2020. Prices increased in 2021 and 2022 with the rebounding economy and increased by 4.7% in 2021 and 8.0% in 2022. Year-over-year inflation in 2022 jumped to 40-year highs

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

in 2022 due to supply chain issues and the Russia-Ukraine conflict, but longer-term inflation is expected to be in the 2.0%–3.0% range.

The graphs on pages 2, 3, and 4 of Exhibit JRW-9 provide clear evidence of the decline, in recent decades, in nominal GDP as well as its components, real GDP, and inflation. To gauge the magnitude of the decline in nominal GDP growth, Table 13 provides the compounded GDP growth rates for 10-, 20-, 30-, 40- and 50- years. Whereas the 50-year compounded GDP growth rate is 6.16%, there has been a significant decline in nominal GDP growth over subsequent 10-year intervals. These figures strongly suggest that nominal GDP growth in recent decades has slowed and that a figure in the range of 4.0% to 5.0% is more appropriate today for the U.S. economy.

Table 13
Historical Nominal GDP Growth Rates

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

Long-Term GDP Projections also Indicate Slower GDP Growth in the Future: A lower range is also consistent with long-term GDP forecasts. There are several forecasts of annual GDP growth that are available from economists and government agencies. These are listed in Panel B of page 5 of Exhibit JRW-9. The mean 10-year nominal GDP growth forecast (as of February 2023) by economists in the recent *Survey of Financial Forecasters* is 4.40%.[51] The Energy Information Administration (EIA), in its

[51] Ten-year median projected real GDP growth of 2.00% and CPI inflation of 2.37%. *Survey of Professional*

projections used in preparing *Annual Energy Outlook*, forecasts long-term GDP growth of 4.3% for the period 2023 to 2053.[52] The Congressional Budget Office (CBO), in its forecasts for the period 2023 to 2053, projects a nominal GDP growth rate of 3.8%.[53] Finally, the Social Security Administration (SSA), in its Annual OASDI Report, provides a projection of nominal GDP from 2023 to 2100.[54] SSA's projected growth GDP growth rate over this period is 4.1%. The average projected GDP growth rate for these four forecasts is 4.15%.

The bottom line is that the trends and projections suggest a long-term GDP growth rate in the 4.0% to 4.5% range. As such, Dr. Fairchild's average projected EPS growth rate of 10.10% is more than double the 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).[55] According to McKinsey, population and productivity growth drove real GDP growth over the past

Forecasters, Fed. Reserve Bank of Philadelphia, https://www.philadelphiafed.org/research-and-data/real-time-center/survey-of-professional-forecasters/.

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

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

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

55 James Manyika, et al., *Can Long-Term Growth be Saved*?, McKinsey Global Institute. (Jan. 1, 2015), https://www.mckinsey.com/featured-insights/employment-and-growth/can-long-term-global-growth-be-saved.

50 years, at compound annual rates of 1.7% and 1.8%, respectively.

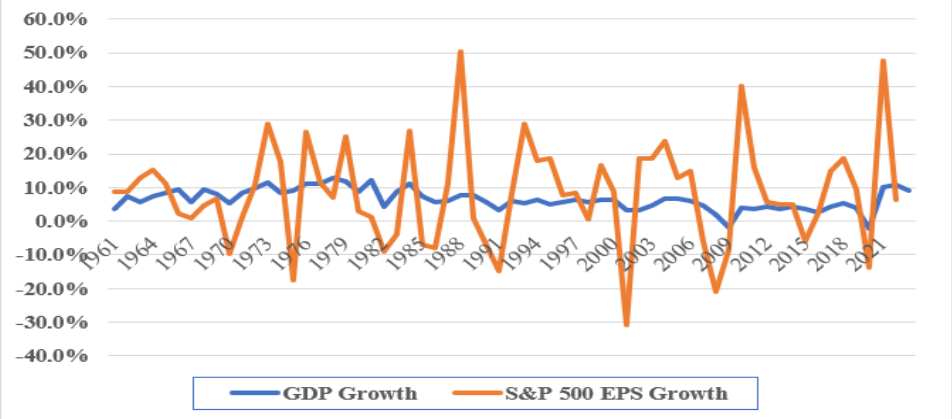
However, global economic growth is projected to slow significantly in the years to come. The primary factor leading to the decline is slow growth in employment (working-age population), which results from slower population growth and longer life expectancy. McKinsey estimates that employment growth will slow to 0.3% over the next 50 years. They conclude that even if productivity remains at the rapid rate of the past 50 years of 1.8%, real GDP growth will fall by 40% to 2.1%.

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

A. No. Figure 17 shows the average annual growth rates for GDP and the S&P 500 EPS since 1960. The one very apparent difference between the two is that the S&P 500 EPS growth rates are much more volatile than the GDP growth rates, when compared using the relatively short, and somewhat arbitrary, annual conventions used in these data.[56] Volatility aside, however, it is clear that over the medium to long run, S&P 500 EPS growth does not significantly outpace GDP growth.

[56] 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 17
Average Annual Growth Rates
GDP and S&P 500 EPS
1960–2023



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

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

Corporate Profits are Constrained by GDP: In a *Fortune* magazine article, Milton Friedman, the winner of the 1976 Nobel Prize in Economic Sciences, warned investors and others not to expect corporate-profit growth to sustainably exceed GDP growth, stating, "Beware of predictions that earnings can grow faster than the economy for long periods. When earnings are exceptionally high, they don't just keep booming."[57] In that same article, Friedman also noted that profits must move back down to their traditional share of GDP. In Table 14, I show that the aggregate net income levels for the S&P 500 companies, using 2022 figures, represent 6.11% of nominal GDP.

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

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

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

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

Short-Term Factors Impact S&P 500 EPS: The growth rates in the S&P 500 EPS and GDP can diverge on a year-to-year basis due to short-term factors that impact S&P 500 EPS in a much greater way than GDP. As shown above, S&P EPS growth rates are much more volatile than GDP growth rates. The EPS growth for the S&P 500 companies has been influenced by low labor costs and interest rates, commodity prices, the recovery of different sectors such as the energy and financial sectors, 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.[58] 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

[58] *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%) than of GDP (23%); (c) corporate profits are more international-trade driven, while exports minus imports tend to drag on GDP; and (d) S&P 500 EPS is affected not just by corporate profits but also by share buybacks on the positive side (fewer shares boost EPS), and by share dilution on the negative side (new shares dilute EPS). While these differences may seem significant, it must be remembered that the Income Approach to measure GDP includes corporate profits (in addition to employee compensation and taxes on production and imports) and therefore effectively accounts for the first three factors.[59]

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

Q. PLEASE PROVIDE ADDITIONAL EVIDENCE SHOWING THAT DR. FAIRCHILD'S S&P 500 EPS GROWTH RATE OF 10.10% IS NOT REALISTIC.

A. Beyond my previous discussion, I have performed the following analysis of S&P 500 EPS and GDP growth in Table 15. Specifically, I started with the 2022 aggregate net income for the S&P 500 companies and 2022 nominal GDP for the U.S. As shown in Table 14, the aggregate profit for the S&P 500 companies represented 6.11% of nominal GDP in 2022. In Table 15, I then projected the aggregate net income level for the S&P 500 companies and GDP as of the year 2050. For the growth rate for the S&P

[59] 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.

500 companies, I used Dr. Fairchild's average projected S&P 500 EPS growth rate of 10.10%. As a growth rate for nominal GDP, I used the average of the long-term projected GDP growth rates from CBO, SFF, SSA, and EIA (3.8%, 4.4%, 4.1%, and 4.3%, respectively), which is 4.15%. The projected 2050 level for the aggregate net income level for the S&P 500 companies using Dr. Fairchild's EPS growth rate of 10.10% is $23.02 trillion. Over the same period, GDP is expected to grow to $79.50 trillion. As such, if the aggregate net income for the S&P 500 grows in accordance with the growth rate used by Dr. Fairchild (10.10%), and if nominal GDP grows at rates projected by major government agencies (4.15%), the net income of the S&P 500 companies will represent growth from 6.11% of GDP in 2022 to 28.95% of GDP in 2050. It is totally unrealistic for the net income of the S&P 500 to become such a large component of GDP.

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

	2022 Value ($B)	Growth Rate	No. of Years	2050 Value ($B)
Aggregate Net Income for S&P 500	$1,555.98	10.10%	28	$ 23,017.03
2022 Nominal U.S. GDP	$25,461.34	4.15%	28	$ 79,495.21
Net Income/GDP (%)	6.11%			28.95%

Data Sources: 2022 Net Income for S&P 500 companies
https://www.gurufocus.com/economic_indicators/5749/sp-500-net-income-ttm.
Growth Rate - Dr. Fairchild's average projected S&P 500 EPS growth rate of 10.10%.
Nominal GDP Growth Rate – The average of the long-term projected GDP growth rates from CBO, SFF, SSA, and EIA (3.8%, 4.4%, 4.1%, and 4.3% = 4.15%).

Q. PLEASE PROVIDE A SUMMARY 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:[60]

> 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, Dr. Fairchild's average long-term S&P 500 EPS growth rate of 10.10% 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."[61]

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

[61] 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/.

3. The Size Premium

Q. PLEASE REVIEW DR. FAIRCHILD'S RISK AND SIZE ADJUSTMENT.

A. Dr. Fairchild includes a size premium of 0.93% in both his historical and projected CAPM. As shown in Exhibit BHF-6, Dr. Fairchild's size adjustment is based on the size decile stock return data published by Kroll. As discussed below, the need for a size adjustment is, at best, questionable, especially for regulated public utilities, but in the end, inappropriate.

Q. PLEASE DISCUSS THE SIZE ADJUSTMENT.

A. Dr. Fairchild claims that KGS deserves an incremental ROE increment due to its small size. Dr. Fairchild computes a size premium based on the historical stock market returns studies as performed by Kroll. One issue with this approach, as discussed above, is that there are numerous errors in using historical market returns to compute risk premiums. These errors provide inflated estimates of expected risk premiums. As noted above, these include survivorship and unattainable return biases. The net result is that Kroll's size premiums are poor measures for risk adjustment to account for the size of the Company.

In addition, Professor Annie Wong has tested for a size premium in utilities and concluded that, unlike industrial stocks, utility stocks do not exhibit a significant size premium.[62] As explained by Professor Wong, there are several reasons why such a size

[62] Annie Wong, *Utility Stocks and the Size Effect: An Empirical Analysis*, J. MIDWEST FIN. ASSOC. (1993), 95–101.

premium would not be attributable to utilities. Utilities are regulated closely by state and federal agencies and commissions, and their financial performance is therefore monitored on an ongoing basis by both the state and federal governments.

In addition, public utilities must gain approval from government entities for common financial transactions, such as the sale of securities. Furthermore, unlike their industrial counterparts, accounting standards and reporting are fairly uniform for public utilities.

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

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

A. Clifford Ang, in his publication, "*The Absence of a Size Effect Relevant to the Cost of Equity*," tested for a company-size effect over the time period of 1981 to 2016.[63] He used value-weighted, size-based decile returns obtained from French's Data Library, with the smallest size-based decile as a proxy for small stocks and the largest size-based decile as a proxy for large stocks. He found that small stocks underperformed large stocks by 12% over the period 1981 to 2016. He claims that this finding is

[63] Clifford Ang, *The Absence of a Size Effect Relevant to the Cost of Equity*, 37 BUS. VALUATION REV. 3, at 87 (2018), https://www.cliffordang.com/ang_bvr_2018.pdf.

consistent with other studies that have shown that the size effect vanished in the 1980s. He concluded that "practitioners should abandon the practice of augmenting or modifying the CAPM Cost of Equity with a size premium":[64]

> My review of the evidence and analysis strongly suggests the proponents of the size effect are nowhere close to meeting their burden. I find that investors use the CAPM and do not demand compensation for size when setting their required rate of return, which directly contradicts the need to augment or modify the CAPM Cost of Equity with a size premium. I show that small stocks do not outperform large stocks, which calls into question the very premise of a size effect. I also find that studies finding a size effect suffer from the twin fatal flaws of lacking a theoretical basis and data mining, which are very difficult, if not impossible, to overcome. Given the above, practitioners should abandon the practice of augmenting or modifying the CAPM Cost of Equity with a size premium.

In addition, Professor Damodaran, the New York University valuation guru, has provided a thorough analysis and review of the company-size effect, which he terms the small-firm or cap premium. Figure 19 traces the small-firm premium over the 1927 to 2014 time period.[65] Damodaran has studied the issue for years and makes a number of observations on the company-size premium or effect: (1) the effect has largely disappeared since 1980, which is the year the Banz article was published; (2) the small-firm premium tends to come and go over time; (3) the small-firm premium tends to be associated with the January effect (small companies earn abnormal returns only in the first two weeks of January); (4) the small-firm premium seems to actually

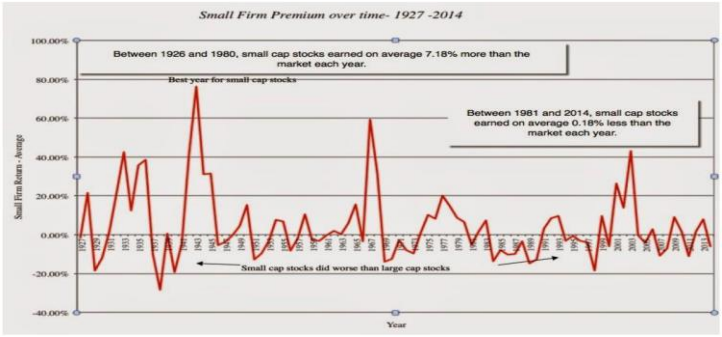
[64] *Id.* at 6.

[65] Damodaran, *The Small Cap Premium: Where is the Beef*, 34 BUS. VALUATION REV. 4, at 152–57 (Winter 2015).

be a microcap premium, as it disappears when companies with market capitalizations below $5 million are removed; (5) Damodaran does not find a small-firm premium when he estimates a small-firm required return; and (6) he has never used a small-firm premium when valuing small companies.

Professor Damodaran blames three factors for some analysts' continued use of a small-firm premium: (i) intuition (it *seems* smaller companies should be riskier); (ii) inertia (individuals and institutions are slow to change and to adopt new ideas); and (iii) bias (analysts prefer higher discount rates and lower valuations).

Figure 18
The Small-Firm Premium
1927–2014



Source: Aswath Damodaran, "The Small Cap Premium - Where is the beef," *Business Valuation Review*: Winter 2015, Vol. 34, No. 4, pp. 152–57, 2015

Q. PLEASE SUMMARIZE YOUR TESTIMONY ON THE SMALL SIZE PREMIUM.

A. Dr. Fairchild has claimed that the Company deserves an incremental return due to its small size. However, he has not performed any empirical studies to support his contention that the Company is riskier due to its small size, and he does not point to any independent reports to support his claim. The size effect is usually associated with

Kroll's annual stock return study where they compute so-called size premiums based on the historical stock market returns for companies where size is measured by market capitalizations. As discussed above, the existence of a size premium in the stock market is an ongoing debate in investment circles, and many believe that it has disappeared over time. In addition, there is evidence that no such size premium exists for regulated public utilities. As such, the Commission should reject the Company's request to have a ROE adder for its small size in the absence of any study that supports this claim.

C. Risk Premium Approach

Q. PLEASE DISCUSS DR. FAIRCHILD'S RISK PREMIUM APPROACH.

A. On pages 34–38 of his testimony and in Schedule BHF-7, Dr. Fairchild develops an equity cost rate by applying the risk premium model to his proxy group. The equity cost rate using the risk-premium model is the sum of the base interest-rate yield plus a risk premium. Dr. Fairchild computes this risk premium using a regression of the historical relationship between the yields on long-term utility bond yields and authorized ROEs for gas distribution companies. This results in risk premiums of 4.75% and 4.88%. He then adds these two risk premiums to the January 2024 yields on single-A utility bonds of 5.48% to arrive at equity cost rates of 10.23% to 13.36%.

Q. WHAT ARE THE ISSUES WITH DR. FAIRCHILD'S RISK PREMIUM APPROACH?

A. There are two issues. First, the base yield in the risk premium is overstated. Second, the risk premium produced from the study is overstated as a measure of investor return requirements and produced an inflated equity cost rate.

1. Base Yield

Q. PLEASE DISCUSS THE BASE YIELD OF DR. FAIRCHILD'S RISK PREMIUM ANALYSIS.

A. As noted, Dr. Fairchild uses the January 2024 yields on single-A utility bonds of 5.48%. The issue here is that the yields on these securities inflate the required return on equity for the Company in two ways: (1) long-term bonds are subject to interest rate risk, a risk which does not affect common stockholders since dividend payments (unlike bond interest payments) are not fixed but tend to increase over time and (2) the base yield in Dr. Fairchild's risk premium study is subject to credit risk since it is not default risk-free like an obligation of the U.S. Treasury. As a result, its yield-to-maturity includes a premium for default risk and therefore, is above its expected return. Hence, using a bond's yield-to-maturity as a base yield results in an overstatement of investors' return expectations.

2. Risk Premium

Q. WHAT ARE THE ISSUES WITH DR. FAIRCHILD'S RISK PREMIUM?

A. The most important issue is that Dr. Fairchild's risk premium is not necessarily applicable to measure utility investors' required rate of return. Dr. Fairchild's risk premium approach is a gauge of *commission* behavior, 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 take into account other utility- and rate case-specific information in setting ROEs. As such, Dr. Fairchild's approach and results reflects 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 be especially true when, due to the inherent compromises and trade-offs upon which settlements are made, the authorized ROE data includes the results of rate cases that are settled and not fully litigated.

In addition, Dr. Fairchild's methodology produces an inflated required rate of return since utilities have been selling at market-to-book ratios in excess of 1.0 for many years. This indicates that the authorized rates of return have been greater than the return that investors require. The relationship between ROE, the equity cost rate, and market-to-book ratios was explained on pages 31 of my testimony. In short, a market-to-book ratio above 1.0 indicates a company's ROE is above its equity cost rate.

Therefore, the risk premium produced from the study is overstated as a measure of investor return requirements and produced an inflated equity cost rate.

Finally, this approach produces inflated ROEs because the ROE is dependent on the authorized ROEs from state utility commissions, even though the Werner and Jarvis study (2022), which was previously discussed, demonstrated that authorized ROEs over the past four decades have not declined in line with capital costs and therefore past authorized ROEs have overstated the actual cost of equity capital.

D. Comparable Earnings Approach

Q. PLEASE REVIEW DR. FAIRCHILD'S COMPARABLE EARNINGS APPROACH.

A. On page 38 of his testimony and in Schedule BHF-8, Dr. Fairchild develops an equity cost rate using his Comparable Earnings approach. In this approach, he computes the equity cost rate as the average of *Value Line*'s projected ROE for the companies in his proxy group. He reports mean/median comparable ROEs of 9.3% for 2024 and 2025 and 10.1% for 2027–2029.

Q. PLEASE ADDRESS THE ISSUES WITH DR. FAIRCHILD'S COMPARABLE EARNINGS APPROACH.

A. There are several errors with his Comparable Earnings methodology: (1) it does not measure the market cost of equity capital, (2) it is independent of most cost of capital indicators, and (3) it has several other empirical problems.

In addition, a study by Szakmary, Conover, and Lancaster evaluated the accuracy of *Value Line*'s projected stock returns, sales, profit margins, and EPS over the 1969 to 2001 time period. Importantly, Szakmary, Conover, and Lancaster found that *Value Line*'s forecasts of earnings per share and profit margins were "strikingly overoptimistic."[66]

Moreover, the risk/size adjustment of 200 basis points is unnecessary.

1. The Comparable Earnings Approach does not Measure the Cost of Equity Capital

Q. DOES THE COMPARABLE EARNINGS APPROACH MEASURE THE COST OF EQUITY CAPITAL?

A. No. The issues include the following:

The Expected (Comparable) Earnings Approach Does Not Measure the Market Cost of Equity Capital: First and foremost, this accounting-based methodology does not measure investor return requirements. As indicated by Professor Roger Morin, a long-term utility rate of return consultant, "More simply, the Comparable (Expected) Earnings standard ignores capital markets. If interest rates go up 2% for example, investor requirements and the cost of equity should increase commensurably, but if regulation is based on accounting returns, no immediate change in equity cost results."[67] As such, this method does not measure the market cost of equity because

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

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

there is no way to assess whether the earnings are greater than or less than the earnings investors require, and therefore this approach does not measure the market cost of equity capital.

The Expected ROEs are not Related to Investors' Market-Priced Opportunities: The ROE ratios are an accounting measure that do not measure investor return requirements. Investors had no opportunity to invest in the proxy companies at the accounting book value of equity. In other words, the equity's book value *to investors* is tied to market prices, which means that investors' required return on market-priced equity aligns with expected return on book equity only when the equity's market price and book value are aligned.

Therefore, a market-based evaluation of the cost of equity to investors in the proxies requires an associated analysis of the proxies' market-to-book ("M/B") ratios. In addition, as I demonstrated in Figure 8 (page 35), there is a strong positive relationship between expected ROEs and the M/B ratios for electric utility and gas distribution companies.

Changes in ROE Ratios do not Track Capital Market Conditions: As also indicated 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."[68]

[68] *Id.*

The Expected Earnings Approach is Circular: The proxies' ROEs ratios 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 the Company'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 regulated electric utility service. These include earnings from: (1) unregulated businesses including merchant generation; (2) electric generation; and (3) international operations.

Q. PLEASE SUMMARIZE YOUR ANALYSIS OF DR. FAIRCHILD'S COMPARABLE EARNINGS APPROACH.

A. In short, Dr. Fairchild's Comparable Earnings approach does not measure the market cost of equity capital, is independent of most cost of capital indicators, and, as shown above, has a number of other empirical issues. Therefore, the Commission should ignore this approach in determining the appropriate ROE for the Company.

VII. SUMMARY AND CONCLUSIONS

Q. PLEASE SUMMARIZE YOUR TESTIMONY ON THE APPROPRIATE COST OF CAPITAL FOR KGS.

A. KGS has proposed a capital structure consisting of 40.42% long-term debt and 59.58%

common equity. The Company has proposed a long-term debt cost rate of 4.399%. The Company's witness, Mr. Bruce M. Fairchild, has recommended a common equity cost rate of 10.25% for the Company. As shown in Table 1, KGS has proposed an overall rate of return of 7.82%.

In my recommendation, I recognize that the Company's proposed capital structure has a much higher common equity ratio (59.58%) and much lower financial risk than the proxy groups. I have proposed a capital structure with a common equity ratio of 52.45%, which was the average common equity ratio for gas distribution companies in 2023. I should emphasize that this capital structure still includes a higher common equity ratio and lower financial risk than the companies in the Gas Proxy Group. I have applied the DCF and CAPM approaches to Dr. Fairchild's Gas Proxy Group as well as the Combination Proxy Group. Dr. Fairchild's Gas Proxy Group includes only seven gas companies, and I believe that a proxy group of only seven companies is a small proxy group which could produce variable results. My analysis indicates that an equity cost rate in the range of 8.50% to 9.65% is appropriate for the Company. Given these results, as well as the fact that I rely primarily on the DCF model, I conclude that a ROE in the range of 9.00% to 9.50% is appropriate for a gas company at this time. I am employing the midpoint of this range, 9.25%, as a ROE for KGS. This seems especially fair since: (1) the Company's investment risk slightly below the proxy groups'; and (2) I have employed a capital structure that has more common equity and less financial risk than the average of the proxy groups. With my

proposed capital structure and debt cost rates, I am recommending an overall fair rate of return or cost of capital of 6.94% for KGS.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

VERIFICATION

COMMONWEALTH OF PENNSYLVANIA)
)
COUNTY OF CENTRE) ss:

Dr. J. Randall Woolridge, being duly sworn upon his oath, deposes and states that he is a consultant for the Citizens' Utility Ratepayer Board, that he has read and is familiar with the foregoing *Direct Testimony*, and that the statements made herein are true and correct to the best of his knowledge, information, and belief.

J. Randall Woolridge

SUBSCRIBED AND SWORN to before me this 29th day of June, 2024.

Notary Public

My Commission expires: Jan 31, 2028

Commonwealth of Pennsylvania - Notary Seal
Nicholas Shea, Notary Public
Centre County
My commission expires January 31, 2028
Commission number 1441329
Member, Pennsylvania Association of Notaries

Appendix A

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

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

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

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

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

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

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

J. Randall Woolridge

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The Pennsylvania State University
University Park, PA 16802
814-865-1160

Home Address
120 Haymaker Circle
State College, PA 16801
814-238-9428

Academic Experience

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

President, Nittany Lion Fund LLC, (January 1, 2005 to the present)

Director, the Smeal College Trading Room (January 1, 2001 to the present)

Goldman, Sachs & Co. and Frank P. Smeal Endowed University Fellow in Business Administration (July 1, 1987 to the present).

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

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

Education

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

Books

James A. Miles and J. Randall Woolridge, *Spinoffs and Equity Carve-Outs: Achieving Faster Growth and Better Performance* (Financial Executives Research Foundation), 1999

Patrick Cusatis, Gary Gray, and J. Randall Woolridge, *The StreetSmart Guide to Valuing a Stock* (2nd Edition, McGraw-Hill), 2003.

J. Randall Woolridge and Gary Gray, *The New Corporate Finance, Capital Markets, and Valuation: An Introductory Text* (Kendall Hunt, 2003).

Research

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

Exhibit JRW-1
Kansas Gas Service

CURB's Cost of Capital

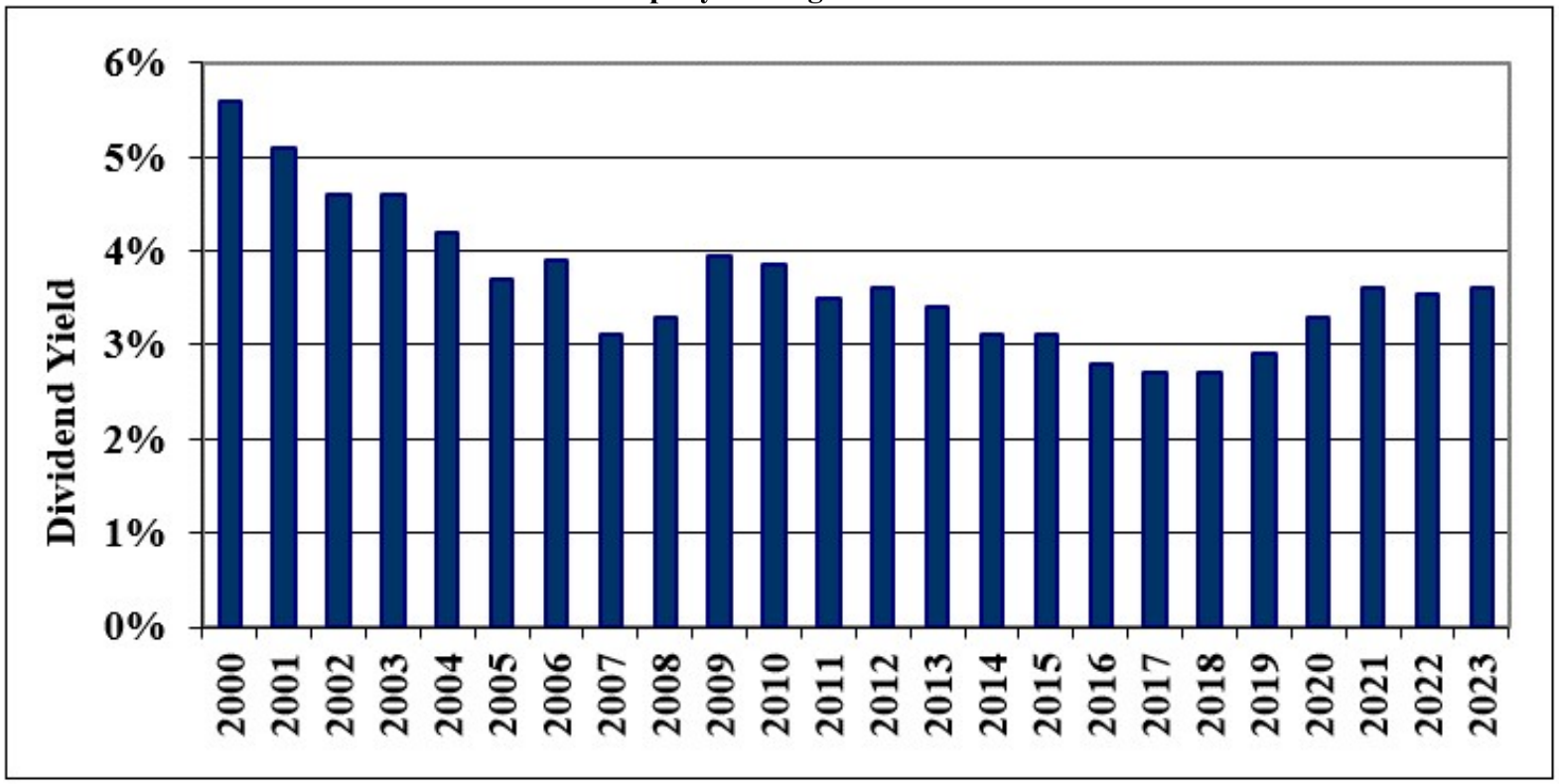
Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	47.55%	4.40%	2.09%
Common Equity	52.45%	9.25%	4.85%
Total	100.00%		6.94%

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

Data Source: Mergent Bond Record

Exhibit JRW-2

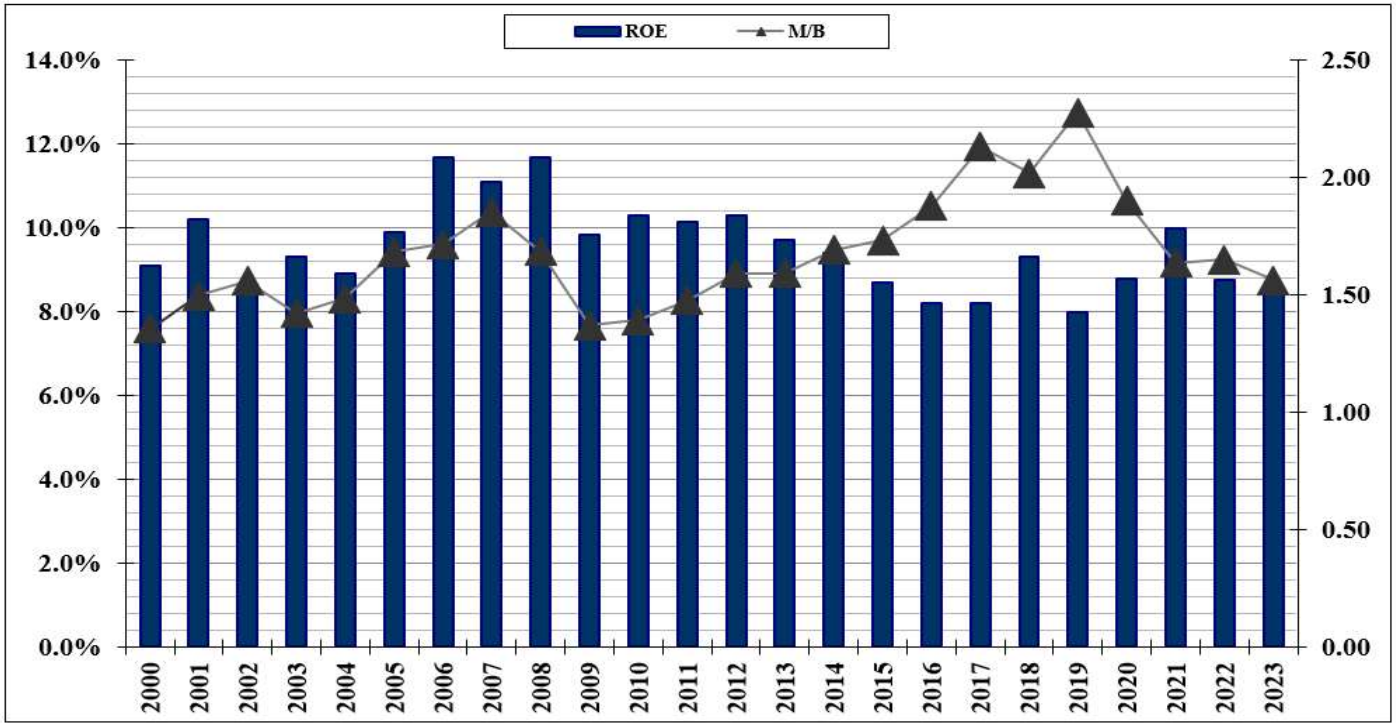
Gas Company Average Dividend Yield



Data Source: *Value Line Investment Survey.*

Exhibit JRW-2

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



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

Exhibit JRW-3
Kansas Gas Service Company
Summary Financial Statistics for Proxy Group

Panel A
Gas Proxy Group

		Operating Revenue ($bil)	Percent Elec Revenue	Percent Gas Revenue	Net Plant ($bil)	Market Cap ($bil)	S&P Issuer Credit Rating	Moody's Issuer Credit Rating	Pre-Tax Interest Coverage	Primary Service Area	Common Equity Ratio	Earned Return on Equity	Market to Book Ratio
Atmos Energy Company (NYSE-ATO)	ATO	$3.95	0%	95%	$20.32	16.97	A-	A1	7.95	10 States	59.9%	8.77	1.51
Chesapeake Utilities (NYSE-CPK)	CPK	$0.70	12%	51%	$2.47	2.28	NR	NR	4.35	DE,MD,FL	47.0%	8.39	1.83
New Jersey Resources Corp. (NYSE-NJR)	NJR	$1.71	0%	39%	$5.27	4.11	NR	NR	3.19	NJ	38.0%	11.94	1.99
NiSource Inc (NYSE-NI)	NI	$5.35	35%	65%	$22.31	11.64	BBB+	Baa2	2.56	IN,OH,PA,KY,VA,MD,MA	35.5%	7.48	1.50
Northwest Natural Holdings (NYSE-NWN)	NWN	$1.20	0%	95%	$3.43	1.38	A	NR	2.57	OR,WA	42.4%	7.63	1.07
ONE Gas, Inc.(NYSE-OGS)	OGS	$2.37	0%	100%	$6.16	3.34	A-	A3	3.24	OK,KS,TX	47.4%	8.64	1.21
Spire (NYSE-SR)	SR	$2.61	0%	95%	$6.56	3.25	A-	Baa2	2.16	MO	37.1%	7.15	1.16
Mean		$2.56	7%	77%	$9.50	$6.14	A-	A3/Baa1	3.72		43.9%	8.57	1.47
Median		$2.37	0%	95%	$6.16	$3.34	A-	A3/Baa1	3.19		42.4%	8.39	1.50

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

Panel B
Combination Proxy Group

Company		Operating Revenue ($bil)	Percent Reg Elec Revenue	Percent Reg Gas Revenue	Net Plant ($bil)	Market Cap ($bil)	S&P Issuer Credit Rating	Moody's Long Term Rating	Pre-Tax Interest Coverage	Primary Service Area	Common Equity Ratio	Return on Equity	Market to Book Ratio
Avista Corporation (NYSE-AVA)	AVA	$1.75	64%	22%	$5.84	2.64	BBB	Baa2	2.07	NY,CT,ME	0.45	7.10	1.06
Black Hills Corporation (NYSE-BKH)	BKH	$2.33	35%	65%	$7.12	3.57	BBB+	Baa2	2.79	11 States	0.42	8.63	1.11
CenterPoint Energy, Inc. (NYSE - CMP)	CNP	$8.70	44%	53%	$29.87	17.46	BBB+	Baa2	2.51	TX,IN,LA,MS,OH	0.34	9.31	1.81
Consolidated Edison, Inc. (NYSE-ED)	ED	$14.66	67%	20%	$50.14	30.02	A-	Baa2	3.04	NY,PA	0.46	11.97	1.42
CMS Energy Corporation (NYSE-CMS)	CMS	$7.46	68%	28%	$25.10	16.88	BBB+	Baa2	2.32	MI	0.32	10.27	2.31
MGE Energy, Inc. (NYSE-MGEE)	MGEE	$0.67	63%	31%	$2.14	2.30	NR	NR	5.00	WI	0.59	10.60	2.02
NorthWestern Corporation (NYSE-NWE)	NWE	$1.42	77%	23%	$6.04	2.97	BBB	Baa2	2.59	MT,SD,NE	0.50	7.12	1.07
Public Service Enterprise Group Incorporated	PEG	$11.24	43%	57%	$38.21	30.70	BBB+	Baa2	5.54	NJ	0.43	17.55	1.98
Sempra Energy (NYSE-SRE)	SRE	$16.72	41%	48%	$55.68	44.72	BBB+	Baa2	3.04	CA,TX	0.48	11.50	1.56
WEC Energy Group (NYSE-WEC)	WEC	$8.89	73%	26%	$31.61	24.44	A-	Baa1	3.00	WI,IL,MN,MI	0.38	11.23	2.08
Xcel Energy Inc. (NYSE-XEL)	XEL	$14.09	79%	20%	$52.51	32.35	A-	Baa1	2.48	MN,WI,ND,SD,MI	0.39	10.33	1.84
Mean		$7.99	59%	36%	$27.66	$18.92	BBB+	Baa2	3.12		43.3%	10.51	1.66
Median		$8.70	64%	28%	$29.87	$17.46	BBB+	Baa2	2.79		43.1%	10.33	1.81

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

Exhibit JRW-3
Docket No. 24-KGSG-610-RTS
***Value Line* Risk Metrics**

Panel A
Gas Proxy Group

Company	Beta	Financial Strength	Safety	Earnings Predictability	Stock Price Stability
Atmos Energy Company (NYSE-ATO)	0.85	A	1	100	95
Chesapeake Utilities (NYSE-CPK)	0.90	A	2	100	85
New Jersey Resources Corp. (NYSE-NJR)	1.00	A	2	60	85
NiSource Inc (NYSE-NI)	0.95	B++	2	60	95
Northwest Natural Gas Co. (NYSE-NWN)	0.85	A	2	15	85
ONE Gas, Inc. (NYSE-OGS)	0.85	B++	2	100	90
Spire (NYSE-SR)	0.85	B++	2	45	90
Mean	0.89	A	1.9	69	89

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

Panel B
Combination Proxy Group

Company	Beta	Financial Strength	Safety	Earnings Predictability	Stock Price Stability
Avista Corporation (NYSE-AVA)	0.95	B+	3	70	70
Black Hills Corporation (NYSE-BKH)	1.05	B++	3	100	85
CenterPoint Energy, Inc. (NYSE - CMP)	1.15	A	3	55	75
CMS Energy Corporation (NYSE-CMS)	0.85	B++	2	90	95
Consolidated Edison, Inc. (NYSE-ED)	0.80	A+	1	100	90
MGE Energy, Inc. (NYSE-MGEE)	0.80	B++	3	100	75
NorthWestern Corporation (NYSE-NWE)	0.95	B+	3	95	90
Public Service Enterprise Group Incorporated	0.95	A	1	100	95
Sempra Energy (NYSE-SRE)	1.00	A	2	95	90
WEC Energy Group (NYSE-WEC)	0.85	A+	1	100	85
Xcel Energy Inc. (NYSE-XEL)	0.85	A	2	100	95
Mean	0.93	A	2.2	91	86

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

Value Line Risk Metrics

Beta

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

Financial Strength

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

Safety Rank

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

Earnings Predictability

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

Stock Price Stability

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

Source: *Value Line Investment Analyzer* .

Exhibit JRW-4
Kansas Gas Service Company

Panel A
KGS' Proposed Capital Structure and Debt Cost Rate

Capital Source	Capitalization Ratio	Cost Rate
Long-Term Debt	40.42%	4.40%
Common Equity	59.58%	
Total	100.00%	

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

Capital Source	Capitalization Ratio	Cost Rate
Long-Term Debt	47.55%	4.40%
Common Equity	52.45%	
Total	100.00%	

2023 Gas Distribution Rate Cases
Return on Equity and Common Equity Ratios

Date		Company	State	ROR (%)	ROE (%)	Common
1/19/23		Texas Gas Service Co. Inc.	TX	7.38	9.60	59.74
1/23/23		Southwest Gas Corp.	AZ	6.73	9.30	50.00
1/23/23		Roanoke Gas Co.	VA	7.90	10.44	59.63
1/24/23		Florida Public Utilities Co.	FL	5.97	10.25	45.16
1/25/23		Indiana Gas Co. Inc.	IN	—	—	—
1/25/23		Southern Indiana Gas and Electric (	IN	—	—	—
1/26/23		Columbia Gas of Ohio Inc.	OH	7.08	9.60	50.60
3/21/23		Atmos Energy Corp.	KS	—	—	—
3/23/23		Northern States Power Co.	MN	6.97	9.57	52.50
3/28/23		Pivotal Utility Holdings Inc.	FL	6.44	9.50	59.60
3/28/23		MidAmerican Energy Co.	SD	6.75	—	—
2023		Q1 averages/total		6.90	9.75	53.89
		Observations		8	7	7
4/20/23		Spire Missouri Inc.	MO	—	—	—
5/4/23		Atmos Energy Corp.	CO	7.00	9.30	58.00
5/9/23		Atmos Energy Corp.	KS	—	—	—
5/15/23		Columbia Gas of Virginia Inc.	VA	—	—	—
5/25/23		Atmos Energy Corp.	KY	6.94	9.55	54.50
6/15/23		National Fuel Gas Distribution Corp	PA	—	—	—
6/22/23		Atmos Energy Corp.	TN	7.58	—	62.20
6/30/23		Intermountain Gas Co.	ID	6.97	9.50	50.00
		Q2: averages/total		7.12	9.45	56.18
		Observations		4	3	4
7/11/23		Oklahoma Natural Gas Co.	OK	—	—	—
7/20/23		Black Hills Kansas Gas Utility Co. I	KS	—	—	—
7/20/23		Consolidated Edison Co. of New Yo	NY	6.75	9.25	48.00
7/26/23		Indiana Gas Co. Inc.	IN	—	—	—
7/26/23		Southern Indiana Gas and Electric (	IN	—	—	—
8/23/23		Northern Indiana Public Service Co	IN	—	—	—
8/28/23		Virginia Natural Gas Inc.	VA	—	—	—
8/29/23		Washington Gas Light Co.	VA	—	—	—
8/30/23		Consumers Energy Co.	MI	—	9.90	—
8/30/23		Michigan Gas Utilities Corp.	MI	—	9.80	—
8/31/23		Avista Corp.	ID	7.19	9.40	50.00
8/31/23		Roanoke Gas Co.	VA	7.30	—	—
9/1/23		Roanoke Gas Co.	VA	7.90	10.44	59.63
9/8/23		Hope Gas Inc.	WV	—	—	—
9/20/23		Northern Utilities Inc.	ME	7.22	9.35	52.01
9/20/23		Dominion Energy South Carolina Ir	SC	7.74	9.49	54.78
9/28/23		Boston Gas Co.	MA	—	—	—
9/29/23		Atmos Energy Corp.	KY	—	—	—
		Q3: averages/total		7.35	9.66	52.88
		Observations		6	7	5
10/4/23		Spire Missouri Inc.	MO	—	—	—
10/5/23		Piedmont Natural Gas Co. Inc.	SC	6.9	9.30	53.13
10/6/23		Chattanooga Gas Co.	TN	7.12	9.80	49.23
10/12/23		New York State Electric & Gas Cor	NY	6.4	9.20	48.00
10/12/23		Rochester Gas and Electric Corp.	NY	6.67	9.20	48.00
10/25/23		NorthWestern Energy Group Inc.	MT	6.67	9.55	48.02
10/26/23		Columbia Gas of Maryland Inc.	MD	—	—	—
10/26/23		Minnesota Energy Resources Corp.	MN	6.72	9.65	53.00
10/26/23		Avista Corp.	OR	7.24	9.50	50.00
10/30/23		NSTAR Gas Co.	MA	—	—	—
11/1/23		Duke Energy Ohio Inc.	OH	6.96	9.60	52.32
11/2/23		Atmos Energy Corp.	KS	—	—	—
11/3/23		Madison Gas and Electric Co.	WI	7.8	9.70	56.06
11/7/23		Questar Gas Co.	WY	6.95	9.65	51.56
11/9/23		Peoples Gas System	FL	7.02	10.15	—
11/9/23		Kansas Gas Service Co. Inc.	KS	—	—	—
11/9/23		Northern States Power Co.	WI	7.58	9.80	52.50
11/9/23		Wisconsin Power and Light Co.	WI	7.42	9.80	53.70
11/16/23		Pacific Gas and Electric Co.	CA	—	—	—
11/16/23		Ameren Illinois Co.	IL	6.85	9.44	50.00
11/16/23		North Shore Gas Co.	IL	6.96	9.38	52.58
11/16/23		Northern Illinois Gas Co.	IL	6.68	9.51	50.00
11/16/23		The Peoples Gas Light and Coke Co	IL	6.65	9.38	50.79
12/4/23		Piedmont Natural Gas Co. Inc.	TN	6.95	9.80	50.09
12/6/23		Columbia Gas of Virginia Inc.	VA	6.69	9.70	—
12/12/23		Virginia Natural Gas Inc.	VA	6.89	9.70	49.06
12/13/23		Washington Gas Light Co.	MD	—	—	—
12/14/23		Baltimore Gas and Electric Co.	MD	6.74	9.45	52.00
12/14/23		Washington Gas Light Co.	MD	7.04	9.50	52.60
12/15/23		Washington Gas Light Co.	DC	7.11	9.65	52.00
12/19/23		Roanoke Gas Co.	VA	—	—	—
12/19/23		Washington Gas Light Co.	VA	7.15	9.65	52.53
12/20/23		Columbia Gas of Maryland Inc.	MD	—	—	—
12/21/23		Mountaineer Gas Co.	WV	7.24	9.75	—
12/22/23		Southern California Gas Co.	CA	7.67	10.50	52.00
		Annual:Averages/total		7.04	9.64	52.45
		Observations		44	43	39

Exhibit JRW-5

Docket No. 24-KGSG-610-RTS
Discounted Cash Flow Analysis

Panel A
Gas Proxy Group

Dividend Yield*	3.90%
Adjustment Factor	1.02825
Adjusted Dividend Yield	4.01%
Growth Rate**	5.65%
Equity Cost Rate***	9.65%

* Page 2 of Exhibit JRW-5

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

*** DCF ROE rounded to nearest 0.05%.

Panel B
Combination Proxy Group

Dividend Yield*	3.70%
Adjustment Factor	1.0285
Adjusted Dividend Yield	3.81%
Growth Rate**	5.70%
Equity Cost Rate***	9.50%

* Page 2 of Exhibit JRW-5

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

Exhibit JRW-5

Kansas Gas Service
Monthly Dividend Yields

Panel A
Gas Proxy Group

Company	SMBL	Annual Dividend	Dividend Yield 30 Day	Dividend Yield 90 Day	Dividend Yield 180 Day
Atmos Energy Company (NYSE-ATO)	ATO	3.22	2.8%	2.8%	2.8%
Chesapeake Utilities (NYSE-CPK)	CPK	2.36	2.2%	2.2%	2.3%
New Jersey Resources Corp. (NYSE-NJR)	NJR	1.68	3.9%	3.9%	3.9%
NiSource Inc (NYSE-NI)	NI	1.06	3.7%	3.9%	4.0%
Northwest Natural Holdings (NYSE-NWN)	NWN	1.95	5.2%	5.3%	5.2%
ONE Gas, Inc.(NYSE-OGS)	OGS	2.64	4.2%	4.2%	4.2%
Spire (NYSE-SR)	SR	3.02	5.0%	5.0%	5.0%
Mean			3.8%	3.9%	3.9%
Median			3.9%	3.9%	4.0%

Data Sources: S&P Capital IQ, June 17, 2024.

Panel B
Combination Proxy Group

Company	SMBL	Annual Dividend	Dividend Yield 30 Day	Dividend Yield 90 Day	Dividend Yield 180 Day
Avista Corporation (NYSE-AVA)	AVA	1.9	5.2%	5.4%	5.5%
Black Hills Corporation (NYSE-BKH)	BKH	2.6	4.7%	4.8%	4.9%
CenterPoint Energy, Inc. (NYSE - CMP)	CNP	0.8	2.7%	2.8%	2.8%
Consolidated Edison, Inc. (NYSE-ED)	ED	3.32	3.5%	3.6%	3.7%
CMS Energy Corporation (NYSE-CMS)	CMS	2.06	3.3%	3.5%	3.6%
MGE Energy, Inc. (NYSE-MGEE)	MGEE	1.71	2.2%	2.3%	2.3%
NorthWestern Corporation (NYSE-NWE)	NWE	2.6	5.1%	5.2%	5.2%
Public Service Enterprise Group Incorporated	PEG	2.4	3.3%	3.6%	3.7%
Sempra Energy (NYSE-SRE)	SRE	2.38	3.1%	3.3%	3.3%
WEC Energy Group (NYSE-WEC)	WEC	3.34	4.1%	4.1%	4.1%
Xcel Energy Inc. (NYSE-XEL)	XEL	2.08	3.8%	3.8%	3.6%
Mean			3.7%	3.9%	3.9%
Median			3.5%	3.6%	3.7%

Data Sources: S&P Capital IQ, June 17, 2024.

Exhibit JRW-5

Kansas Gas Service
DCF Equity Cost Growth Rate Measures
***Value Line* Historic Growth Rates**

Panel A
Gas Proxy Group

	Value Line Historical Growth					
	Past 10 Years			Past 5 Years		
Company	Earnings	Dividends	Book Value	Earnings	Dividends	Book Value
Atmos Energy Company (NYSE-ATO)	9.5	7.0	9.5	9.0	8.5	12.0
Chesapeake Utilities (NYSE-CPK)	9.0	8.0	10.5	10.0	10.0	10.5
New Jersey Resources Corp. (NYSE-NJR)	5.0	6.5	7.5	2.5	6.5	7.0
NiSource Inc (NYSE-NI)	1.5	-0.5	-3.0	15.0	3.5	0.5
Northwest Natural Gas Co. (NYSE-NWN)	-1.0	1.5	1.0	2.5	0.5	0.5
ONE Gas, Inc. (NYSE-OGS)				6.0	8.5	4.5
Spire (NYSE-SR)	5.0	5.0	5.5	3.0	5.5	3.5
Mean	4.8	4.6	5.2	6.9	6.1	5.5
Median	5.0	5.8	6.5	6.0	6.5	4.5
	Average of Median Figures =			5.7		

Data Source: *Value Line Investment Survey.*

Panel B
Combination Proxy Group

	Value Line Historic Growth					
Company	Past 10 Years			Past 5 Years		
	Earnings	Dividends	Book Value	Earnings	Dividends	Book Value
Avista Corporation (NYSE-AVA)	3.0	4.5	4.0	1.0	4.5	3.5
Black Hills (NYSE-BKH)	7.5	5.0	5.0	4.0	6.0	6.5
CenterPoint Energy, Inc. (NYSE - CMP)		-1.0	4.0	3.5	-9.5	7.0
Consolidated Edison, Inc. (NYSE-ED)	2.0	2.5	4.0	2.0	2.5	3.5
CMS Energy Corporation (NYSE-CMS)	6.0	7.0	6.5	5.5	6.5	8.0
MGE Energy, Inc. (NYSE-MGEE)	5.0	45.0	6.0	6.5	4.5	6.0
NorthWestern Corporation (NYSE-NWE)	3.5	5.5	6.0		3.5	4.0
Public Service Enterprise Group Incorporated	3.0	4.5	3.0	4.0	4.5	1.5
Sempra Energy (NYSE-SRE)	7.5	7.0	7.0	13.5	7.0	10.0
WEC Energy Group (NYSE-WEC)	6.5	10.0	7.0	7.0	6.5	3.5
Xcel Energy Inc. (NYSE-XEL)	5.5	6.0	5.0	6.5	6.5	6.0
Mean	5.0	8.7	5.2	5.4	3.9	5.4
Median	5.3	5.5	5.0	4.8	4.5	6.0
	Average of Median Figures =			5.2		

Data Source: *Value Line Investment Survey.*

Exhibit JRW-5

Kansas Gas Service
DCF Equity Cost Growth Rate Measures
***Value Line* Projected Growth Rates**

Panel A
Gas Proxy Group

Company	*Value Line* Projected Growth Est'd. '21-'23 to '27-'29			*Value Line* Sustainable Growth		
	Earnings	Dividends	Book Value	Return on Equity	Retention Rate	Internal Growth
Atmos Energy Company (NYSE-ATO)	7.0	7.5	4.0	10.0%	50.0%	5.0%
Chesapeake Utilities (NYSE-CPK)	6.5	8.0	6.5	10.0%	54.0%	5.4%
New Jersey Resources Corp. (NYSE-NJR)	5.0	5.0	4.5	13.0%	44.0%	5.7%
NiSource Inc (NYSE-NI)	9.5	4.5	5.0	11.0%	45.0%	5.0%
Northwest Natural Gas Co. (NYSE-NWN)	6.5	0.5	4.0	9.0%	38.0%	3.4%
ONE Gas, Inc. (NYSE-OGS)	3.5	2.5	4.5	8.5%	43.0%	3.7%
Spire (NYSE-SR)	4.5	4.5	5.5	8.5%	30.0%	2.6%
Mean	6.1	4.6	4.9	10.0%	43.4%	4.4%
Median	6.5	4.5	4.5	10.0%	44.0%	5.0%
Average of Median Figures =		5.2			Median =	5.0%

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

Panel B
Combination Proxy Group

Company	*Value Line* Projected Growth Est'd. '21-'23 to '27-'29			*Value Line* Sustainable Growth		
	Earnings	Dividends	Book Value	Return on Equity	Retention Rate	Internal Growth
Avista Corporation (NYSE-AVA)	6.0	4.5	3.5	8.5%	23.0%	2.0%
Black Hills Corporation	3.5	4.0	3.5	8.5%	35.0%	3.0%
CenterPoint Energy, Inc. (NYSE - CMP)	6.5	6.0	5.5	9.5%	49.0%	4.7%
CMS Energy Corporation (NYSE-CMS)	5.0	4.0	4.0	12.5%	38.0%	4.8%
Consolidated Edison, Inc. (NYSE-ED)	6.0	3.5	4.5	9.0%	40.0%	3.6%
MGE Energy, Inc. (NYSE-MGEE)	7.0	3.5	4.5	12.0%	58.0%	7.0%
NorthWestern Corporation (NYSE-NWE)	4.0	2.0	3.0	8.0%	35.0%	2.8%
Public Service Enterprise Group Incorporated	5.0	5.0	5.0	12.0%	38.0%	4.6%
Sempra Energy (NYSE-SRE)	7.0	5.0	6.0	10.5%	51.0%	5.4%
WEC Energy Group (NYSE-WEC)	6.0	7.0	4.0	13.0%	36.0%	4.7%
Xcel Energy Inc. (NYSE-XEL)	7.0	5.5	5.5	11.5%	43.0%	4.9%
Mean	5.7	4.5	4.5	10.5%	40.5%	4.3%
Median	6.0	4.5	4.5	10.5%	38.0%	4.7%
Average of Median Figures =		5.0			Median =	4.7%

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

Exhibit JRW-5

Kansas Gas Service
DCF Equity Cost Growth Rate Measures
Analysts Projected EPS Growth Rate Estimates

Panel A
Gas Proxy Group

Company	Yahoo	Zacks	S&P Cap IQ	Mean
Atmos Energy Company (NYSE-ATO)	7.40%	7.00%	7.00%	7.1%
Chesapeake Utilities (NYSE-CPK)	7.60%	NA	8.10%	7.9%
New Jersey Resources Corp. (NYSE-NJR)	6.00%	NA	5.87%	5.9%
NiSource Inc (NYSE-NI)	7.40%	6.00%	7.00%	6.8%
Northwest Natural Gas Co. (NYSE-NWN)	2.80%	NA	4.40%	3.6%
ONE Gas, Inc. (NYSE-OGS)	5.00%	5.00%	3.00%	4.3%
Spire (NYSE-SR)	6.36%	5.00%	6.50%	6.0%
Mean	6.1%	5.8%	6.0%	5.9%
Median	6.4%	5.5%	6.5%	6.0%

Data Source: www.https://finance.yahoo.com/, https://zacks.com/, S&P Cap IQ, June 17, 2024.

Panel B
Combination Proxy Group

Company	Yahoo	Zacks	S&P Cap IQ	Mean
Avista Corporation (NYSE-AVA)	6.20%	NA	5.00%	5.6%
Black Hills Corporation	0.70%	NA	4.43%	2.6%
CenterPoint Energy, Inc. (NYSE - CMP)	7.70%	7.51%	7.90%	7.7%
CMS Energy Corporation (NYSE-CMS)	7.60%	7.56%	7.29%	7.5%
Consolidated Edison, Inc. (NYSE-ED)	6.09%	7.39%	5.79%	6.4%
MGE Energy, Inc. (NYSE-MGEE)	5.40%	NA	NA	5.4%
NorthWestern Corporation (NYSE-NWE)	4.50%	NA	5.10%	4.8%
Public Service Enterprise Group Incorporated NYSE-PEG	5.45%	6.55%	6.56%	6.2%
Sempra Energy (NYSE-SRE)	5.90%	6.00%	5.44%	5.8%
WEC Energy Group (NYSE-WEC)	7.21%	7.95%	7.35%	7.5%
Xcel Energy Inc. (NYSE-XEL)	6.73%	6.39%	6.36%	6.5%
Mean	5.8%	7.1%	6.1%	6.0%
Median	6.1%	7.4%	6.1%	6.2%

Data Source: www.https://finance.yahoo.com/, https://zacks.com/, S&P Cap IQ, June 17, 2024.

Exhibit JRW-5

Kansas Gas Service
DCF Growth Rate Indicators

Proxy Group

Growth Rate Indicator	Gas Proxy Group	Combination Proxy Group
Historic *Value Line* Growth in EPS, DPS, and BVPS	5.7%	5.2%
Projected *Value Line* Growth in EPS, DPS, and BVPS	5.2%	5.0%
Sustainable Growth ROE * Retention Rate	5.0%	4.7%
Projected EPS Growth from Yahoo, Zacks, and S&P Cap IQ - Mean/Median	5.9%/6.0%	6.0%/6.2%
DCF Growth Rate	5.65%	5.70%

Exhibit JRW-6

Docket No. 24-KGSG-610-RTS
Capital Asset Pricing Model

Panel A
Gas Proxy Group

Risk-Free Interest Rate	4.50%
Beta*	0.81
Ex Ante Market Risk Premium**	5.00%
CAPM Cost of Equity***	8.55%

*** See page 3 of Exhibit JRW-6**

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

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

Panel B
Combination Proxy Group

Risk-Free Interest Rate	4.50%
Beta*	0.80
Ex Ante Market Risk Premium**	5.00%
CAPM Cost of Equity***	8.50%

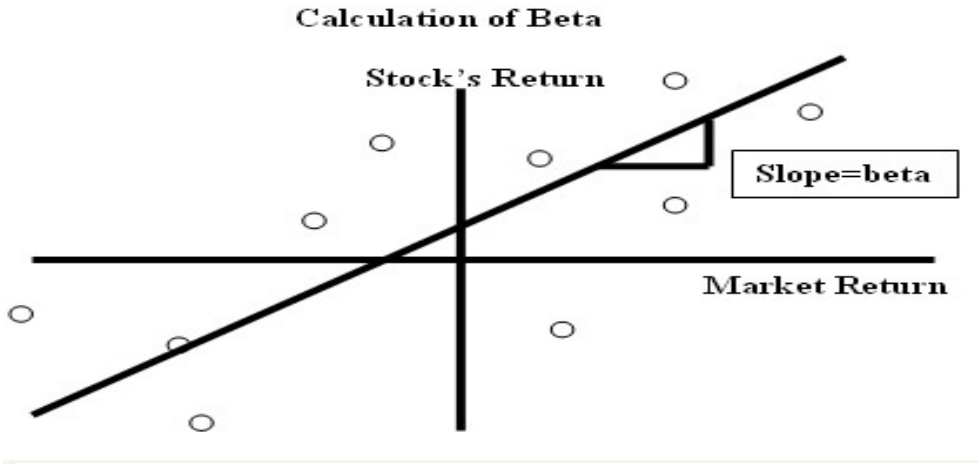
*** See page 3 of Exhibit JRW-6**

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

Exhibit JRW-6

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

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



Panel A
Gas Proxy Group

	V-Line	Cap IQ	Average
Company	Beta	Adj. Beta	Beta
Atmos Energy Company (NYSE-ATO)	0.85	0.78	0.81
Chesapeake Utilities (NYSE-CPK)	0.90	0.75	0.82
New Jersey Resources Corp. (NYSE-NJR)	1.00	0.75	0.88
NiSource Inc (NYSE-NI)	0.95	0.67	0.81
Northwest Natural Gas Co. (NYSE-NWN)	0.85	0.71	0.78
ONE Gas, Inc. (NYSE-OGS)	0.85	0.76	0.81
Spire (NYSE-SR)	0.85	0.68	0.76
Mean	0.89	0.73	0.81
Median	0.85	0.75	0.81

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

Panel B
Combination Proxy Group

	V-Line	Cap IQ	Average
Company	Beta	Adj. Beta	Beta
Avista Corporation (NYSE-AVA)	0.95	0.65	0.80
Black Hills Corporation (NYSE-BKH)	1.05	0.78	0.92
CenterPoint Energy, Inc. (NYSE - CMP)	1.15	0.94	1.04
CMS Energy Corporation (NYSE-CMS)	0.85	0.59	0.72
Consolidated Edison, Inc. (NYSE-ED)	0.80	0.56	0.68
MGE Energy, Inc. (NYSE-MGEE)	0.80	0.82	0.81
NorthWestern Corporation (NYSE-NWE)	0.95	0.65	0.80
Public Service Enterprise Group Incorporated	0.95	0.73	0.84
Sempra Energy (NYSE-SRE)	1.00	0.83	0.92
WEC Energy Group (NYSE-WEC)	0.85	0.61	0.73
Xcel Energy Inc. (NYSE-XEL)	0.85	0.59	0.72
Mean	0.93	0.71	0.82
Median	0.95	0.65	0.80

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

Exhibit JRW-6
Risk Premium Approaches

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

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

CAPM Study

Market Risk Premium - 2000-2024

Category	Category	Study Authors	Publication Date	Time Period Of Study	Methodology	Return Measure	Range Low	Range High	Midpoint of Range	Mean	Median
Historical Risk	**Historical Risk Premium**										
		Ibbotson	2016	1928-2015	Historical Stock Returns - Bond Returns	Arithmetic				6.00%	
						Geometric				4.40%	
		Damodaran	2024	1928-2023	Historical Stock Returns - Bond Returns	Arithmetic				6.80%	
						Geometric				5.23%	
		Dimson, Marsh, Staunton _Credit Suisse Report	2023	1900-2022	Historical Stock Returns - Bond Returns	Arithmetic				6.40%	
						Geometric				4.60%	
		Bate	2008	1900-2007	Historical Stock Returns - Bond Returns	Geometric				4.50%	
		Shiller	2006	1926-2005	Historical Stock Returns - Bond Returns	Arithmetic				7.00%	
						Geometric				5.50%	
		Siegel	2005	1926-2005	Historical Stock Returns - Bond Returns	Arithmetic				6.10%	
						Geometric				4.60%	
		Dimson, Marsh, and Staunton	2006	1900-2005	Historical Stock Returns - Bond Returns	Arithmetic				5.50%	
		Goyal & Welch	2006	1872-2004	Historical Stock Returns - Bond Returns					4.77%	
		Median									5.50%
Ex Ante Mode	**Ex Ante Models (Puzzle Research)**										
		Claus Thomas	2001	1985-1998	Abnormal Earnings Model					3.00%	
		Arnott and Bernstein	2002	1810-2001	Fundamentals - Div Yld + Growth					2.40%	
		Constantinides	2002	1872-2000	Historical Returns & Fundamentals - P/D & P/E					6.90%	
		Cornell	1999	1926-1997	Historical Returns & Fundamental GDP/Earnings		3.50%	5.50%	4.50%	4.50%	
		Easton, Taylor, et al	2002	1981-1998	Residual Income Model					5.30%	
		Fama French	2002	1951-2000	Fundamental DCF with EPS and DPS Growth		2.55%	4.32%		3.44%	
		Harris & Marston	2001	1982-1998	Fundamental DCF with Analysts' EPS Growth					7.14%	
		McKinsey	2002	1962-2002	Fundamental (P/E, D/P, & Earnings Growth)		3.50%	4.00%		3.75%	
		Siegel	2005	1802-2001	Historical Earnings Yield					2.50%	
		Grabowski	2006	1926-2005	Historical and Projected		3.50%	6.00%	4.75%	4.75%	
		Maheu & McCurdy	2006	1885-2003	Historical Excess Returns, Structural Breaks,		4.02%	5.10%	4.56%	4.56%	
		Bostock	2004	1960-2002	Bond Yields, Credit Risk, and Income Volatility		3.90%	1.30%	2.60%	2.60%	
		Bakshi & Chen	2005	1982-1998	Fundamentals - Interest Rates					7.31%	
		Donaldson, Kamstra, & Kramer	2006	1952-2004	Fundamental, Dividend yld., Returns,, & Volatility		3.00%	4.00%	3.50%	3.50%	
		Campbell	2008	1982-2007	Historical & Projections (D/P & Earnings Growth)		4.10%	5.40%		4.75%	
		Best & Byrne	2001	Projection	Fundamentals - Div Yld + Growth					2.00%	
		Fernandez	2007	Projection	Required Equity Risk Premium					4.00%	
		DeLong & Magin	2008	Projection	Earnings Yield - TIPS					3.22%	
		Siegel - Rethink ERP	2011	Projection	Real Stock Returns and Components					5.50%	
		Kroll (Duff & Phelps)	2024	Projection	Normalized with 3.5% Long-Term Treasury Yield					5.00%	
		Mschchowski - VL - 2014	2014	Projection	Fundamentals - Expected Return Minus 10-Year Treasury Rate					5.50%	
		American Appraisal Quarterly ERP	2015	Projection	Fundamental Economic and Market Factors					6.00%	
		JP Morgan Asset Management	2023	Projection	Equity Return of 7.90% and Long-Term Bond of 3.50%					4.40%	
		Market Risk Premia - 3-1-24	2023	Projection	Fundamental Economic and Market Factors					2.61%	
		KPMG	2024	Projection	Fundamental Economic and Market Factors					5.00%	
		Damodaran 6-1-24	2024	Projection	Fundamentals - Implied from FCF to Equity Model (Trailing 12 month, with adjusted payout)					4.12%	
		John Campbell	2001	1860-2000	Historical & Projections (D/P & Earnings Growth)	Arithmetic	3.00%	4.00%	3.50%	3.50%	
				Projected for 75 Years		Geometric	1.50%	2.50%	2.00%	2.00%	
		Peter Diamond	2001	Projected for 75 Years	Fundamentals (D/P, GDP Growth)		3.00%	4.80%	3.90%	3.90%	
		John Shoven	2001	Projected for 75 Years	Fundamentals (D/P, P/E, GDP Growth)		3.00%	3.50%	3.25%	3.25%	
		Median									4.06%
Surveys	**Surveys**										
		New York Fed	2015	Five-Year	Survey of Wall Street Firms					5.70%	
		Survey of Financial Forecasters	2024	10-Year Projection	Equity Return of 7.00% and Long-Term Bond of 3.60%					3.40%	
		Duke - CFO Magazine Survey	2024	10-Year Projection	Approximately 300 CFOs Expected S&P 500 Return of 9.1% and Risk-Free Rate of 5.5%					4.60%	
		Fernandez - Academics, Analysts, and Companies	2024	Long-Term	Survey of Academics, Analysts, and Companies					5.50%	
		Median									5.05%
Building Block	**Building Block**										
		Ibbotson and Chen	2015	Projection	Historical Supply Model (D/P & Earnings Growth)	Arithmetic			6.22%	5.21%	
						Geometric			4.20%		
		Chen - Rethink ERP	2010	20-Year Projection	Combination Supply Model (Historic and Projection)	Geometric				4.00%	
		Ilmanen - Rethink ERP	2010	Projection	Current Supply Model (D/P & Earnings Growth)	Geometric				3.00%	
		Grinold, Kroner, Siegel - Rethink ERP	2011	Projection	Current Supply Model (D/P & Earnings Growth)	Arithmetic			4.63%	4.12%	
						Geometric			3.60%		
		Median									4.06%
Mean	**Mean**										**4.67%**
Median	**Median**										**4.56%**

CAPM Study

Market Risk Premium Results - 2010-2024

Category	Study Authors	Publication Date	Time Period Of Study	Methodology	Return Measure	Range Low	Range High	Midpoint of Range	Mean	Median
Historical Risk Premium										
	Ibbotson	2016	1928-2015	Historical Stock Returns - Bond Returns	Arithmetic				6.00%	
					Geometric				4.40%	
	Damodaran	2024	1928-2023	Historical Stock Returns - Bond Returns	Arithmetic				6.80%	
					Geometric				5.23%	
	Dimson, Marsh, Staunton _Credit Suisse Report	2023	1900-2022	Historical Stock Returns - Bond Returns	Arithmetic				6.40%	
					Geometric				4.60%	
	Median									5.57%
Ex Ante Models (Puzzle Research)										
	Siegel - Rethink ERP	2011	Projection	Real Stock Returns and Components					5.50%	
	Kroll (Duff & Phelps)	2024	Projection	Normalized with 3.5% Long-Term Treasury Yield					5.00%	
	Mschchowski - VL - 2014	2014	Projection	Fundamentals - Expected Return Minus 10-Year Treasury Rate					5.50%	
	American Appraisal Quarterly ERP	2015	Projection	Fundamental Economic and Market Factors					6.00%	
	JP Morgan Asset Management	2023	Projection	Equity Return of 7.90% and Long-Term Bond of 3.50%					4.40%	
	Market Risk Premia - 3-1-24	2023	Projection	Fundamental Economic and Market Factors					2.61%	
	KPMG	2024	Projection	Fundamental Economic and Market Factors					5.00%	
	Damodaran 6-1-24	2024	Projection	Fundamentals - Implied from FCF to Equity Model (Trailing 12 month, with adjusted payout)					4.12%	
	Median									5.00%
Surveys										
	New York Fed	2015	Five-Year	Survey of Wall Street Firms					5.70%	
	Survey of Financial Forecasters	2024	10-Year Projection	Equity Return of 7.00% and Long-Term Bond of 3.60%					3.40%	
	Duke - CFO Magazine Survey	2024	10-Year Projection	Approximately 300 CFOs Expected S&P 500 Return of 9.1% and Risk-Free Rate of 5.5%					4.60%	
	Fernandez - Academics, Analysts, and Companies	2024	Long-Term	Survey of Academics, Analysts, and Companies					5.50%	
	Median									5.05%
Building Block										
	Ibbotson and Chen	2015	Projection	Historical Supply Model (D/P & Earnings Growth)	Arithmetic			6.22%	5.21%	
					Geometric			4.20%		
	Chen - Rethink ERP	2010	20-Year Projection	Combination Supply Model (Historic and Projection)	Geometric				4.00%	
	Ilmanen - Rethink ERP	2010	Projection	Current Supply Model (D/P & Earnings Growth)	Geometric				3.00%	
	Grinold, Kroner, Siegel - Rethink ERP	2011	Projection	Current Supply Model (D/P & Earnings Growth)	Arithmetic			4.63%	4.12%	
					Geometric			3.60%		
	Median									4.06%
Mean										**4.92%**
Median										**5.03%**

CAPM Study

Kroll Equity Risk Premium Estimates

KROLL

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

For additional information, please vis
kroll.com/cost-of-capital-resources-com

Date	Risk-free Rate (R_f)	R_f (%)	Kroll Recommended U.S. ERP (%)	What Changed
Current Guidance:				
June 5, 2024 – UNTIL FURTHER NOTICE*	Normalized 20-year U.S. Treasury yield*	3.50*	5.00	*ERP*
June 8, 2023 – June 4, 2024*	Normalized 20-year U.S. Treasury yield*	3.50*	5.50	*ERP*
October 18, 2022 – June 7, 2023*	Normalized 20-year U.S. Treasury yield*	3.50*	6.00	*ERP*
June 16, 2022 – October 17, 2022*	Normalized 20-year U.S. Treasury yield*	3.50*	5.50	*RF*
April 7, 2022 – June 15, 2022	Normalized 20-year U.S. Treasury yield	3.00	5.50	*RF*
December 7, 2020 – April 6, 2022	Normalized 20-year U.S. Treasury yield	2.50	5.50	*ERP*
June 30, 2020 – December 6, 2020	Normalized 20-year U.S. Treasury yield	2.50	6.00	*RF*
March 25, 2020 – June 29, 2020	Normalized 20-year U.S. Treasury yield	3.00	6.00	*ERP*
December 19, 2019 – March 24, 2020	Normalized 20-year U.S. Treasury yield	3.00	5.00	*ERP*
September 30, 2019 – December 18, 2019	Normalized 20-year U.S. Treasury yield	3.00	5.50	R_f
December 31, 2018 – September 29, 2019	Normalized 20-year U.S. Treasury yield	3.50	5.50	*ERP*
September 5, 2017 – December 30, 2018	Normalized 20-year U.S. Treasury yield	3.50	5.00	*ERP*
November 15, 2016 – September 4, 2017	Normalized 20-year U.S. Treasury yield	3.50	5.50	R_f
January 31, 2016 – November 14, 2016	Normalized 20-year U.S. Treasury yield	4.00	5.50	*ERP*
December 31, 2015	Normalized 20-year U.S. Treasury yield	4.00	5.00	
December 31, 2014	Normalized 20-year U.S. Treasury yield	4.00	5.00	
December 31, 2013	Normalized 20-year U.S. Treasury yield	4.00	5.00	
February 28, 2013 – January 30, 2016	Normalized 20-year U.S. Treasury yield	4.00	5.00	*ERP*
December 31, 2012	Normalized 20-year U.S. Treasury yield	4.00	5.50	
January 15, 2012 – February 27, 2013	Normalized 20-year U.S. Treasury yield	4.00	5.50	*ERP*
December 31, 2011	Normalized 20-year U.S. Treasury yield	4.00	6.00	
September 30, 2011 – January 14, 2012	Normalized 20-year U.S. Treasury yield	4.00	6.00	*ERP*
July 1 2011 – September 29, 2011	Normalized 20-year U.S. Treasury yield	4.00	5.50	R_f
June 1, 2011 – June 30, 2011	Spot 20-year U.S. Treasury yield	Spot	5.50	R_f
May 1, 2011 – May 31, 2011	Normalized 20-year U.S. Treasury yield	4.00	5.50	R_f
December 31, 2010	Spot 20-year U.S. Treasury yield	Spot	5.50	
December 1, 2010 – April 30, 2011	Spot 20-year U.S. Treasury yield	Spot	5.50	R_f
June 1, 2010 – November 30, 2010	Normalized 20-year U.S. Treasury yield	4.00	5.50	R_f
December 31, 2009	Spot 20-year U.S. Treasury yield	Spot	5.50	
December 1, 2009 – May 31, 2010	Spot 20-year U.S. Treasury yield	Spot	5.50	*ERP*
June 1, 2009 – November 30, 2009	Spot 20-year U.S. Treasury yield	Spot	6.00	R_f
December 31, 2008	Normalized 20-year U.S. Treasury yield	4.50	6.00	
November 1, 2008 – May 31, 2009	Normalized 20-year U.S. Treasury yield	4.50	6.00	R_f
October 27, 2008 – October 31, 2008	Spot 20-year U.S. Treasury yield	Spot	6.00	*ERP*
January 1, 2008 – October 26, 2008	Spot 20-year U.S. Treasury yield	Spot	5.00	Initialized

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

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

Exhibit JRW-7
Kansas Gas Service's Rate of Return Recemmendation

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	40.42%	4.40%	1.78%
Common Equity	59.58%	10.25%	6.11%
Total	100.00%		7.88%

Fairchild ROE Results

	Range	
	Low-End	**High-End**
DCF Model		
	9.50%	**10.50%**
CAPM		
W/Size Premium	**11.40%**	**11.80%**
W/O Size Premium	**10.20%**	**10.40%**
Comparable Earnings		
	8.70%	**10.10%**
Recommended Range		
	9.75%	**10.75%**
Recommended ROE		
	10.25%	

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

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

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

GDP and S&P 500 Growth Rates

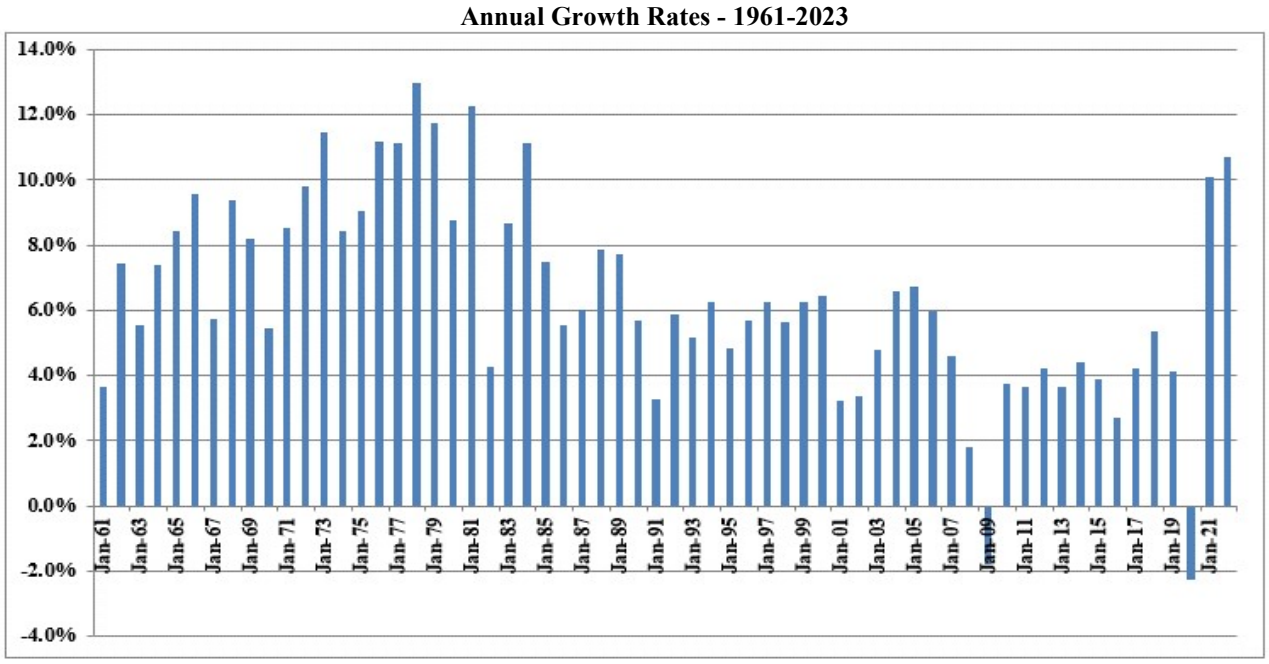
Growth Rates
GDP, S&P 500 Price, EPS, and DPS

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

esearch.stlouisfed.org/fred2/series/GDPA/downloaddata

DPS - http://pages.stern.nyu.edu/~adamodar/

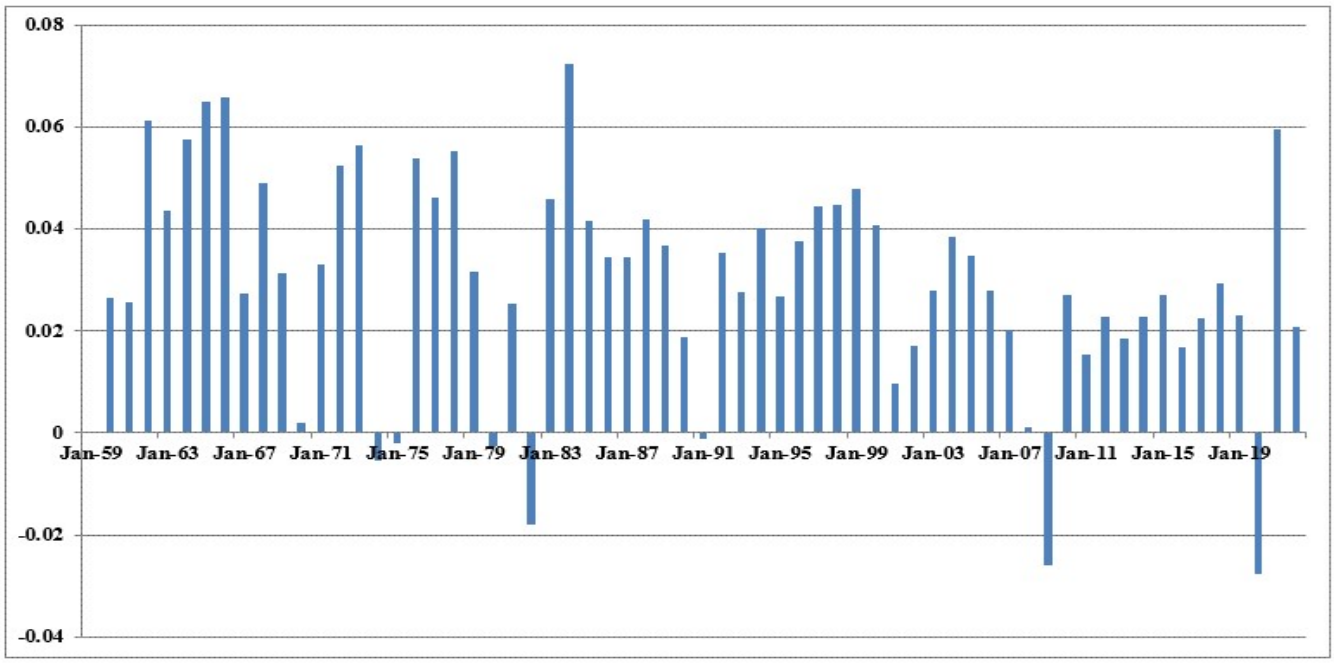
Annual Nominal GDP Growth Rates



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

Real GDP Growth Rates

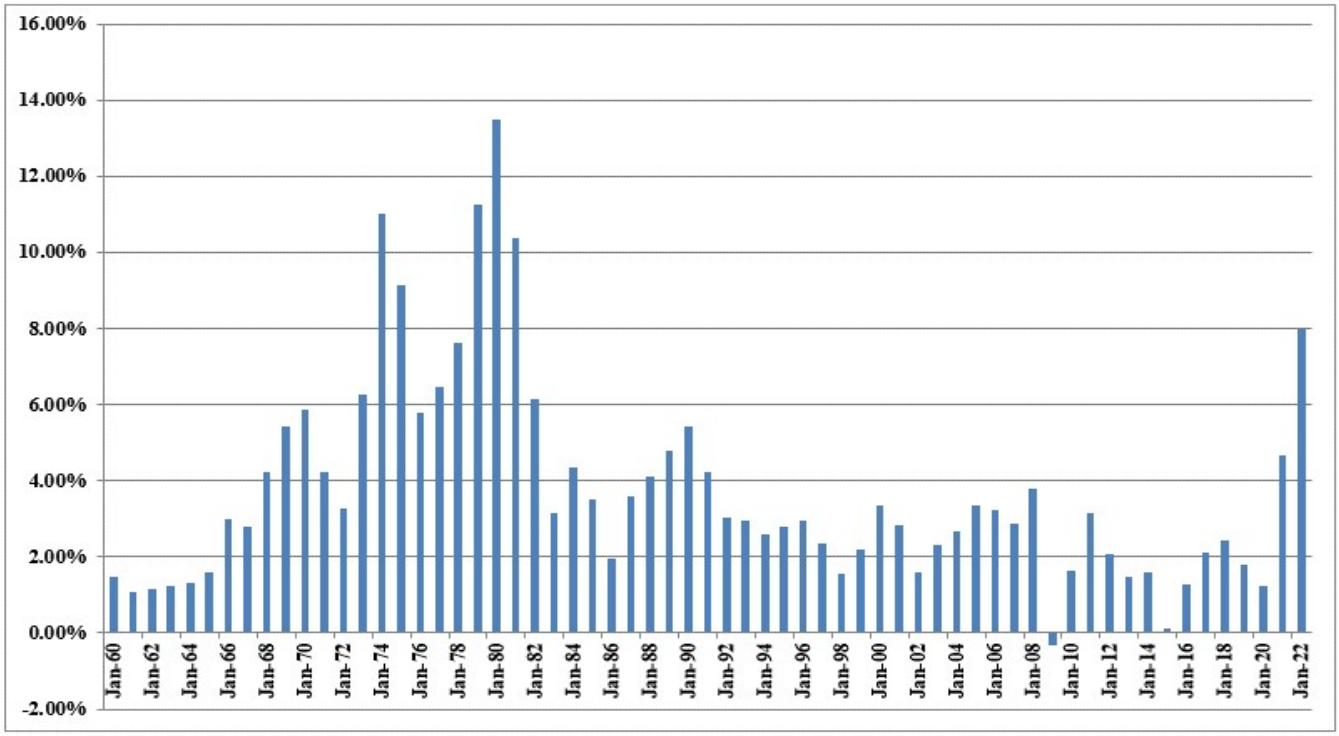
Annual Average Real GDP Growth Rates
1961-2023



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

Inflation Rates

Annual Inflation Rates
1961-2023



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

Projected Nominal GDP Growth Rates

Panel A
Historic GDP Growth Rates

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

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

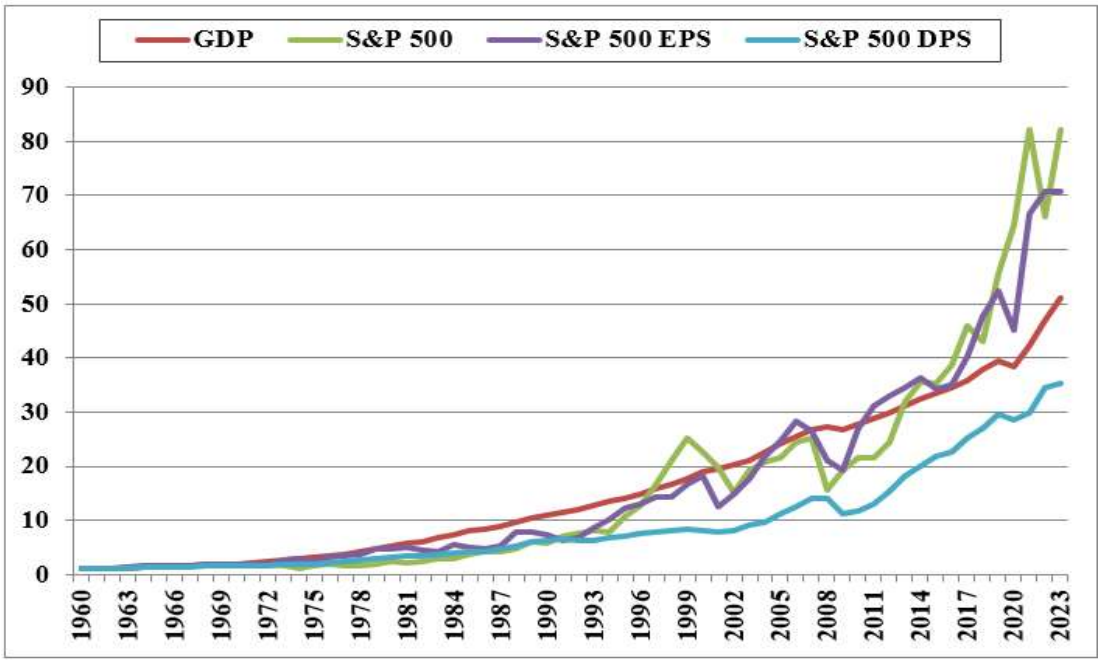
Panel B
Projected GDP Growth Rates

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

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

GDP and S&P 500 Growth Rates

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



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

CERTIFICATE OF SERVICE

24-KGSG-610-RTS

I, the undersigned, hereby certify that a true and correct copy of the above and foregoing document was served by electronic service on this 1st day of July, 2024, to the following:

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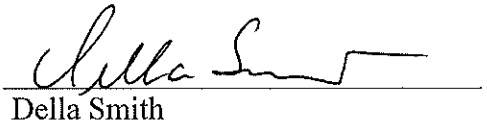

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