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MISSOURI PUBLIC SERVICE COMMISSION

FILE NO. ER-2024-0319

REBUTTAL TESTIMONY

OF

ANN E. BULKLEY

ON

BEHALF OF

UNION ELECTRIC COMPANY

D/B/A AMEREN MISSOURI

St. Louis, Missouri
January 2025

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REBUTTAL TESTIMONY

OF

ANN E. BULKLEY

FILE NO. ER-2024-0319

I. Introduction

Q: Are you the same Ann E. Bulkley that previously filed direct testimony in this proceeding?

A. Yes. I previously submitted direct testimony before the Missouri Public Service Commission ("Commission") in this proceeding on behalf of Ameren Missouri ("Company" or "Ameren Missouri"), a wholly-owned subsidiary of Ameren Corporation ("Ameren"), regarding the Company's electric utility operations.

Q: What is the purpose of your rebuttal testimony?

A. The purpose of my rebuttal testimony is to respond to the direct testimonies of Dr. Seoung Joun Won on behalf of the Missouri Public Service Commission Staff ("Staff"),[1] David Murray on behalf of the Missouri Office of the Public Counsel ("OPC"),[2] Christopher C. Walters on behalf of the Missouri Industrial Energy

[1] Missouri Public Service Commission, Direct Testimony Revenue Requirement of Seoung Joun Won, PhD, Case No. ER-2024-03197, December 3, 2024 ("Won Direct").

[2] Missouri Public Service Commission, Direct Testimony of David Murray, Case No. ER-2024-03197, December 3, 2024 ("Murray Direct").

Consumers,[3] and Tyler Comings on behalf of the Sierra Club,[4] regarding their respective proposals for the return on equity for the Company in this proceeding. In addition, while it is my understanding that the intent of the testimonies to be filed by the intervening parties on December 3, 2024 was to be direct testimony, Mr. Comings has nonetheless provided rebuttal testimony in part to my cost of equity analyses that I will also address herein.

Q: Are you sponsoring any exhibits in support of rebuttal direct testimony?

A. Yes. I am sponsoring Schedule AEB-R1, Attachments 1 through 13, which have been prepared by me or under my direction.

Q: Have you prepared cost of equity analyses to support your rebuttal testimony that reflect current market conditions?

A. Yes. As discussed in more detail herein, I have prepared updated cost of equity analyses based on market data through November 30, 2024 to rebut the cost of equity analyses of the other witnesses in this proceeding. These analyses validate the reasonableness of my recommended ROE range of 9.90 to 11.25 percent, and that the Company's proposed ROE of 10.25 percent is reasonable.[5] My conclusion continues to be based on not only the results of multiple cost of equity models, as

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[3] Missouri Public Service Commission, Direct Testimony and Schedules of Christopher C. Walters, Case No. ER-2024-03197, December 3, 2024 ("Walters Direct").

[4] Missouri Public Service Commission, Direct Testimony of Tyler Comings, Case No. ER-2024-03197, December 3, 2024 ("Comings Direct").

[5] Missouri Public Service Commission, Direct Testimony of Ann E. Bulkley, Case No. ER-2024-03197, June 28, 2024 ("Bulkley Direct"), at 73.

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well as other factors, including capital market conditions, the capital attraction and comparable return standards, and the Company's specific risks.

Q: How is the remainder of your rebuttal testimony organized?

A. The remainder of my testimony is organized as follows:

- Section II provides a summary and overview of my rebuttal testimony and the important factors to be considered in establishing the authorized ROE for the Company.
- Section III provides cost of equity analyses based on market data as of November 30, 2024.
- Section IV discusses the changes in capital market conditions since my direct testimony and their effect on the cost of equity and authorized ROEs for comparable utilities nationwide relative to the witnesses' ROE recommendations in this proceeding.
- Section V provides my response to Dr. Won's cost of equity analyses and recommendations.
- Section VI provides my response to Mr. Murray's cost of equity analyses and recommendations.
- Section VII provides my response to Mr. Walters's cost of equity analyses and recommendations.
- Section VIII provides my response to Mr. Comings's cost of equity analyses and recommendations
- Section IX provides my response to these witnesses discussion of the Company's business and regulatory risks.

II. Summary and Overview

Q: What factors should be considered in evaluating the results of the cost of equity analyses and establishing the authorized ROE?

A. The primary factors that should be considered are: (1) the importance of providing a return that is comparable to returns on alternative investments with commensurate risk; (2) the need for a return that supports a utility's ability to attract needed capital at reasonable terms; (3) the effect of current and expected capital market conditions; and (4) achieving a reasonable balance between the interests of investors and customers.

Q: What are the ROE recommendations of the parties in this proceeding?

A. Figure 1 summarizes the results of the cost of equity analyses presented by Dr. Won, Mr. Murray, Mr. Walters, and Mr. Comings in this proceeding, as well as each of their final ROE recommendations. As shown, the ROE recommendations of these witnesses range from 9.25 percent to 9.74 percent. Specifically, while Dr. Won does not indicate how he develops his recommended ROE range, his ROE recommendation is equal to the average result of both his CAPM analysis and his Bond Yield Plus Risk Premium ("BYRP" or "Risk Premium") analysis, while the results of his DCF analyses are significantly lower. Mr. Murray conducts a multi-stage DCF analysis and a CAPM analysis, and also a "rule of thumb" BYRP analysis as a check on the reasonableness of his other two cost of equity analyses. While Mr. Murray's recommended ROE is significantly greater than any of the results of the cost of equity analyses that he conducts, Mr. Murray acknowledges

his recommendation is based on several factors,[6] including a fair and reasonable range of 9.00 percent to 9.50 percent. Mr. Comings recommends a range of returns from 9.25 percent to 9.50 percent but does not provide the Commission with a specific point estimate for the ROE.

FIGURE 1: SUMMARY OF RESULTS OF THE COST OF EQUITY ANALYSES AND ROE RECOMMENDATIONS OF DR. WON, MR. MURRAY, MR. WALTERS, AND MR. COMINGS

	Dr. Won	Mr. Murray	Mr. Walters	Mr. Comings
DCF Analysis				
Two-Step DCF	7.49% - 9.70%	n/a	n/a	n/a
Constant Growth DCF	n/a	n/a	8.70% - 10.81%	8.00% - 8.87%
Multi-Stage DCF (Utility Proxy Group)	n/a	7.92% - 8.38%	8.43% - 8.67%	n/a
Multi-Stage DCF (Ameren)	n/a	7.94% - 8.25%	n/a	n/a
CAPM				
Utility Proxy Group	9.06% - 10.42%	7.39% - 8.38%	7.70% - 11.92%	9.03% - 10.50%
Ameren	n/a	7.58% - 8.33%	n/a	n/a
ECAPM	n/a	n/a	n/a	9.12% - 10.61%
Bond Yield Plus Risk Premium	9.72% - 9.76%	8.50%	9.75% - 10.12%	n/a
Recommended ROE Range	9.49% - 9.99%	9.00% - 9.50%	9.00% - 10.00%	9.25% - 9.50%
Recommended ROE	**9.74%**	**9.50%**	**9.50%**	**9.25% - 9.50%**

Q: What are your key conclusions and recommendations regarding the appropriate ROE for Ameren Missouri in this proceeding?

A. Nothing in the direct testimonies of Dr. Won, Mr. Murray, Mr. Walters, or Mr. Comings has caused me to change my conclusions or recommendations. Based on my review of the direct testimonies of these witnesses, my key conclusions regarding a reasonable ROE for the Company in this proceeding are as follows:

[6] Murray Direct, at 2-3, and 32-33.

- Updated cost of equity analyses based on market data through November 30, 2024 confirms that Company's requested ROE of 10.25 percent continues to be reasonable.
- When Dr. Won's DCF, CAPM, and BYRP analyses are updated to reflect the most current data available and corrected for the issues that I discuss in detail herein, the average cost of equity is 10.53 percent – *which is substantially higher than the Company proposed cost of equity in this proceeding*.
- Mr. Murray's ROE recommendation lacks analytical foundation and simply represents his own unsupported opinion as to the appropriate ROE for Ameren Missouri. Specifically:
    - Mr. Murray conducts DCF and CAPM analyses, as well as a "rule of thumb" BYRP analysis, but does not rely on the results of any of these analyses for his ROE recommendation.
    - Despite a significant increase in interest rates over the past few years that indicates an increase in the cost of equity, which Mr. Murray acknowledges, he nonetheless recommends an ROE that is nearly 20 basis points below what he states is the average authorized ROE nationally for vertically-integrated electric utilities in 2024.
- When Mr. Walters' analyses are updated to place primary weight on his DCF that uses analyst projected EPS growth rates such as he has done in the past, and corrected to reflect the inverse relationship between interest rates and risk premia in his CAPM and BYRP analyses, the results indicate an ROE of 10.50 percent would be appropriate - *which too is higher than the Company proposed cost of equity in this proceeding*.
- Mr. Comings's cost of equity analyses suffer from the same flaws as I identify in my response to the other witnesses, and consequently, the results of his analyses are understated.

III. Updated Cost of Equity Analyses

Q: Have you updated your cost of equity analyses to support your rebuttal testimony?

A. Yes. I have updated the analyses that I prepared in my direct testimony using market data through November 30, 2024,. In addition, I provide additional analyses that also rebut the outdated cost of equity analyses provided by Dr. Won, Mr.

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Murray, Mr. Walters, and Mr. Comings. Figure 2 summarizes the range of results of my cost of equity analyses for the Company. This summary is also reflected in Schedule AEB-R1, Attachment 1, and the details of these cost of equity analyses are provided in Schedule AEB-R1, Attachments 2 through 6.

FIGURE 2: SUMMARY OF COST OF EQUITY ANALYTICAL RESULTS

Constant Growth DCF

	Minimum Growth Rate	Average Growth Rate	Maximum Growth Rate
Mean Results:			
30-Day Avg. Stock Price	8.99%	10.26%	11.25%
90-Day Avg. Stock Price	9.08%	10.35%	11.34%
180-Day Avg. Stock Price	9.35%	10.62%	11.62%
Average	9.14%	10.41%	11.41%
Median Results:			
30-Day Avg. Stock Price	9.18%	10.04%	10.71%
90-Day Avg. Stock Price	9.36%	10.19%	10.83%
180-Day Avg. Stock Price	9.61%	10.39%	11.15%
Average	9.38%	10.21%	10.90%

CAPM / ECAPM / Bond Yield Risk Premium

	30-Year Treasury Bond Yield		
	Current 30-Day Avg	Near-Term Projected	Longer-Term Projected
CAPM:			
Current *Value Line* Beta	11.65%	11.65%	11.64%
Current Bloomberg Beta	10.45%	10.43%	10.40%
Long-term Avg. *Value Line* Beta	10.29%	10.27%	10.24%
ECAPM:			
Current *Value Line* Beta	11.75%	11.75%	11.74%
Current Bloomberg Beta	10.85%	10.84%	10.82%
Long-term Avg. *Value Line* Beta	10.73%	10.71%	10.69%
Bond Yield Risk Premium:	10.53%	10.47%	10.40%

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Q: Do the updated results support the Company's requested ROE of 10.25 percent in this proceeding?

A. Yes. While the results of the cost of equity analyses reflecting market data through November 30, 2024 are moderately lower than the results filed in my direct testimony, the updated results continue to support the Company's recommended ROE of 10.25 percent in this proceeding.

IV. Capital Markets Conditions and Comparable Return

Q: Do you generally agree with Dr. Won's and Mr. Murray's characterizations of the changes in market conditions over the past few years and their effect on the cost of equity?

A. Yes. I generally agree with Dr. Won's and Mr. Murray's respective characterizations of the capital market conditions over the past few years and the fact that they both acknowledge the cost of equity for electric utilities has increased since the Company's last rate proceeding as a result of the changes in capital market conditions.[7] Dr. Won and Mr. Murray recognize that short-term and long-term interest rates are significantly higher since that time due to the Federal Reserve's efforts to combat persistently high inflation. As Dr. Won notes, inflation remains elevated above the Federal Reserve's target and that one of the most important factors in the economic conditions that impact the cost of equity is the

[7] *See, e.g.*, Won Direct, at 4 (range of 9.49 percent to 9.99 percent) as compared to Missouri Public Service Commission, Case No. ER-2022-0337, Direct Testimony of Seoung Joun Won, PhD, January 10, 2023, at 4 (range of 9.34 percent to 9.84 percent); Murray Direct, at 3 (cost of equity range is approximately 0.75 percent higher than his estimate in Ameren Missouri's 2022 rate case).

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interest rate as influenced by the Federal Reserve's monetary policy.[8] However, while Dr. Won and Mr. Murray summarize the capital market conditions over the past few years in a similar manner as I have done, it is our respective conclusions regarding those conditions that differ.

Q: What conclusions have Dr. Won and Mr. Murray drawn from the changes in market conditions?

A. While recognizing the increase in the cost of equity for electric utilities, Dr. Won contends that the results of the DCF and CAPM are "overstated":

> The combined net result of the rise in interest rates and changes in overall market conditions is an increase in COE. Staff's COE estimates for the electric proxy group have also increased. The current COE, as estimated by the DCF and CAPM methods, is overstated when considering utility bond market conditions. Therefore, Staff is cautious about using COE estimates from DCF and CAPM [sic] to recommend a specific authorized ROE in this proceeding, as demonstrated later in this testimony.[9]

Similarly, Mr. Murray also acknowledges that there has been an increase in the electric utility industry's cost of equity in the past few years; however; he contends that his recommended ROE of 9.50 percent in this proceeding is reasonable since, despite recent increases in long-term bond yields, the price-to-earnings ("P/E") ratios for the electric industry are trading similar to 2015 levels when the

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8 Won Direct, at 9.

9 *Id*., at 22.

Commission separately authorized an ROE of 9.50 percent for Ameren Missouri and Evergy Metro.[10]

Q: Has Dr. Won provided any support for his contention that the results of the DCF and CAPM are "overstated" as a result of the current capital market conditions?

A. No. Dr. Won's position that the results of the DCF and CAPM are "overstated" in the current capital market conditions is invalidated by the fact that his recommended ROE for the Company in this proceeding (*i.e.*, 9.74 percent) is actually greater than the result of his DCF analysis (*i.e.*, 8.60 percent) and is the exact same as the result of his CAPM analysis.

Q: Is Mr. Murray's ROE recommendation of 9.50 percent in this proceeding consistent with the P/E ratio data that he references to support his recommendation?

A. No. As shown in Figure 3, I have calculated the P/E ratios for Mr. Murray's electric utility proxy group companies in this proceeding over the duration of the Company's last four rate proceedings and compared those P/E ratios to his recommended ROEs in those proceedings. As shown, while Mr. Murray suggests that there should be an inverse relationship between the P/E ratios and the ROE, it is clear that Mr. Murray's historical recommendations for Ameren have not taken into consideration the P/E ratios of his proxy group. While the P/E ratios have

[10] Murray Direct, at 2.

steadily declined over this period, Mr. Murray's recommendation declined from 2019 to 2021, and his recommended ROE in 2022 was the same as his recommendation in 2019, despite the decline in the P/E ratio over that time period. Therefore, it is clear that Mr. Murray does not rely on the P/E ratios in establishing his ROE recommendations.

FIGURE 3: COMPARISON OF MR. MURRAY'S P/E RATIOS AND ROE RECOMMENDATIONS

Docket	Filed	Order/Current	Electric Utility Group P/E	Murray's Recommended ROE
ER-2019-0335	7/3/2019	3/18/2020	21.89	9.25%
ER-2021-0240	3/31/2021	12/22/2021	20.19	9.00%
ER-2022-0337	8/1/2022	6/14/2023	19.34	9.25%
ER-2024-0319	6/28/2024	10/31/2024	17.71	9.50%

Q: Do changes in capital market conditions since the Company's last rate proceeding continue to indicate an increase in the cost of equity?

A. Yes. Changes in long-term bond yields since the Company's last rate proceeding continue to demonstrate an increase in the cost of equity. Specifically, as shown in Figure 4, long-term bond yields have increased substantially since the time I filed my rebuttal testimony in Company's last proceeding. Further, while the federal funds rate was reduced by the Federal Reserve at the Federal Open Market Committee ("FOMC") at it meetings in September, November, and

December 2024, in the most recent meeting, the FOMC indicated an expectation that there may be only two rate reductions before the end of 2025.[11]

FIGURE 4: CHANGE IN MARKET CONDITIONS SINCE AMEREN MISSOURI'S LAST RATE PROCEEDING[12]

	Date	Federal Funds Rate	30-Day Avg of 30-Year Treasury Bond Yield	Core Inflation Rate
ER-2022-0337				
Company Rebuttal	2/15/2023	4.58%	3.67%	4.41%
ER-2024-0319				
Company Direct	6/28/2024	5.33%	4.50%	3.28%
Company Rebuttal	Current	4.33%	4.56%	3.30%

Q: What is the expected path of the monetary policy over the near term?

A. At the FOMC meeting in September 2024, Federal Reserve Chairman Powell noted that, while over the past two years the risks associated with inflation have far exceeded the risks associated with the labor market, the FOMC's current view is that the risks associated with both inflation and the labor market have become more balanced given the effectiveness of restrictive monetary policy in combatting inflation. As a result, the FOMC indicated it was time to change monetary policy in order to continue to achieve the Federal Reserve's dual mandate of maximum

[11] Howard Schneider and Ann Saphir, "Fed lowers rates but sees fewer cuts next year due to stubbornly high inflation," *Reuters*, December 18, 2024.

[12] St. Louis Federal Reserve Bank; Bureau of Labor Statistics.

employment and price stability and, as a result, decided to lower the target range for the federal funds rate by 50 basis points to a range of 4.75 percent to 5.00 percent.

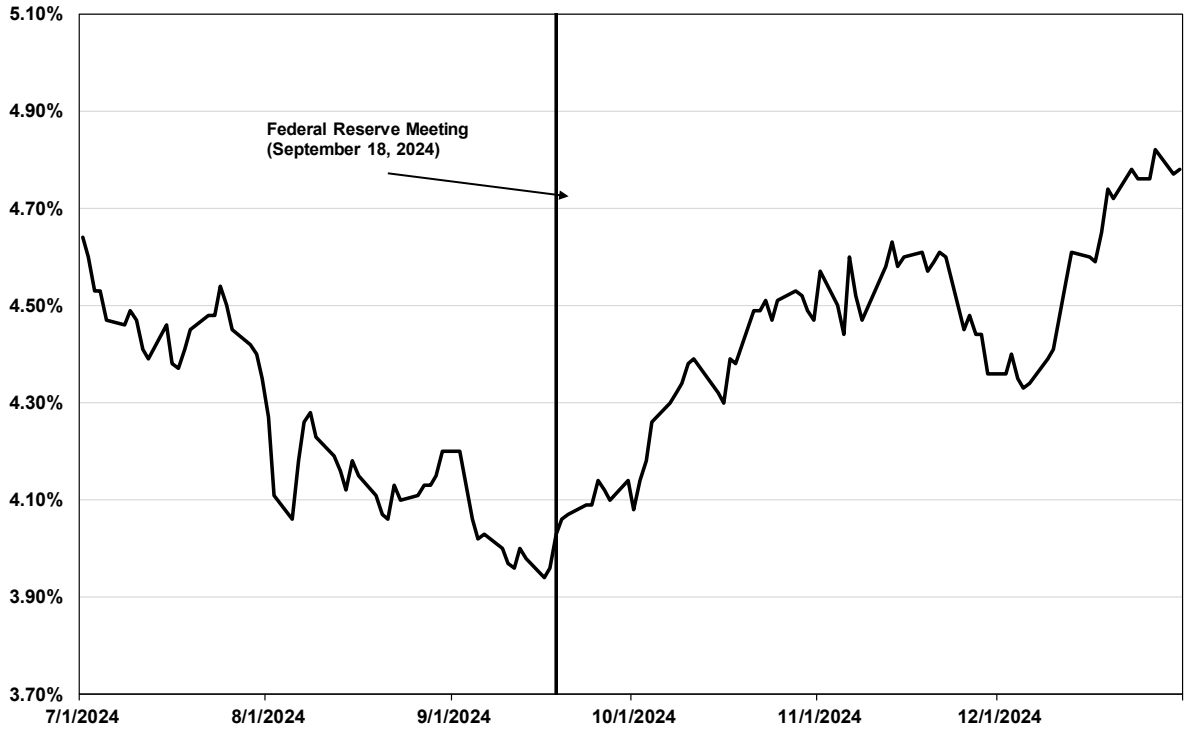
The FOMC recently also reduced the federal funds rate range by 25 basis points at both its November and December 2024 meetings. However, at the December 2024 meeting, Chairman Powell's tone changed slightly, indicating any further reductions "now hinge on further progress in lowering stubbornly high inflation" and noted that from this point the FOMC will be "cautious about further cuts," forecasting just two rate cuts before the end of 2025.[13]

Q: What has happened to the yields on long-term government bonds since the FOMC reduced the federal funds rate in September 2024?

A. As shown in Figure 5, the yield on the 30-year Treasury bond declined prior to the time of the federal funds rate cut, but has increased since the September 2024 FOMC meeting. As of December 31, 2024, the 30-year Treasury bond yield was 4.78 percent, which is consistent with levels seen in April 2024, several months prior to the reductions in the federal funds rate.

[13] Howard Schneider and Ann Saphir, "Fed lowers rates but sees fewer cuts next year due to stubbornly high inflation," *Reuters*, December 18, 2024.

FIGURE 5: 30-YEAR TREASURY BOND YIELD, JULY 1, 2024 – DECEMBER 31, 2024[14]



Q: Why have long-term interest rates increased since the Federal Reserve reduced the federal funds rate in September 2024?

A. According to a recent *Reuters* article, the increase in long-term government bond yields in the third quarter of 2024 was initially related to investors responding to an increasing probability of a Trump Administration in 2025 and has continued with the re-election of President Trump.[15] This is because investors view key elements of President Trump's economic plan such as tax cuts and tariffs as inflationary. The FOMC has indicated that the expectation of sustained inflation means that the

[14] S&P Capital IQ Pro.

[15] Davide Barbuscia and Lewis Krauskopf, "Bond rebound uncertain as Trump plans overshadow Fed rate cuts," *Reuters*, November 8, 2024.

Federal Reserve expects to lower the federal funds rate more gradually in 2025. For example, at the time the article was published in November 2024, *Reuters* noted that investors expected the federal funds rate to decline to 3.70 percent by the end of 2025 from the current range of 4.50 percent to 4.75 percent, which is 100 basis points above investors' expectations in September 2024.[16] As of January 2025, according to the CME Group, investors' expect the federal funds rate to decline by only 25 basis points by the end of 2025 to a range of 4.00 percent to 4.25 percent.[17]

Q: What are investors' expectations for the yields on long-term government bonds over the near-term?

A. Economists consider the expected policy of the Federal Reserve in the development of their forecasts of long-term government bond yields. Currently, economists are projecting that long-term government bond yields will remain elevated. For example, the most recent consensus estimates published in the *Blue Chip Financial Forecasts* for the average yield on the 30-year Treasury bond is 4.28 percent through 1Q/2026[18] and 4.30 percent over the longer term through 2030.[19] This is important because it means that long-term interest rates: (1) are expected to remain elevated during the period that the Company's rates will be in

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16 *Id*.

17 CME Group, as of January 6, 2025.

18 *Blue Chip Financial Forecasts*, Vol. 44, No. 1, December 30, 2024, at 2.

19 *Blue Chip Financial Forecasts*, Vol. 43, No. 12, November 27, 2024, at 14.

effect; and (2) will remain at levels well above the levels at the time of the Company's last rate proceeding.

Q: Are authorized returns in other jurisdictions a relevant benchmark to evaluate the reasonableness of Dr. Won's and Mr. Murray's ROE recommendations?

A. Yes, they can be when the corresponding market conditions are considered. The *Hope* and *Bluefield* cases establish that authorized ROEs must be commensurate with other investments having corresponding risk. Therefore, the regulatory decisions of other utility regulatory commissions provide a range of reasonableness and a benchmark that investors consider in assessing the authorized ROE of one utility against the returns available from other regulated utilities with comparable risk.

Q: Do either Dr. Won or Mr. Murray agree that it is appropriate to consider previously authorized ROEs?

A. Yes. Dr. Won appears to benchmark his recommended ROE of 9.74 percent to average authorized returns for electric utilities in fully litigated and settled cases in 2024, which he states are 9.81 percent and 9.63 percent respectively.[20] Similarly, Mr. Murray also considered the average authorized return for electric utilities in 2024, which he states was 9.68 percent.[21] Further, while the recent increase in

[20] Won Direct, at 50.

[21] Murray Direct, at 5.

interest rates since 2021 would indicate that authorized returns should also increase, Mr. Murray explains that investors do not expect authorized returns to increase because, when interest rates were declining during the period of 2010 through 2020, authorized returns did not decline by as much as they should have.[22]

Q: Do you have any concerns with the review of authorized returns conducted by Dr. Won and Mr. Murray?

A. Yes. Dr. Won and Mr. Murray rely primarily on annual average authorized returns instead of also considering the full range of authorized returns. For example, while Dr. Won relies on various averages of litigated and settled ROEs to suggest his recommendation is reasonable, he does not consider the full range of recent returns, nor does he consider the business risk of the Company.

Q: Have you reviewed recently authorized ROES for utilities?

A. Yes. I have analyzed the recently authorized returns for vertically integrated electric utilities and applied the following screening criteria:

- I excluded limited-issue rider cases because these cases address only a specific issue or issues, such as the construction of generation assets and the associated incremental risk, and not a utility's entire operations.
- I excluded jurisdictions that set ROEs using a formula as opposed to following an approach that is similar to what the Commission has typically considered in setting the ROE.
- I excluded returns awarded in Arizona, because the determinations in Arizona are based on fair value ratemaking adjustments. Therefore, the

[22] *Id.* at 14-15.

ROE that was established in the Arizona cases may have been set on a different basis.

- Lastly, I excluded authorized returns that reflect a utility-specific penalty, because an authorized ROE that includes a penalty is not indicative of a market-derived cost of equity.

As shown in Figure 6, since 2020, authorized ROEs for vertically-integrated electric utilities have increased. Further, both Dr. Won's recommended ROE of 9.74 percent and Mr. Murray's recommended ROE of 9.50 percent are below the average authorized ROE for vertically-integrated electric utilities in the United States in 2024. Finally, the Company's requested ROE of 10.25 percent is within the range of authorized ROEs for vertically-integrated electric utilities in 2024. Neither Dr. Won nor Mr. Murray have provided any evidence to demonstrate that the Company's ROE should be below the mean authorized ROE in 2024.

FIGURE 6: RANGE OF ANNUAL AUTHORIZED ROES FOR VERTICALLY INTEGRATED ELECTRIC UTILITIES, 2020 –2024[23]

Year	Mean	Low	High
2020	9.62%	9.20%	10.02%
2021	9.60%	9.00%	10.60%
2022	9.80%	9.30%	10.80%
2023	9.81%	9.25%	11.45%
2024	9.86%	9.26%	10.50%

[23] S&P Capital IQ Pro.

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Q: Do you agree with Mr. Murray that investors do not expect authorized returns to increase?

A. No, I do not. First, Mr. Murray's conclusion is inconsistent with the trend in the average annual authorized returns for water, natural gas and T&D electric utilities since 2020 as shown in Figure 6 above. Second, Mr. Murray's conclusion is not consistent with the equity analyst report that he references as support. Specifically, Mr. Murray cited a report from Barclays that noted the following:

> **High Returns Unlikely as ROEs Sticky While Rates Were at Decade Lows**
>
> Simplistically, from 2010 to early 2020s long term risk free yields have only declined, while utility ROEs remained steady at an average 9.8% authorized rate on the electric side. Utilities were arguably over-earning during this timeframe in our view. ***We believe over a long term (10yr+) time horizon there should be a case for higher ROEs if risk free yields remain elevated or move higher, but we see it unlikely that regulated ROEs return to 12%+ levels anytime soon***. This likely leads to an extended CoC [cost of capital] crunch for the utility industry, which will pressure management teams' abilities to raise capex budgets materially in the five-year window. Please see our additional work below highlighting the CoC crunch.[24]

In the referenced quote, Barclays does not conclude that authorized returns will remain at current levels. Instead, Barclays concludes that while they do not see returns exceeding 12 percent, ROEs are likely to increase from current levels if bond yields remain elevated. As noted above, according to the most recent

[24] Murray Direct, at 14. Referencing: Nicholas Campanella, *et al*., "U.S. Power & Utilities: Initiating Coverage: Down but Not Out," Barclays, August 22, 2023, at 23.

consensus estimates published in the *Blue Chip Financial Forecasts* report, long-term government bond yields are expected to remain elevated through 2030. As a result, it is reasonable to conclude that investors do expect authorized returns to continue to increase.

Q: Are you aware of an example where capital attraction and willingness to invest have been hampered when a regulatory jurisdiction is perceived as not being credit supportive?

A. Yes. Illinois and Connecticut are two recent examples. First, approximately a year ago, the Illinois Commerce Commission ("ICC") rejected the multiyear grid plan proposals of Ameren Illinois Co. ("Ameren IL") and Commonwealth Edison Co. ("ComEd") and authorized lower-than-expected ROEs for both utilities. Specifically, the ICC authorized an ROE for Ameren IL of 8.72 percent and 8.905 percent for ComEd, which was a significant reduction from the Administrative Law Judge's recommendations of 9.24 percent and 9.28 percent, respectively.[25] Market reactions to the ICC's decisions were universally negative and both parent companies considered shifting investment to their other utility operating subsidiaries outside of Illinois. Specifically, while the Standard & Poor's ("S&P") 500 Index was increasing, the share prices of the parent companies of both Ameren IL and ComEd (*i.e.*, Ameren Corp. and Exelon Corp., respectively) each dropped more than 7 percent on December 14, 2023 after the ICC's decision, and

[25] Allison Good, "Ameren, Exelon shares fall after Illinois regulators reject grid plans," Platts, December 15, 2023.

declined again by more than 4.4 percent and 6.4 percent the following day, respectively.[26] As of the market close on January 5, 2024, Ameren and Exelon's stock prices were, respectively, 8.9 percent and 11.4 percent below where their stock prices closed on December 13, 2023, or the day immediately prior to the ICC's decisions.[27]

In addition, the reactions of equity analysts were universally negative, and also questioned whether the parents of both Ameren IL and ComEd (*i.e.*, Ameren Corp. and Exelon Corp., respectively) will shift their capital spending out of the jurisdiction as a result of the uncertainty associated with the multiyear rate plan and low authorized ROEs. For example:

- Barclays characterized the ICC's ROE authorizations as "draconian" and "one of the lowest awarded in recent memory, especially in an elevated interest rate and cost of capital environment."[28] Barclays also stated it found it hard to believe utilities "can deploy capital under the same magnitude on the updated grid plans to be filed, especially under the current proposed ROE framework."

- In its assessment of the impact on Exelon, the parent of ComEd, UBS stated that, "[t]he actions taken by the ICC today call into question, in our view, the regulatory backdrop in which EXC operates."[29]

- Wells Fargo stated that it was not mincing words, and that the ICC's orders were "onerous" and that:

- In its evaluation of Ameren IL, BofA Securities characterized the ICC's decision as "punitive" and stated that it was a surprise based on numerous

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[26] Yahoo! Finance; stock prices for AEE and EXC from November 1, 2023, through January 5, 2024.

[27] Ameren Corp.'s stock price closed at $81.32 on December 13, 2023 and $74.05 on January 5, 2023. Exelon Corp.'s stock price closed at $41.00 on December 13, 2023 and $36.31 on January 5, 2023.

[28] Barclays, "AEE/EXC: Coal Stocking-Stuffer in Illinois," December 14, 2023.

[29] UBS, First Read Exelon Corp., "Negative Rate Case Outcome – Rating and PT Under Review," December 14, 2023.

conversations with investors that believed the ICC may authorize an ROE above the ALJ's recommendation, not substantially lower, and that the downside surprise was one of the biggest in recent memory for their regulated utility coverage.[30] While BofA Securities acknowledged that Ameren IL represents less than 20 percent of Ameren Corp.'s consolidated rate base, it will nonetheless need offsets or capital expenditures elsewhere in order to hit its earnings growth rate targets.[31]

- After the decisions, Guggenheim questioned, "Is Illinois Becoming the Next Connecticut?" Guggenheim noted that investors questioned whether Illinois was "slowly becoming a CT-esque jurisdiction," and that equity and debt holders are going to be wary of Illinois as a jurisdiction going forward and that the ICC is "simply sending a negative message to investors."[32]

Also, after the ICC's decisions, Regulatory Research Associates ("RRA") lowered its rating of the Illinois regulatory jurisdiction from Average/2 to Average/3 due to the "concerning pattern of restrictive" rate actions in the state.

Q: Please summarize the changes in investment in Connecticut that have directly resulted from unconstructive regulation in that regulatory jurisdiction.

A. Connecticut, is viewed by research analysts, equity analysts, and investors as among the least credit supportive jurisdictions in the United States for utilities. This jurisdiction is the most recent example of where capital attraction and a willingness to invest have been hampered. For example:

- The two major utility holding companies operating in Connecticut (i.e., Eversource Energy ("Eversource") and Avangrid Inc. ("Avangrid")) have

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30 BofA Securities, Ameren Corporation, "Illinois delivers downside surprise," December 15, 2023. See Exh. AEB-17C.

31 *Id*.

32 Guggenheim, "IL: Is Illinois Becoming the Next Connecticut? To Be Determined, but Taking a Neutral Stance on the State," December 15, 2023.

announced their unwillingness to continue discretionary investment in the state until the regulatory environment and cost recovery outcomes change.

- Avangrid's utility operating subsidiaries in Connecticut (*i.e.*, Connecticut Natural Gas Corporation ("CNG") and Southern Connecticut Gas Company ("SCG")) have recently experienced difficulty fully subscribing bond issuances, and while able to do so, the premiums were higher than anticipated.

- Eversource has also indicated that it is exploring a sale of Aquarion Water due to the Connecticut regulatory environment.[33]

In May 2024, Eversource, which owns Connecticut Light & Power ("CL&P") and Aquarion Water in Connecticut, announced on its earnings call that it would be cutting investment by its utilities within the state due to "unreasonable, arbitrary decisions by the regulator (*i.e.*, the Public Utilities Regulatory Authority ("PURA")), and that the company had "grave concerns" regarding the Connecticut regulatory environment.[34] Eversource executives stated that the company is unwilling to place capital at risk within Connecticut given that the state's regulatory policy discourages investment.[35] Driving the reduction in utility investment is Eversource's view that utility regulators have been slow to approve the recovery of $635 million in storm costs incurred from 2018 through 2021, $400 million in uncollected bills from ratepayers, a rate reduction imposed on Aquarion Water in its most recent rate proceeding, and elimination of a program supporting electric

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[33] Luther Turmelle, "Aquarion is for sale, but who will buy it? Here's a look at what's next," CT Insider, March 23, 2024.

[34] Mark Pazniokas, "Eversource escalates CT fight, saying it will cut investments," CT Mirror, May 2, 2024.

[35] Jared Anderson, "Eversource cutting investment in Connecticut by up to $500 million over 5 years," S&P Capital IQ Pro, May 3, 2024.

vehicles.[36] Consequently, Eversource stated that is taking a "hard look" at its capital deployment priorities in Connecticut and plans to reduce its capital investment in Connecticut by $500 million over the next five years, which will likely come from reliability areas until "Connecticut's regulatory decisions come back into alignment with law and state policy."[37] Eversource indicated that it will not reduce safety spending, but that it has made significant investments in reliability over the past decade but is unwilling to continue doing so without a secure and predictable cost recovery path.[38]

Entering 2025, Eversource's subsidiary CL&P announced that it will spend approximately 15 percent less than previously planned on capital programs and reliability investments due to the state's adverse regulatory environment.[39] CL&P stated that its decision was made because the Connecticut utility regulator's decisions have failed to adhere to utility finance principles, economics, or law and were politically motivated solely to reduce rates. Due to the reduction in reliability spending, CL&P projects a decrease in service reliability over the next five years, although reliability will remain above baseline levels set by law.[40] In addition, Eversource and its subsidiaries, including CL&P, were downgraded one notch by

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36 Mark Pazniokas, "Eversource escalates CT fight, saying it will cut investments," CT Mirror, May 2, 2024.

37 Jared Anderson, "Eversource cutting investment in Connecticut by up to $500 million over 5 years," S&P Capital IQ Pro, May 3, 2024.

38 *Id*.

39 Noah Schwartz, "Eversource pares back Connecticut investment plan, risking grid reliability," S&P Capital IQ Pro, December 31, 2024.

40 *Id*.

S&P in December 2024, with S&P highlighting "a recent pattern of adverse regulatory developments for investor-owned utilities operating in Connecticut, which we believe has increased business risk for Eversource Energy and its Connecticut-based subsidiaries."[41]

Similarly, Avangrid, which owns United Illuminating, CNG, and SCG in Connecticut, has also announced that its planned $191 million in capital investment in the state hinges on both regulatory decisions associated with the pending rate cases of CNG and SCG, and the resolution of Avangrid's ongoing legal appeal of PURA's August 2023 order whereby UI's rate request was reduced from $131 million to $23 million, which the utility says will require it to operate at a loss.

In addition, Avangrid has indicated that it experienced difficulties in attracting adequate subscription levels for debt issuances by its Connecticut utilities that closed in December 2023, and the bonds priced at a higher coupon rate than anticipated.[42] Specifically, as stated in its currently pending rate proceeding:

> The debt issuance was a private offering in which four banks served as lead placement agents and worked with the Company to market the transaction to investors in advance of pricing. On the day of pricing, November 15th, the subscriptions sought for CNG and SCG were only 65% and 50% fulfilled, respectively. This compares to the offering for one of the other Avangrid utilities which was more than

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41 S&P Global Ratings, "Eversource Energy Issuer Credit Rating Lowered To 'BBB+' From 'A-'; Subsidiaries Ratings Also Lowered; Outlooks Stable," December 9, 2024.

42 Public Utilities Regulatory Authority, Docket No. 23-11-02, Response of Connecticut Natural Gas Corporation to data request RRU-402, February 27, 2024.

> two-times subscribed. After some additional negotiation, the banks were able to get one investor to fill the remaining portions of the issuance sought for CNG and SCG and the full transaction priced on the following day; however, the credit spreads were wider than anticipated across the Avangrid Connecticut utilities, raising the financing cost by approximately 10-15 basis points. *The bankers informed Avangrid that the difficulty in fulfilling the necessary subscription levels and the wider credit spreads attracted were caused in part by the limited interest to invest in Connecticut utilities due to concerns over the regulatory environment and potential impacts to current ratings*.[43]

Q: What is your conclusion regarding the effect of regulation on the ability of a company to access capital and the cost of equity?

A. Recent examples demonstrate that there are significant financial consequences imposed by the market in jurisdictions where regulation has been unconstructive, resulting in increased costs to customers in the form of higher debt costs and limiting access to capital markets. Further, the effect of scaling back investment to meet minimum standards for safety and reliability, rather than having the ability to make strategic planned investment to improve and expand service can further increase costs to customers.

[43] *Id*.; emphasis added.

V. Response to Dr. Won

V.A. Proxy Group

Q: Does Dr. Won rely on the same proxy group that you have used for your cost of equity analyses?

A. No, although they are similar. Dr. Won relies on a proxy group that is based on a group of U.S. utilities that the Edison Electric Institute classifies as electric utilities, to which he then applies a set of screening criteria. Dr. Won's proxy group consists of 14 companies, which include the same companies as utilized in my updated cost of equity analyses with the exception of DTE Energy Company ("DTE"), NextEra Energy, Inc. ("NextEra"), and PPL Corporation ("PPL"). Dr. Won indicates that DTE fails his screening criterion requiring that at least 60 percent of income must be from regulated electric utility operations, NextEra fails his screening criterion that requires a company must generate at least 80 percent of its income from regulated utility operations, and PPL fails his screening criterion that requires a company must have a positive dividend payout since 2019.[44]

Q: Do you agree with Dr. Won's proxy group?

A. No. I do not agree with Dr. Won's proxy group. First, it appears that Dr. Won has incorrectly applied his screening criteria to the universe of companies that he evaluated. Dr. Won indicates that PPL fails his screening criterion because the company has not had a positive dividend payout since 2019; however, PPL has

[44] Schedule SJW-d8.

had a positive dividend payout since 2019. While PPL had a dividend cut in April 2022, it nonetheless has had a positive dividend payout since 2019, and also has consistently increased its dividend since April 2022. DTE also cut its dividend in October 2021 and has increased its dividend since that time, and yet Dr. Won indicates that DTE passes his dividend screening criterion.

Second, I disagree with Dr. Won's screening criterion that requires 80 percent of a company's assets be U.S. regulated. Rather than assets, more importantly for comparability to the Company is that approximately 77 percent of NextEra Energy Inc.'s total revenue is from regulated operations, and approximately 88 percent of its total operating income is from regulated operations. Therefore, it is reasonable to include NextEra Energy in the proxy group.

Lastly, Dr. Won's screening criteria is inconsistent with the screening criteria that Staff has applied in prior electric rate proceedings. For example, in the 2019 Empire District Electric rate proceeding, Staff relied on a screening criterion requiring that a company generate at least 80 percent of its income from regulated utility operations[45] – rather than requiring 80 percent of a company's *assets* be U.S. regulated as Dr. Won is applying in this proceeding. In that same proceeding, Staff also applied a screening criterion that required a company have a positive dividend payout over approximately the past 3 years; however, as noted, Dr. Won is applying

[45] Missouri Public Service Commission, Case No. ER-2019-0374, Staff Report, January 15, 2020, at 14.

a screening criterion that requires a company have positive payout over approximately the past 5 years.

Q: Has Dr. Won explained the basis for changes in Staff's screening criteria?

A. No.

Q: Does the difference in proxy group result explain the material differences in the results that you and Dr. Won generate in the cost of equity models?

A. No. As a result, I will not discuss further the differences in our proxy groups; however, since Dr. Won's exclusion of PPL appears to be incorrect and inconsistent with his screening criterion, I have shown adjustments to Dr. Won's cost of equity analyses both excluding PPL as Dr. Won has presented, but also including PPL given that this company did met Dr. Won's screening criteria.

V.B. Two-Step DCF Analysis

Q: Please summarize Dr. Won's specification of his DCF model.

A. Dr. Won conducts a two-step DCF analysis where he relies on (1) the average of the monthly high and low stock prices for his proxy companies as of April 2024 through June 2024; and (2) a growth rate for each proxy company that is based on a short-term growth rate to which he applies an 80 percent weighting and a long-term growth rate to which he applies a 20 percent weighting.[46] Dr. Won's short-term growth rate is an average of the projected earnings per share ("EPS"),

[46] Won Direct, at 42 and Schedules SJW-d10 through SJW-d12.

dividend per share ("DPS"), and book value per share ("BVPS") growth rates for each of his proxy group companies published by *The Value Line Investment Survey* ("*Value Line*").[47] Dr. Won's long-term growth rate is a projected nominal gross domestic product ("GDP") growth rate of 3.90 percent as reported by the Congressional Budget Office in its Economic Outlook.[48] After calculating the cost of equity for each of his proxy group companies Dr. Won narrows the range of results by eliminating the highest and lowest individual company results. The upper bound of his range is set by averaging the second and third highest results produced by his analysis. The lower bound is set by averaging the second and third lowest produced by his analysis.[49] Dr. Won's estimated cost of equity is the midpoint between his derived upper and lower bounds, resulting in an estimate of 8.60 percent.[50]

Q: Are the results of Dr. Won's DCF analyses reasonable?

A. No. The result of Dr. Won's DCF analysis is significantly below the current average authorized ROE for vertically-integrated electric utilities nationally, which as Dr. Won notes in Table 5 of his testimony was 9.69 percent for all electric utilities in 2024. While I disagree with Dr. Won's application of the two-step DCF model and his measure of central tendency, it is important to note that it appears that Dr. Won

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47 Schedule SJW-d10.

48 Schedule SJW-d10

49 Schedule SJW-d12.

50 *Id*.

also recognizes that the results of his constant growth DCF analysis are not reasonable given that his ROE recommendation is more than 110 basis points greater than the result of his DCF analysis. Although Dr. Won does not indicate specifically how he determines his recommended ROE of 9.74 percent for Ameren in this proceeding, the average result of his CAPM analyses as well as the average result of his BYRP analyses are both 9.74 percent. Thus, it appears that Dr. Won does not rely on the result of his DCF analysis. The *Hope* and *Bluefield* decisions, which Dr. Won acknowledges are standards to be followed in setting a just and reasonable return, require the authorized return to be comparable to other returns available to investors in companies with similar risk. Dr. Won's DCF result of 8.60 percent does not meet this standard.

Q: Why you do you disagree with Dr. Won's specification of his two-step DCF analysis?

A. There are several reasons. First, Dr. Won references the FERC's ROE methodology, set forth in Opinion No. 575, as support for his two-step DCF analysis, however, he fails to follow that methodology.[51] In addition, the stock price and dividend data that Dr. Won relies on for his DCF analysis is outdated based on when he filed his testimony and is inconsistent with the dates used in other cost of equity estimation methodologies in his testimony. Finally, I disagree with Dr. Won's short-term and long-term growth rates.

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[51] Won Direct, at 42.

The FERC relies on a six month average stock price for purposes of calculating the dividend yield; however, Dr. Won uses a three month average stock price. Furthermore, not only is Dr. Won's stock price averaging inconsistent with the FERC's methodology, the stock price data that he relies on is outdated. Specifically, Dr. Won relies on stock price data for the quarter ending June 30, 2024, even though his testimony was filed in December 2024. Given that Dr. Won relies on data through September 30, 2024 in his BYRP analysis,[52] there is no reason that the data in his DCF should be outdated and misaligned with the data he has used elsewhere.

Q: Are the annual dividends for each proxy company that Dr. Won relies on to estimate the dividend yield in his DCF analysis also outdated?

A. Yes. Dr. Won relies on the annual 2023 dividends (stated in dollars) published by *Value Line* for each of his proxy group companies. However, given that Dr. Won's testimony was filed in December 2024, it is appropriate to rely on more current dividend assumptions, particularly when current quarterly dividend data is readily available from public sources for each of the proxy group companies, including the fact that *Value Line* also publishes dividend data for each of his proxy group companies for 2024.

[52] Schedule SJW-d14-1.

Q: Are Dr. Won's short-term growth rates consistent with the FERC methodology?

A. No. Dr. Won's short-term growth rates in his two-step DCF analysis are an average of the projected EPS, DPS, and BVPS growth rates for each of the proxy group companies as published by *Value Line*, which is not the methodology used by the FERC. As stated in Opinion No. 575, the FERC has consistently relied solely on projected EPS growth rates as the short-term growth rate.[53]

Q: Has Staff previously relied solely on EPS growth rates for the short-term growth rate in prior cases?

A. Yes. For example, in the 2019 Empire District Electric rate proceeding, Staff witness Mr. Chari relied solely on historical and projected EPS growth rates as short-term growth rates in the DCF, and did not rely on either DPS or BVPS growth rates.[54] Similarly, in the Ameren Missouri 2021 rate proceeding, Staff witness Mr. Chari relied solely on projected EPS growth rates from both *Value Line* and S&P Global Market Intelligence as short-term growth rates, and did not rely on DPS or BVPS growth rates.[55]

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53 *Entergy Arkansas, et al*., Opinion No. 575, 175 FERC ¶ 61,136 (2021), at P 131.

54 Missouri Public Service Commission, Case No. ER-2019-0374, Staff Report, January 15, 2020, at 14.

55 Missouri Public Service Commission, Case No. ER-2021-0240, Staff Report, September 3, 2021, at 25.

Q: Why are projected EPS growth rates the appropriate growth rate in the DCF analysis?

A. It is appropriate to rely on analysts' projected EPS growth rates in the development of the DCF model for numerous reasons:

- Earnings are the fundamental determinant of a company's ability to pay dividends, and over the long-term dividend growth can only be sustained by earnings growth.[56] Therefore, EPS, not DPS or BVPS, should be relied on in the DCF analysis.
- Management decisions to conserve cash for capital investments, to manage the dividend payout for the purpose of minimizing future dividend reductions, or to signal future earnings prospects, can influence dividend growth rates in near-term periods. These decisions affect the dividends and the payout ratio in the short term, but are not necessarily indicative of a firm's long-term earnings growth.

  For example, forty S&P 500 companies suspended dividend payments in 2020 as a result of the increased uncertainty due to COVID-19.[57] These dividend suspensions occurred because companies believed earnings over the short term would decline and, therefore, elected to conserve cash to offset the financial effects of COVID-19.
- Given that BVPS is the inverse of DPS, estimates of BVPS growth are also highly influenced by dividend policy. All else equal, investing earnings in assets increases BVPS, while paying dividends and not investing in assets decreases BVPS.

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[56] As noted by Brigham and Houston: "Growth in dividends occurs primarily as a result of growth in earnings per share (EPS). Earnings growth, in turn, results from a number of factors, including (1) inflation, (2) the amount of earnings the company retains and invests, and (3) the rate of return the company earns on its equity (ROE)." Eugene F. Brigham and Joel F. Houston, Fundamentals of Financial Management, at 317 (Concise Fourth Edition, Thomson South-Western, 2004).

[57] Karen Langley, U.S. Companies Slashed Dividends at Fastest Pace in More Than a Decade, Wall Street Journal, July 8, 2020.

- There is significant academic research demonstrating that EPS growth rates are most relevant in stock price valuation.[58] For example, Liu, *et al*. (2002) examined "the valuation performance of a comprehensive list of value drivers" and found that "forward earnings explain stock prices remarkably well" and were generally superior to other value drivers analyzed. Gleason, *et al*. (2012) found that the sell-side analysts with the most accurate stock price targets were those whom the researchers found to have more accurate earnings forecasts.

- Investment analysts report predominant reliance on EPS growth projections. In a survey completed by 297 members of the Association for Investment Management and Research, the majority of respondents ranked earnings as the most important variable in valuing a security (more important than cash flow, dividends, or book value).[59]

- Projected EPS growth rates such as those available from *S&P Cap IQ* and *Zacks Investment Research* ("*Zacks*") are based on consensus estimates available from multiple sources. In other words, projected EPS growth rates include the contributions of more than one analyst and thus the results are less likely to be biased in one direction or another. Moreover, the fact that projected EPS growth estimates are available from multiple sources on a consensus basis attests to the importance of projected EPS growth rates to investors when developing long-term growth expectations.

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[58] *See, e.g.*, Robert S. Harris, "Using Analysts' Growth Forecasts to Estimate Shareholder Required Rates of Return," *Financial Management*, Spring 1986, at 66; James H. Vander Weide and Willard T. Carleton, "Investor growth expectations: Analysts vs. history," *The Journal of Portfolio Management*, Spring, 1988; Robert S. Harris and Felicia C. Marston, "Estimating Shareholder Risk Premia Using Analysts' Growth Forecasts," *Financial Management*, Summer, 1992; Advanced Research Center, "Investor Growth Expectations," Summer 2004; Eugene F. Brigham, Dilip K. Shome and Steve R. Vinson, "The Risk Premium Approach to Measuring a Utility's Cost of Equity," *Financial Management*, Vol. 14, No. 1, Spring, 1985; Roger A. Morin, *New Regulatory Finance*, Public Utilities Reports, Inc., 2006, at 299-303; Jing Liu, *et. al*., "Equity Valuation Using Multiples," *Journal of Accounting Research*, Vol. 40 No. 1, March 2002; C. A. Gleason, *et. al*., "Valuation Model Use and the Price Target Performance of Sell-Side Equity Analysts," *Contemporary Accounting Research*, September 2011; Bochun Jung, *et al*., "Do financial analysts' long-term growth forecasts matter? Evidence from stock recommendations and career outcomes," *Journal of Accounting and Economics*, Vol. 53 Issues 1-2, February-April 2012.

[59] Stanley B. Block, "A Study of Financial Analysts: Practice and Theory," *Financial Analysts Journal*, July/August 1999.

For all of these reasons, projected EPS growth rates, not projected DPS or BVPS growth rates, should be used for purposes of estimating the cost of equity using the constant growth DCF analysis.

Q: Have other regulatory commissions relied on projected EPS growth rates as the estimate of perpetual growth in the constant growth DCF model, such as you have done?

A. Yes. For example, the Pennsylvania Public Utilities Commission ("Pennsylvania PUC") has historically preferred the use of analysts' projected EPS growth rates in the constant growth DCF analysis.[60] The Pennsylvania PUC has noted the following:

> Upon our consideration of the record evidence, we find that I&E's DCF calculation correctly used forecasted earnings growth rates instead of considering historical growth rates. The record indicates that growth rate forecasts are made by analysts who already factor historical data into their forecasts of earnings per share growth. Although past performance can yield valuable information, relying on it for a DCF analysis results in placing too much weight on past performance. ***Thus, the best measure of growth for use in the DCF model are forecasted earnings growth rates***.[61]

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[60] *See, e.g.,* Pennsylvania Public Utility Commission, Opinion and Order, October 4, 2018, at 93. *See, also*, Docket No. M-2018-3006643, Public Meeting held January 17, 2018, at 16, in which the Commission discusses the method it uses to set the ROE for the Distribution System Improvement Charge.

[61] Pennsylvania Public Utility Commission, Docket No. Docket No. R-2020-3018929, Opinion and Order, June 17, 2021, at 160; emphasis added.

Q: Do you agree with Dr. Won's GDP growth rate?

A. No. Dr. Won's two-stage DCF model assumes a long-term growth rate in perpetuity However, Dr. Won's GDP growth forecast only reflects growth for the 10-year period of 2024 through 2034, even though his two-stage DCF model extends into perpetuity.[62] In other words, the long-term growth rate only covers a small portion of the long-term period to which it is being applied. As a result, Dr. Won's projected GDP growth rate may not be indicative of the expected growth in GDP over the long term.

Q: Is the GDP growth rate that Dr. Won relies on supported by *Morningstar*, which Dr. Won has relied on elsewhere in his cost of equity analyses?

A. No. *Morningstar*, the former publisher of the SBBI Yearbook that is now owned by *Kroll*, which is a data source Dr. Won relies on in his CAPM analysis, recommends estimating a projected long-term nominal GDP growth rate by first calculating the historical growth in real GDP and then adding the expected inflation rate:

> Growth in real GDP (with only a few exceptions) has been reasonably stable over time; therefore, its historical performance is a good estimate of expected long-term future performance. ***By combining the inflation estimate with the real growth rate estimate, a long-term estimate of nominal growth is formed***.[63]

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62 Won Direct, at 11.

63 *Ibbotson and Associates*, Stocks, Bonds, Bills and Inflation, 1926-2012, 2013 Valuation Yearbook, at 52; emphasis added.

Q: What is the resulting estimate of a long-term growth rate when the methodology outlined by *Morningstar* is applied?

A. As shown on Schedule AEB-R1, Attachment 9, when longer-term GDP growth is estimated consistent with the methodology outlined by *Morningstar*, the long-term nominal GDP growth rate is 5.51 percent. Specifically, the long-term nominal GDP growth rate is based on the real GDP growth rate of 3.18 percent from 1929 through 2023, and a projected inflation rate of 2.25 percent. The projected rate of inflation is based on three measures: (1) the average long-term projected growth rate in the Consumer Price Index ("CPI") of 2.20 percent, as reported by *Blue Chip Financial Forecasts*;[64] (2) the compound annual growth rate of the CPI for all urban consumers for 2035-2050 of 2.26 percent as projected by the Energy Information Administration ("EIA") in its Annual Energy Outlook 2024; and (3) the compound annual growth rate of the GDP chain-type price index for 2035-2050 of 2.30 percent, also reported by the EIA in the Annual Energy Outlook 2024.[65]

Q: Is the way in which Dr. Won establishes the upper and lower bounds of the results of his DCF analysis also inconsistent with the FERC's methodology for excluding high-end and low-end outliers?

A. Yes. Dr. Won's approach for establishing the upper and lower bounds of his results is arbitrary and inconsistent with the FERC methodology that he references as

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64 *Blue Chip Financial Forecasts*, Vol. 43, No. 12, November 27, 2024, at 14.

65 Energy Information Administration, Annual Energy Outlook 2023 at Table 20, March 16, 2023. Note, this is the most current Annual Energy Outlook currently available.

support for his two-step DCF approach. Specifically, as stated in the FERC's Opinion No. 575, the FERC excludes low-end and high-end outliers from the results of the DCF analysis, whereby cost of equity results lower than the yield on corporate Baa bonds plus 20 percent of the market risk premium in the CAPM are excluded, as are cost of equity results higher than 200 percent of the median result of the DCF analysis. As shown on Schedule AEB-R1, Attachment 10, none of the results of Dr. Won's DCF analysis would be excluded pursuant to FERC's outlier methodology, and the average DCF result would be approximately 10 basis points higher than Dr. Won's stated cost of equity from his DCF that is based on his arbitrary method of establishing a range of results.

Q: How would the result of Dr. Won's two-step DCF analysis change when current data is utilized and the FERC's two-step DCF approach is accurately applied?

A. Schedule AEB-R1, Attachments 7 through 10 compare the stock prices, growth rates, and results of Dr. Won's two-step DCF analysis as filed in his testimony to his two-step DCF analysis after it has been (1) updated to reflect data through September 2024 consistent with his BYRP analysis; and (2) corrected to rely solely on projected EPS growth rates for the short-term growth rates and the *Morningstar* methodology for the long-term growth rates. In addition, Schedule AEB-R1, Attachments 7 through 10 also correct Dr. Won's proxy group to include PPL given that, as previously discussed, the company meets his screening criteria.

As shown on Schedule AEB-R1, Attachment 10, page 3, when Dr. Won's analysis is updated with current data and corrected as discussed, the average resulting cost of equity for his proxy group is 10.14 percent. In addition, while Dr. Won's outlier test is inconsistent with the FERC's approach and is unsupported, even when his arbitrary approach for setting an upper and lower bound is maintained, the average cost of equity is 9.84 percent. Therefore, regardless of the measure of central tendency used, when his analysis is corrected and updated, the resulting cost of equity is approximately 125 to 155 basis points higher than his stated result of 8.60 percent.

V.C. CAPM Analysis

Q: Please summarize Dr. Won's application of the CAPM.

A. Dr. Won's CAPM analysis relies on (1) a risk-free rate based on the average yield on the 30-year Treasury bond for the three months ending June 30, 2024; (2) betas for his proxy group published by *Value Line*; and, (3) an average of four measures of a market risk premium. Specifically, Dr. Won's first two estimates of the market risk premium are the long-term arithmetic average and geometric average market risk premia of 4.54 percent and 5.94 percent, respectively, calculated as the difference between the return on large company stocks and long-term government bonds from 1926 to 2023 based on data published by *Kroll*. The second two estimates of Dr. Won's market risk premium are the long-term arithmetic average and geometric average market risk premia of 5.23 percent and 6.80 percent, respectively, calculated as the difference between the return on the S&P 500 and

long-term government bonds from 1928 to 2023 as published by Professor Damodaran of the NYU Stern School of Business. The results of Dr. Won's CAPM analyses range from 8.74 percent to 10.81 percent. Dr. Won also applies an upper and lower bound to the results of his CAPM analysis similar to his DCF analysis and averages the upper and lower bounds to estimate a cost of equity of 9.74 percent.[66]

Q: Do you agree with Dr. Won's specification of his CAPM analysis?

A. No. There are several flaws with Dr. Won's CAPM analysis, including:

- Relying on historical data to estimate a forward-looking market return and market risk premium.
- Relying on a historical market risk premium that is unrelated to the current risk-free rate, and therefore does not correctly reflect the inverse relationship between interest rates and the market risk premium.
- Calculating the market risk premium incorrectly, by relying on the historical total return on long-term government bonds instead of the historical income-only return.
- Relying on historical geometric averages of the market return and market risk premia rather than arithmetic averages to estimate the cost of equity.

Each of these assumptions independently and combined cause the result of Dr. Won's CAPM analysis to be severely understated and unreliable.

[66] Schedule SJW-d13.

Q: Why is it inappropriate to use an historical market risk premium in the CAPM to estimate the cost of equity?

A. The cost of equity that is being set in this proceeding is the return that investors expect on current and future investments in the Company. Therefore, the market return and market risk premium fundamentally should be forward-looking. Dr. Won has not provided any evidence that the historical average market return or the market risk premium that he relies on reflect the expected market conditions during the period in which the Company's proposed rates will be in effect. *Morningstar*, which is the prior publisher of the historical dataset relied on by Dr. Won for his CAPM that is now published by *Kroll*, specifically supports that the market risk premium should be a forward-looking, not historical, analysis:

> It is important to note that the expected equity risk premium, as it is used in discount rates and the cost of capital analysis, is a forward-looking concept. That is, the equity risk premium that is used in the discount rate should be reflective of what investors think the risk premium will be going forward.[67]

Given that the current and projected market conditions that both Dr. Won and I have discussed affect the current and projected equity risk premium, a forward-looking market return and market risk premium should be used in the CAPM analysis for estimating the cost of equity.

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[67] *Morningstar Inc.*, 2010 Ibbotson SBBI Valuation Yearbook, at 55.

Q: Has *Kroll* also highlighted a potential inconsistency with relying on historical data for a forward-looking analysis such as the CAPM?

A. Yes. *Kroll* has stated that, "[i]n using a historical measure of the equity risk premium, one assumes that what has happened in the past is representative of what might be expected in the future."[68] As will be discussed in more detail, because the current long-term government bond yields are currently below those that Dr. Won relies on in his historical average market risk premium estimates, the market risk premium based on long-term historical average data is certainly not representative of what is expected in the future. Given the inverse relationship between interest rates and the market risk premium, and since the current interest rate that Dr. Won relies on for his risk-free rate is *lower* than the historical average, it is reasonable to expect that the current market risk premium should be *higher* than the historical average market risk premium.

Q: Is there also evidence that the use of a historical market premium can produce counter-intuitive results?

A. Yes. Figure 7 illustrates the problem with relying on a historical market risk premium such as Dr. Won has done. Specifically, the figure shows that from 2007-2009, the historical market risk premium decreased even as market volatility (the primary statistical measure of risk) significantly increased. Further, this figure demonstrates the significant swings in the annual equity risk premium that are

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[68] *Kroll*, 2022 SBBI Yearbook, at 198.

averaged into the long-term historical average calculations. As shown, in 2008, the annual equity risk "premium" was actually negative, which implies a discount for equity holders relative to the cost of debt. It is incomprehensible that the perceived risk for equity was negative (implying a required equity return lower than the cost of debt) in the height of the financial market collapse when the overall market return for equities was negative 37 percent. The assumption that investors would expect or require an equity risk "premium" below the cost of debt during periods of increased volatility is counter-intuitive and leads to unreliable analytical results. In fact, as shown, this individual observation alone, which runs counter to the theory of the equity risk premium, reduces the historical average market risk premium for the prior 80 years by 60 basis points.

FIGURE 7: HISTORICAL MARKET RISK PREMIUM AND MARKET VOLATILITY

	Market Volatility	Market Return	Annual Equity Risk Premium	Long-term Average Historical Market Risk Premium[69]
2007	17.54	5.49%	0.63%	7.10%
2008	32.69	-37.00%	-41.45%	6.50%
2009	31.48	26.46%	3.47%	6.70%

As noted earlier, the relevant objective in the application of the CAPM is to ensure that all three components of the model (*i.e.*, the risk-free rate, the beta, and the

[69] Ibbotson SBBI Yearbook. *Morningstar Inc*. 2008, at 28. *Ibbotson SBBI Yearbook*. *Morningstar Inc*. 2009, at 23; Ibbotson SBBI Yearbook. *Morningstar Inc*. 2010, at 23. The historical market risk premium equals the total return on large company stocks less the income-only return on long-term government securities.

market risk premium) are consistent with market conditions and investor perceptions. The forecasted market risk premium estimates used in my CAPM analyses specifically address this concern.

Q: Dr. Won references the FERC's ROE methodology when discussing his DCF analysis. Does the FERC support the use of a historical market return and market risk premium when conducting the CAPM analysis?

A. No. Dr. Won's approach to the CAPM is inconsistent with the FERC's methodology. The FERC has concluded that a forward-looking market return and market risk premium should be relied on for estimating a forward-looking estimate of the cost of equity when using the CAPM analysis.[70] Further, the methodology that was most recently endorsed by the FERC to estimate the market risk premium is generally consistent with the approach I have relied upon, which is to calculate the market risk premium based on the difference between the projected return on the market and the risk-free rate.

Q: Has Dr. Won previously relied on a forward-looking estimate of the market risk premium in his CAPM analysis such as you have done in your direct testimony?

A. Yes. In Missouri-American Water's 2020 rate proceeding, Dr. Won relied on two estimates of a historical market risk premium, as well as an estimate of a forward-

[70] *See, e.g.*, *Entergy Arkansas, et al.*, Opinion No. 575, 175 FERC ¶ 61,136 (2021), at P 163-164.

looking market risk premium based on the market return of the S&P 500 less the current risk-free rate.[71]

Q: How would the results of Dr. Won's CAPM analysis changed if he had calculated the market risk premium in this proceeding in the same way that he had calculated it in the Missouri-American Water 2020 rate proceeding?

A. The results of Dr. Won's CAPM analysis would have been higher in this proceeding had he relied on a forward-looking market risk premium such as he had done previously.

Q: Recognizing that you disagree with the use of historical data to calculate the market risk premium for the reasons you noted previously, is Dr. Won's calculation of the historical market risk premia relied on in his CAPM analyses correct?

A. No. Dr. Won has incorrectly used that historical data to estimate a market risk premium in all four of his CAPM scenarios.

Q: Please explain the errors in Dr. Won's calculation of the historical market risk premia.

A. Dr. Won's estimates of the market risk premia are incorrect and understated because, when calculating a historical market risk premium, the market return

[71] Missouri Public Service Commission, Case No. WR-2020-0344, Staff Report Cost of Service, at 26 and Schedule SJW-14, columns [8] through [10].

should be reduced by the *income-only* return on the risk-free investment – ***not the total return on that investment***. Specifically,

- In two of his CAPM scenarios, Dr. Won has calculated the market risk premia as the difference between the long-term average return on large company stocks and the long-term average *total* return on long-term government bonds.
- In his two other CAPM scenarios, Dr. Won has calculated the market risk premia as the difference between the long-term average total return on the S&P 500 and the long-term average *total* return on 30-year Treasury bonds.

Therefore, in all four of his CAPM scenarios, Dr. Won has incorrectly calculated the market risk premium but deducting the total return instead of the income-only return on the risk-free investment from the overall market return.

The market risk premium estimates the premium that is necessary for an investor to hold equity as compared to a risk-free investment. The problem with Dr. Won's use of the total return on long-term government bonds is that it reflects the sum of both (i) the income-only return, which is the return expected by investors at the time of investment since the interest rate on the bond is known at that time; plus (ii) the capital appreciation of the bond, which is the return associated with the investor selling the bond at a higher price. However, the income-only return is the only portion of the total return on long-term government bonds that can be considered risk-free. The capital appreciation portion of the return is not without risk since the price of the bond could increase or decrease depending on the market.

As Dr. Won acknowledges in his testimony, "investors demand a greater return in exchange for taking on higher levels of risk," and that an investment in "a company's common stock equity is riskier than its corporate bonds because equity holders have residual claims on a company's assets and earnings, which means they are not guaranteed fixed returns and may face greater volatility in their investment."[72]

Therefore, the proper calculation of the market risk premium is the return on the market less the *income-only* return on the risk-free investment.

Q: How does this error affect the market risk premia that Dr. Won relies on?

A. By subtracting the total return on the risk-free investment from the market return, instead of the income-only return on the risk-free investment, Dr. Won has understated the market risk premium. To illustrate this point, in one of his estimates of the historical market risk premium, Dr. Won takes the arithmetic historical market return of 12.16 percent and deducts the arithmetic *total* return on long-term government bonds of 6.22 percent to derive a market risk premium of 5.94 percent.[73] However, when calculated correctly, the historical market risk premium is 7.17 percent – over more than 120 basis points higher.[74]

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72 Won Direct, at 45.

73 Schedule SJW-d13.

74 *Kroll*, Cost of Capital Navigator. Calculated correctly as the total return on the S&P 500 from 1926-2023 of 12.04 percent less the income-only return on long-term government bonds over this same period of 4.87 percent.

Q: Has the publisher of the historical data on which Dr. Won relies noted that his approach to deriving an historical market risk premium is not appropriate?

A. Yes. *Morningstar*, the former publisher of the historical data on which Dr. Won relies for purposes of his market risk premium and which is now owned by *Kroll*, states that a historical market risk premium is appropriately calculated by subtracting the *income-only* portion of the government bond return from the total return on large company stocks:

> Another point to keep in mind when calculating the equity risk premium is that the income return on the appropriate-horizon Treasury security, rather than the total return, is used in the calculation. The total return is comprised of three return components: the income return, the capital appreciation return, and the reinvestment return…The income return is thus used in the estimation of the equity risk premium because it represents the truly riskless portion of the return.[75]

Q: Are Dr. Won's historical market risk premia consistent with the inverse relationship between interest rates and the market risk premium?

A. No. Dr. Won's use of a historical market risk premium in the CAPM with a current interest rate also disregards the demonstrated relationship between interest rates and the market risk premium. As just discussed, the market risk premium is the difference between the market return and the return on a risk-free investment. Therefore, at any point in time, the market risk premium is based on the

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[75] *Morningstar Inc.*, Ibbotson SBBI 2012 Valuation Yearbook, Market Results for Stocks, Bonds, Bills, and Inflation 1926-2011, at 55.

relationship between the market return and the risk-free rate. Dr. Won calculates the cost of equity using the CAPM by relying on a long-term *historical* average market risk premia, which, while calculated incorrectly, attempts to reflect the long-term relationship between the risk free rate and the market risk premium. However, applying that historical market risk premium to a *current* risk-free rate is incorrect because Dr. Won's current risk-free rate bears no relationship to the historical average interest rates underlying the historical average market risk premia. The use of assumptions from different time periods fails to account for the inverse relationship that exists between the risk-free rate and the equity risk premium. Both academic literature and market evidence indicate that the equity risk premium is inversely related to the level of interest rates (*i.e.*, as interest rates increase, the equity risk premium decreases, and vice versa).[76]

Q: Does Dr. Won acknowledge the historical relationship between interest rates and the market risk premium?

A. Yes. In Figure 6 of his testimony, Dr. Won specifically acknowledges this relationship when discussing his BYRP analysis.[77] Therefore, given that current interest rates on long-term government bonds are below the historical average interest rate of those same bonds, the market risk premium should be *greater than*

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[76] *See e.g.*, S. Keith Berry, "Interest Rate Risk and Utility Risk Premia during 1982-93," *Managerial and Decision Economics*, Vol. 19, No. 2, March, 1998. *See also*, Robert S. Harris, "Using Analysts' Growth Forecasts to Estimate Shareholder Required Rates of Return," *Financial Management*, Spring 1986, at 66.

[77] Won Direct, at 46.

the long-term historical average market risk premium – which is not the case for Dr. Won's CAPM analyses.

Q: How does this error of not reflecting the relationship between interest rates and the market risk premium affect the market risk premia that Dr. Won relies on?

A. As noted, one of Dr. Won's estimates of the historical market risk premium is based on the arithmetic historical market return less the arithmetic *total* return on long-term government bonds resulting in a market risk premium of 5.94 percent. However, as discussed, when calculated correctly by deducting the *income-only* return instead of the total return on the long-term government bonds, the historical market risk premium is actually 7.17 percent.

This same CAPM scenario can be used to demonstrate the extent to which Dr. Won has understated the market risk premium as a result of failing to reflect the relationship between interest rates and the market risk premium. Specifically, in developing his CAPM analysis, Dr. Won relies on a 3-month average risk-free rate on long-term government bonds as of June 30, 2024 of 4.57 percent. However, this current risk-free rate is lower than the long-term historical average rate of 4.87 percent. Therefore, recognizing the inverse relationship between interest rates and the market risk premium, a relationship with which Dr. Won agrees, the current market risk premium should be *greater than* the long-term historical average of 7.17 percent. However, in Dr. Won's market risk premium of 5.94 percent in this

scenario is substantially lower than the long-term historical average, which is inconsistent with the negative relationship that Dr. Won notes exists between these two assumptions.

Q: How does the understatement of the market risk premium affect Dr. Won's CAPM analyses?

A. By understating the historical market risk premia in two significant respects (*i.e.*, deducting the total return instead of income-only return on the risk-free investment and failing to reflect the inverse relationship between interest rates and the market risk premium), Dr. Won's CAPM results are also understated. As discussed subsequently herein, Mr. Murray's, Mr. Walters's, and Mr. Comings's CAPM analyses suffer from this same flaw and also understate the cost of equity.

Q: Is it appropriate to rely on the geometric mean to estimate a historical market return for the CAPM?

A. No. Geometric and arithmetic means are used for different purposes. The geometric mean is used to determine the exact rate of compounded return between a specific starting and ending point. The geometric mean is most appropriately used for series that exhibit serial correlation. It is also commonly referred to as a "holding period return." The arithmetic mean is the appropriate calculation to estimate the market risk premium because it is the simple average of single period rates of return and therefore best approximates the uncertainty associated with returns from year to year. The important distinction between the two methods is that the arithmetic mean assumes each periodic return is an

independent observation and, therefore, incorporates uncertainty into the calculation of the long-term average. In contrast, the geometric mean does not incorporate the same degree of uncertainty because it assumes that returns remain constant from year to year.

Cooper (2006) reviewed the literature on the topic and noted the following rationale for using the arithmetic mean:

> Note that the arithmetic mean, not the geometric mean is the relevant value for this purpose. The quantity desired is the rate of return that investors expect over the next year for the random annual rate of return on the market. The arithmetic mean, or simple average, is the unbiased measure of the expected value of repeated observations of a random variable, not the geometric mean.…[The] geometric mean underestimates the expected annual rate of return.[78]

Furthermore, Pratt and Grabowski note the following in their review of the literature:

> The choice between which average to use is a matter of disagreement among practitioners. The arithmetic average receives the most support in the literature, though other authors recommend a geometric average. The use of the arithmetic average relies on the assumption that (1) market returns are serially independent (not correlated) and (2) the distribution of market returns is stable (not time-varying). Under these assumptions, an arithmetic average gives an unbiased estimate of expected future returns assuming expected conditions in the future are similar to conditions during the

[78] Ian Cooper, "Arithmetic versus geometric mean estimators: Setting discount rates for capital budgeting," *European Financial Management 2.2*, 1996, at 158.

observation period. Moreover, the more observations available, the more accurate will be the estimate.[79]

Q: How do the results of Dr. Won's CAPM analysis change when the issues you have identified are corrected?

A. Schedule AEB-R1, Attachment 11 presents Dr. Won's CAPM analysis corrected for the issues that I have identified with his CAPM analyses. Specifically, I have adjusted Dr. Won's CAPM analysis to calculate the market risk premium as the historical arithmetic average market return from 1926 through 2023 minus his current estimate of the risk-free rate.[80] While I do not agree with the use of a historical market return and historical market risk premium to estimate the forward-looking cost of equity for all of the reasons discussed, at a minimum this calculation at least derives the market risk premium from the risk-free rate being used in the CAPM to estimate the cost of equity, which is more appropriate than the calculation performed by Dr. Won that fails to reflect the inverse relationship between interest rates and the market risk premium. In addition, as previously discussed with respect to Dr. Won's DCF analysis, Dr. Won's corrected CAPM analysis presented on Schedule AEB-R1, Attachment 10 also updates the risk-free rate for the 3 months ending September 30, 2024 (which is lower than the risk-free rate used by

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79 Shannon P. Pratt and Roger J. Grabowski, *Cost of Capital: Applications and Examples*, Wiley, 2008, at 96.

80 For the risk-free rate in his CAPM analysis, Dr. Won relies on the 3-month average yield of the 30-year Treasury bond as of June 30, 2024 of 4.57 percent. Consistent with my corrections to Dr. Won's DCF analysis and using the most current data available, I have updated his risk-free rate as the 3-month average yield on the 30-year Treasury bond as of September 30, 2024, which is lower at 4.23 percent.

Dr. Won) and presents the results including PPL from the proxy group given that the company meets Dr. Won's screening criteria.

As shown on Schedule AEB-R1, Attachment 11 when these corrections are reflected, the average cost of equity for Dr. Won's CAPM analysis is 11.57 percent, which is an increase of over 180 basis points from his as-filed position.

V.D. BYRP Analysis

Q: Please summarize Dr. Won's BYRP analysis.

A. Dr. Won's BYRP analysis is similar to the BYRP analysis that I have also conducted, with the exception that he evaluates the inverse relationship between A-rated and Baa-rated utility bond yields and authorized ROEs for vertically-integrated electric utilities to estimate the risk premium, while I evaluate the inverse relationship using 30-year Treasury bond yields and authorized ROEs for vertically-integrated electric utilities to estimate the risk premium. In addition, Dr. Won's regression of the utility bond yields and authorized ROEs is based on authorized ROEs for the 10-year period 2014 to 2023, while my regression relies on a longer data set of authorized ROEs from 1980 to current.

Q: Do you agree with Dr. Won's BYRP analysis?

A. No, while Dr. Won has conducted a regression analysis for his BYRP analysis, there are a elements of his analysis with which I disagree. Specifically:

- Dr. Won only utilizes a 10-year period of data for the analysis when a significantly longer period of utility bond yield and authorized ROE data is

available that incorporates a much broader set of market conditions than has been considered in Dr. Won's analysis and is more appropriate to be considered in setting the return on equity.

- As shown in Figure 6 and Exhibit SJW-d14-2 of his testimony, Dr. Won has conducted a single regression of the risk premium and bond yield for both A-rated and Baa-rated utility bond yields, which he then uses to estimate a forward-looking market risk premium associated with both current A-rated and Baa-rated utility bond yields. However, it is unclear why Dr. Won did not conduct separate regressions of the risk premium and bond yield for A-rated versus Baa-rated utility bond yields, which would then be used separately to estimate a forward-looking market risk premium for the current A-rated bond yield and separately for the current Baa-rated bond yield.

Q: Have you adjusted Dr. Won's BYRP analysis to address the issues you just identified?

A. Yes. Schedule AEB-R1, Attachment 12 reruns Dr. Won's BYRP analysis using the Baa-rated utility bond yield data that is available back to January 1993 and the corresponding quarterly authorized ROEs over that same period. As shown, when a longer period of data is appropriately utilized, when Dr. Won's regression results are applied to the current 30-day average of the Baa-rated public utility bond yield, the result of Dr. Won's BYRP analysis is an ROE of 10.19 percent.

V.E. Overall Cost of Equity Results

Q: Based on the various issues that you have identified with Dr. Won's DCF and CAPM analyses, what would the results of those analyses, when updated and corrected, indicate for an overall cost of equity for the Company in this proceeding?

A. Figure 8 presents the results of Dr. Won's analyses when they are updated to use the most current data available and corrected for the issues that I have discussed.

Specifically, the changes to Dr. Won's two-step DCF, CAPM, and BYRP analyses are shown in Schedule AEB-R1, Attachments 10 through 12, respectively. As shown in Figure 8, the resulting average cost of equity is 10.53 percent – which is significantly higher than the Company's proposed ROE of 10.25 percent in this proceeding.

FIGURE 8: RESULTING COST OF EQUITY FROM DR. WON'S ADJUSTED COST OF EQUITY ANALYSES

	Analysis Results
Two-Step DCF Analysis	9.84%
CAPM Analysis	11.57%
BYRP Analysis	10.19%
Average	**10.53%**

VI. Response to Mr. Murray

VI.A. Overview

Q: Please summarize Mr. Murray's cost of equity analyses.

A. Mr. Murray estimates the cost of equity by conducting multiple scenarios of a multi-stage DCF and CAPM analysis. In these analyses, Mr. Murray relies on a proxy group of comparable electric companies, as well as separately calculates results based on Ameren instead of a proxy group. Mr. Murray also uses an ad hoc "rule of thumb" bond risk premium approach as a reasonableness test on the results of

Corrected Page

his multi-stage DCF and CAPM analyses. While the results from Mr. Murray's cost of equity analyses range from 7.39 percent to 8.38 percent,[81] he considers a reasonable range for the Company's ROE to be 9.00 percent to 9.50 percent, and recommends an ROE of 9.50 percent.[82]

Q: Are the results of any of Mr. Murray's cost of equity models using an electric utility proxy group consistent with the reasonable range for the Company's ROE or his ROE recommendation for the Company?

A. No. The results of all of Mr. Murray's cost of equity models are well below both his recommended ROE range and his recommended ROE in this proceeding.

Q: How does Mr. Murray reconcile the significant difference between the results of his cost of equity analyses and his overall ROE recommendation?

A. Mr. Murray's position is that regulators have authorized ROEs higher than the cost of equity.[83] As a result, Mr. Murray states that he first estimates Ameren Missouri's cost of equity, and then compares those estimates to both his own estimates from a recent rate case and authorized ROEs in recent years, with specific consideration given to Ameren Illinois' rate case, in order to determine if there has been a fundamental change in the cost of capital.[84]

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81 Schedule DM-D-2 and Schedule DM-D-5.

82 Murray Direct, at 2.

83 *Id*., at 5.

84 *Id*., at 5.

Q: Do you agree with Mr. Murray that regulators consistently have authorized ROEs that overstate the cost of equity?

A. No. I disagree with Mr. Murray that regulatory commissions, including this Commission, have consistently erred for decades in establishing utilities' ROEs. While I agree with Mr. Murray that: (1) there is a distinction between the cost of equity and the ROE authorized by regulatory commissions in setting just and reasonable rates; (2) the cost of equity cannot be definitively determined and therefore must be estimated by analysts; and (3) there is significant disagreement as to the way in which to estimate the cost of equity; there is no basis to conclude that that regulators have consistently incorrectly authorized ROEs substantially higher than the cost of equity.

Regulatory commissions are mandated to approve rates that balance the interests of customers and shareholders and that are just and reasonable. There is no evidence that Mr. Murray's estimate of the cost of equity, which includes the results of both his multi-stage DCF and CAPM analyses that are substantially lower than any ROE that has been authorized by a regulatory commission in the past, is in fact reasonable and that regulatory commissions have been consistently approving unjust and unreasonable rates. In fact, Mr. Murray's conclusion is solely reliant on the assumption that he has "correctly" specified his cost of equity models, even though the cost of equity is not observable and his models produce results that even he does not rely on in establishing his recommended ROE. Given regulatory commissions' legal mandates for setting just and reasonable rates, it

has to be concluded that the ROEs that these commissions authorized were deemed by those agencies to reflect the investor-required return and produced just and reasonable rates at that time based on the information presented in those proceedings.

Q: Are you aware of any other regulatory jurisdiction in the United States that has adopted Mr. Murray's views?

A. No. I am not aware of any regulatory commission in the United States – state or Federal – that has adopted Mr. Murray's position that regulatory commissions have consistently and predictably authorized ROEs that exceed the investor-required return.

Q: Are you aware of any regulatory commissions that have specifically disagreed with Mr. Murray's notion that there is and has been a substantial difference between authorized ROEs and the cost of equity for utilities?

A. Yes. For example, the Minnesota Public Utilities Commission clearly stated in a recent decision when the same argument was made by the Minnesota Department of Commerce, Division of Energy Resources that it did not agree that utility ROEs have exceeded the cost of equity historically:

> The Department's recommended cost of equity of 9.30% is informed by an underlying assumption that the cost of equity and the return on equity are distinct concepts in the sense that utility earnings exceed the cost of equity over time. This understanding, according to the Department, undermines the reliability of earnings' estimates in predicting long-term growth and instead justifies the use of a multi-

stage DCF analysis that uses GDP to forecast the long-term cost of equity. ***The Commission does not share this concern***.[85]

Q: What has Mr. Murray stated regarding the "zone of reasonableness" for the ROE to be established in this proceeding?

A. Mr. Murray notes that the Commission has developed a "zone of reasonableness standard" with the starting point for establishing such zone as 100 basis points above and below a recent industry average authorized ROE. Mr. Murray contends that the zone of reasonableness in this proceeding should be 8.68 percent to 10.68 percent, based on the recent average authorized ROE of 9.68 percent.[86]

Q: Are the results of Mr. Murray's multi-stage DCF or CAPM analyses within the zone of reasonableness that he suggests should be applicable in this proceeding?

A. No. Figure 9 and Figure 10 present the results of Mr. Murray's multi-stage DCF and CAPM analyses. As shown, none of the results, regardless of the variation of the proxy group utilized, are within his proposed zone of reasonableness, but rather are all below or well below the low end of such zone. Therefore, Mr. Murray's ROE recommendation in this proceeding is based simply on his own judgment and not on any of his cost of equity analyses.

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[85] Minnesota Public Utilities Commission, Docket No. E-015/GR-21-335, Findings of Fact, Conclusions, and Order. February 28, 2023, at 45; emphasis added.

[86] Murray Direct, at 5.

FIGURE 9: COMPARISON OF THE RESULTS OF MR. MURRAY'S MULTI-STAGE DCF ANALYSES RELATIVE TO HIS PROPOSED ZONE OF REASONABLENESS[87]

	Cost of Equity	Mr. Murray Zone of Reasonableness	Within Zone?
Multi-Stage DCF			
Ameren / 6 month Avg. Stock Prices			
2.5% Perpetual Growth Rate	8.07%		No
3.0% Perpetual Growth Rate	8.15%		No
3.5% Perpetual Growth Rate	8.25%		No
Ameren / 3 month Avg. Stock Prices			
2.5% Perpetual Growth Rate	7.72%		No
3.0% Perpetual Growth Rate	7.83%		No
3.5% Perpetual Growth Rate	7.94%		No
Elec Proxy Group / 6 month Avg. Stock Prices		8.68% - 10.68%	
Average	8.25%		No
Less Than 10% Non-Regulated or International	8.38%		No
Common Proxy Companies Since 2012/2014	8.19%		No
Elec Proxy Group / 3 month Avg. Stock Prices			
Average	8.04%		No
Less Than 10% Non-Regulated or International	8.14%		No
Common Proxy Companies Since 2012/2014	7.92%		No

[87] Schedule DM-D-2.

FIGURE 10: COMPARISON OF THE RESULTS OF MR. MURRAY'S CAPM ANALYSES RELATIVE TO HIS PROPOSED ZONE OF REASONABLENESS[88]

	Cost of Equity: Market Risk Premium = 5%	Mr. Murray Zone of Reasonableness	Within Zone?	Cost of Equity: Market Risk Premium = 6%	Mr. Murray Zone of Reasonableness	Within Zone?
CAPM						
20-Year Treas. Bond Yld. as Risk-Free Rate						
Ameren	7.58%		No	8.26%		No
EEI Electric Proxy Group	7.62%		No	8.30%		No
Less Than 10% Non-Regulated or International	7.40%		No	8.04%		No
Common Proxy Companies Since 2012/2014	7.39%		No	8.03%		No
					8.68% - 10.68%	
30-Year Treasury Bond Yield as Risk-Free Rate						
Ameren	7.65%		No	8.33%		No
EEI Electric Proxy Group	7.69%	8.68% - 10.68%	No	8.38%		No
Less Than 10% Non-Regulated or International	7.48%		No	8.12%		No
Common Proxy Companies Since 2012/2014	7.46%		No	8.10%		No
Kroll Risk-Free Rate & Equity Risk Premium						
Ameren	7.77%		No			
EEI Electric Proxy Group	7.81%		No			
Less Than 10% Non-Regulated or International	7.59%		No			
Common Proxy Companies Since 2012/2014	7.58%		No			

Q: Are the results of Mr. Murray's multi-stage DCF or CAPM analyses reasonable?

A. No. Given the results of Mr. Murray's cost of equity analyses, it is not surprising that he does not rely on them for purposes of developing his recommended ROE in this proceeding. All of the results of Mr. Murray's multi-stage DCF and CAPM analyses are *below the low end of the range* of comparable authorized ROEs that have been approved for vertically-integrated electric utilities since at least 1980. I recognize that Mr. Murray contends that the results of his cost of equity analyses are reasonable based on his claim that utility commissions have consistently authorized ROEs well in excess of the cost of equity. However, as I have discussed, his position is unsupported and unfounded given the mandate of

88 Schedule DM-D-5.

regulatory commissions to authorize just and reasonable rates and that his position has been specifically rejected previously.

Q: In prior Ameren Missouri rate proceedings, has Mr. Murray relied on the results of his cost of equity analyses for purposes of his ROE recommendation?

A. No. As seen in Figure 11, Mr. Murray's model results have consistently been below his ROE recommendation.

FIGURE 11: COMPARISON OF THE RESULTS OF MR. MURRAY'S COST OF EQUITY ESTIMATION METHODOLOGIES AND RECOMMENDED ROE IN PRIOR AMEREN MISSOURI RATE PROCEEDINGS[89]

Methodology	Case No. ER-2024-0319	Case No. ER-2022-0337	Case No. ER-2021-0240	Case No. ER-2019-0335
Multi-Stage DCF (AEE, 3.5% long-term growth rate)	7.83% (8.15%)	7.62%	7.12%	6.83%
Multi-Stage DCF (AEE, 3.0% long-term growth rate)	7.83% (8.15%)	7.47%	6.95%	6.65%
Multi-Stage DCF (AEE, 2.5% long-term growth rate)	7.94% (8.07%)	7.33%	6.78%	6.48%
Multi-Stage DCF (Electric Utility Group, 3.0% long-term growth rate)	7.92% - 8.14% (8.19% - 8.38%)	7.65% - 7.89%	7.08% - 7.33%	6.50%-6.75%
CAPM	7.58% - 8.38%	8.52% - 9.05%	6.40% - 7.04%	5.38%-6.06%
Rule of Thumb	8.50%	8.00% - 8.25%	5.75%	6.25%
Cost of Equity Range	7.50% - 8.50%	7.00% - 7.50%	6.50% - 7.00%	5.50% - 6.50%
ROE Recommendation	9.50%	9.25%	9.00%	9.25%
Amount by which Mr. Murray's ROE recommendation is greater than his highest cost of equity model result	**1.00%**	**0.20%**	**1.67%**	**2.42%**

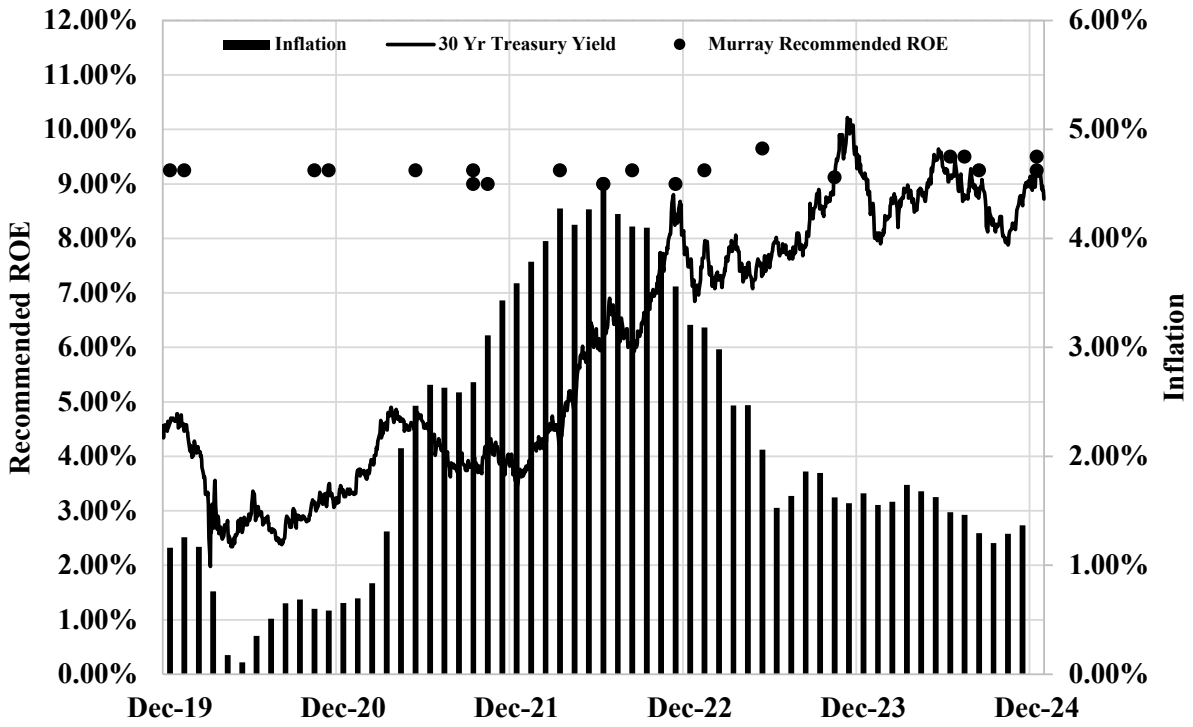
Q: Have Mr. Murray's ROE recommendations changed with the changes in capital market conditions over time?

A. No. As shown in Figure 12, Mr. Murray's recommended ROEs have consistently been between 9.00 percent and 9.50 percent since 2019 – regardless of capital

89 Murray Direct (Mr. Murray presents his DCF analyses using a three-month period such as he has done previously, as well additional results using six-month period, and the six-month results in this table are presented in parenthesis); File No. ER-2022-0337, Direct Testimony of David Murray, January 13, 2023; File No. ER-2021-0240, Direct Testimony of David Murray, September 3, 2021; File No. ER-2019-0335, Direct Testimony of David Murray, December 4, 2019.

market conditions, with exception of recommending 9.65 percent for Confluence Rivers in WR-2023-0006. While long-term interest rates have varied over this period and increased substantially beginning in late 2021, Mr. Murray's ROE recommendations have remained constant over the past five years. This suggests that Mr. Murray does not seriously consider his own cost of equity analyses when recommending an appropriate ROE.

FIGURE 12: MR. MURRAY'S ROE RECOMMENDATIONS COMPARED TO CHANGING MARKET CONDITIONS



VI.B. Proxy Group

Q: What proxy group does Mr. Murray utilize to estimate the cost of equity?

A. Mr. Murray relies on a broad proxy group of utilities classified as "regulated and "mostly regulated" as compiled by Edison Electric Institute ("EEI"), and develops cost of equity estimates that consider the entire proxy group, as well as two subsets of this broad proxy group: (1) companies that have less than 10 percent of their operations exposed to non-regulated or international markets; and (2) companies that Mr. Murray has consistently followed in electric rate cases since 2012.[90] In addition, instead of using a proxy group, Mr. Murray also separately estimates the cost of equity for the Company based on its parent, Ameren.[91]

Q: Do you agree with the proxy group on which Mr. Murray relies for his cost of equity analyses?

A. No. Mr. Murray applies no screening criteria to his first proxy group in which he relies on all of the companies compiled by EEI, and provides no support for the very limited screening criteria that he applies in establishing his other two proxy groups (*i.e.*, companies with more than 10 percent of their operations as unregulated or international; and companies that Mr. Murray has used for the past decade). Mr. Murray's proxy groups are overly broad and include numerous companies that are not comparable to Ameren Missouri (*e.g.*, those that are only electric transmission and distribution-only companies). However, given that Mr.

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90 Murray Direct, at 25.

91 *Id.*, at 21-23.

Murray's ROE recommendation is not based on the results of any of his cost of equity analyses, there is no need to discuss my disagreements with his proxy group further and I have limited my response to focus on those issues that cause the unreasonably low cost of equity results of Mr. Murray's multi-stage DCF and CAPM analyses.

VI.C. Multi-Stage DCF Model

Q: What is the DCF approach that Mr. Murray utilizes to estimate the cost of equity?

A. Mr. Murray utilizes a multi-stage DCF analysis that includes three stages, the first two of which have defined time horizons, while the third assumes cash flows in perpetuity. In the first stage, Mr. Murray calculates the projected dividends for each proxy company based on analysts' projected EPS growth rates through 2027 multiplied by their projected dividend payout ratios based on analysts' estimated annual DPS and EPS. For the second stage, which is 2028 through 2038, Mr. Murray relies on a linear transition from analysts' projected 5-year EPS growth rate for each proxy company as reported by S&P to his assumed long-term growth rate of 3.00 percent in 2038. Mr. Murray also conducts scenarios of his multi-stage DCF analysis by using long-term growth rates of 2.50 percent and 3.50 percent as well.[92] Mr. Murray performs his DCF with a six-month stock price period in addition to his typical three-month stock period because Ameren and electric utility stock

[92] Murray Direct, at 21-24.

prices appreciated beginning in July 2024.[93] The results of Mr. Murray's multi-stage DCF analyses are shown previously in Figure 9.

Q: Do you agree with Mr. Murray's specification of his multi-stage DCF model?

A. No. I disagree with multiple aspects of Mr. Murray's multi-stage DCF model; however, as noted previously, he does not rely on the results of his DCF model for purposes of his ROE recommendation in this proceeding. Therefore, I recommend that the Commission also not rely on his multi-stage DCF results.

Q: Regardless of whether Mr. Murray relies on the results of his multi-stage DCF for purposes of his ROE recommendation, do the results of his multi-stage DCF analysis indicate that the cost of equity has increased for electric utilities since the Company's last rate proceeding?

A. Yes. While I disagree with the specification of Mr. Murray's multi-stage DCF model, the results of his analysis in the current proceeding indicate an increase in the cost of equity since the Company's last rate proceeding. Specifically, as shown in Figure 13, the results of Mr. Murray's multi-stage DCF analysis are approximately 15 to 40 basis points greater than the results of his equivalent multi-stage DCF analyses in the Company's last rate proceeding.[94]

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93 *Id*., at 22.

94 Missouri Public Service Commission, Case Nos. ER-2024-0119, at Schedule DM-D-3 pages 1-2, and ER-2022-0337, Direct Testimony of David Murray, January 13, 2023, at Schedule DM-D-3, page 1. The results of Mr. Murray's multi-stage DCF analysis ranged from 7.56 percent to 7.89 percent, depending on which of his proxy group scenarios is utilized.

FIGURE 13: RESULTS OF MR. MURRAY'S MULTI-STAGE DCF ANALYSES IN THE CURRENT PROCEEDING AS COMPARED TO AMEREN MISSOURI'S LAST RATE PROCEEDING[95]

	Current Case	Prior Case	Basis Point Increase
Multi-Stage DCF			
Ameren / 6 month Avg. Stock Prices			
2.5% Perpetual Growth Rate	8.07%	n/a	n/a
3.0% Perpetual Growth Rate	8.15%	n/a	n/a
3.5% Perpetual Growth Rate	8.25%	n/a	n/a
Ameren / 3 month Avg. Stock Prices			
2.5% Perpetual Growth Rate	7.72%	7.32%	40
3.0% Perpetual Growth Rate	7.83%	7.46%	37
3.5% Perpetual Growth Rate	7.94%	7.61%	33
Elec Proxy Group / 6 month Avg. Stock Prices			
Average	8.25%	n/a	n/a
Less Than 10% Non-Regulated or International	8.38%	n/a	n/a
Common Proxy Companies Since 2012/2014	8.19%	n/a	n/a
Elec Proxy Group / 3 month Avg. Stock Prices			
Average	8.04%	7.89%	14
Less Than 10% Non-Regulated or International	8.14%	7.75%	40
Common Proxy Companies Since 2012/2014	7.92%	7.65%	28

Mr. Murray also notes that, based on his former method for conducting the DCF (*i.e.*, his approach prior to 2019), the results in the current proceeding are also higher using both six-month average stock prices and three-month average stock prices.[96]

[95] Multi-Stage DCF results for Ameren 3 and 6 month Avg. Stock Prices are based on DM-D-2 pages 1 and 2 where Mr. Murray discounts his projected cash flows to the year 2224. Figure 10 does not present non-materially different results from DM-D-2 pages 3 and 4 where Mr. Murray discounts his projected cash flows until 2038 with a terminal value.

[96] Murray Direct, at 27. Mr. Murray notes that he changed the approach of his multi-stage DCF analysis around 2019.

Q: Does a multi-stage DCF such as Mr. Murray has conducted increase the accuracy of the DCF results?

A. No. First, the utility industry is considered a mature industry due to its regulated status and relatively stable demand. Thus, financial projections such as analysts' projected EPS growth rates are also likely to be relatively stable over the long term. In fact, as Mr. Murray acknowledges, the utility industry is characterized by slow, but steady growth in earnings.[97] Thus, the relative stability of the financial forecasts for utilities as recognized by Mr. Murray supports the use of the constant growth DCF model to estimate the cost of equity for a mature industry like utilities.

Second, since the cost of equity is not observable, it is not possible to conclude that the results of a multi-stage DCF model are more accurate than the results of a constant growth DCF model. The multi-stage DCF model introduces additional assumptions and potential analyst bias. Specifically, the multi-stage DCF model presented by Mr. Murray in this proceeding reflects the following additional assumptions that require subjective judgment:

- Specification of the Model: In this case, Mr. Murray presents a multi-stage DCF model with three stages of growth; however, there are other forms of multi-stage DCF models.
- Selection of the Growth Rates: Mr. Murray's multi-stage DCF model requires selecting both short-term and long-term growth rates.
- Duration of Each Stage of the Multi-Stage DCF Model: For his multi-stage DCF model, Mr. Murray assumes first stage growth from years 1-5 and second stage growth from years 6-15, and then perpetual growth thereafter.

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[97] Murray Direct, at 9.

Given the number of additional subjective assumptions required, it is reasonable to conclude that a multi-stage DCF analysis creates greater opportunity for an analyst to influence the results of the DCF model.

Q: Do you agree with the projected long-term growth rate that Mr. Murray uses in his DCF analysis?

A. No, there are multiple problems with the long-term growth rate that Mr. Murray relies on in his multi-stage DCF analysis. Most importantly, just as I discussed in my response to Dr. Won, the methodology that Mr. Murray uses to estimate the long-term growth rate is not supported by the publisher of the data he relies on for purposes of his CAPM analysis.

Morningstar, which is now owned by *Kroll*, which is the data source Mr. Murray relies on in his CAPM analysis, recommends estimating the projected long-term nominal GDP growth rate by first calculating the historical growth in real GDP and then adding the expected inflation rate:

> Growth in real GDP (with only a few exceptions) has been reasonably stable over time; therefore, its historical performance is a good estimate of expected long-term future performance. *By combining the inflation estimate with the real growth rate estimate, a long-term estimate of nominal growth is formed*.[98]

Furthermore, regarding the use of long-term historical data, *Morningstar* notes:

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[98] *Ibbotson and Associates*, Stocks, Bonds, Bills and Inflation, 1926-2012, 2013 Valuation Yearbook, at 52; emphasis added.

> The 87-year period starting with 1926 is representative of what can happen: it includes high and low returns, volatile and quiet markets, war and peace, inflation and deflation, and prosperity and depression. Restricting attention to a shorter historical period underestimates the amount of change that could occur in a long future period. Finally, because historical event-types (not specific events) tend to repeat themselves, long-run capital market return studies can reveal a great deal about the future. Investors probably expect "unusual" events to occur from time to time, and their return expectations reflect this.[99]

Applying *Morningstar's* methodology, the long-term growth rate is 5.51 percent as shown in Schedule AEB-1R, Attachment 9, which is substantially higher than the long-term growth rate relied on by Mr. Murray.

While I do not support Dr. Won's long-term growth rate, the long-term growth rate of 3.90 percent that he relies on is materially greater than the 2.50 percent to 3.50 percent long-term growth rate range that Mr. Murray suggests is appropriate.

Q: Has Mr. Murray acknowledged that the long-term growth rate assumption could have a significant effect on the result of the multi-stage DCF model?

A. Yes, Mr. Murray acknowledged in his testimony on behalf of Staff in the 2014/2015 Ameren Missouri Rate Case that the, "[c]ost of equity estimates using multi-stage DCF methodologies are **extremely sensitive** to the assumed perpetual growth rate."[100] As I have demonstrated, investors expect the long-term growth rate for

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[99] *Id.* at 59.

[100] Missouri Public Service Commission, Case No. ER-2014-0258, Staff Cost of Service Report, December 5, 2014, at 34; emphasis in original.

utilities to exceed the long-term growth rate range of 2.50 percent to 3.50 percent that he has relied on for his multi-stage DCF model. Therefore, Mr. Murray's reliance on a low long-term growth rate with the current stock prices of Ameren and the companies in his proxy group results in a significantly understated cost of equity estimate. If Mr. Murray were to assume a long-term growth rate more consistent with the result from applying the *Morningstar* methodology, he would have obtained a much higher cost of equity estimate for Ameren and the proxy group.

Q: Do you agree with Mr. Murray that Ameren also considers sustainable growth for the utility industry to be in the range that Mr. Murray relies on in his multi-stage DCF analysis?

A. No. **[redacted]

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101 Murray Direct, at 23.

102 **[redacted]**

[redacted]**

VI.D. CAPM Analysis

Q: How does Mr. Murray conduct his CAPM analysis?

Mr. Murray develops three separate specifications of the CAPM analysis. The first CAPM analysis uses a risk-free rate based on the average monthly yield on the 20-year Treasury bond for August 2024 through October 2024, four-year raw betas for Ameren Missouri and the electric utility proxy group as published by S&P that Mr. Murray adjusts using the Blume adjustment, and a market risk premium of 5.00 percent and 6.00 percent, which he contends is consistent with the investment community's consensus. The second CAPM analysis is the same as the first, except that it uses a risk-free rate based on the average monthly yield on the 30-year Treasury bond for August 2024 through October 2024. Mr. Murray's third CAPM analysis relies on a risk-free rate and market risk premium published by *Kroll*, and the same betas as in his first two CAPM scenarios.[103] The results of Mr. Murray's CAPM analyses range from 7.39 percent to 8.38 percent, and ultimately,

[103] *Kroll* states that the risk-free rate should be the spot yield on the 20-year Treasury bond since the spot yield currently exceeds *Kroll*'s normalized risk-free rate.

he states that his CAPM analyses indicate a cost of equity in the 7.40 percent to 8.40 percent range.[104]

Q: Do you agree with Mr. Murray's specification of the CAPM?

A. No. I disagree with several assumptions relied on by Mr. Murray in his CAPM analyses; however, it is important to recognize that he does not rely on the results of his CAPM model for purposes of his ROE recommendation in this proceeding. Therefore, I recommend that the Commission also not rely on his CAPM results.

Q: Does Mr. Murray's assumed market risk premia have similar flaws that you have identified in your response to Dr. Won?

A. Yes. Mr. Murray states that his estimated risk premia range of 5.0 percent and 6.0 percent is based on the range of historical arithmetic and geometric equity risk premia, as well as *Kroll*'s current recommended market risk premium.[105] However, the historical data referenced by Mr. Murray is the same data relied on by Dr. Won, and Mr. Murray's reliance on that information also suffers from the same issues that I have previously discussed in my response to Dr. Won (*i.e.*, the use of historical data to estimate a forward-looking market return and market risk premium; incorrectly mismatching a historically-derived market risk premium with a current risk-free rate; incorrectly calculating the market risk premia based on the total return on long-term government bonds instead of the income-only return; and

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104 Murray Direct, at 27-31 and Schedule DM-D-5.

105 *Id.*, at 28.

relying on historical geometric averages of the market return and market risk premia to estimate the cost of equity).

Q: Does Mr. Murray's projected market risk premium reflect the inverse relationship between interest rates and the market risk premium?

A. No. The projected market risk premia that Mr. Murray relies on from *Kroll* in his third CAPM scenario also fails to reflect the inverse relationship between interest rates and the market risk premium. For example, as noted previously in my response to Dr. Won, the historical arithmetic mean market risk premium from 1926-2023 is 7.17 percent,[106] and the historical income-only return on government bonds used to calculate the historical market risk premium over that same period is 4.87 percent. Mr. Murray's assumed risk-free rate in this scenario is 4.38 percent.[107] The fact that current interest rates on long-term government bonds are *less than* the historical long-term average interest rate for those same bonds, the inverse relationship between interest rates and the market risk premium indicates that the projected market risk premium should be *greater than*, not less than, the long-term historical average of 7.17 percent. However, the projected market risk premium assumed by Mr. Murray of 5.00 percent in this CAPM scenario is materially *less than* the historical average market risk premium of 7.17 percent, thereby understating the current market risk premium. Therefore, the result of Mr. Murray's CAPM analyses that rely on a projected market risk premium, which are

106 *Kroll*, Cost of Capital Navigator.

107 Schedule DM-D-5, at 3.

in the range from 7.58 percent to 7.81 percent,[108] understate the cost of equity. Further, these results are *substantially lower than any ROE authorized for a vertically-integrated electric utility in at least 40 years*.

Q: Is there further evidence that Mr. Murray's assumed 6.00 percent market risk premium is unreasonable?

A. Yes. In his first two CAPM analyses where he relies on a market risk premium of 6.00 percent as an upper bound, Mr. Murray relies on risk-free rates of 4.19 percent and 4.26 percent, respectively,[109] which implies an overall market return of 10.19 percent and 10.26 percent, respectively. However, in his workpapers, Mr. Murray notes that the long-term arithmetic historical market return is 12.16 percent, or significantly greater than the implied market returns on which the upper bound of his risk premium is based. Consequently, the implied market returns of the market risk premia relied on by Mr. Murray are well below, and cannot be reconciled with, the long-term historical returns for the market.

VI.E. "Rule of Thumb" BYRP Analysis

Q: Please summarize Mr. Murray's BYRP analysis.

A. Mr. Murray conducts a BYRP analysis that he characterizes as a simple "rule of thumb" methodology and uses this as a check on the reasonableness of his DCF and CAPM results. Mr. Murray's "rule of thumb" BYRP analysis estimates the cost

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[108] *Id*.

[109] *Id*., at 1-2.

of equity by adding an estimated equity risk premium to an average utility bond yield in order to estimate the cost of equity. He relies on a the yield to maturity on Ameren Missouri's recent long-term bonds of 5.50 percent, and proposes to add a "rule of thumb" risk premium of 3.00 percent to 4.00 percent, although he contends that the risk premium should be no higher than 3.00 percent since utility stocks are viewed by the investment community as bond substitutes. From this analysis, Mr. Murray concludes that his "rule of thumb" BYRP analysis supports a cost of equity 8.50 percent.[110]

Q: Is this "rule of thumb" approach employed by Mr. Murray reasonable?

A. No. Mr. Murray's specification of a simplistic BYRP approach fails to account for the effect of current market conditions on the market risk premium. As previously discussed, both academic literature and market evidence indicate that the equity risk premium is inversely related to the level of interest rates (*i.e.*, as interest rates increase, the equity risk premium decreases, and vice versa).[111] In fact, Dr. Won also demonstrates this inverse relationship regarding his BYRP analysis in Figure 6 of his testimony. Therefore, given that current yields on long-term government bonds are below the historical average yields on those same bonds, the market

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110 *Id.*, at 31.

111 *See e.g.*, S. Keith Berry, "Interest Rate Risk and Utility Risk Premia during 1982-93," Managerial and Decision Economics, Vol. 19, No. 2, March, 1998. See also, Robert S. Harris, "Using Analysts' Growth Forecasts to Estimate Shareholder Required Rates of Return," Financial Management, Spring 1986, at 66.

risk premium should be *greater than* the long-term historical average market risk premium – which is not the case for Mr. Murray's simplistic BYRP analysis.

Furthermore, Mr. Murray's "rule of thumb" does not provide any meaningful insight into the cost of equity for the Company in this proceeding given that multiple ranges for this "rule of thumb" have been offered in testimony in prior cases before the Commission. For example, in the Company's last rate proceeding, Dr. Won testified that the "rule of thumb" risk premium ranged from 3.50 percent to 5.50 percent.[112] In addition, Dr. Won has previously testified that the range of the "rule of thumb" market risk premium was 4.00 percent to 6.00 percent.[113] Given Mr. Murray's position that the yield to maturity on Ameren Missouri's recent long-term bonds is about 5.50 percent, if Dr. Won's prior "rule of thumb" range of 4.00 percent to 6.00 percent were utilized, it would suggest that Mr. Murray's estimated cost of equity should be in the range of 9.50 percent to 11.50 percent, or an average of 10.50 percent – which is clearly not supportive of Mr. Murray's ROE recommendation and is in fact higher than the Company's requested ROE of 10.25 percent in this proceeding.

Lastly, Mr. Murray's simplistic "rule of thumb" produces material differences in the results that are inconsistent with his ROE recommendations over time.

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112 Missouri Public Service Commission, Case Nos. ER-2022-0129 and ER-2022-0130, Direct Testimony of Seoung Joun Won, June 8, 2022, at 29.

113 Missouri Public Service Commission, Case No. WR-2020-0344, Staff Cost of Service Report, November 2020, at 27.

Corrected Page

Specifically, in Ameren Missouri's 2021 rate proceeding, Mr. Murray testified that his "rule of thumb" analysis suggested a cost of equity of 5.75 percent, and he recommended an ROE of 9.00 percent.[114] However, in this proceeding, Mr. Murray claims that this "rule of thumb" analysis indicates a cost of equity of 8.50 percent, while he is recommending an ROE of 9.50 percent.[115] In other words, while Mr. Murray suggests that this methodology offers a reasonableness check on his results, it yields a cost of equity result 275 basis points higher in the current proceeding than he indicated in Ameren Missouri's 2021 rate proceeding, yet his ROE recommendation is just 50 basis points higher.

In summary Mr. Murray's "rule of thumb" analysis is not credible, and the results of this methodology do not offer any reasonable "check" on the results of his own models, nor does this result support his ROE recommendation.

VII. RESPONSE TO MR. WALTERS

Q: Please summarize Mr. Walter's cost of equity analyses.

A. Relying on the same proxy group as I have used, Mr. Walters relies on three analytical approaches to estimate the cost of equity: (1) three forms of a DCF model (a constant growth DCF that relies on analysts' projected EPS growth rates; a constant growth DCF using sustainable growth rates, and a multi-stage DCF);

[114] File No. ER-2021-0240, September 3, 2021, Direct Testimony of David Murray, at 28.

[115] Murray Direct, at 31.

(2) a BYRP analysis, and (3) a CAPM analysis.[116] As shown in Figure 14, Mr. Walters recommends an ROE range of 9.00 percent to 10.00 percent and selects the midpoint of that range as his recommended ROE for the Company.[117]

FIGURE 14: SUMMARY OF MR. WALTERS'S COST OF EQUITY ESTIMATION RESULTS AND ROE RECOMMENDATION

	Cost of Equity
DCF	
Constant Growth (Analysts' EPS Gwth Rates)	10.49% - 10.81%
Constant Growth (Sustainable Gwth Rates)	8.70% - 8.72%
Multi-Stage	8.43% - 8.67%
BYRP	
Projected Treasury Yield	9.90%
3-Month Historical Yields	9.75% - 9.96%
6-Month Historical Yields	9.90% - 10.12%
CAPM	7.70% - 11.92%
Recommended Range	9.00% - 10.00%
ROE Recommendation	**9.50%**

VII.A. DCF Analyses

Q: How does Mr. Walters use the results of his DCF models to establish his ROE recommendation?

A. While his specification of the DCF analyses have not changed, Mr. Walters's use of the DCF model results to establish his ROE range has changed over time.

[116] Walters Direct, at 22.

[117] *Id.*, at 2-3.

Specifically, Mr. Walters has gone from primarily weighting his constant growth DCF using projected EPS growth rates, to generally weighting all three of his DCF analyses equally, to now in the current proceeding, stating that he gives primary weight to his constant growth DCF using sustainable growth rates and his multi-stage DCF.[118]

Q: Why does Mr. Walters contend that primary weight should be placed on the results of his constant growth DCF model that relies on sustainable growth rates and his multi-stage DCF analyses?

A. Mr. Walters states that he supports placing less weight on his constant growth DCF that relies on analysts' projected EPS growth rates because the average projected EPS growth rate exceeds his projected GDP growth rate.[119]

Q: Is this rationale for the change in his approach credible?

A. No. While Mr. Walters offers this as his current rationale for limiting the weight on his DCF models that rely on EPS growth rates, the fact is that the average projected EPS growth rates that he has relied on in prior cases referenced previously have exceeded his projected GDP growth rates in each of those cases.

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[118] *See, e.g.*, Oklahoma Corporation Commission, Case No. 2021-00164, Responsive Testimony of Christopher C. Walters, April 22, 2022, at 35, 38 and Exhibit CCW-3; Oklahoma Corporation Commission, Case No. 2022-000093, Responsive Testimony of Christopher C. Walters, March 7, 2023, at 35, 38 and Exhibit CCW-3; Wyoming Public Service Commission, Docket No. 20000-633-ER-23, Direct Testimony of Christopher C. Walters, August 14, 2023at 41, 43 and WOCA Exhibit No. 602.5; Michigan Public Service Commission, Case No. U-21389, Direct Testimony of Christopher C. Walters, August 29, 2023, at 39, 42 and Exhibit AB-14.

[119] Walters Direct, at 38.

Q: Do you agree with Mr. Walters's specification of the DCF models?

A. No, I do not agree with Mr. Walters's constant growth DCF model using sustainable growth rates or his multi-stage DCF model. The use of a sustainable growth rate in the DCF suggests there is a positive relationship between future earnings and the retention ratio; however, this assumption does not necessarily hold in practice and academic research has found the opposite to be true (*i.e.*, there is a negative relationship between earnings growth rates and payout ratios).

For example, management may decide to (i) conserve cash for capital investments; (ii) manage the dividend payout for the purpose of minimizing future dividend reductions; (iii) manage its capital structure; or (iv) signal future earnings prospects. These decisions can and do influence the dividend payout (and therefore earnings retention) in the near-term, and such decisions have been seen recently in the market. For example, as a result of the economic effects of COVID-19, more than forty S&P 500 companies temporarily suspended their dividends.[120] Counter to Mr. Walters's assumption, a company's management will alter dividend policy to respond to changes in earnings, and therefore dividend growth will not always reflect earnings growth (and vice versa).

Both Zhou and Ruland (2006) and Gwilym, *et al*. (2006) discussed the theory that high dividend payouts (*i.e.*, low retention ratios) are associated with low future

[120] Karen Langley, "U.S. Companies Slashed Dividends at Fastest Pace in More Than a Decade," *Wall Street Journal*, July 8, 2020.

earnings growth.[121] Each of these studies also cited Arnott and Asness (2003) that found, over the course of 130 years of data, future earnings growth is associated with high, rather than low payout ratios.[122] Specifically, Arnott and Asness (2003) concluded:

> Unlike optimistic new-paradigm advocates, we found that low payout ratios (high retention rates) historically precede low earnings growth. This relationship is statistically strong and robust. We found that the empirical facts conform to a world in which managers possess private information that causes them to pay out a large share of earnings when they are optimistic that dividend cuts will not be necessary and to pay out a small share when they are pessimistic, perhaps so that they can be confident of maintaining the dividend payouts. Alternatively, the facts also fit a world in which low payout ratios lead to, or come with, inefficient empire building and the funding of less than-ideal projects and investments, leading to poor subsequent growth, whereas high payout ratios lead to more carefully chosen projects. The empire-building story also fits the initial macroeconomic evidence quite well. At this point, these explanations are conjectures; more work on discriminating among competing stories is appropriate.[123]

All three studies found that there is a negative, not a positive, relationship between earnings growth rates and retention ratios.

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[121] Ping Zhou and William Ruland, "Dividend Payout and Future Earnings Growth," *Financial Analysts Journal*, Vol. 62, No. 3, 2006; Owain Gwilym, James Seaton, Karina Suddason, and Stephen Thomas, "International Evidence on the Payout Ratio, Earnings, Dividends and Returns," *Financial Analysts Journal*, Vol. 62, No. 1, 2006.

[122] Robert Arnott and Clifford Asness, "Surprise: Higher Dividends = Higher Earnings Growth," *Financial Analysts Journal*, Vol. 59, No. 1, January/February 2003. Since the payout ratio is the inverse of the retention ratio, the authors found that future earnings growth is negatively related to the retention ratio.

[123] *Id.*

For all these reasons, Mr. Walters's reliance on sustainable growth rates in the constant growth DCF model is not appropriate.

Q: Are there other reasons why sustainable growth rates should not be used in the DCF model?

A. Yes. Beyond the empirical evidence and academic research demonstrating that projected EPS growth rates are the most relevant for stock price valuation as discussed in my response to Dr. Won, there are two additional issues with Mr. Walters's assumed sustainable growth rate.

First, the use of the sustainable growth rates involves estimating investor expectations for four separate variables over the near-term: (1) the retention ratio, reflected as the "b" variable; (2) the expected return on book equity, reflected as the "r" variable; (3) the growth in the number of shares of common equity, reflected as the "s" variable; and (4) the portion of the market-to-book ratio that exceeds unity, reflected as the "v" variable. This means that the growth estimate includes the forecasting error of the four separate variables.

Second, Mr. Walters relies on two growth rates that he suggests represent the long-term growth of the proxy group (*i.e.*, the sustainable growth rate assumed in his constant growth DCF analysis and the long-term growth rate assumed in his multi-stage DCF analysis); however, these assumed growth rates are significantly different from one another and affect the results of his DCF analyses. The average long-term "sustainable" growth rate that Mr. Walters relies on in a constant growth

DCF model is 4.87 percent.[124] Mr. Walters states that the sustainable growth rate is limited by the projected long-term GDP growth rate as that reflects the projected long-term growth in the economy as a whole,[125] yet this growth rate is inconsistent with the long-term growth rate that he assumes in his multi-stage DCF model (*i.e.*, 4.14 percent).[126]

Q: Is Mr. Walters's assumed long-term growth rate in his multi-stage DCF consistent with the analyst literature that he relies on?

A. No. Mr. Walters's assumed long-term growth rate in his multi-stage DCF of 4.14 percent is inconsistent with the analyst literature he cites in his testimony. Specifically, Mr. Walters's long-term growth rate in his multi-stage DCF is based on the projected nominal GDP growth rate reported by *Blue Chip Economic Indicators*, as supported by other sources of projected nominal GDP growth.[127] However, *Blue Chip Economic Indicators* does not publish a GDP growth rate that can be used in perpetuity, as is the intention of the multi-stage DCF model, but rather, the growth rate relied upon by Mr. Walters is the projected growth rate for the next ten years.[128]

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124 Walters Direct, Schedule CCW-6, at 1.

125 *Id*., at 31.

126 *Id*., Schedule CCW-8, at 1.

127 Walters Direct, at 31.

128 *Id*.

When discussing the long-term growth rate for his multi-stage DCF, Mr. Walters references the following quote from the *Ibbotson* SBBI 2013 Valuation Yearbook:

> Another approach to estimating long-term growth rates is to focus on estimating the overall economic growth rate. Again, this is the approach used in the Ibbotson Cost of Capital Yearbook. To obtain the economic growth rate, a forecast is made of the growth rate's component parts. Expected growth can be broken into two main parts: expected inflation and expected real growth. By analyzing these components separately, it is easier to see the factors that drive growth.[129]

However, Mr. Walters cites only a portion of the quote and omits the remainder of the discussion, which indicates that his assumed long-term growth rate is inconsistent with the approach recommended by *Ibbotson* for establishing a long-term growth rate:

> Once the long-term expected inflation rate is estimated, the real growth rate must be determined. The growth rate in real Gross Domestic Product (GDP) for the period 1929 to 2012 was approximately 3.22 percent. Growth in real GDP (with only a few exceptions) has been reasonably stable over time; therefore, its historical performance is a good estimate of expected long-term (future) performance.
>
> By combining the inflation estimate with the real growth rate estimate, a long-term estimate of nominal growth is formed.[130]

The *Ibbotson* SBBI 2013 Valuation Yearbook recommends that the long-term growth rate reflect the sum of the long-term historical average real GDP growth

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[129] *Id*., at 36.

[130] *Morningstar, Inc*., Ibbotson SBBI 2013 Valuation Yearbook, at 52 (emphasis added).

rate and the expected inflation rate. As shown in Schedule AEB-R1, Attachment 11, had Mr. Walters used the Ibbotson approach, based on the full citation, taking into consideration the real GDP growth rate and expected inflation, the resulting long-term growth is 5.51 percent. As a result, Mr. Walters understates the long-term growth rate consistent with *Ibbotson's* methodology that he cites in his testimony.

Q: Do you agree with Mr. Walters that it is necessary to consider a multi-stage DCF model for establishing the Company's ROE in this proceeding?

A. No. As stated in my response to Mr. Murray, the utility industry is considered a mature industry due to its regulated status and relatively stable demand. Thus, financial projections such as earnings growth rates are also likely to be relatively stable over the long-term. The relative stability of the financial forecasts for utilities supports the use of a constant growth DCF model to estimate the cost of equity for a mature industry like utilities.

Q: Are there other problems with Mr. Walters's multi-stage DCF analysis that indicate the constant growth DCF model is the appropriate DCF model to estimate the cost of equity in this proceeding?

A. Yes. First, as discussed in my response to Mr. Murray, Mr. Walters's multi-stage DCF model requires the introduction of multiple additional assumptions, with each having a significant effect on the results. Given the number of additional subjective assumptions required, it is reasonable to conclude that a multi-stage DCF analysis

creates greater opportunity for an analyst to influence the results of the DCF model.

Second, Mr. Walters supports his conclusion that it is not reasonable to assume that utilities can grow at a rate that is greater than the economy over the long term by comparing the projected growth rate in the constant growth DCF to his projected GDP growth rate. However, this comparison relies entirely on the accuracy of his estimate of the long-term GDP growth rate. However, as discussed, Mr. Walters's selection of a nominal GDP growth rate as his estimate of long-term growth is inconsistent with and understates the long-term growth rate that would be consistent with *Ibbotson's* methodology that he cites in his testimony.

Finally, considering the empirical studies comparing the total factor productivity ("TFP") growth of the utility industry relative to the economy, it is not unreasonable to assume that earnings growth for utilities could exceed GDP growth over the long term. In a study filed as part of the Rate Regulation Initiative of the Alberta Utilities Commission, the authors calculated TFP growth[131] for 72 U.S. electric and combination electric and natural gas utilities and for the U.S. economy for the period of 1972 through 2009. For the U.S. utility group, TFP growth averaged 0.96 percent over the period of 1972 to 2009,[132] while TFP growth for the U.S. economy

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131 TFP growth is a measure of productivity calculated as the difference between output growth and input growth. Higher TFP growth indicates that a company is converting inputs into higher levels of output growth (*i.e.*, increased productivity).

132 Jeff Makholm, and Agustin Ros, "Update, Reply and PBR Plan Review for AUC Proceeding 566 – Rate Regulation Initiative", February 22, 2012, at 5.

was 0.91 percent,[133] indicating that electric and combination electric and natural gas utilities were approximately 5 percent more productive than the U.S. economy over the study period. Therefore, the authors showed that utility growth exceeded growth for the U.S. economy for approximately 40 years.

Therefore, for all these reasons, the constant growth DCF model is the appropriate DCF model to estimate the cost of equity in this proceeding.

Q: Are the results of either Mr. Walters's constant growth DCF analysis using sustainable growth rates or his multi-stage DCF reasonable?

A. No. Not only do I disagree with Mr. Walters's specification of these DCF analyses for the reasons discussed, but the results of both his constant growth DCF analysis using sustainable growth rates and his multi-stage DCF are unreasonable and inconsistent with the comparable return standard. Specifically, the results of Mr. Walters's constant growth DCF analysis using sustainable growth rates is at the low end of any authorized ROE for a vertically-integrated electric utility in the past half century, while the results of his multi-stage DCF range well below any comparable authorized ROE over those same decades.

[133] *Id.*, at 19.

VII.B. BYRP Analysis

Q: Please summarize Mr. Walter's BYRP Analysis.

A. Mr. Walters conducts two Risk Premium analyses: one based on utility equity risk premia relative to yields on 30-year Treasury bonds (referred to herein as his "Treasury Bond Approach"), and one based on utility equity risk premia relative to yields on Moody's A-rated utility bonds (referred to herein as his "Utility Bond Approach"). To calculate the equity risk premium used in each of these analyses, Mr. Walters first calculates the average of the implied equity risk premium. In his Treasury Bond Approach, the implied equity risk premium is calculated as the difference between average annual authorized returns and the average annual yield on the 30-year Treasury bond in each year from 1986 through September 2024. In his Utility Bond Approach, the implied equity risk premium is the difference between the authorized ROEs and the yields on A-rated utility bonds in each year over the same time frame. The resulting risk premia used in Mr. Walters's analyses are 5.70 percent (Treasury Bond Approach) and 4.34 percent (Utility Bond Approach).[134]

As shown in Table CCW-9 of his testimony, Mr. Walters uses these two risk premium estimates to develop five estimates of the cost of equity:[135]

- A cost of equity of 9.90 percent based on the sum of his long-term historical Treasury bond risk premium (5.70 percent) and the near-term projected 30-

[134] Walters Direct, at 40-41; also Exhibit CCW-9.

[135] *Id.,* at 42-43.

year Treasury bond yield from *Blue Chip Financial Forecasts* as of November 2024 (4.20 percent).

- A cost of equity of 9.75 percent based on the sum of his long-term historical A-rated utility bond risk premium (4.34 percent) and the 3-month average A-rated utility bond yield as of September 2024 (5.41 percent).

- A cost of equity of 9.96 percent based on the sum of his long-term historical A-rated utility bond risk premium (4.34 percent) and the 3-month average Baa-rated utility bond yield as of September 2024 (5.62 percent).

- A cost of equity of 9.90 percent based on the sum of his long-term historical A-rated utility bond risk premium (4.34 percent) and the 6-month average A-rated utility bond yield as of September 2024 (5.56 percent).

- A cost of equity of 10.12 percent based on the sum of his long-term historical A-rated utility bond risk premium (4.34 percent) and the 26-week average Baa-rated utility bond yield as of September 2024 (5.78 percent).

Q: Do you agree with Mr. Walters's specification of his BYRP analysis?

A. No. I disagree with Mr. Walters regarding *how* to reflect the changing relationship between bond yields and authorized utility returns in the calculation and estimate of the ROE. As noted, Mr. Walters adds the *historical* average equity risk premium to a *projected* bond yield (*i.e.*, his Treasury Bond Approach) and a *current* bond yield (*i.e.*, his Utility Bond Approaches). In other words, Mr. Walters's methodology attempts to estimate a forward-looking equity risk premium based on a historical average risk premium. However, the fundamental misspecification of Mr. Walters's application of the BYRP approach is that it fails to properly account for the dynamic and inverse relationship between risk premia and interest rates over time, and as a result, understates the risk premium, and thus the resulting ROE.

Q: Can you demonstrate the extent to which Mr. Walters has understated the risk premium that he uses in his BYRP analyses?

A. Yes. To recognize the dynamic and inverse relationship between risk premia and interest rates over time, it is more appropriate to develop a regression equation as I have done in both Schedule AEB-2, Attachment 7 and Schedule AEB-2R, Attachment 6. The benefit of conducting a regression equation is that it can be used to estimate a forward-looking equity risk premium that corresponds to *any* interest rate that an analyst wishes to specify – whether it be Mr. Walter's near-term projected Treasury bond yield or his current utility bond yields. By specifying the interest rate projected for the time period that the Company's rates from this proceeding will be in effect, one can estimate an equity risk premium (and thus an ROE) for the forward-looking time-period that corresponds with the rates that are set in this proceeding.

Using Mr. Walters' Treasury Bond Approach as an example, I have developed a regression analysis that uses the following equation that is similar to the equation I rely on for my risk premium analysis:

$$RP = a + b(T) \qquad [1]$$

Where:

RP = average Treasury bond risk premia

a = intercept term

b = slope term

T = average Treasury bond yield

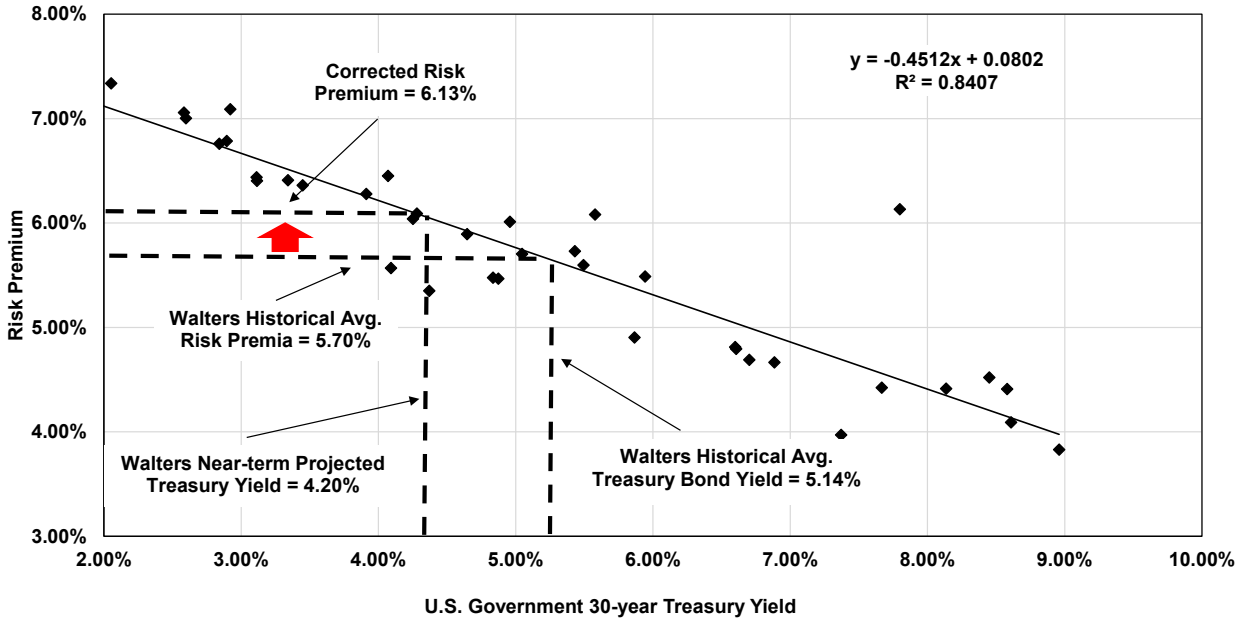
This regression uses 30-year Treasury bond yield and annual risk premia data from 1986 through September 2024 that Mr. Walters presents in Exhibit CCW-10. In addition, I conduct a similar regression for Mr. Walters' Utility Bond Approach that is based on the utility bond and annual risk premia data he presents in Exhibit CCW-11. These regressions are presented in Figure 15 and in Figure 16, as well as in Schedule AEB-1R, Attachment 13. As shown, the regression equations have an R^2 of approximately 0.84 and 0.86, respectively, and the coefficients are statistically significant at the 99.00 percent level, thus indicating the strong negative relationship between the risk premia and interest rates.

Figure 15 demonstrates that the result of Mr. Walters' Treasury Bond Approach is understated. Specifically, in his Treasury Bond Approach, Mr. Walters adds the near-term projected Treasury bond yield of 4.20 percent to his long-term historical average Treasury bond risk premium of 5.70 percent, which he contends results in an estimated ROE of 9.90 percent.[136] However, as shown, Mr. Walters's historical average Treasury bond risk premium of 5.70 percent corresponds to a historical average Treasury bond yield of 5.14 percent, not the near-term projected Treasury bond yield of 4.20 percent that he relies on. Rather, as also shown, the projected Treasury bond yield of 4.20 percent that Mr. Walters relies on corresponds to a risk premium of 6.13 percent. Therefore, by relying on his historical average risk premium of 5.70 percent, Mr. Walters understates the risk

[136] Walters Direct, at 42.

premium (the amount of the understatement is depicted by the red arrow in Figure 15), and thus also understates the ROE estimated by his Treasury Bond Approach.

FIGURE 15: MR. WALTERS'S TREASURY BOND RISK PREMIUM ANALYSIS IS UNDERSTATED



Q: Are the results of Mr. Walters' Utility Bond Approach also understated?

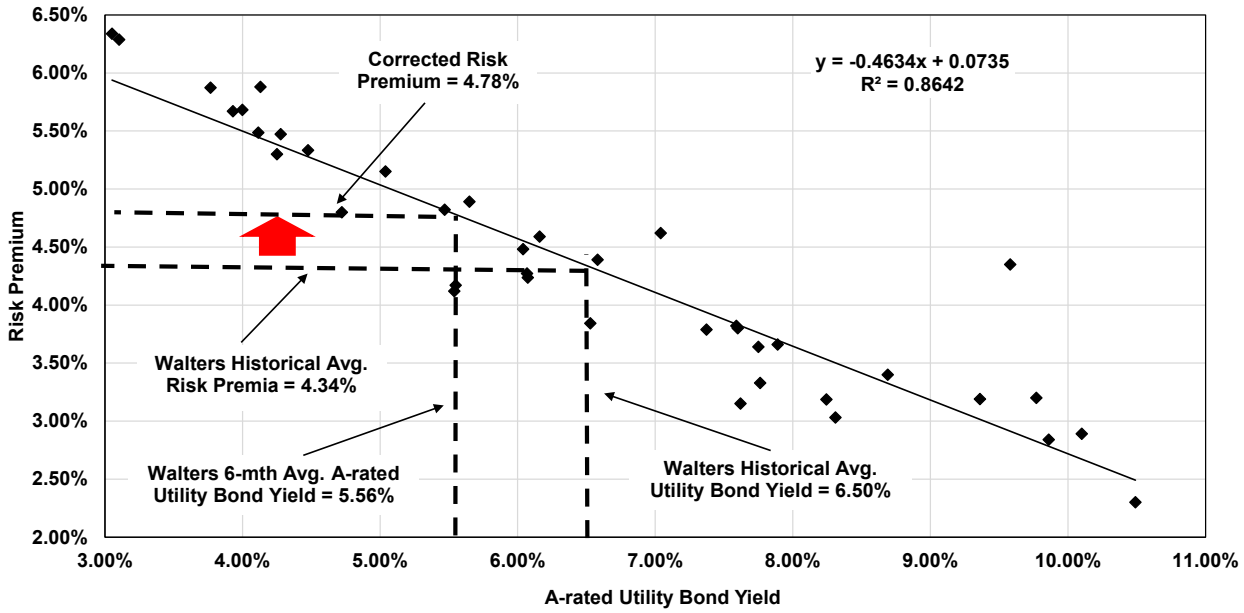
A. Yes. Similar to Figure 15, Figure 16 also graphs the relationship between Mr. Walters' historical average utility bond risk premia and historical average annual utility bond yields. For his Utility Bond Approach, Mr. Walters adds both 3-month and 6-month average A-rated and Baa-rated utility bond yields to his historical average utility bond risk premium of 4.34 percent, which produces four BYRP scenarios and results in an estimated ROE ranging from 9.75 percent to 10.12 percent depending on the scenario.[137] However, just as with his Treasury Bond

[137] *Id.*, at 43.

Approach, Mr. Walters also understates the risk premium, and thus has also understates the ROE estimated by his Utility Bond Approach.

Specifically, Figure 16 uses Mr. Walters's 6-month average A-rated utility bond yield scenario as an example. As noted, Mr. Walters adds his current 6-month average A-rated utility bond yield of 5.56 percent to his long-term historical average utility bond risk premium of 4.34 percent, which he contends results in an estimated ROE of 9.90 percent. However, as shown in Figure 14, the current 6-month average A-rated utility bond yield of 5.56 percent that Mr. Walters relies on does not correspond to his historical average utility bond risk premium of 4.34 percent, but rather corresponds to a risk premium of 4.78 percent. Therefore, by relying on his historical average risk premium of 4.34 percent, Mr. Walters has understated the risk premium (again, the amount of the understatement is depicted by the red arrow in Figure 16), and thus also understates the ROE estimated by his Utility Bond Approach.

FIGURE 16: MR. WALTERS'S UTILITY BOND RISK PREMIUM ANALYSIS IS UNDERSTATED



Q: Have you adjusted the results of Mr. Walters's BYRP analyses to account for the errors that you just discussed?

A. Yes. I have adjusted both Mr. Walters's Treasury Bond Approach and his Utility Bond Approach as noted in Figure 15 and in Figure 16, respectively, so that the results of the analyses reflect the inverse relationship between interest rates and the risk premium.

As shown in Figure 15, when Mr. Walter's near-term projected Treasury bond yield of 4.20 percent is added to the corrected the risk premium is 6.13 percent that properly reflects the inverse relationship between interest rates and risk premia, the resulting ROE is 10.33 percent. Likewise, as shown in Figure 14, when Mr. Walter's 6-month average A-rated utility bond yield of 5.56 percent is added to the

corrected utility bond risk premium of 4.78 percent that properly reflects the inverse relationship between interest rates and risk premia, the resulting ROE is 10.34 percent. Therefore, by not appropriately considering the inverse relationship between interest rate and the risk premium, the results of Mr. Walters's Treasury Bond and Utility Bond Approaches understate the expected equity return.

VII.C. CAPM Analysis

Q: Please summarize Mr. Walter's CAPM Analysis.

A. Mr. Walters produces twelve different cost of equity estimates from his CAPM analysis, relying on different estimates of the risk-free rate, beta, and market risk premium. Specifically, for the risk-free rate, Mr. Walters relies on a projected 30-year Treasury yield in eight scenarios, and a *Kroll* "normalized" risk-free rate in the remaining four scenarios. For beta, Mr. Walters relies on four estimates for the proxy group companies: (1) current five-year betas published by *Value Line*; (2) historical average betas published by *Value Line*; (3) current beta estimates from S&P Market Intelligence's Beta Generator ("Market Intelligence"); and (4) current three-year raw betas published by S&P and then applying the Blume adjustment such as done by *Value Line*. For the market risk premium, Mr. Walters also relies on three estimates: (1) the long-term historical arithmetic average real return on the S&P 500 plus an expected inflation rate, less the risk-free rate; (2) a constant growth DCF-derived return on the S&P 500, averaging the method prescribed by the FERC in Order No. 569-A with an alternative where all the companies in the S&P 500 are used rather than just the dividend-paying companies, less the risk-

free rate; and (3) a "normalized" market risk premium published by *Kroll*. Mr. Walters's CAPM results produce a cost of equity range from 7.70 percent to 11.92 percent.[138]

Q: Do you have any concerns with the inputs that Mr. Walters relies on to conduct his CAPM analyses?

A. Yes. My primary areas of disagreement with Mr. Walters's CAPM analyses are: (1) his reliance on the *Kroll* normalized market risk premium; and (2) his use of a "forward-looking" Risk Premium-derived market return and thus market risk premium.

Q: Is the *Kroll* "normalized" market risk premium relied on by Mr. Walters for four of his CAPM scenarios reasonable?

A. No. As discussed in my response to Mr. Murray, Mr. Walters's reliance on the *Kroll* "normalized" market risk premium is inconsistent with the well-established inverse relationship between interest rates and the market risk premium (*i.e.*, as interest rates increase, the market risk premium decreases, and vice versa).[139] Thus, the 4.30 percent risk-free rate relied on by Mr. Walters is *lower than* the long-term historical arithmetic average interest rate of 4.87 percent, indicating that, as just discussed, a lower interest rate would correspond to a *higher* market risk premium than 7.17 percent. However, Mr. Walters relies on a market risk premium of 5.00

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138 *Id.,* at 54.

139 *Kroll,* Cost of Capital Navigator, data through December 31, 2023.

percent, which is substantially *lower* than 7.17 percent, meaning his market risk premium in these CAPM scenarios does not reflect the inverse relationship between interest rates and the market risk premium, and is understated.

Q: How does the use of a market risk premium that is understated affect Mr. Walters's CAPM results?

A. Relying on a market risk premium that is internally inconsistent with his risk-free rate renders the results of three of his twelve CAPM models, which rely on his "normalized" market risk premium, unreliable.

Q: Are the results of Mr. Walters's CAPM analyses that rely on the *Kroll* "normalized" market risk premium reasonable?

A. No. Beyond the fact that his market risk premium is understated in these four CAPM scenarios because it fails to reflect the inverse relationship between interest rates and the market risk premium, the cost of equity results of these four scenarios are also unreasonable. Due to this misspecification, the results of three of Mr. Walters's four CAPM scenarios that rely on the *Kroll* "normalized" market risk premium are well below the lowest awarded ROE, and his fourth result of 9.07

percent is at the lower end of any authorized ROE for vertically integrated electric utility for the same period.[140]

Q: How does Mr. Walters develop his "forward-looking" risk premium-based estimate of the market return?

A. Mr. Walters calculates what he terms a "forward-looking" estimate of the market return, which reflects the long-term historical arithmetic average real return of the S&P 500 from 1926 through 2023 of 9.02 percent plus a projected inflation rate based on the Consumer Price Index of 2.40 percent as reported by *Blue Chip Financial Forecasts* as of November 1, 2024.[141] From this market return of 11.64 percent, Mr. Walters then subtracts his projected risk-free rate of 4.20 percent to estimate a market risk premium that he then uses in four of his twelve CAPM scenarios.

Q: Is Mr. Walter's "forward-looking" risk premium-based estimate of the market return reasonable?

A. No. Mr. Walters's risk premium-derived estimate of the market return is neither "forward-looking" nor does it reflect the current and expected market conditions during which the Company's rates will be in effect. First, while Mr. Walters

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[140] Specifically**,** Mr. Walters relies on a normalized risk-free rate of 4.30 percent in his CAPM scenarios in which he relies on the *Kroll* "normalized" market risk premium of 5.00 percent. However, as previously discussed herein, the long-term historical arithmetic average *income-only* return on long-term government bonds as published by *Kroll* is 4.87 percent and the corresponding long-term historical arithmetic average market risk premium over that same time period is 7.17 percent. See Walters Direct, at 54, and Exhibit CCW-15, at 1.

[141] Walters Direct, at 49.

characterizes his market return as "forward-looking," which presumably is to recognize that the market return estimate of the CAPM should be forward-looking, simply applying a projected inflation rate to a long-term historical average market return does not produce a "forward-looking" market return. Second, while Mr. Walters's use of the average real return of the S&P 500 from 1926 through 2023 is reflective of the returns realized by investors under different market and economic conditions, it is not necessarily reflective of the market return required by investors in the current and expected market environment. Mr. Walters provides no evidence that the historical average market return is reflective of the expected market conditions during the period in which the Company's proposed rates will be in effect.

VII.D. Overall Cost of Equity Results

Q: How do the results of Mr. Walters's cost of equity analyses change based on the issues that you have identified and discussed herein?

A. Yes. Figure 17 summarizes the results of Mr. Walters's cost of equity models based on the adjustments to his analyses that I have discussed, specifically:

- Adjusting his DCF analyses to place primary weight on the results of his constant growth DCF model using analysts' projected EPS growth rates such as he has done previously, thereby excluding the results of his constant growth DCF analysis using sustainable growth rates and his multi-stage DCF analysis;

- Correcting the inverse relationship between interest rates and risk premia in his BYRP analyses; and

- Excluding his CAPM scenarios that rely on the *Kroll* "normalized" market risk premium for failing to account for the inverse relationship between interest rates and the market risk premium.[142]

Based on these changes, the average results of each of Mr. Walters's three analyses range from 10.35 percent to 10.65 percent, with a midpoint of 10.50 percent, which supports the Company's proposed ROE of 10.25 percent, and is significantly greater than Mr. Walters's recommended ROE of 9.50 percent.

FIGURE 17: COMPARISON OF THE RESULTS OF MR. WALTERS'S COST OF EQUITY ANALYSES – AS FILED V ADJUSTED

	Mr. Walters As Filed		Mr. Walters As Adjusted	
	Mean	**Median**	**Mean**	**Median**
DCF				
Constant Growth (analyst growth rates)	10.81%	10.49%	10.81%	10.49%
Constant Growth (sustainable growth rates)	8.70%	8.72%	n/a	n/a
Multi-Stage	8.67%	8.43%	n/a	n/a
Average	**9.30%**		**10.65%**	
DCF				
Near-Term Projected Treasury Bond Yield	9.90%		10.33%	
3-Month Avg. A-rated Utility Bond Yield	9.75%		10.26%	
3-Month Avg. Baa-rated Utility Bond Yield	9.96%		10.37%	
6-Month Avg. A-rated Utility Bond Yield	9.90%		10.34%	
6-Month Avg. Baa-rated Utility Bond Yield	10.12%		10.45%	
Average	**9.99%**		**10.35%**	
CAPM				
Kroll Normalized Method:	8.37%		n/a	
Risk Premium Method:	10.21%		9.85%	
FERC DCF Method:	10.78%		11.03%	
Average	**9.40%**		**10.44%**	
Midpoint			**10.50%**	

[142] Walters Direct, Exhibit CCW-15, at 1; reflects the CAPM results of Mr. Walters's (i) Risk Premium Derived MRP; and (ii) Average FERC S&P 500 DCF Derived MRP scenarios.

Corrected Page

VIII. RESPONSE TO MR. COMINGS

Q: Please summarize the cost of equity analyses conducted by and the ROE recommendation of Mr. Comings.

A. To estimate the cost of equity, Mr. Comings relies on two forms of a constant growth DCF model (*i.e.*, one that relies on a sustainable growth rate, and another that relies on an average of historical and projected EPS, DPS, and BVPS growth rates);[143] a CAPM analysis, and an ECAPM analysis.[144] The results of Mr. Comings's cost of equity analyses range from 8.35 percent to 9.55 percent,[145] and he recommends an ROE for the Company of between 9.25 percent and 9.50 percent.[146]

VIII.A. Proxy Group

Q: What proxy group does Mr. Comings utilize to estimate the cost of equity?

A. For establishing his proxy group, Mr. Comings starts with the 37 electric utility holding companies covered by *Value Line*, and then applies screening criteria to exclude companies that: (1) are subject to a recent or announced merger; (2) do not have more than 60 percent of their revenue from regulated electric utility

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143 Comings Direct, at 38.

144 *Id.*, at 42-43.

145 Sierra Club Exhibit TC-4, at 2-4.

146 Comings Direct, at 46.

operations; (3) do not have significant rate-based generation; and (4) do not have increasing dividends in the past five years.[147]

Q: Do you agree with Mr. Comings's proxy group?

A. No. First, Mr. Comings includes Ameren in his proxy group and it is not appropriate to include Ameren in the proxy group used to determine the authorized ROE for Ameren Missouri because of the circular logic that would occur. Specifically, the ROE for Ameren Missouri is being established in the current proceeding, which in turn will contribute to the ROE of its parent company, Ameren. If Ameren was included in the proxy group, Ameren would be being used to determine its own subsidiary's ROE. Therefore, to avoid this circular logic, Ameren should be excluded from the proxy group. Additionally, Mr. Comings includes MGE Energy, Inc. ("MGEE") in his proxy group, yet the company is not covered by more than a single analyst and should be excluded from the proxy group. Dr. Won, Mr. Walters and I all agree that these companies should be excluded from the proxy group.

However, as discussed in my response to Dr. Won, the more significant differences in the results of our respective cost of equity analyses are generally not primarily a function of our proxy group differences. As a result, I will not discuss further the differences in our proxy groups

[147] *Id*., at 36-37.

VIII.B. DCF Analyses

Q: How does Mr. Comings conduct his DCF analyses?

A. As noted, Mr. Comings relies on two forms of a constant growth DCF model - one that relies on a sustainable growth rate (which he terms “DCF 1”), and another that relies on an average of historical and projected EPS, DPS, and BVPS growth rates which he terms “DCF 2”).

Q: Are the results of Mr. Comings’s DCF analyses reasonable?

A. No. While I disagree with Mr. Comings’s specifications of the DCF model, the results of both of his DCF analyses are unreasonable. Specifically, the result of Mr. Comings’s DCF 1 analysis analyses is 8.35 percent and well below any ROE authorized for a vertically-integrated electric utility in more than 45 years, while the result of his DCF 2 analysis of 8.87 percent is at the very low end of any authorized ROE for a vertically-integrated electric utility over those same decades.[148] Further, it appears that Mr. Comings also does not rely on the results of these analyses for purposes of his recommended ROE range of 9.25 percent to 9.50 percent, which appears to be supported by the results of his CAPM and ECAPM analyses.

Q: Are the growth rates in either of Mr. Comings’s DCF analyses appropriate?

A. No. First, as discussed in my response to Mr. Walters, the use of a sustainable growth rate is not appropriate. The use of a sustainable growth rate in the DCF

[148] Sierra Club Exhibit TC-4, at 2-3.

presumes that there is a positive relationship between future earnings and the retention ratio; however, this assumption does not necessarily hold in practice and academic research has found the opposite to be true (*i.e.*, there is a negative relationship between earnings growth rates and payout ratios).

Second, I disagree with the use of historical growth rates and the use of projected DPS or BVPS growth rates such as relied on by Mr. Comings in the specification of the DCF analysis.

Q: Why do you disagree with the use of historical growth rates in the constant growth DCF analysis?

A. Historical growth rates are not appropriate for determining the cost of equity in the constant growth DCF analysis because the cost of equity that is being set in this proceeding is the return that investors expect on current and future investments in the Company. The constant growth DCF model is a forward-looking model that evaluates investors' required returns based on future cash flows. As such, the appropriate measure of growth is investors' expectations of future growth, not historical results, and should be based on current and prospective market conditions. Historical growth rates may not reflect future growth potential and Mr. Comings has provided no evidence that historical average growth rates for his proxy group companies reflect the expected future growth rates. Furthermore, securities analysts' projected EPS growth rates incorporate historical performance to the extent the analysts believe that historical performance is relevant and applicable for the future. Additional consideration of historical growth rates

provides no meaningful incremental information regarding the proxy companies' future growth potential and places unwarranted weight on historical events.

Q: Why do you disagree with Mr. Comings's consideration of projected DPS and BVPS growth rates?

A. As I discuss in detail in my response to Dr. Won, there are numerous reasons why it is not appropriate to rely on projected DPS and BVPS growth rates, and that projected EPS growth should be used in the DCF analysis. In summary, there is strong academic and investment analyst support for the use of projected EPS growth rates in the DCF analysis, since earnings are the fundamental driver of growth in dividends. Further, dividends are subject to management decisions and therefore can influence future DPS (and BVPS since it is the inverse of DPS) and may not represent the true long-term earnings growth of the company. Finally, the use of *Value Line* projections of DPS and BVPS growth rely on estimates from individual analysts rather than consensus estimates that are available for EPS growth rates. As such, projected EPS growth rates should be utilized in the constant growth DCF analysis.

Q: Has Mr. Comings also commented on your DCF analyses?

A. Yes. As noted previously, while it is my understanding that Mr. Comings testimony pursuant to the procedural schedule in this proceeding was supposed to be limited strictly to direct testimony, he has nonetheless provided, in part, rebuttal testimony to my cost of equity analyses.

Q: Please summarize Mr. Comings's position with respect to your DCF analyses.

A. Mr. Comings claims that my use of 90-day and 180-day average stock prices for calculating the dividend yield in my DCF is not appropriate given his belief that "[r]ecent stock prices are the best information available as they incorporate all recent data and have more updated expectations for the future."[149]

Q: What is your response to Mr. Comings's criticism of the longer stock price averaging period scenarios developed in your DCF analyses?

A. As discussed later herein in my response to Mr. Comings regarding his rebuttal to my Risk Premium analysis, there is no basis to his assumption that 30-day average stock prices are the best information available. As discussed therein, economists have found that the theory behind Mr. Comings's conclusion is inaccurate. Further, empirical market evidence supports these findings.

VIII.C. CAPM and ECAPM Analyses

Q: Please summarize Mr. Comings's CAPM and ECAPM analyses?

A. Mr. Comings derives three different cost of equity estimates from his CAPM analyses and an additional three estimates from his ECAPM analyses, with two of the CAPM/ECAPM analyses using historical risk premia and the other using a projected risk premium. Specifically, Mr. Comings's CAPM and ECAPM analyses

[149] Comings Direct, at 36, 38.

each rely on the current average beta for his proxy group as published by *Value Line.* His projected analyses rely on a six-week historical average 20-year Treasury bond yield as the risk-free rate and a market risk premium specified by *Kroll*, while his historical analyses rely on a six-week historical average 10-year Treasury bond yield as the risk-free rate and an average of a historical arithmetic and geometric average market risk premium as published by Professor Damodaran.[150]

Q: Do you agree with Mr. Comings's CAPM and ECAPM analyses?

A. No. For the same reasons discussed in my response to Dr. Won, I do not agree with Mr. Comings's market risk premia assumptions. The use of these assumptions understate the resulting cost of equity produced by Mr. Comings's CAPM and ECAPM analyses.

Q: Do you disagree with Mr. Comings's specification of the CAPM and ECAPM analyses?

A. Yes. I disagree with the use of the 10-year Treasury bond yield as the risk-free rate. As noted by *Morningstar*, the risk-free rate should match the long-term lifespan of the underlying investment:

> The traditional thinking regarding the time horizon of the chosen Treasury security is that it should match the time horizon of whatever is being valued.

[150] *Id*., at 4. The Treasury bond yields that Mr. Comings relies on for his risk-free rates reflect data from October 1, 2024 through November 13, 2024.

> When valuing a business that is being treated as a going concern, the appropriate Treasury yield should be that of a long-term Treasury bond. Note that the horizon is a function of the investment, not the investor. If an investor plans to hold stock in a company for only five years, the yield on a five-year Treasury note would not be appropriate since the company will continue to exist beyond those five years.[151]

Given that utility investments are long-lived assets, and the ROE that is being authorized in this proceeding is being applied to such long-lived assets, it is appropriate to use a Treasury bond yield as the risk-free rate that most closely matches the lives of the underlying assets, which is a 30-year Treasury bond.

Q: Does Mr. Comings also provided rebuttal testimony regarding your ECAPM analyses?

A. Yes. While Mr. Comings acknowledges that I have stated the ECAPM is helpful because it addresses the tendency of the traditional CAPM to understate the cost of equity for companies with a beta less than 1.0, he contends that this does not appear to be the case because he states that the results of my CAPM analysis are higher than the results of my DCF or BYRP analyses and my final recommended ROE is below the lowest range of my CAPM results. As a result, Mr. Comings contends:

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[151] *Morningstar, Inc*., Ibbotson SBBI 2013 Valuation Yearbook, at 44.

> The ECAPM merely adjusts this already high CAPM values [sic] even higher, and thus further away from the ultimate ROE recommendation. Therefore, the need for the ECAPM method appears dubious here. I have presented it in my results as well, but I see it as an extreme value that I do not put on equal footing with the DCF or CAPM results.[152]

Q: Is Mr. Comings's characterization of your testimony and the ECAPM accurate?

A. No. Mr. Comings's characterization of my testimony and model results are not accurate.

First, I considered the results of all of my models to establish a recommended range of 9.90 percent to 11.25 percent for the Company's ROE in this proceeding. As shown on Schedule AEB-D2, Attachment 1 of my direct testimony, the results of these analyses are above, within, and below my recommended ROE range. In particular, the results of my CAPM analyses are both within and above my recommended ROE range. Mr. Comings provides no evidence for his characterization that my CAPM results are "already high." Furthermore, while Mr. Comings contends that my final recommended ROE is below the lowest range of my CAPM results, this too is a mischaracterization. As noted in my direct testimony, I recommend that a reasonable range for the ROE for the Company in this proceeding is 9.90 percent to 11.25 percent, but I did not recommend a specific ROE for the Company. Rather, based on my recommended range, the Company

[152] Comings Direct, at 44.

is proposing an ROE of 10.25 percent. Thus, there is no basis for Mr. Comings to suggest that the results of my CAPM analyses or recommended range somehow impugn the applicability of the ECAPM for purposes of establishing the Company's authorized ROE in this proceeding.

Second, the ECAPM does not "merely adjust" an "already high CAPM" result and thus suggest that the need for the analysis is "dubious" as Mr. Comings contends. As I discussed in my direct testimony, the ECAPM is conducted because the traditional CAPM understates the cost of equity for companies such as utilities with a beta less than 1.0. The cost of equity is not a figure that can be determined definitively and must be estimated, and thus that is precisely why it is reasonable and appropriate to rely on the results of multiple cost of equity estimation models for purposes of recommending an ROE. The ECAPM is one of multiple models that are appropriately used by analysts to estimate the cost of equity and used by regulatory commissions to establish a utility's ROE.

Q: Do you agree with Mr. Comings's criticism of the equity risk premium that you rely on in your CAPM and ECAPM analyses by reference to his own assumption?[153]

A. No. The market risk premia relied on by Mr. Comings suffer from all of the same flaws that I previously discussed in my response to Dr. Won and, as a result,

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understate the cost of equity.[154] Therefore, there is no basis for Mr. Comings's conclusion that my risk premia are overstated based on a comparison to his inappropriate market risk premia.

VIII.D. Risk Premium Analyses

Q: Does Mr. Comings conduct a Risk Premium analysis?

A. No. Mr. Comings states that he does not believe that the Risk Premium analysis provides a reasonable estimate of the cost of equity. Specifically, Mr. Comings believes that the risk premium method is not valid because (1) it relies solely on historical data and that both historical and projected data should be used in a model to estimate the cost of equity; and (2) the historical data includes ROEs authorized by utility commissions that tend to overstate the cost of equity because, despite the general downward trend in authorized ROEs since the 1980s, the market-to-book value of utility holding companies indicates that investors are willing to pay more on the market than book value.[155]

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[154] Consistent with my response to Dr. Won, Mr. Comings's market risk premia also suffer from (1) relying on historical data to estimate a forward-looking market risk premium; (2) relying on market risk premia unrelated to the current risk-free rate, and therefore not correctly reflecting the inverse relationship between interest rates and the market risk premia; (3) calculating the historical market risk premium incorrectly by relying on the historical total return on long-term government bonds instead of the historical income-only return; and (4) relying on historical geometric averages of the market risk premia.

[155] *Id*., at 45.

Q: Do you agree with Mr. Comings that regulatory commissions, including this Commission, have improperly authorized ROEs for decades as suggested by Mr. Comings?

A. No. I disagree with Mr. Comings's claim that regulators, including this Commission, have incorrectly and consistently erred for decades by authorizing utilities' ROEs that are substantially higher than the cost of equity. While Mr. Comings does not specifically state as such, the premise of his conclusion that authorized ROEs have been and continue to be greater than investors' required returns is based on his belief in the Efficient Market Hypothesis ("EMH").[156] The theory of the EMH contends that all information that is currently known by investors is already reflected in current stock prices,[157] meaning that the market-to-book ratio for utilities should equal 1.0 if their authorized ROEs equal the cost of equity. However, there are several reasons why the market-to-book ratio for utilities may exceed 1.00 other than the authorized ROE exceeding the cost of equity.

Q: Is Mr. Comings's claim that your Risk Premium method "relies solely on historical data" accurate?[158]

A. No. As discussed in my direct testimony, my Risk Premium analysis relies on a regression of historical authorized ROEs and equity risk premia as a means of estimating a going-forward ROE based on current and projected interest rates.

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156 R. J. Shiller, "Do Stock Prices Move Too Much to be Justified by Subsequent Changes in Dividends?," *The American Economic Review*, Vol. 71, No. 3, 1981, 421-436.

157 *Id*.

158 Comings Direct, at 45.

There is a large body of research that supports the inverse relationship between equity risk premia and interest rates. For example, Berry (1998) came to similar conclusions regarding the inverse relationship between interest rates and the risk premia.[159] Also, as summarized in *New Regulatory Finance*, there has been a recognition that the risk premium is not constant over time:

> Published studies by Brigham, Shome, and Vinson (1985), Harris (1986), Harris and Marston (1992, 1993), Carleton, Chambers, and Lakonishok (1983), Morin (2005), and McShane (2005), and others demonstrate that, beginning in 1980, risk premiums varied inversely with the level of interest rates—rising when rates fell and declining when interest rates rose. The reason for this relationship is that when interest rates rise, bondholders suffer a capital loss. This is referred to as interest rate risk…. Conversely in low interest rate environments, when bondholders' interest rate fears subside and shareholders' fears of loss of earning power dominate, the risk differential will widen and hence the risk premium will increase.[160]

In his more recent textbook, *Modern Regulatory Finance*, Dr. Morin outlines the issues and academic research and concludes the following with respect to the relationship between interest rates and the equity risk premium:

> This is particularly true in a high inflation environment. Interest rates rise as a result of accelerating inflation, and the interest rate risk of bonds intensifies more than the earnings of common stocks, which are partially hedged from the ravages of inflation. This phenomenon has been termed as a "lock-in" premium. Conversely, in low interest rate environments, when bondholders' interest rate fears subside

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[159] S. Keith Berry, "Interest Rate Risk and Utility Risk Premia during 1982-93," *Managerial and Decision Economics*, Vol. 19, No. 2, March 1998.

[160] Roger A. Morin, *New Regulatory Finance*, Public Utilities Reports, Inc., 2006, at 128.

> and shareholders' fears of loss of earnings power dominate, the risk differential will widen and hence the risk premium will increase.[161]

As shown on Schedule AEB-D2, Attachment 7 of my direct testimony and Schedule AEB-R1, Attachment 6 of my rebuttal testimony, the regressions in my BYRP analyses have an R^2 of approximately 0.83, which means that 83 percent of the variation in historical implied utility equity risk premia can be explained by changes in interest rates. These regressions indicate that there indeed exists a strong negative correlation between utility equity risk premia and interest rates, and that the regression equations are an effective tool for predicting authorized ROEs at specified interest rate levels, whether current or projected interest rates.

IX. BUSINESS AND REGULATORY RISKS

Q: What have Dr. Won, Mr. Murray, Mr. Walters, and Mr. Comings stated regarding the Company's business and regulatory risk?

A. The following summarizes the positions of these witnesses regarding the Company's business and regulatory risk:

- Dr. Won states that Ameren Missouri's credit ratings are comparable to those of the average electric utilities in the U.S., and thus Ameren Missouri is perceived to have similar credit risks as the average electric utilities in the U.S.[162] Dr. Won contends that this comparison of credit ratings suggests

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[161] Roger A. Morin, *Modern Regulatory Finance*, Public Utilities Reports, Inc., 2021, at 146; graphic referenced in cite and shown in text has been omitted.

[162] Won Direct, at 28-29.

that Ameren Missouri's authorized ROE should fall within a reasonable range of the average authorized ROE of electric utilities in the U.S.[163]

- Mr. Murray contends that, as a result of Missouri's electric utilities' ability to utilize plant in service accounting ("PISA") as well as recover energy transition costs and qualified extraordinary costs through securitization, both of which Ameren Missouri has elected to do, the Company's business risk is reduced.[164]

- Mr. Walters does not specifically draw a conclusion regarding the Company's business and regulatory risk; however, he notes that S&P views Ameren Missouri's retirement of the coal-fired Rush Island Energy Center as reducing business risk by avoiding significant capital costs and lowering greenhouse gas emissions, and discusses the factors that S&P views could result in a future credit rating upgrade or downgrade.[165]

- Mr. Comings does not discuss the Company's business and regulatory risk.

Q: Do you agree with these witnesses' assessments of the relative risk of the Company?

A. No. The estimation of the cost of equity conducted by all of the witnesses in this proceeding is based on the market data for a proxy group of publicly traded risk - comparable companies. In each case, the witnesses in this case estimate the cost of equity for those proxy companies to create a range of estimated market required returns. For the purposes of establishing the appropriate ROE for Ameren Missouri, it is therefore necessary to evaluate the Company's risk as compared to that of the proxy group of companies in order to determine where within the range of market data developed that Ameren Missouri's ROE should be estimated. A

163 *Id*.

164 Murray Direct, at 3-4.

165 Walters Direct, at 22-24.

comparison of the Company's risk with or without any of the recovery mechanisms that it has available is by itself, an incomplete analysis and does not provide the Commission with any meaningful information about how the Company's ROE should compare to the range of market data that has been developed for the proxy group companies. Neither Dr. Won nor Mr. Murray have considered the relative risk of Ameren Missouri relative to the companies in the proxy group. Simply because the Company has the ability to recover costs through PISA and securitization as noted by Mr. Murray does not provide any insight into the *relative* risk of the Company as compared to the proxy group. While regulatory mechanisms that reduce a utility's regulatory lag in cost recovery may help to mitigate risk an individual company's risk, that information alone is insufficient for the purpose that we consider in setting the ROE. Rather the relevant comparison is the Company's risk *relative* to the proxy group in setting the ROE.

In addition, while Dr. Won notes that the credit rating of Ameren Missouri is comparable to those of average electric utilities in the U.S., it is important to acknowledge that credit ratings are assessments of the likelihood that a company could default on its debt, whereas the topic of the current proceeding is to determine the riskiness and cost of the Company's equity, not debt. Also, while credit rating agencies consider the business risks of an individual company, they do not conduct a comparative analysis of business risks relative to the proxy group when establishing its debt credit rating. The development of the investor-required ROE is based on a proxy group of risk-comparable companies. In developing the

proxy group, it is essential to balance the relative risk of the companies included in the proxy group with the overall size of the group. Therefore, it is always the case that the proxy companies do not have exactly the same risk profile as the subject company. As such, it is reasonable to review the relative risks of the proxy group companies and the subject company to determine how the subject company's risk profile compares with the group to determine the appropriate placement of the ROE within the range of results established using the proxy group companies, which neither Dr. Won, Mr. Murray, Mr. Walters, nor Mr. Comings have done.

Q: Have the other witnesses in this proceeding raised issues that would increase regulatory risk?

A. Yes. The adoption of adjustments such as those that have been proposed by Staff, OPS and MIEG regarding the High Prairie Energy Center, without any evidence that the Company's decision-making has been imprudent, would increase the overall regulatory risk in Missouri and would likely increase the investor-required return in this jurisdiction. As discussed previously regarding recent Illinois and Connecticut decisions, investors are evaluating the regulatory environment when making investment decisions and, as indicated by the market response to those decisions, it is reasonable to expect that increased risk would result in higher overall expected returns.

Q: Does this conclude your rebuttal testimony?

A. Yes.

COST OF EQUITY ANALYSES
SUMMARY OF RESULTS

Constant Growth DCF

	Minimum Growth Rate	Average Growth Rate	Maximum Growth Rate
Mean Results:			
30-Day Avg. Stock Price	9.08%	10.31%	11.27%
90-Day Avg. Stock Price	9.17%	10.39%	11.36%
180-Day Avg. Stock Price	9.44%	10.67%	11.64%
Average	9.23%	10.46%	11.42%
Median Results:			
30-Day Avg. Stock Price	9.27%	10.04%	10.71%
90-Day Avg. Stock Price	9.39%	10.21%	10.83%
180-Day Avg. Stock Price	9.64%	10.50%	11.15%
Average	9.43%	10.25%	10.90%

CAPM / ECAPM / Bond Yield Risk Premium

	30-Year Treasury Bond Yield		
	Current 30-Day Avg	Near-Term Projected	Longer-Term Projected
CAPM:			
Current *Value Line* Beta	11.65%	11.65%	11.64%
Current Bloomberg Beta	10.45%	10.43%	10.40%
Long-term Avg. *Value Line* Beta	10.29%	10.27%	10.24%
ECAPM:			
Current *Value Line* Beta	11.75%	11.75%	11.74%
Current Bloomberg Beta	10.85%	10.84%	10.82%
Long-term Avg. *Value Line* Beta	10.73%	10.71%	10.69%
Bond Yield Risk Premium:	10.53%	10.47%	10.40%

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CONSTANT GROWTH DCF

30-DAY AVERAGE STOCK PRICES

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]
Company	Ticker	Annualized Dividend	Stock Price	Dividend Yield	Expected Dividend Yield	Value Line EPS Growth	S&P CapIQ EPS Growth	Zacks EPS Growth	Average Growth Rate	Cost of Equity - Minimum Growth Rate	Cost of Equity - Average Growth Rate	Cost of Equity - Maximum Growth Rate
Alliant Energy Corporation	LNT	$1.92	$60.54	3.17%	3.27%	6.00%	6.69%	6.70%	6.46%	9.27%	9.74%	9.98%
American Electric Power Company, Inc.	AEP	$3.72	$97.21	3.83%	3.95%	6.50%	6.28%	6.20%	6.33%	10.15%	10.28%	10.45%
Avista Corporation	AVA	$1.90	$37.55	5.06%	5.17%	5.00%	4.68%	3.90%	4.53%	9.06%	9.70%	10.19%
CMS Energy Corporation	CMS	$2.06	$69.03	2.98%	3.09%	6.00%	7.37%	7.50%	6.96%	9.07%	10.04%	10.60%
DTE Energy Company	DTE	$4.08	$123.55	3.30%	3.41%	4.50%	7.82%	8.00%	6.77%	7.88%	10.19%	11.43%
Duke Energy Corporation	DUK	$4.18	$114.30	3.66%	3.77%	5.00%	6.39%	6.40%	5.93%	8.75%	9.69%	10.17%
Entergy Corporation	ETR	$4.80	$144.84	3.31%	3.40%	0.50%	7.56%	8.30%	5.45%	3.82%	8.86%	11.75%
Evergy, Inc.	EVRG	$2.67	$61.88	4.31%	4.45%	7.50%	5.62%	5.80%	6.31%	10.06%	10.76%	11.98%
IDACORP, Inc.	IDA	$3.44	$111.29	3.09%	3.20%	6.00%	7.12%	8.30%	7.14%	9.18%	10.34%	11.52%
NextEra Energy, Inc.	NEE	$2.06	$78.02	2.64%	2.75%	8.50%	8.31%	8.10%	8.30%	10.85%	11.05%	11.25%
NorthWestern Corporation	NWE	$2.60	$54.86	4.74%	4.86%	4.00%	5.36%	6.10%	5.15%	8.83%	10.01%	10.98%
OGE Energy Corporation	OGE	$1.69	$42.03	4.01%	4.13%	6.50%	6.02%	5.20%	5.91%	9.31%	10.03%	10.64%
Pinnacle West Capital Corporation	PNW	$3.58	$89.78	3.99%	4.12%	4.50%	7.04%	8.20%	6.58%	8.58%	10.70%	12.35%
Portland General Electric Company	POR	$2.00	$47.45	4.21%	4.41%	6.00%	8.79%	12.60%	9.13%	10.34%	13.54%	17.08%
PPL Corporation	PPL	$1.03	$33.28	3.10%	3.21%	7.50%	7.04%	6.80%	7.11%	10.00%	10.32%	10.71%
Southern Company	SO	$2.88	$88.95	3.24%	3.34%	6.50%	6.47%	6.80%	6.59%	9.82%	9.94%	10.15%
Xcel Energy Inc.	XEL	$2.19	$67.57	3.24%	3.35%	6.00%	7.03%	6.90%	6.64%	9.34%	9.99%	10.39%
Mean				3.64%	3.76%	5.68%	6.80%	7.16%	6.55%	9.08%	10.31%	11.27%
Median				3.31%	3.41%	6.00%	7.03%	6.80%	6.58%	9.27%	10.04%	10.71%

Notes:

[1] Bloomberg Professional

[2] Bloomberg Professional, equals 30-day average as of November 30, 2024

[3] Equals [1] / [2]

[4] Equals [3] x (1 + 0.50 x [8])

[5] Value Line

[6] Yahoo! Finance

[7] Zacks

[8] Equals Average ([5], [6], [7])

[9] Equals [3] x (1 + 0.50 x Minimum ([5], [6], [7]) + Minimum ([5], [6], [7])

[10] Equals [4] + [8]

[11] Equals [3] x (1 + 0.50 x Maximum ([5], [6], [7]) + Maximum ([5], [6], [7])

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CONSTANT GROWTH DCF

90-DAY AVERAGE STOCK PRICES

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]
Company	Ticker	Annualized Dividend	Stock Price	Dividend Yield	Expected Dividend Yield	Value Line EPS Growth	S&P CapIQ EPS Growth	Zacks EPS Growth	Average Growth Rate	Cost of Equity - Minimum Growth Rate	Cost of Equity - Average Growth Rate	Cost of Equity - Maximum Growth Rate
Alliant Energy Corporation	LNT	$1.92	$58.88	3.26%	3.37%	6.00%	6.69%	6.70%	6.46%	9.36%	9.83%	10.07%
American Electric Power Company, Inc.	AEP	$3.72	$98.33	3.78%	3.90%	6.50%	6.28%	6.20%	6.33%	10.10%	10.23%	10.41%
Avista Corporation	AVA	$1.90	$37.70	5.04%	5.15%	5.00%	4.68%	3.90%	4.53%	9.04%	9.68%	10.17%
CMS Energy Corporation	CMS	$2.06	$68.06	3.03%	3.13%	6.00%	7.37%	7.50%	6.96%	9.12%	10.09%	10.64%
DTE Energy Company	DTE	$4.08	$123.46	3.30%	3.42%	4.50%	7.82%	8.00%	6.77%	7.88%	10.19%	11.44%
Duke Energy Corporation	DUK	$4.18	$113.29	3.69%	3.80%	5.00%	6.39%	6.40%	5.93%	8.78%	9.73%	10.21%
Entergy Corporation	ETR	$4.80	$129.94	3.69%	3.79%	0.50%	7.56%	8.30%	5.45%	4.20%	9.25%	12.15%
Evergy, Inc.	EVRG	$2.67	$59.93	4.46%	4.60%	7.50%	5.62%	5.80%	6.31%	10.21%	10.90%	12.12%
IDACORP, Inc.	IDA	$3.44	$104.54	3.29%	3.41%	6.00%	7.12%	8.30%	7.14%	9.39%	10.55%	11.73%
NextEra Energy, Inc.	NEE	$2.06	$79.31	2.60%	2.71%	8.50%	8.31%	8.10%	8.30%	10.80%	11.01%	11.21%
NorthWestern Corporation	NWE	$2.60	$54.44	4.78%	4.90%	4.00%	5.36%	6.10%	5.15%	8.87%	10.05%	11.02%
OGE Energy Corporation	OGE	$1.69	$40.34	4.18%	4.30%	6.50%	6.02%	5.20%	5.91%	9.49%	10.21%	10.81%
Pinnacle West Capital Corporation	PNW	$3.58	$87.62	4.09%	4.22%	4.50%	7.04%	8.20%	6.58%	8.68%	10.80%	12.45%
Portland General Electric Company	POR	$2.00	$47.22	4.24%	4.43%	6.00%	8.79%	12.60%	9.13%	10.36%	13.56%	17.10%
PPL Corporation	PPL	$1.03	$32.12	3.21%	3.32%	7.50%	7.04%	6.80%	7.11%	10.12%	10.43%	10.83%
Southern Company	SO	$2.88	$87.75	3.28%	3.39%	6.50%	6.47%	6.80%	6.59%	9.86%	9.98%	10.19%
Xcel Energy Inc.	XEL	$2.19	$63.47	3.45%	3.56%	6.00%	7.03%	6.90%	6.64%	9.55%	10.21%	10.60%
Mean				3.73%	3.85%	5.68%	6.80%	7.16%	6.55%	9.17%	10.39%	11.36%
Median				3.69%	3.79%	6.00%	7.03%	6.80%	6.58%	9.39%	10.21%	10.83%

Notes:
[1] Bloomberg Professional
[2] Bloomberg Professional, equals 90-day average as of November 30, 2024
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [8])
[5] Value Line
[6] Yahoo! Finance
[7] Zacks
[8] Equals Average ([5], [6], [7])
[9] Equals [3] x (1 + 0.50 x Minimum ([5], [6], [7]) + Minimum ([5], [6], [7])
[10] Equals [4] + [8]
[11] Equals [3] x (1 + 0.50 x Maximum ([5], [6], [7]) + Maximum ([5], [6], [7])

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CONSTANT GROWTH DCF

180-DAY AVERAGE STOCK PRICES

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]
Company	Ticker	Annualized Dividend	Stock Price	Dividend Yield	Expected Dividend Yield	Value Line EPS Growth	S&P CapIQ EPS Growth	Zacks EPS Growth	Average Growth Rate	Cost of Equity - Minimum Growth Rate	Cost of Equity - Average Growth Rate	Cost of Equity - Maximum Growth Rate
Alliant Energy Corporation	LNT	$1.92	$54.28	3.54%	3.65%	6.00%	6.69%	6.70%	6.46%	9.64%	10.12%	10.36%
American Electric Power Company, Inc.	AEP	$3.72	$91.99	4.04%	4.17%	6.50%	6.28%	6.20%	6.33%	10.37%	10.50%	10.68%
Avista Corporation	AVA	$1.90	$36.08	5.27%	5.39%	5.00%	4.68%	3.90%	4.53%	9.27%	9.91%	10.40%
CMS Energy Corporation	CMS	$2.06	$63.61	3.24%	3.35%	6.00%	7.37%	7.50%	6.96%	9.34%	10.31%	10.86%
DTE Energy Company	DTE	$4.08	$116.80	3.49%	3.61%	4.50%	7.82%	8.00%	6.77%	8.07%	10.38%	11.63%
Duke Energy Corporation	DUK	$4.18	$105.61	3.96%	4.08%	5.00%	6.39%	6.40%	5.93%	9.06%	10.00%	10.48%
Entergy Corporation	ETR	$4.80	$117.51	4.08%	4.20%	0.50%	7.56%	8.30%	5.45%	4.59%	9.65%	12.55%
Evergy, Inc.	EVRG	$2.67	$55.88	4.78%	4.93%	7.50%	5.62%	5.80%	6.31%	10.54%	11.24%	12.46%
IDACORP, Inc.	IDA	$3.44	$98.14	3.51%	3.63%	6.00%	7.12%	8.30%	7.14%	9.61%	10.77%	11.95%
NextEra Energy, Inc.	NEE	$2.06	$74.17	2.78%	2.89%	8.50%	8.31%	8.10%	8.30%	10.99%	11.20%	11.40%
NorthWestern Corporation	NWE	$2.60	$51.94	5.01%	5.14%	4.00%	5.36%	6.10%	5.15%	9.11%	10.29%	11.26%
OGE Energy Corporation	OGE	$1.69	$37.38	4.51%	4.64%	6.50%	6.02%	5.20%	5.91%	9.82%	10.55%	11.15%
Pinnacle West Capital Corporation	PNW	$3.58	$80.85	4.43%	4.57%	4.50%	7.04%	8.20%	6.58%	9.03%	11.15%	12.81%
Portland General Electric Company	POR	$2.00	$44.77	4.47%	4.67%	6.00%	8.79%	12.60%	9.13%	10.60%	13.80%	17.35%
PPL Corporation	PPL	$1.03	$29.84	3.45%	3.57%	7.50%	7.04%	6.80%	7.11%	10.37%	10.69%	11.08%
Southern Company	SO	$2.88	$81.04	3.55%	3.67%	6.50%	6.47%	6.80%	6.59%	10.14%	10.26%	10.47%
Xcel Energy Inc.	XEL	$2.19	$58.37	3.75%	3.88%	6.00%	7.03%	6.90%	6.64%	9.86%	10.52%	10.92%
Mean				3.99%	4.12%	5.68%	6.80%	7.16%	6.55%	9.44%	10.67%	11.64%
Median				3.96%	4.08%	6.00%	7.03%	6.80%	6.58%	9.64%	10.50%	11.15%

Notes:
[1] Bloomberg Professional
[2] Bloomberg Professional, equals 180-day average as of November 30, 2024
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [8])
[5] Value Line
[6] Yahoo! Finance
[7] Zacks
[8] Equals Average ([5], [6], [7])
[9] Equals [3] x (1 + 0.50 x Minimum ([5], [6], [7]) + Minimum ([5], [6], [7])
[10] Equals [4] + [8]
[11] Equals [3] x (1 + 0.50 x Maximum ([5], [6], [7]) + Maximum ([5], [6], [7])

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CAPITAL ASSET PRICING MODEL
CURRENT RISK FREE RATE AND VALUE LINE BETA

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Current 30-day average of 30-year U.S. Treasury bond yield	Beta	Market Return	Market Risk Premium	Cost of Equity - CAPM	Cost of Equity - ECAPM
Alliant Energy Corporation	LNT	4.52%	0.90	12.05%	7.54%	11.30%	11.49%
American Electric Power Company, Inc.	AEP	4.52%	0.85	12.05%	7.54%	10.92%	11.20%
Avista Corporation	AVA	4.52%	0.95	12.05%	7.54%	11.68%	11.77%
CMS Energy Corporation	CMS	4.52%	0.85	12.05%	7.54%	10.92%	11.20%
DTE Energy Company	DTE	4.52%	1.00	12.05%	7.54%	12.05%	12.05%
Duke Energy Corporation	DUK	4.52%	0.90	12.05%	7.54%	11.30%	11.49%
Entergy Corporation	ETR	4.52%	1.00	12.05%	7.54%	12.05%	12.05%
Evergy, Inc.	EVRG	4.52%	0.95	12.05%	7.54%	11.68%	11.77%
IDACORP, Inc.	IDA	4.52%	0.85	12.05%	7.54%	10.92%	11.20%
NextEra Energy, Inc.	NEE	4.52%	1.00	12.05%	7.54%	12.05%	12.05%
NorthWestern Corporation	NWE	4.52%	1.00	12.05%	7.54%	12.05%	12.05%
OGE Energy Corporation	OGE	4.52%	1.05	12.05%	7.54%	12.43%	12.33%
Pinnacle West Capital Corporation	PNW	4.52%	0.95	12.05%	7.54%	11.68%	11.77%
Portland General Electric Company	POR	4.52%	0.95	12.05%	7.54%	11.68%	11.77%
PPL Corporation	PPL	4.52%	1.10	12.05%	7.54%	12.81%	12.62%
Southern Company	SO	4.52%	0.95	12.05%	7.54%	11.68%	11.77%
Xcel Energy Inc.	XEL	4.52%	0.85	12.05%	7.54%	10.92%	11.20%
Mean						11.65%	11.75%
Median						11.68%	11.77%

Notes:

[1] Bloomberg Professional, as of November 30, 2024.

[2] Value Line

[3] Schedule AEB-D2, Attachment 6

[4] Equals [3] - [1]

[5] Equals [1] + [2] x [4]

[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL
NEAR TERM PROJECTED RISK-FREE RATE AND VALUE LINE BETA

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Near-term projected 30-year U.S. Treasury bond yield (Q1 2025 - Q1 2026)	Beta	Market Return	Market Risk Premium	Cost of Equity - CAPM	Cost of Equity - ECAPM
Alliant Energy Corporation	LNT	4.42%	0.90	12.05%	7.63%	11.29%	11.48%
American Electric Power Company, Inc.	AEP	4.42%	0.85	12.05%	7.63%	10.91%	11.19%
Avista Corporation	AVA	4.42%	0.95	12.05%	7.63%	11.67%	11.77%
CMS Energy Corporation	CMS	4.42%	0.85	12.05%	7.63%	10.91%	11.19%
DTE Energy Company	DTE	4.42%	1.00	12.05%	7.63%	12.05%	12.05%
Duke Energy Corporation	DUK	4.42%	0.90	12.05%	7.63%	11.29%	11.48%
Entergy Corporation	ETR	4.42%	1.00	12.05%	7.63%	12.05%	12.05%
Evergy, Inc.	EVRG	4.42%	0.95	12.05%	7.63%	11.67%	11.77%
IDACORP, Inc.	IDA	4.42%	0.85	12.05%	7.63%	10.91%	11.19%
NextEra Energy, Inc.	NEE	4.42%	1.00	12.05%	7.63%	12.05%	12.05%
NorthWestern Corporation	NWE	4.42%	1.00	12.05%	7.63%	12.05%	12.05%
OGE Energy Corporation	OGE	4.42%	1.05	12.05%	7.63%	12.43%	12.34%
Pinnacle West Capital Corporation	PNW	4.42%	0.95	12.05%	7.63%	11.67%	11.77%
Portland General Electric Company	POR	4.42%	0.95	12.05%	7.63%	11.67%	11.77%
PPL Corporation	PPL	4.42%	1.10	12.05%	7.63%	12.82%	12.62%
Southern Company	SO	4.42%	0.95	12.05%	7.63%	11.67%	11.77%
Xcel Energy Inc.	XEL	4.42%	0.85	12.05%	7.63%	10.91%	11.19%
Mean						11.65%	11.75%
Median						11.67%	11.77%

Notes:
[1] Blue Chip Financial Forecasts, Vol. 43, No. 12, November 27, 2024, at 2
[2] Value Line
[3] Schedule AEB-D2, Attachment 6
[4] Equals [3] - [1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL
LONG-TERM PROJECTED RISK-FREE RATE AND VALUE LINE BETA

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Projected 30-year U.S. Treasury bond yield (2026 - 2030)	Beta	Market Return	Market Risk Premium	Cost of Equity - CAPM	Cost of Equity - ECAPM
Alliant Energy Corporation	LNT	4.30%	0.90	12.05%	7.75%	11.28%	11.47%
American Electric Power Company, Inc.	AEP	4.30%	0.85	12.05%	7.75%	10.89%	11.18%
Avista Corporation	AVA	4.30%	0.95	12.05%	7.75%	11.66%	11.76%
CMS Energy Corporation	CMS	4.30%	0.85	12.05%	7.75%	10.89%	11.18%
DTE Energy Company	DTE	4.30%	1.00	12.05%	7.75%	12.05%	12.05%
Duke Energy Corporation	DUK	4.30%	0.90	12.05%	7.75%	11.28%	11.47%
Entergy Corporation	ETR	4.30%	1.00	12.05%	7.75%	12.05%	12.05%
Evergy, Inc.	EVRG	4.30%	0.95	12.05%	7.75%	11.66%	11.76%
IDACORP, Inc.	IDA	4.30%	0.85	12.05%	7.75%	10.89%	11.18%
NextEra Energy, Inc.	NEE	4.30%	1.00	12.05%	7.75%	12.05%	12.05%
NorthWestern Corporation	NWE	4.30%	1.00	12.05%	7.75%	12.05%	12.05%
OGE Energy Corporation	OGE	4.30%	1.05	12.05%	7.75%	12.44%	12.34%
Pinnacle West Capital Corporation	PNW	4.30%	0.95	12.05%	7.75%	11.66%	11.76%
Portland General Electric Company	POR	4.30%	0.95	12.05%	7.75%	11.66%	11.76%
PPL Corporation	PPL	4.30%	1.10	12.05%	7.75%	12.83%	12.63%
Southern Company	SO	4.30%	0.95	12.05%	7.75%	11.66%	11.76%
Xcel Energy Inc.	XEL	4.30%	0.85	12.05%	7.75%	10.89%	11.18%
Mean						11.64%	11.74%
Median						11.66%	11.76%

Notes:
[1] Blue Chip Financial Forecasts, Vol. 43, No. 12, November 27, 2024, at 14
[2] Value Line
[3] Schedule AEB-D2, Attachment 6
[4] Equals [3] - [1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL
CURRENT RISK FREE RATE AND BLOOMBERG BETA

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Current 30-day average of 30-year U.S. Treasury bond yield	Beta	Market Return	Market Risk Premium	Cost of Equity - CAPM	Cost of Equity - ECAPM
Alliant Energy Corporation	LNT	4.52%	0.77	12.05%	7.54%	10.30%	10.74%
American Electric Power Company, Inc.	AEP	4.52%	0.74	12.05%	7.54%	10.09%	10.58%
Avista Corporation	AVA	4.52%	0.75	12.05%	7.54%	10.13%	10.61%
CMS Energy Corporation	CMS	4.52%	0.73	12.05%	7.54%	9.99%	10.51%
DTE Energy Company	DTE	4.52%	0.80	12.05%	7.54%	10.54%	10.92%
Duke Energy Corporation	DUK	4.52%	0.71	12.05%	7.54%	9.86%	10.41%
Entergy Corporation	ETR	4.52%	0.84	12.05%	7.54%	10.86%	11.16%
Evergy, Inc.	EVRG	4.52%	0.77	12.05%	7.54%	10.29%	10.73%
IDACORP, Inc.	IDA	4.52%	0.77	12.05%	7.54%	10.32%	10.75%
NextEra Energy, Inc.	NEE	4.52%	0.80	12.05%	7.54%	10.53%	10.91%
NorthWestern Corporation	NWE	4.52%	0.85	12.05%	7.54%	10.95%	11.23%
OGE Energy Corporation	OGE	4.52%	0.90	12.05%	7.54%	11.30%	11.49%
Pinnacle West Capital Corporation	PNW	4.52%	0.80	12.05%	7.54%	10.57%	10.94%
Portland General Electric Company	POR	4.52%	0.77	12.05%	7.54%	10.31%	10.74%
PPL Corporation	PPL	4.52%	0.92	12.05%	7.54%	11.47%	11.62%
Southern Company	SO	4.52%	0.76	12.05%	7.54%	10.27%	10.71%
Xcel Energy Inc.	XEL	4.52%	0.71	12.05%	7.54%	9.87%	10.41%
Mean						10.45%	10.85%
Median						10.31%	10.74%

Notes:
[1] Bloomberg Professional, as of November 30, 2024.
[2] Bloomberg Professional, based on 10-year weekly returns, as of November 30, 2024
[3] Schedule AEB-D2, Attachment 6
[4] Equals [3] - [1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL
NEAR TERM PROJECTED RISK-FREE RATE AND BLOOMBERG BETA

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Near-term projected 30-year U.S. Treasury bond yield (Q1 2025 - Q1 2026)	Beta	Market Return	Market Risk Premium	Cost of Equity - CAPM	Cost of Equity - ECAPM
Alliant Energy Corporation	LNT	4.42%	0.77	12.05%	7.63%	10.28%	10.72%
American Electric Power Company, Inc.	AEP	4.42%	0.74	12.05%	7.63%	10.07%	10.56%
Avista Corporation	AVA	4.42%	0.75	12.05%	7.63%	10.11%	10.59%
CMS Energy Corporation	CMS	4.42%	0.73	12.05%	7.63%	9.97%	10.49%
DTE Energy Company	DTE	4.42%	0.80	12.05%	7.63%	10.52%	10.90%
Duke Energy Corporation	DUK	4.42%	0.71	12.05%	7.63%	9.83%	10.39%
Entergy Corporation	ETR	4.42%	0.84	12.05%	7.63%	10.85%	11.15%
Evergy, Inc.	EVRG	4.42%	0.77	12.05%	7.63%	10.27%	10.71%
IDACORP, Inc.	IDA	4.42%	0.77	12.05%	7.63%	10.29%	10.73%
NextEra Energy, Inc.	NEE	4.42%	0.80	12.05%	7.63%	10.51%	10.90%
NorthWestern Corporation	NWE	4.42%	0.85	12.05%	7.63%	10.94%	11.22%
OGE Energy Corporation	OGE	4.42%	0.90	12.05%	7.63%	11.29%	11.48%
Pinnacle West Capital Corporation	PNW	4.42%	0.80	12.05%	7.63%	10.55%	10.93%
Portland General Electric Company	POR	4.42%	0.77	12.05%	7.63%	10.28%	10.73%
PPL Corporation	PPL	4.42%	0.92	12.05%	7.63%	11.47%	11.61%
Southern Company	SO	4.42%	0.76	12.05%	7.63%	10.24%	10.70%
Xcel Energy Inc.	XEL	4.42%	0.71	12.05%	7.63%	9.84%	10.39%
Mean						10.43%	10.84%
Median						10.28%	10.73%

Notes:
[1] Blue Chip Financial Forecasts, Vol. 43, No. 12, November 27, 2024, at 2
[2] Bloomberg Professional, based on 10-year weekly returns, as of November 30, 2024
[3] Schedule AEB-D2, Attachment 6
[4] Equals [3] - [1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL
LONG-TERM PROJECTED RISK-FREE RATE AND BLOOMBERG BETA

Company	Ticker	[1] Projected 30-year U.S. Treasury bond yield (2026 - 2030)	[2] Beta	[3] Market Return	[4] Market Risk Premium	[5] Cost of Equity - CAPM	[6] Cost of Equity - ECAPM
Alliant Energy Corporation	LNT	4.30%	0.77	12.05%	7.75%	10.25%	10.70%
American Electric Power Company, Inc.	AEP	4.30%	0.74	12.05%	7.75%	10.03%	10.54%
Avista Corporation	AVA	4.30%	0.75	12.05%	7.75%	10.08%	10.57%
CMS Energy Corporation	CMS	4.30%	0.73	12.05%	7.75%	9.93%	10.46%
DTE Energy Company	DTE	4.30%	0.80	12.05%	7.75%	10.50%	10.89%
Duke Energy Corporation	DUK	4.30%	0.71	12.05%	7.75%	9.80%	10.36%
Entergy Corporation	ETR	4.30%	0.84	12.05%	7.75%	10.83%	11.13%
Evergy, Inc.	EVRG	4.30%	0.77	12.05%	7.75%	10.24%	10.69%
IDACORP, Inc.	IDA	4.30%	0.77	12.05%	7.75%	10.27%	10.71%
NextEra Energy, Inc.	NEE	4.30%	0.80	12.05%	7.75%	10.49%	10.88%
NorthWestern Corporation	NWE	4.30%	0.85	12.05%	7.75%	10.92%	11.20%
OGE Energy Corporation	OGE	4.30%	0.90	12.05%	7.75%	11.28%	11.47%
Pinnacle West Capital Corporation	PNW	4.30%	0.80	12.05%	7.75%	10.53%	10.91%
Portland General Electric Company	POR	4.30%	0.77	12.05%	7.75%	10.26%	10.70%
PPL Corporation	PPL	4.30%	0.92	12.05%	7.75%	11.46%	11.61%
Southern Company	SO	4.30%	0.76	12.05%	7.75%	10.21%	10.67%
Xcel Energy Inc.	XEL	4.30%	0.71	12.05%	7.75%	9.81%	10.37%
Mean						10.40%	10.82%
Median						10.26%	10.70%

Notes:
[1] Blue Chip Financial Forecasts, Vol. 43, No. 12, November 27, 2024, at 14
[2] Bloomberg Professional, based on 10-year weekly returns, as of November 30, 2024
[3] Schedule AEB-D2, Attachment 6
[4] Equals [3] - [1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL
CURRENT RISK FREE RATE AND LONG-TERM VALUE LINE BETA

Company	Ticker	[1] Current 30-day average of 30-year U.S. Treasury bond yield	[2] Beta	[3] Market Return	[4] Market Risk Premium	[5] Cost of Equity - CAPM	[6] Cost of Equity - ECAPM
Alliant Energy Corporation	LNT	4.52%	0.76	12.05%	7.54%	10.27%	10.72%
American Electric Power Company, Inc.	AEP	4.52%	0.69	12.05%	7.54%	9.69%	10.28%
Avista Corporation	AVA	4.52%	0.80	12.05%	7.54%	10.51%	10.90%
CMS Energy Corporation	CMS	4.52%	0.70	12.05%	7.54%	9.83%	10.38%
DTE Energy Company	DTE	4.52%	0.77	12.05%	7.54%	10.34%	10.77%
Duke Energy Corporation	DUK	4.52%	0.69	12.05%	7.54%	9.69%	10.28%
Entergy Corporation	ETR	4.52%	0.76	12.05%	7.54%	10.27%	10.72%
Evergy, Inc.	EVRG	4.52%	0.94	12.05%	7.54%	11.58%	11.70%
IDACORP, Inc.	IDA	4.52%	0.74	12.05%	7.54%	10.10%	10.59%
NextEra Energy, Inc.	NEE	4.52%	0.75	12.05%	7.54%	10.20%	10.67%
NorthWestern Corporation	NWE	4.52%	0.76	12.05%	7.54%	10.27%	10.72%
OGE Energy Corporation	OGE	4.52%	0.94	12.05%	7.54%	11.61%	11.72%
Pinnacle West Capital Corporation	PNW	4.52%	0.75	12.05%	7.54%	10.20%	10.67%
Portland General Electric Company	POR	4.52%	0.76	12.05%	7.54%	10.27%	10.72%
PPL Corporation	PPL	4.52%	0.84	12.05%	7.54%	10.82%	11.13%
Southern Company	SO	4.52%	0.68	12.05%	7.54%	9.65%	10.25%
Xcel Energy Inc.	XEL	4.52%	0.67	12.05%	7.54%	9.59%	10.20%
Mean						10.29%	10.73%
Median						10.27%	10.72%

Notes:
[1] Bloomberg Professional, as of November 30, 2024.
[2] Schedule AEB-D2, Attachment 5
[3] Schedule AEB-D2, Attachment 6
[4] Equals [3] - [1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL
NEAR-TERM PROJECTED RISK FREE RATE AND LONG-TERM VALUE LINE BETA

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Near-term projected 30-year U.S. Treasury bond yield (Q1 2025 - Q1 2026)	Beta	Market Return	Market Risk Premium	Cost of Equity - CAPM	Cost of Equity - ECAPM
Alliant Energy Corporation	LNT	4.42%	0.76	12.05%	7.63%	10.25%	10.70%
American Electric Power Company, Inc.	AEP	4.42%	0.69	12.05%	7.63%	9.66%	10.26%
Avista Corporation	AVA	4.42%	0.80	12.05%	7.63%	10.49%	10.88%
CMS Energy Corporation	CMS	4.42%	0.70	12.05%	7.63%	9.80%	10.36%
DTE Energy Company	DTE	4.42%	0.77	12.05%	7.63%	10.32%	10.75%
Duke Energy Corporation	DUK	4.42%	0.69	12.05%	7.63%	9.66%	10.26%
Entergy Corporation	ETR	4.42%	0.76	12.05%	7.63%	10.25%	10.70%
Evergy, Inc.	EVRG	4.42%	0.94	12.05%	7.63%	11.58%	11.69%
IDACORP, Inc.	IDA	4.42%	0.74	12.05%	7.63%	10.07%	10.57%
NextEra Energy, Inc.	NEE	4.42%	0.75	12.05%	7.63%	10.18%	10.65%
NorthWestern Corporation	NWE	4.42%	0.76	12.05%	7.63%	10.25%	10.70%
OGE Energy Corporation	OGE	4.42%	0.94	12.05%	7.63%	11.60%	11.71%
Pinnacle West Capital Corporation	PNW	4.42%	0.75	12.05%	7.63%	10.18%	10.65%
Portland General Electric Company	POR	4.42%	0.76	12.05%	7.63%	10.25%	10.70%
PPL Corporation	PPL	4.42%	0.84	12.05%	7.63%	10.80%	11.12%
Southern Company	SO	4.42%	0.68	12.05%	7.63%	9.62%	10.23%
Xcel Energy Inc.	XEL	4.42%	0.67	12.05%	7.63%	9.55%	10.18%
Mean						10.27%	10.71%
Median						10.25%	10.70%

Notes:
[1] Blue Chip Financial Forecasts, Vol. 43, No. 12, November 27, 2024, at 2
[2] Schedule AEB-D2, Attachment 5
[3] Schedule AEB-D2, Attachment 6
[4] Equals [3] - [1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL
LONG-TERM PROJECTED RISK FREE RATE AND LONG-TERM VALUE LINE BETA

Company	Ticker	[1] Projected 30-year U.S. Treasury bond yield (2026 - 2030)	[2] Beta	[3] Market Return	[4] Market Risk Premium	[5] Cost of Equity - CAPM	[6] Cost of Equity - ECAPM
Alliant Energy Corporation	LNT	4.30%	0.76	12.05%	7.75%	10.22%	10.68%
American Electric Power Company, Inc.	AEP	4.30%	0.69	12.05%	7.75%	9.62%	10.23%
Avista Corporation	AVA	4.30%	0.80	12.05%	7.75%	10.47%	10.86%
CMS Energy Corporation	CMS	4.30%	0.70	12.05%	7.75%	9.76%	10.33%
DTE Energy Company	DTE	4.30%	0.77	12.05%	7.75%	10.29%	10.73%
Duke Energy Corporation	DUK	4.30%	0.69	12.05%	7.75%	9.62%	10.23%
Entergy Corporation	ETR	4.30%	0.76	12.05%	7.75%	10.22%	10.68%
Evergy, Inc.	EVRG	4.30%	0.94	12.05%	7.75%	11.57%	11.69%
IDACORP, Inc.	IDA	4.30%	0.74	12.05%	7.75%	10.04%	10.55%
NextEra Energy, Inc.	NEE	4.30%	0.75	12.05%	7.75%	10.15%	10.63%
NorthWestern Corporation	NWE	4.30%	0.76	12.05%	7.75%	10.22%	10.68%
OGE Energy Corporation	OGE	4.30%	0.94	12.05%	7.75%	11.59%	11.71%
Pinnacle West Capital Corporation	PNW	4.30%	0.75	12.05%	7.75%	10.15%	10.63%
Portland General Electric Company	POR	4.30%	0.76	12.05%	7.75%	10.22%	10.68%
PPL Corporation	PPL	4.30%	0.84	12.05%	7.75%	10.78%	11.10%
Southern Company	SO	4.30%	0.68	12.05%	7.75%	9.59%	10.20%
Xcel Energy Inc.	XEL	4.30%	0.67	12.05%	7.75%	9.52%	10.15%
Mean						10.24%	10.69%
Median						10.22%	10.68%

Notes:
[1] Blue Chip Financial Forecasts, Vol. 43, No. 12, November 27, 2024, at 14
[2] Schedule AEB-D2, Attachment 5
[3] Schedule AEB-D2, Attachment 6
[4] Equals [3] - [1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

HISTORICAL BETA

Company	Ticker	[1] 12/31/2013	[2] 12/31/2014	[3] 12/31/2015	[4] 12/31/2016	[5] 12/31/2017	[6] 12/31/2018	[7] 12/31/2019	[8] 12/31/2020	[9] 12/31/2021	[10] 12/31/2022	[11] 12/31/2023	[12] Average
Alliant Energy Corporation	LNT	0.75	0.80	0.80	0.70	0.70	0.60	0.60	0.85	0.85	0.85	0.90	0.76
American Electric Power Company, Inc.	AEP	0.70	0.70	0.70	0.65	0.65	0.55	0.55	0.75	0.75	0.75	0.80	0.69
Avista Corporation	AVA	0.75	0.80	0.80	0.70	0.75	0.65	0.60	0.95	0.95	0.90	0.90	0.80
CMS Energy Corporation	CMS	0.70	0.70	0.75	0.65	0.65	0.55	0.50	0.80	0.80	0.80	0.85	0.70
DTE Energy Company	DTE	0.80	0.75	0.75	0.65	0.65	0.55	0.55	0.95	0.95	0.95	0.95	0.77
Duke Energy Corporation	DUK	0.65	0.60	0.65	0.60	0.60	0.50	0.50	0.85	0.85	0.85	0.90	0.69
Entergy Corporation	ETR	0.70	0.70	0.70	0.65	0.65	0.60	0.60	0.95	0.95	0.95	0.95	0.76
Evergy, Inc.	EVRG						NMF	NMF	1.00	0.95	0.90	0.90	0.94
IDACORP, Inc.	IDA	0.75	0.80	0.80	0.75	0.70	0.55	0.55	0.80	0.80	0.80	0.85	0.74
NextEra Energy, Inc.	NEE	0.70	0.70	0.75	0.65	0.65	0.55	0.55	0.90	0.90	0.95	1.00	0.75
NorthWestern Corporation	NWE	0.70	0.70	0.70	0.70	0.70	0.55	0.60	0.95	0.95	0.90	0.95	0.76
OGE Energy Corporation	OGE	0.85	0.90	0.95	0.90	0.95	0.85	0.75	1.10	1.05	1.00	1.05	0.94
Pinnacle West Capital Corporation	PNW	0.75	0.70	0.75	0.70	0.70	0.55	0.50	0.90	0.90	0.90	0.95	0.75
Portland General Electric Company	POR	0.75	0.80	0.80	0.70	0.70	0.60	0.55	0.85	0.90	0.85	0.90	0.76
PPL Corporation	PPL	0.65	0.60	0.70	0.70	0.75	0.70	0.70	1.15	1.10	1.05	1.10	0.84
Southern Company	SO	0.55	0.55	0.60	0.55	0.55	0.50	0.50	0.90	0.95	0.90	0.95	0.68
Xcel Energy Inc.	XEL	0.65	0.65	0.65	0.60	0.60	0.50	0.50	0.80	0.80	0.80	0.85	0.67
Mean		0.71	0.72	0.74	0.68	0.68	0.58	0.57	0.91	0.91	0.89	0.93	0.77

Notes:
[1] Value Line, dated December 26, 2013.
[2] Value Line, dated December 31, 2014.
[3] Value Line, dated December 30, 2015.
[4] Value Line, dated December 29, 2016.
[5] Value Line, dated December 28, 2017.
[6] Value Line, dated December 27, 2018.
[7] Value Line, dated December 26, 2019.
[8] Value Line, dated December 30, 2020.
[9] Value Line, dated December 29, 2021.
[10] Value Line, dated December 30, 2022.
[11] Value Line, Dated December 29, 2023.
[12] Average ([1] - [11])

MARKET RISK PREMIUM DERIVED FROM ANALYSTS' LONG-TERM GROWTH ESTIMATES

[1] Estimated Weighted Average Dividend Yield	1.46%
[2] Estimated Weighted Average Long-Term Growth Rate	10.51%
[3] S&P 500 Estimated Required Market Return	12.05%

STANDARD AND POOR'S 500 INDEX

		[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]
Name	Ticker	Shares Outst'g	Price	Market Capitalization	Weight in Index	Estimated Dividend Yield	Cap-Weighted Dividend Yield	Bloomberg Long-Term Growth Est.	Cap-Weighted Long-Term Growth Est.
LyondellBasell Industries NV	LYB	324.76	82.00	26,630		6.54%		-11.21%	
American Express Co	AXP	704.44	304.68	214,630	0.56%	0.92%	0.01%	15.55%	0.09%
Verizon Communications Inc	VZ	4,209.63	44.34	186,655	0.49%	6.11%	0.03%	2.98%	0.01%
Texas Pacific Land Corp	TPL	22.97	1,598.49	36,725		0.40%			
Broadcom Inc	AVGO	4,670.58	162.08	757,007	1.98%	1.31%	0.03%	17.05%	0.34%
Boeing Co/The	BA	747.17	155.44	116,140				34.61%	
Solventum Corp	SOLV	172.75	71.51	12,354				-6.78%	
Caterpillar Inc	CAT	482.80	406.11	196,071	0.51%	1.39%	0.01%	7.02%	0.04%
JPMorgan Chase & Co	JPM	2,815.34	249.72	703,047	1.84%	2.00%	0.04%	2.80%	0.05%
Chevron Corp	CVX	1,797.09	161.93	291,003	0.76%	4.03%	0.03%	3.60%	0.03%
Coca-Cola Co/The	KO	4,307.80	64.08	276,044	0.72%	3.03%	0.02%	5.98%	0.04%
AbbVie Inc	ABBV	1,767.14	182.93	323,263	0.84%	3.59%	0.03%	11.26%	0.10%
Walt Disney Co/The	DIS	1,810.94	117.47	212,731	0.56%	0.77%	0.00%	15.80%	0.09%
Corpay Inc	CPAY	69.71	381.18	26,572	0.07%			14.54%	0.01%
Extra Space Storage Inc	EXR	211.98	170.96	36,241	0.09%	3.79%	0.00%	1.62%	0.00%
Exxon Mobil Corp	XOM	4,395.09	117.96	518,445		3.36%		-1.82%	
Phillips 66	PSX	412.99	133.98	55,332		3.43%		-8.20%	
General Electric Co	GE	1,082.29	182.16	197,151		0.61%		30.30%	
HP Inc	HPQ	963.72	35.43	34,145	0.09%	3.27%	0.00%	3.80%	0.00%
Home Depot Inc/The	HD	993.36	429.13	426,282	1.11%	2.10%	0.02%	3.56%	0.04%
Monolithic Power Systems Inc	MPWR	48.78	567.64	27,689		0.88%		22.00%	
International Business Machines Corp	IBM	924.65	227.41	210,274	0.55%	2.94%	0.02%	3.80%	0.02%
Johnson & Johnson	JNJ	2,407.62	155.01	373,206	0.97%	3.20%	0.03%	3.00%	0.03%
Lululemon Athletica Inc	LULU	117.66	320.66	37,729	0.10%			7.00%	0.01%
McDonald's Corp	MCD	716.62	294.24	210,858	0.55%	2.41%	0.01%	4.77%	0.03%
Merck & Co Inc	MRK	2,529.64	101.64	257,112	0.67%	3.19%	0.02%	13.00%	0.09%
3M Co	MMM	544.56	133.53	72,715	0.19%	2.10%	0.00%	1.81%	0.00%
American Water Works Co Inc	AWK	194.89	136.94	26,689	0.07%	2.23%	0.00%	7.83%	0.01%
Bank of America Corp	BAC	7,672.88	47.51	364,539	0.95%	2.19%	0.02%	5.00%	0.05%
Pfizer Inc	PFE	5,666.99	26.21	148,532	0.39%	6.41%	0.02%	10.02%	0.04%
Procter & Gamble Co/The	PG	2,355.04	179.26	422,165	1.10%	2.25%	0.02%	7.37%	0.08%
AT&T Inc	T	7,175.29	23.16	166,180	0.43%	4.79%	0.02%	1.16%	0.01%
Travelers Cos Inc/The	TRV	227.02	266.04	60,396	0.16%	1.58%	0.00%	18.71%	0.03%
RTX Corp	RTX	1,331.02	121.83	162,158	0.42%	2.07%	0.01%	10.62%	0.04%
Analog Devices Inc	ADI	496.30	218.05	108,218	0.28%	1.69%	0.00%	14.05%	0.04%
Walmart Inc	WMT	8,038.25	92.50	743,538	1.94%	0.90%	0.02%	9.24%	0.18%
Cisco Systems Inc	CSCO	3,982.76	59.21	235,819	0.62%	2.70%	0.02%	4.04%	0.02%
Intel Corp	INTC	4,313.00	24.05	103,728	0.27%			2.86%	0.01%
General Motors Co	GM	1,099.60	55.59	61,127	0.16%	0.86%	0.00%	18.41%	0.03%
Microsoft Corp	MSFT	7,434.88	423.46	3,148,375	8.22%	0.78%	0.06%	15.35%	1.26%
Dollar General Corp	DG	219.92	77.27	16,993		3.05%		-7.74%	
Cigna Group/The	CI	278.15	337.80	93,960	0.25%	1.66%	0.00%	11.65%	0.03%
Kinder Morgan Inc	KMI	2,221.64	28.27	62,806	0.16%	4.07%	0.01%	6.39%	0.01%
Citigroup Inc	C	1,891.26	70.87	134,034		3.16%		26.39%	
American International Group Inc	AIG	623.77	76.88	47,955	0.13%	2.08%	0.00%	10.49%	0.01%
Altria Group Inc	MO	1,694.81	57.74	97,859	0.26%	7.07%	0.02%	4.20%	0.01%
HCA Healthcare Inc	HCA	253.30	327.22	82,884	0.22%	0.81%	0.00%	10.84%	0.02%
International Paper Co	IP	347.41	58.83	20,438		3.14%		-2.00%	
Hewlett Packard Enterprise Co	HPE	1,298.67	21.22	27,558	0.07%	2.45%	0.00%	4.73%	0.00%
Abbott Laboratories	ABT	1,734.46	118.77	206,001	0.54%	1.85%	0.01%	8.15%	0.04%
Aflac Inc	AFL	555.53	114.00	63,330	0.17%	1.75%	0.00%	9.37%	0.02%
Air Products and Chemicals Inc	APD	222.38	334.33	74,348	0.19%	2.12%	0.00%	10.24%	0.02%
Super Micro Computer Inc	SMCI	585.57	32.64	19,113					
Royal Caribbean Cruises Ltd	RCL	268.88	244.06	65,622		0.66%		32.53%	
Hess Corp	HES	308.12	147.18	45,349		1.36%			
Archer-Daniels-Midland Co	ADM	478.53	54.60	26,128		3.66%		-4.65%	
Automatic Data Processing Inc	ADP	407.46	306.93	125,061	0.33%	2.01%	0.01%	9.10%	0.03%
Verisk Analytics Inc	VRSK	141.21	294.21	41,546	0.11%	0.53%	0.00%	12.00%	0.01%
AutoZone Inc	AZO	16.90	3,169.54	53,579	0.14%			13.50%	0.02%
Linde PLC	LIN	476.16	460.99	219,504	0.57%	1.21%	0.01%	11.47%	0.07%
Avery Dennison Corp	AVY	80.35	205.95	16,547	0.04%	1.71%	0.00%	13.82%	0.01%
Enphase Energy Inc	ENPH	135.11	71.35	9,640	0.03%			4.56%	0.00%
MSCI Inc	MSCI	78.37	609.63	47,777	0.12%	1.05%	0.00%	12.00%	0.01%
Ball Corp	BALL	298.43	61.96	18,490	0.05%	1.29%	0.00%	12.66%	0.01%
Axon Enterprise Inc	AXON	76.25	646.96	49,334				24.64%	
Dayforce Inc	DAY	157.70	79.99	12,614					
Carrier Global Corp	CARR	897.23	77.37	69,418	0.18%	0.98%	0.00%	12.25%	0.02%
Bank of New York Mellon Corp/The	BK	727.08	81.87	59,526	0.16%	2.30%	0.00%	12.10%	0.02%
Otis Worldwide Corp	OTIS	399.46	102.98	41,136	0.11%	1.51%	0.00%	10.00%	0.01%
Baxter International Inc	BAX	510.59	33.71	17,212	0.04%	2.02%	0.00%	1.27%	0.00%
Becton Dickinson & Co	BDX	289.12	221.90	64,156	0.17%	1.87%	0.00%	9.00%	0.02%
Berkshire Hathaway Inc	BRK/B	1,328.45	483.02	641,666					
Best Buy Co Inc	BBY	214.73	90.00	19,325	0.05%	4.18%	0.00%	4.89%	0.00%
Boston Scientific Corp	BSX	1,473.83	90.66	133,617	0.35%			12.64%	0.04%
Bristol-Myers Squibb Co	BMY	2,028.18	59.22	120,109		4.05%		-0.11%	
Brown-Forman Corp	BF/B	303.54	42.08	12,773		2.15%		-3.20%	
Coterra Energy Inc	CTRA	736.61	26.72	19,682		3.14%			
Hilton Worldwide Holdings Inc	HLT	243.78	253.44	61,784	0.16%	0.24%	0.00%	12.62%	0.02%
Carnival Corp	CCL	1,154.16	25.43	29,350					
Qorvo Inc	QRVO	94.53	69.05	6,527	0.02%			3.70%	0.00%

STANDARD AND POOR'S 500 INDEX

Name	Ticker	[4] Shares Outst'g	[5] Price	[6] Market Capitalization	[7] Weight in Index	[8] Estimated Dividend Yield	[9] Cap-Weighted Dividend Yield	[10] Bloomberg Long-Term Growth Est.	[11] Cap-Weighted Long-Term Growth Est.
Builders FirstSource Inc	BLDR	115.08	186.47	21,460	0.06%			0.15%	0.00%
UDR Inc	UDR	329.96	45.86	15,132	0.04%	3.71%	0.00%	1.46%	0.00%
Clorox Co/The	CLX	123.78	167.17	20,693	0.05%	2.92%	0.00%	10.56%	0.01%
Paycom Software Inc	PAYC	57.66	231.92	13,373	0.03%	0.65%	0.00%	10.23%	0.00%
CMS Energy Corp	CMS	298.78	69.71	20,828	0.05%	2.96%	0.00%	7.43%	0.00%
Colgate-Palmolive Co	CL	817.01	96.63	78,948	0.21%	2.07%	0.00%	8.23%	0.02%
EPAM Systems Inc	EPAM	56.72	243.92	13,835	0.04%			6.44%	0.00%
Conagra Brands Inc	CAG	477.27	27.55	13,149	0.03%	5.08%	0.00%	0.62%	0.00%
Airbnb Inc	ABNB	440.00	136.11	59,889	0.16%			19.27%	0.03%
Consolidated Edison Inc	ED	346.41	100.59	34,846	0.09%	3.30%	0.00%	5.79%	0.01%
Corning Inc	GLW	856.21	48.67	41,672	0.11%	2.30%	0.00%	16.38%	0.02%
GoDaddy Inc	GDDY	140.39	197.57	27,737					
Cummins Inc	CMI	137.18	375.04	51,449	0.13%	1.94%	0.00%	11.78%	0.02%
Caesars Entertainment Inc	CZR	212.48	38.49	8,178					
Danaher Corp	DHR	722.28	239.69	173,122	0.45%	0.45%	0.00%	0.85%	0.00%
Target Corp	TGT	458.21	132.31	60,626	0.16%	3.39%	0.01%	11.09%	0.02%
Deere & Co	DE	273.60	465.90	127,470	0.33%	1.26%	0.00%	1.13%	0.00%
Dominion Energy Inc	D	840.01	58.75	49,351	0.13%	4.54%	0.01%	16.29%	0.02%
Dover Corp	DOV	137.19	205.90	28,248	0.07%	1.00%	0.00%	9.23%	0.01%
Alliant Energy Corp	LNT	256.60	63.20	16,217	0.04%	3.04%	0.00%	7.27%	0.00%
Steel Dynamics Inc	STLD	152.24	145.27	22,117		1.27%		-4.40%	
Duke Energy Corp	DUK	771.00	117.05	90,246	0.24%	3.57%	0.01%	6.70%	0.02%
Regency Centers Corp	REG	181.51	75.59	13,720	0.04%	3.73%	0.00%	4.24%	0.00%
Eaton Corp PLC	ETN	395.20	375.42	148,366	0.39%	1.00%	0.00%	15.29%	0.06%
Ecolab Inc	ECL	283.16	248.77	70,442	0.18%	0.92%	0.00%	18.46%	0.03%
Revvity Inc	RVTY	121.70	116.14	14,134	0.04%	0.24%	0.00%	7.86%	0.00%
Dell Technologies Inc	DELL	333.87	127.59	42,599	0.11%	1.40%	0.00%	9.51%	0.01%
Emerson Electric Co	EMR	569.53	132.60	75,520	0.20%	1.59%	0.00%	13.14%	0.03%
EOG Resources Inc	EOG	562.45	133.26	74,952		2.93%		-1.24%	
Aon PLC	AON	216.27	391.54	84,677	0.22%	0.69%	0.00%	11.18%	0.02%
Entergy Corp	ETR	214.41	156.17	33,484	0.09%	3.07%	0.00%	7.36%	0.01%
Equifax Inc	EFX	123.95	261.56	32,421		0.60%		22.00%	
EQT Corp	EQT	596.68	45.44	27,113		1.39%		-6.00%	
IQVIA Holdings Inc	IQV	181.50	200.84	36,452	0.10%			9.02%	0.01%
Gartner Inc	IT	77.13	517.93	39,950	0.10%			9.00%	0.01%
FedEx Corp	FDX	244.32	302.67	73,949	0.19%	1.82%	0.00%	12.33%	0.02%
FMC Corp	FMC	124.84	59.09	7,377		3.93%		-3.67%	
Brown & Brown Inc	BRO	285.96	113.10	32,342	0.08%	0.53%	0.00%	11.31%	0.01%
Ford Motor Co	F	3,903.44	11.13	43,445	0.11%	5.39%	0.01%	3.06%	0.00%
NextEra Energy Inc	NEE	2,056.40	78.67	161,777	0.42%	2.62%	0.01%	7.65%	0.03%
Franklin Resources Inc	BEN	523.67	22.76	11,919	0.03%	5.45%	0.00%	5.00%	0.00%
Garmin Ltd	GRMN	192.02	212.60	40,825		1.41%		21.60%	
Freeport-McMoRan Inc	FCX	1,436.93	44.20	63,512	0.17%	1.36%	0.00%	15.37%	0.03%
Dexcom Inc	DXCM	390.60	77.99	30,463				20.11%	
General Dynamics Corp	GD	274.97	284.01	78,094	0.20%	2.00%	0.00%	14.58%	0.03%
General Mills Inc	GIS	555.16	66.26	36,785	0.10%	3.62%	0.00%	2.45%	0.00%
Genuine Parts Co	GPC	139.04	126.73	17,620		3.16%			
Atmos Energy Corp	ATO	155.40	151.32	23,515		2.30%			
WW Grainger Inc	GWW	48.70	1,205.34	58,700	0.15%	0.68%	0.00%	5.61%	0.01%
Halliburton Co	HAL	878.50	31.86	27,989	0.07%	2.13%	0.00%	2.85%	0.00%
L3Harris Technologies Inc	LHX	189.67	246.25	46,706	0.12%	1.88%	0.00%	9.00%	0.01%
Healthpeak Properties Inc	DOC	699.44	21.99	15,381	0.04%	5.46%	0.00%	4.99%	0.00%
Insulet Corp	PODD	70.14	266.78	18,713				31.17%	
Catalent Inc	CTLT	181.51	61.11	11,092					
Fortive Corp	FTV	346.95	79.33	27,523	0.07%	0.40%	0.00%	10.74%	0.01%
Hershey Co/The	HSY	147.74	176.13	26,022		3.11%		-4.55%	
Synchrony Financial	SYF	389.34	67.52	26,289		1.48%		39.62%	
Hormel Foods Corp	HRL	548.36	32.43	17,783	0.05%	3.58%	0.00%	6.23%	0.00%
Arthur J Gallagher & Co	AJG	219.40	312.24	68,505	0.18%	0.77%	0.00%	12.81%	0.02%
Mondelez International Inc	MDLZ	1,337.19	64.95	86,851	0.23%	2.89%	0.01%	5.07%	0.01%
CenterPoint Energy Inc	CNP	651.73	32.62	21,259	0.06%	2.58%	0.00%	8.01%	0.00%
Humana Inc	HUM	120.41	296.38	35,688		1.19%		-8.82%	
Willis Towers Watson PLC	WTW	100.73	322.00	32,434	0.08%	1.09%	0.00%	10.81%	0.01%
Illinois Tool Works Inc	ITW	295.30	277.52	81,952	0.21%	2.16%	0.00%	7.08%	0.02%
CDW Corp/DE	CDW	133.26	175.93	23,445	0.06%	1.42%	0.00%	3.96%	0.00%
Trane Technologies PLC	TT	225.02	416.22	93,659	0.24%	0.81%	0.00%	16.94%	0.04%
Interpublic Group of Cos Inc/The	IPG	372.51	30.48	11,354	0.03%	4.33%	0.00%	0.91%	0.00%
International Flavors & Fragrances Inc	IFF	255.68	91.36	23,359	0.06%	1.75%	0.00%	3.39%	0.00%
Generac Holdings Inc	GNRC	59.50	188.20	11,197					
NXP Semiconductors NV	NXPI	254.16	229.37	58,296	0.15%	1.77%	0.00%	2.29%	0.00%
Kellanova	K	344.70	80.72	27,824	0.07%	2.82%	0.00%	9.41%	0.01%
Broadridge Financial Solutions Inc	BR	116.89	236.02	27,588		1.49%			
Kimberly-Clark Corp	KMB	333.49	139.35	46,471	0.12%	3.50%	0.00%	8.06%	0.01%
Kimco Realty Corp	KIM	674.12	25.57	17,237	0.05%	3.91%	0.00%	4.66%	0.00%
Oracle Corp	ORCL	2,771.06	184.84	512,203	1.34%	0.87%	0.01%	11.95%	0.16%
Kroger Co/The	KR	723.49	61.08	44,191	0.12%	2.10%	0.00%	3.11%	0.00%
Lennar Corp	LEN	238.81	174.39	41,646	0.11%	1.15%	0.00%	9.07%	0.01%
Eli Lilly & Co	LLY	949.32	795.35	755,038		0.65%		28.50%	
Charter Communications Inc	CHTR	142.20	396.97	56,447	0.15%			7.71%	0.01%
Loews Corp	L	217.78	86.73	18,888		0.29%			
Lowe's Cos Inc	LOW	564.65	272.43	153,828		1.69%		-0.44%	
Hubbell Inc	HUBB	53.67	460.09	24,693	0.06%	1.15%	0.00%	18.00%	0.01%
IDEX Corp	IEX	75.72	230.63	17,464		1.20%			
Marsh & McLennan Cos Inc	MMC	491.12	233.23	114,544	0.30%	1.40%	0.00%	8.79%	0.03%
Masco Corp	MAS	215.75	80.56	17,381	0.05%	1.44%	0.00%	7.54%	0.00%
S&P Global Inc	SPGI	317.50	522.51	165,897	0.43%	0.70%	0.00%	14.00%	0.06%
Medtronic PLC	MDT	1,282.29	86.54	110,969	0.29%	3.24%	0.01%	6.49%	0.02%
Viatris Inc	VTRS	1,193.59	13.09	15,624		3.67%		-3.41%	
CVS Health Corp	CVS	1,258.41	59.85	75,316		4.44%		-2.27%	
DuPont de Nemours Inc	DD	417.96	83.59	34,937	0.09%	1.82%	0.00%	4.01%	0.00%

STANDARD AND POOR'S 500 INDEX

Name	Ticker	[4] Shares Outst'g	[5] Price	[6] Market Capitalization	[7] Weight in Index	[8] Estimated Dividend Yield	[9] Cap-Weighted Dividend Yield	[10] Bloomberg Long-Term Growth Est.	[11] Cap-Weighted Long-Term Growth Est.
Micron Technology Inc	MU	1,110.48	97.95	108,772		0.47%		53.55%	
Motorola Solutions Inc	MSI	167.12	499.70	83,510	0.22%	0.87%	0.00%	9.48%	0.02%
Cboe Global Markets Inc	CBOE	104.69	215.85	22,596	0.06%	1.17%	0.00%	13.68%	0.01%
Newmont Corp	NEM	1,138.45	41.94	47,747		2.38%		37.81%	
NIKE Inc	NKE	1,190.60	78.37	93,307		2.04%		-1.83%	
NiSource Inc	NI	466.78	38.09	17,780	0.05%	2.78%	0.00%	8.00%	0.00%
Norfolk Southern Corp	NSC	226.24	275.85	62,408	0.16%	1.96%	0.00%	8.84%	0.01%
Principal Financial Group Inc	PFG	228.73	86.36	19,753	0.05%	3.38%	0.00%	12.60%	0.01%
Eversource Energy	ES	366.40	64.49	23,629	0.06%	4.43%	0.00%	5.09%	0.00%
Northrop Grumman Corp	NOC	145.70	487.59	71,040	0.19%	1.69%	0.00%	19.22%	0.04%
Wells Fargo & Co	WFC	3,329.49	76.17	253,607	0.66%	2.10%	0.01%	10.67%	0.07%
Nucor Corp	NUE	234.81	154.69	36,323		1.40%		-8.72%	
Occidental Petroleum Corp	OXY	938.34	50.58	47,461	0.12%	1.74%	0.00%	12.00%	0.01%
Omnicom Group Inc	OMC	195.09	104.82	20,450	0.05%	2.67%	0.00%	5.61%	0.00%
ONEOK Inc	OKE	584.18	113.60	66,363	0.17%	3.49%	0.01%	7.39%	0.01%
Raymond James Financial Inc	RJF	204.04	169.28	34,541	0.09%	1.06%	0.00%	10.00%	0.01%
PG&E Corp	PCG	2,137.54	21.63	46,235	0.12%	0.46%	0.00%	9.84%	0.01%
Parker-Hannifin Corp	PH	128.72	702.90	90,478	0.24%	0.93%	0.00%	7.90%	0.02%
Rollins Inc	ROL	484.31	50.33	24,375	0.06%	1.31%	0.00%	14.00%	0.01%
PPL Corp	PPL	737.97	34.93	25,777	0.07%	2.95%	0.00%	6.93%	0.00%
ConocoPhillips	COP	1,293.56	108.34	140,145	0.37%	2.88%	0.01%	4.50%	0.02%
PulteGroup Inc	PHM	205.08	135.27	27,741	0.07%	0.65%	0.00%	7.98%	0.01%
Pinnacle West Capital Corp	PNW	113.70	93.70	10,654	0.03%	3.82%	0.00%	7.26%	0.00%
PNC Financial Services Group Inc/The	PNC	396.78	214.72	85,197	0.22%	2.98%	0.01%	18.19%	0.04%
PPG Industries Inc	PPG	232.00	124.37	28,854	0.08%	2.19%	0.00%	6.89%	0.01%
Progressive Corp/The	PGR	585.81	268.88	157,513		0.15%		39.87%	
Veralto Corp	VLTO	247.31	108.19	26,756		0.33%			
Public Service Enterprise Group Inc	PEG	498.23	94.30	46,983	0.12%	2.55%	0.00%	6.29%	0.01%
Cooper Cos Inc/The	COO	199.16	104.46	20,804	0.05%			12.43%	0.01%
Edison International	EIX	387.15	87.75	33,972	0.09%	3.56%	0.00%	7.58%	0.01%
Schlumberger NV	SLB	1,412.15	43.94	62,050	0.16%	2.50%	0.00%	9.17%	0.01%
Charles Schwab Corp/The	SCHW	1,779.66	82.76	147,285	0.38%	1.21%	0.00%	8.94%	0.03%
Sherwin-Williams Co/The	SHW	251.85	397.40	100,086	0.26%	0.72%	0.00%	10.29%	0.03%
West Pharmaceutical Services Inc	WST	72.42	325.68	23,587	0.06%	0.26%	0.00%	2.49%	0.00%
J M Smucker Co/The	SJM	106.42	117.79	12,535	0.03%	3.67%	0.00%	5.49%	0.00%
Snap-on Inc	SNA	52.51	369.69	19,411	0.05%	2.32%	0.00%	4.81%	0.00%
AMETEK Inc	AME	231.31	194.38	44,962	0.12%	0.58%	0.00%	7.34%	0.01%
Uber Technologies Inc	UBER	2,105.71	71.96	151,527				61.51%	
Southern Co/The	SO	1,094.63	89.13	97,565	0.25%	3.23%	0.01%	7.94%	0.02%
Truist Financial Corp	TFC	1,327.52	47.68	63,296	0.17%	4.36%	0.01%	7.01%	0.01%
Southwest Airlines Co	LUV	599.74	32.36	19,407	0.05%	2.22%	0.00%	7.97%	0.00%
W R Berkley Corp	WRB	381.07	64.55	24,598	0.06%	0.50%	0.00%	13.07%	0.01%
Stanley Black & Decker Inc	SWK	154.16	89.45	13,790		3.67%			
Public Storage	PSA	175.70	348.05	61,154	0.16%	3.45%	0.01%	2.10%	0.00%
Arista Networks Inc	ANET	314.94	405.82	127,809	0.33%			17.80%	0.06%
Sysco Corp	SYY	491.23	77.11	37,878	0.10%	2.65%	0.00%	7.00%	0.01%
Corteva Inc	CTVA	692.25	62.07	42,968	0.11%	1.10%	0.00%	9.10%	0.01%
Texas Instruments Inc	TXN	912.22	201.03	183,383	0.48%	2.71%	0.01%	0.10%	0.00%
Textron Inc	TXT	185.51	85.63	15,885		0.09%			
Thermo Fisher Scientific Inc	TMO	382.50	529.63	202,584	0.53%	0.29%	0.00%	8.37%	0.04%
TJX Cos Inc/The	TJX	1,127.87	125.69	141,762	0.37%	1.19%	0.00%	8.42%	0.03%
Globe Life Inc	GL	83.95	111.24	9,338	0.02%	0.86%	0.00%	6.00%	0.00%
Johnson Controls International plc	JCI	662.19	83.86	55,531	0.14%	1.76%	0.00%	9.59%	0.01%
Ulta Beauty Inc	ULTA	47.11	386.64	18,216				-0.55%	
Union Pacific Corp	UNP	606.26	244.66	148,327	0.39%	2.19%	0.01%	9.24%	0.04%
Keysight Technologies Inc	KEYS	173.54	170.84	29,648	0.08%			13.10%	0.01%
UnitedHealth Group Inc	UNH	920.28	610.20	561,557	1.47%	1.38%	0.02%	10.52%	0.15%
Blackstone Inc	BX	722.00	191.09	137,967		1.80%		22.49%	
Ventas Inc	VTR	419.35	64.07	26,868	0.07%	2.81%	0.00%	7.65%	0.01%
Labcorp Holdings Inc	LH	83.64	241.16	20,170	0.05%	1.19%	0.00%	9.21%	0.00%
Vulcan Materials Co	VMC	132.06	288.13	38,051	0.10%	0.64%	0.00%	14.45%	0.01%
Weyerhaeuser Co	WY	726.58	32.26	23,440		2.48%		-13.66%	
Williams Cos Inc/The	WMB	1,219.01	58.52	71,337	0.19%	3.25%	0.01%	5.57%	0.01%
Constellation Energy Corp	CEG	315.12	256.56	80,847	0.21%	0.55%	0.00%	18.94%	0.04%
WEC Energy Group Inc	WEC	316.35	101.05	31,968	0.08%	3.31%	0.00%	7.09%	0.01%
Adobe Inc	ADBE	440.20	515.93	227,112	0.59%			16.34%	0.10%
Vistra Corp	VST	340.23	159.84	54,382		0.55%			
AES Corp/The	AES	711.03	13.04	9,272		5.29%			
Expeditors International of Washington Inc	EXPD	139.98	120.91	16,924	0.04%	1.21%	0.00%	6.49%	0.00%
Amgen Inc	AMGN	537.53	282.87	152,052	0.40%	3.18%	0.01%	4.81%	0.02%
Apple Inc	AAPL	15,115.82	237.33	3,587,438	9.37%	0.42%	0.04%	14.22%	1.33%
Autodesk Inc	ADSK	215.00	291.90	62,759	0.16%			12.84%	0.02%
Cintas Corp	CTAS	403.30	225.79	91,061	0.24%	0.69%	0.00%	12.00%	0.03%
Comcast Corp	CMCSA	3,817.10	43.19	164,860	0.43%	2.87%	0.01%	8.63%	0.04%
Molson Coors Beverage Co	TAP	193.57	62.06	12,013	0.03%	2.84%	0.00%	4.90%	0.00%
KLA Corp	KLAC	133.76	647.03	86,547	0.23%	1.05%	0.00%	12.54%	0.03%
Marriott International Inc/MD	MAR	277.89	289.09	80,336	0.21%	0.87%	0.00%	5.20%	0.01%
Fiserv Inc	FI	568.92	220.96	125,708	0.33%			11.99%	0.04%
McCormick & Co Inc/MD	MKC	252.19	78.41	19,774	0.05%	2.30%	0.00%	6.92%	0.00%
PACCAR Inc	PCAR	524.30	117.00	61,343	0.16%	1.03%	0.00%	0.48%	0.00%
Costco Wholesale Corp	COST	443.07	971.88	430,614	1.12%	0.48%	0.01%	9.88%	0.11%
Stryker Corp	SYK	381.22	392.15	149,494	0.39%	0.82%	0.00%	12.22%	0.05%
Tyson Foods Inc	TSN	285.86	64.50	18,438	0.05%	3.10%	0.00%	18.97%	0.01%
Lamb Weston Holdings Inc	LW	142.60	77.24	11,014	0.03%	1.86%	0.00%	0.57%	0.00%
Applied Materials Inc	AMAT	824.40	174.71	144,032	0.38%	0.92%	0.00%	11.58%	0.04%
Cardinal Health Inc	CAH	242.01	122.24	29,583	0.08%	1.65%	0.00%	7.60%	0.01%
Cincinnati Financial Corp	CINF	156.32	159.83	24,984	0.07%	2.03%	0.00%	8.30%	0.01%
Paramount Global	PARA	626.27	10.85	6,795		1.84%		45.00%	
DR Horton Inc	DHI	321.17	168.78	54,207	0.14%	0.95%	0.00%	9.24%	0.01%
Electronic Arts Inc	EA	262.27	163.67	42,926	0.11%	0.46%	0.00%	12.85%	0.01%

STANDARD AND POOR'S 500 INDEX

Name	Ticker	[4] Shares Outst'g	[5] Price	[6] Market Capitalization	[7] Weight in Index	[8] Estimated Dividend Yield	[9] Cap-Weighted Dividend Yield	[10] Bloomberg Long-Term Growth Est.	[11] Cap-Weighted Long-Term Growth Est.
Erie Indemnity Co	ERIE	46.19	440.56	20,349		1.16%			
Fair Isaac Corp	FICO	24.35	2,375.03	57,827				30.00%	
Fastenal Co	FAST	572.89	83.56	47,870	0.12%	1.87%	0.00%	7.79%	0.01%
M&T Bank Corp	MTB	165.92	218.64	36,277	0.09%	2.47%	0.00%	5.10%	0.00%
Xcel Energy Inc	XEL	595.31	72.56	43,196	0.11%	3.02%	0.00%	7.36%	0.01%
Fifth Third Bancorp	FITB	670.54	48.06	32,226		3.08%		25.00%	
Gilead Sciences Inc	GILD	1,246.27	92.58	115,379	0.30%	3.33%	0.01%	16.28%	0.05%
Hasbro Inc	HAS	139.50	65.15	9,089		4.30%		27.48%	
Huntington Bancshares Inc/OH	HBAN	1,452.81	18.01	26,165	0.07%	3.44%	0.00%	3.45%	0.00%
Welltower Inc	WELL	622.69	138.18	86,043	0.22%	1.94%	0.00%	15.72%	0.04%
Biogen Inc	BIIB	145.72	160.63	23,407	0.06%			4.43%	0.00%
Northern Trust Corp	NTRS	198.22	111.16	22,034	0.06%	2.70%	0.00%	12.04%	0.01%
Packaging Corp of America	PKG	89.80	248.85	22,348	0.06%	2.01%	0.00%	7.85%	0.00%
Paychex Inc	PAYX	359.90	146.27	52,642	0.14%	2.68%	0.00%	6.99%	0.01%
QUALCOMM Inc	QCOM	1,111.00	158.53	176,127	0.46%	2.14%	0.01%	7.73%	0.04%
Ross Stores Inc	ROST	331.76	154.87	51,380		0.95%		98.30%	
IDEXX Laboratories Inc	IDXX	81.88	421.75	34,535	0.09%			9.75%	0.01%
Starbucks Corp	SBUX	1,133.80	102.46	116,169		2.38%			
KeyCorp	KEY	991.28	19.48	19,310	0.05%	4.21%	0.00%	20.00%	0.01%
Fox Corp	FOXA	221.16	47.12	10,421	0.03%	1.15%	0.00%	9.54%	0.00%
Fox Corp	FOX	235.58	44.73	10,538	0.03%	1.21%	0.00%	9.54%	0.00%
State Street Corp	STT	293.15	98.51	28,878	0.08%	3.09%	0.00%	10.37%	0.01%
Norwegian Cruise Line Holdings Ltd	NCLH	439.71	26.89	11,824				58.74%	
US Bancorp	USB	1,560.03	53.29	83,134	0.22%	3.75%	0.01%	8.51%	0.02%
A O Smith Corp	AOS	119.11	74.49	8,873		1.83%			
Gen Digital Inc	GEN	616.20	30.85	19,010	0.05%	1.62%	0.00%	6.77%	0.00%
T Rowe Price Group Inc	TROW	222.16	123.84	27,512	0.07%	4.01%	0.00%	8.17%	0.01%
Waste Management Inc	WM	401.37	228.22	91,600	0.24%	1.31%	0.00%	14.57%	0.03%
Constellation Brands Inc	STZ	181.54	240.95	43,741	0.11%	1.68%	0.00%	10.88%	0.01%
Invesco Ltd	IVZ	449.44	18.09	8,130	0.02%	4.53%	0.00%	12.44%	0.00%
Intuit Inc	INTU	279.92	641.73	179,631	0.47%	0.65%	0.00%	18.41%	0.09%
Morgan Stanley	MS	1,611.04	131.61	212,028	0.55%	2.81%	0.02%	10.16%	0.06%
Microchip Technology Inc	MCHP	537.01	68.17	36,608		2.67%		-19.88%	
Crowdstrike Holdings Inc	CRWD	233.85	345.97	80,906				54.97%	
Chubb Ltd	CB	403.10	288.73	116,386	0.30%	1.26%	0.00%	1.99%	0.01%
Hologic Inc	HOLX	226.94	79.50	18,042	0.05%			7.42%	0.00%
Citizens Financial Group Inc	CFG	440.70	48.14	21,215		3.49%			
Jabil Inc	JBL	112.84	135.83	15,327	0.04%	0.24%	0.00%	10.82%	0.00%
O'Reilly Automotive Inc	ORLY	57.73	1,243.22	71,772	0.19%			9.11%	0.02%
Allstate Corp/The	ALL	264.80	207.39	54,918		1.77%		175.00%	
Equity Residential	EQR	379.43	76.66	29,087	0.08%	3.52%	0.00%	3.08%	0.00%
BorgWarner Inc	BWA	218.70	34.21	7,482		1.29%		-1.00%	
Keurig Dr Pepper Inc	KDP	1,356.45	32.65	44,288	0.12%	2.82%	0.00%	6.73%	0.01%
Host Hotels & Resorts Inc	HST	699.03	18.42	12,876		4.34%		-1.49%	
Incyte Corp	INCY	192.65	74.59	14,370				39.79%	
Simon Property Group Inc	SPG	326.27	183.60	59,903	0.16%	4.58%	0.01%	1.34%	0.00%
Eastman Chemical Co	EMN	115.91	104.72	12,138	0.03%	3.09%	0.00%	5.72%	0.00%
AvalonBay Communities Inc	AVB	142.24	235.35	33,476	0.09%	2.89%	0.00%	5.41%	0.00%
Prudential Financial Inc	PRU	356.00	129.41	46,070	0.12%	4.02%	0.00%	3.22%	0.00%
United Parcel Service Inc	UPS	731.37	135.72	99,261	0.26%	4.80%	0.01%	1.72%	0.00%
Walgreens Boots Alliance Inc	WBA	864.62	9.02	7,799		11.09%		-21.19%	
STERIS PLC	STE	98.71	219.06	21,623		1.04%			
McKesson Corp	MCK	126.94	627.79	79,692	0.21%	0.45%	0.00%	13.43%	0.03%
Lockheed Martin Corp	LMT	237.04	526.11	124,707	0.33%	2.51%	0.01%	2.61%	0.01%
Cencora Inc	COR	193.28	251.55	48,620	0.13%	0.87%	0.00%	8.78%	0.01%
Capital One Financial Corp	COF	381.51	192.01	73,254	0.19%	1.25%	0.00%	14.13%	0.03%
The Campbell's Company	CPB	297.62	46.20	13,750	0.04%	3.20%	0.00%	5.71%	0.00%
Waters Corp	WAT	59.38	384.72	22,843	0.06%			6.20%	0.00%
Palantir Technologies Inc	PLTR	2,180.65	67.08	146,278				36.08%	
Nordson Corp	NDSN	57.18	260.99	14,924		1.20%			
Dollar Tree Inc	DLTR	214.99	71.27	15,322	0.04%			6.86%	0.00%
Darden Restaurants Inc	DRI	117.50	176.27	20,712	0.05%	3.18%	0.00%	9.75%	0.01%
Evergy Inc	EVRG	229.75	64.63	14,848	0.04%	4.13%	0.00%	5.35%	0.00%
Match Group Inc	MTCH	251.09	32.74	8,221				34.93%	
Domino's Pizza Inc	DPZ	34.53	476.19	16,444	0.04%	1.27%	0.00%	11.05%	0.00%
NVR Inc	NVR	3.06	9,235.58	28,297	0.07%			9.43%	0.01%
NetApp Inc	NTAP	203.31	122.64	24,933	0.07%	1.70%	0.00%	7.66%	0.00%
Old Dominion Freight Line Inc	ODFL	213.50	225.14	48,067	0.13%	0.46%	0.00%	8.80%	0.01%
DaVita Inc	DVA	82.00	166.17	13,626	0.04%			17.90%	0.01%
Hartford Financial Services Group Inc/The	HIG	289.89	122.79	35,596	0.09%	1.69%	0.00%	12.07%	0.01%
Iron Mountain Inc	IRM	293.46	123.67	36,292	0.09%	2.31%	0.00%	4.00%	0.00%
Estee Lauder Cos Inc/The	EL	233.44	72.12	16,835	0.04%	1.94%	0.00%	10.56%	0.00%
Cadence Design Systems Inc	CDNS	274.26	306.81	84,147	0.22%			15.76%	0.03%
Tyler Technologies Inc	TYL	42.80	629.17	26,928					
Universal Health Services Inc	UHS	58.71	205.00	12,037		0.39%		23.30%	
Skyworks Solutions Inc	SWKS	159.92	87.59	14,007	0.04%	3.20%	0.00%	15.09%	0.01%
Quest Diagnostics Inc	DGX	111.62	162.66	18,155	0.05%	1.84%	0.00%	6.28%	0.00%
Rockwell Automation Inc	ROK	112.90	295.14	33,320		1.78%			
Kraft Heinz Co/The	KHC	1,209.17	31.97	38,657	0.10%	5.00%	0.01%	1.87%	0.00%
American Tower Corp	AMT	467.29	209.00	97,663	0.25%	3.10%	0.01%	13.39%	0.03%
Regeneron Pharmaceuticals Inc	REGN	108.07	750.22	81,078				29.39%	
Amazon.com Inc	AMZN	10,515.01	207.89	2,185,966				35.35%	
Jack Henry & Associates Inc	JKHY	72.96	175.63	12,814	0.03%	1.25%	0.00%	9.30%	0.00%
Ralph Lauren Corp	RL	40.22	231.40	9,306	0.02%	1.43%	0.00%	11.25%	0.00%
BXP Inc	BXP	158.11	81.99	12,963	0.03%	4.78%	0.00%	0.65%	0.00%
Amphenol Corp	APH	1,205.61	72.65	87,588	0.23%	0.91%	0.00%	18.77%	0.04%
Howmet Aerospace Inc	HWM	406.26	118.38	48,093		0.27%		27.36%	
Valero Energy Corp	VLO	316.59	139.08	44,031		3.08%		-19.65%	
Synopsys Inc	SNPS	153.61	558.49	85,792	0.22%			12.82%	0.03%
CH Robinson Worldwide Inc	CHRW	118.21	105.58	12,480	0.03%	2.35%	0.00%	19.90%	0.01%

STANDARD AND POOR'S 500 INDEX

Name	Ticker	[4] Shares Outst'g	[5] Price	[6] Market Capitalization	[7] Weight in Index	[8] Estimated Dividend Yield	[9] Cap-Weighted Dividend Yield	[10] Bloomberg Long-Term Growth Est.	[11] Cap-Weighted Long-Term Growth Est.
Accenture PLC	ACN	626.38	362.37	226,983	0.59%	1.63%	0.01%	8.18%	0.05%
TransDigm Group Inc	TDG	56.23	1,252.97	70,455	0.18%			16.05%	0.03%
Yum! Brands Inc	YUM	279.07	138.27	38,587	0.10%	1.94%	0.00%	9.89%	0.01%
Prologis Inc	PLD	925.91	116.78	108,128	0.28%	3.29%	0.01%	3.56%	0.01%
FirstEnergy Corp	FE	576.32	42.55	24,522	0.06%	4.00%	0.00%	6.31%	0.00%
VeriSign Inc	VRSN	96.10	187.18	17,988					
Quanta Services Inc	PWR	147.61	344.52	50,855		0.12%			
Henry Schein Inc	HSIC	124.68	77.05	9,607	0.03%			8.39%	0.00%
Ameren Corp	AEE	266.51	94.39	25,156	0.07%	2.84%	0.00%	6.25%	0.00%
ANSYS Inc	ANSS	87.45	351.10	30,704	0.08%			11.53%	0.01%
FactSet Research Systems Inc	FDS	37.99	490.67	18,640	0.05%	0.85%	0.00%	9.00%	0.00%
NVIDIA Corp	NVDA	24,490.00	138.25	3,385,743		0.03%		49.81%	
Cognizant Technology Solutions Corp	CTSH	495.82	80.49	39,909	0.10%	1.49%	0.00%	6.40%	0.01%
Intuitive Surgical Inc	ISRG	356.18	542.00	193,049	0.50%			18.85%	0.09%
Take-Two Interactive Software Inc	TTWO	175.63	188.38	33,085				60.59%	
Republic Services Inc	RSG	313.15	218.30	68,361	0.18%	1.06%	0.00%	11.44%	0.02%
eBay Inc	EBAY	479.00	63.29	30,316	0.08%	1.71%	0.00%	9.93%	0.01%
Goldman Sachs Group Inc/The	GS	313.91	605.57	190,094	0.50%	1.98%	0.01%	14.95%	0.07%
SBA Communications Corp	SBAC	107.52	226.25	24,327	0.06%	1.73%	0.00%	17.77%	0.01%
Sempra	SRE	633.40	93.67	59,331	0.15%	2.65%	0.00%	6.46%	0.01%
Moody's Corp	MCO	181.20	499.98	90,596		0.68%			
ON Semiconductor Corp	ON	425.80	71.12	30,283				-1.44%	
Booking Holdings Inc	BKNG	33.10	5,201.98	172,168	0.45%	0.67%	0.00%	15.98%	0.07%
F5 Inc	FFIV	58.61	250.35	14,674	0.04%			6.72%	0.00%
Akamai Technologies Inc	AKAM	150.23	94.02	14,124	0.04%			7.09%	0.00%
Charles River Laboratories International Inc	CRL	51.14	199.06	10,179	0.03%			4.06%	0.00%
MarketAxess Holdings Inc	MKTX	37.70	258.69	9,754	0.03%	1.14%	0.00%	3.02%	0.00%
Devon Energy Corp	DVN	656.90	37.95	24,929		2.32%			
Bio-Techne Corp	TECH	158.89	75.36	11,974		0.42%			
Alphabet Inc	GOOGL	5,843.00	168.95	987,175	2.58%	0.47%	0.01%	16.07%	0.41%
Teleflex Inc	TFX	46.44	192.85	8,957	0.02%	0.71%	0.00%	7.50%	0.00%
Netflix Inc	NFLX	427.46	886.81	379,074				35.22%	
Allegion plc	ALLE	86.93	140.84	12,243	0.03%	1.36%	0.00%	8.33%	0.00%
Agilent Technologies Inc	A	287.33	137.97	39,643	0.10%	0.72%	0.00%	6.83%	0.01%
Warner Bros Discovery Inc	WBD	2,453.17	10.48	25,709				29.09%	
Elevance Health Inc	ELV	231.92	406.96	94,383	0.25%	1.60%	0.00%	11.90%	0.03%
Trimble Inc	TRMB	244.21	72.97	17,820					
CME Group Inc	CME	360.36	238.00	85,765	0.22%	1.93%	0.00%	3.55%	0.01%
Juniper Networks Inc	JNPR	331.09	35.70	11,820	0.03%	2.46%	0.00%	3.56%	0.00%
DTE Energy Co	DTE	206.93	125.78	26,027	0.07%	3.24%	0.00%	10.06%	0.01%
Nasdaq Inc	NDAQ	574.76	82.99	47,699	0.12%	1.16%	0.00%	9.60%	0.01%
Celanese Corp	CE	109.31	73.21	8,003	0.02%	3.82%	0.00%	9.15%	0.00%
Philip Morris International Inc	PM	1,554.83	133.06	206,886	0.54%	4.06%	0.02%	10.00%	0.05%
Salesforce Inc	CRM	956.00	329.99	315,470	0.82%	0.48%	0.00%	17.52%	0.14%
Ingersoll Rand Inc	IR	403.01	104.17	41,982	0.11%	0.08%	0.00%	17.00%	0.02%
Huntington Ingalls Industries Inc	HII	39.13	197.92	7,744	0.02%	2.73%	0.00%	7.36%	0.00%
Roper Technologies Inc	ROP	107.23	566.44	60,739		0.58%			
MetLife Inc	MET	692.42	88.23	61,092	0.16%	2.47%	0.00%	13.14%	0.02%
Tapestry Inc	TPR	233.04	62.28	14,513	0.04%	2.25%	0.00%	7.34%	0.00%
CSX Corp	CSX	1,928.42	36.55	70,484	0.18%	1.31%	0.00%	7.56%	0.01%
Edwards Lifesciences Corp	EW	589.80	71.35	42,082	0.11%			6.86%	0.01%
Ameriprise Financial Inc	AMP	97.01	573.97	55,683	0.15%	1.03%	0.00%	16.72%	0.02%
Zebra Technologies Corp	ZBRA	51.58	407.00	20,993					
Zimmer Biomet Holdings Inc	ZBH	199.07	112.10	22,316	0.06%	0.86%	0.00%	6.50%	0.00%
CBRE Group Inc	CBRE	306.02	139.99	42,839					
Camden Property Trust	CPT	106.68	125.80	13,421	0.04%	3.28%	0.00%	2.11%	0.00%
Mastercard Inc	MA	910.77	532.94	485,384	1.27%	0.50%	0.01%	14.68%	0.19%
CarMax Inc	KMX	154.92	83.97	13,009	0.03%			17.91%	0.01%
Intercontinental Exchange Inc	ICE	574.18	160.96	92,419	0.24%	1.12%	0.00%	11.26%	0.03%
Smurfit WestRock PLC	SW	520.16	55.02	28,619		2.20%		-1.71%	
Fidelity National Information Services Inc	FIS	538.35	85.30	45,922		1.69%		22.90%	
Chipotle Mexican Grill Inc	CMG	1,362.59	61.52	83,827				22.88%	
Wynn Resorts Ltd	WYNN	109.81	94.38	10,364		1.06%		-13.11%	
Live Nation Entertainment Inc	LYV	232.35	138.25	32,123				32.27%	
Assurant Inc	AIZ	51.29	227.10	11,647		1.41%			
NRG Energy Inc	NRG	202.57	101.61	20,583	0.05%	1.60%	0.00%	9.40%	0.01%
Regions Financial Corp	RF	908.86	27.01	24,548	0.06%	3.70%	0.00%	5.52%	0.00%
Monster Beverage Corp	MNST	972.52	55.13	53,615	0.14%			9.94%	0.01%
Mosaic Co/The	MOS	317.65	26.46	8,405		3.17%		-22.38%	
Baker Hughes Co	BKR	989.53	43.95	43,490		1.91%		25.86%	
Expedia Group Inc	EXPE	122.82	184.62	22,676				22.64%	
CF Industries Holdings Inc	CF	174.02	89.66	15,603		2.23%		-6.90%	
Leidos Holdings Inc	LDOS	133.43	165.40	22,070	0.06%	0.97%	0.00%	15.41%	0.01%
APA Corp	APA	369.95	22.65	8,379		4.42%		-10.77%	
Alphabet Inc	GOOG	5,534.00	170.49	943,492	2.46%	0.47%	0.01%	16.07%	0.40%
First Solar Inc	FSLR	107.06	199.27	21,333				41.38%	
Discover Financial Services	DFS	251.07	182.43	45,803	0.12%	1.53%	0.00%	11.74%	0.01%
Visa Inc	V	1,728.11	315.08	544,491	1.42%	0.75%	0.01%	12.50%	0.18%
Mid-America Apartment Communities Inc	MAA	116.88	164.16	19,187	0.05%	3.58%	0.00%	0.79%	0.00%
Xylem Inc/NY	XYL	242.94	126.75	30,793		1.14%			
Marathon Petroleum Corp	MPC	321.39	156.15	50,185		2.33%		-13.05%	
Advanced Micro Devices Inc	AMD	1,622.81	137.18	222,609				41.66%	
Tractor Supply Co	TSCO	106.84	283.67	30,307	0.08%	1.55%	0.00%	6.20%	0.00%
ResMed Inc	RMD	146.80	249.02	36,555	0.10%	0.85%	0.00%	12.61%	0.01%
Mettler-Toledo International Inc	MTD	21.10	1,251.20	26,404	0.07%			8.25%	0.01%
Jacobs Solutions Inc	J	123.97	141.23	17,508		0.82%			
Copart Inc	CPRT	963.53	63.39	61,078					
VICI Properties Inc	VICI	1,043.14	32.61	34,017	0.09%	5.31%	0.00%	2.72%	0.00%
Fortinet Inc	FTNT	766.45	95.05	72,851	0.19%			17.59%	0.03%
Albemarle Corp	ALB	117.54	107.70	12,659		1.50%		23.74%	

STANDARD AND POOR'S 500 INDEX

Name	Ticker	[4] Shares Outst'g	[5] Price	[6] Market Capitalization	[7] Weight in Index	[8] Estimated Dividend Yield	[9] Cap-Weighted Dividend Yield	[10] Bloomberg Long-Term Growth Est.	[11] Cap-Weighted Long-Term Growth Est.
Moderna Inc	MRNA	384.82	43.06	16,570	0.04%			17.67%	0.01%
Essex Property Trust Inc	ESS	64.27	310.46	19,952	0.05%	3.16%	0.00%	2.91%	0.00%
CoStar Group Inc	CSGP	409.96	81.34	33,346					
Realty Income Corp	O	875.21	57.63	50,435	0.13%	5.49%	0.01%	3.78%	0.00%
Westinghouse Air Brake Technologies Corp	WAB	171.89	200.62	34,484	0.09%	0.40%	0.00%	18.16%	0.02%
Pool Corp	POOL	38.06	377.09	14,350	0.04%	1.27%	0.00%	0.20%	0.00%
Western Digital Corp	WDC	345.71	72.99	25,233				-10.00%	
PepsiCo Inc	PEP	1,371.99	163.45	224,252	0.59%	3.32%	0.02%	6.26%	0.04%
TE Connectivity PLC	TEL	299.16	151.12	45,209	0.12%	1.72%	0.00%	4.55%	0.01%
Diamondback Energy Inc	FANG	291.99	177.59	51,854		2.03%			
Palo Alto Networks Inc	PANW	328.10	387.82	127,244	0.33%			13.41%	0.04%
ServiceNow Inc	NOW	206.00	1,049.44	216,185				25.00%	
Church & Dwight Co Inc	CHD	245.00	110.13	26,982	0.07%	1.03%	0.00%	7.39%	0.01%
Federal Realty Investment Trust	FRT	84.96	116.65	9,911	0.03%	3.77%	0.00%	4.26%	0.00%
Amentum Holdings Inc	AMTM	243.29	24.35	5,924					
MGM Resorts International	MGM	297.74	38.34	11,415	0.03%			5.61%	0.00%
American Electric Power Co Inc	AEP	532.57	99.86	53,182	0.14%	3.73%	0.01%	6.40%	0.01%
Invitation Homes Inc	INVH	612.61	34.25	20,982	0.05%	3.27%	0.00%	3.63%	0.00%
PTC Inc	PTC	120.13	200.06	24,033	0.06%			16.59%	0.01%
JB Hunt Transport Services Inc	JBHT	100.83	189.11	19,068	0.05%	0.91%	0.00%	11.01%	0.01%
Lam Research Corp	LRCX	1,286.69	73.88	95,060	0.25%	1.25%	0.00%	15.78%	0.04%
Mohawk Industries Inc	MHK	63.12	138.83	8,763	0.02%			2.71%	0.00%
Pentair PLC	PNR	165.23	108.99	18,009	0.05%	0.84%	0.00%	12.71%	0.01%
GE HealthCare Technologies Inc	GEHC	456.87	83.22	38,021	0.10%	0.17%	0.00%	10.24%	0.01%
Vertex Pharmaceuticals Inc	VRTX	257.53	468.13	120,557	0.31%			12.20%	0.04%
Amcor PLC	AMCR	1,445.34	10.64	15,378	0.04%	4.79%	0.00%	7.52%	0.00%
Meta Platforms Inc	META	2,180.00	574.32	1,252,018		0.35%		21.60%	
T-Mobile US Inc	TMUS	1,160.49	246.94	286,571	0.75%	1.43%	0.01%	5.00%	0.04%
United Rentals Inc	URI	65.62	866.00	56,829	0.15%	0.75%	0.00%	7.62%	0.01%
Honeywell International Inc	HON	650.25	232.93	151,462	0.40%	1.94%	0.01%	7.58%	0.03%
Alexandria Real Estate Equities Inc	ARE	174.76	110.23	19,264	0.05%	4.72%	0.00%	2.82%	0.00%
Delta Air Lines Inc	DAL	645.28	63.82	41,182	0.11%	0.94%	0.00%	8.76%	0.01%
Seagate Technology Holdings PLC	STX	211.53	101.33	21,434		2.84%		-11.00%	
United Airlines Holdings Inc	UAL	328.80	96.83	31,838	0.08%			9.00%	0.01%
News Corp	NWS	190.00	32.09	6,097		0.62%			
Centene Corp	CNC	504.87	60.00	30,292	0.08%			6.35%	0.01%
Martin Marietta Materials Inc	MLM	61.12	599.21	36,623	0.10%	0.53%	0.00%	8.39%	0.01%
Teradyne Inc	TER	162.86	110.00	17,915	0.05%	0.44%	0.00%	14.60%	0.01%
PayPal Holdings Inc	PYPL	1,002.54	86.77	86,990	0.23%			14.76%	0.03%
Tesla Inc	TSLA	3,210.06	345.16	1,107,984	2.89%			1.00%	0.03%
Blackrock Inc	BLK	148.13	1,022.80	151,506	0.40%	1.99%	0.01%	12.51%	0.05%
Arch Capital Group Ltd	ACGL	376.24	100.72	37,895	0.10%			4.00%	0.00%
KKR & Co Inc	KKR	888.23	162.87	144,666		0.43%		29.00%	
Dow Inc	DOW	700.09	44.21	30,951		6.33%		-4.83%	
Everest Group Ltd	EG	42.98	387.56	16,657	0.04%	2.06%	0.00%	0.81%	0.00%
Teledyne Technologies Inc	TDY	46.60	485.26	22,614	0.06%			7.41%	0.00%
GE Vernova Inc	GEV	275.65	334.12	92,101				81.12%	
News Corp	NWSA	378.91	29.35	11,121		0.68%			
Exelon Corp	EXC	1,004.83	39.56	39,751	0.10%	3.84%	0.00%	5.48%	0.01%
Global Payments Inc	GPN	254.49	118.96	30,275	0.08%	0.84%	0.00%	9.02%	0.01%
Crown Castle Inc	CCI	434.60	106.25	46,176	0.12%	5.89%	0.01%	2.12%	0.00%
Aptiv PLC	APTV	235.04	55.53	13,052	0.03%			13.28%	0.00%
Align Technology Inc	ALGN	74.65	232.77	17,377	0.05%			5.19%	0.00%
Kenvue Inc	KVUE	1,917.26	24.08	46,168	0.12%	3.41%	0.00%	13.58%	0.02%
Targa Resources Corp	TRGP	218.06	204.30	44,550		1.47%		27.23%	
Bunge Global SA	BG	139.63	89.74	12,530		3.03%		-8.88%	
Deckers Outdoor Corp	DECK	151.92	195.96	29,771	0.08%			10.50%	0.01%
LKQ Corp	LKQ	259.96	39.29	10,214		3.05%			
Zoetis Inc	ZTS	451.17	175.25	79,067	0.21%	0.99%	0.00%	9.58%	0.02%
Digital Realty Trust Inc	DLR	331.71	195.69	64,913	0.17%	2.49%	0.00%	4.12%	0.01%
Equinix Inc	EQIX	96.49	981.48	94,701	0.25%	1.74%	0.00%	16.07%	0.04%
Las Vegas Sands Corp	LVS	725.03	53.06	38,470		1.51%			
Molina Healthcare Inc	MOH	57.20	297.90	17,040	0.04%			11.73%	0.01%

Notes:
[1] Equals sum of Col. [9]
[2] Equals sum of Col. [11]
[3] Equals ([1] x (1 + (0.5 x [2]))) + [2]
[4] Bloomberg Professional as of November 30, 2024
[5] Bloomberg Professional as of November 30, 2024
[6] Equals [4] x [5]
[7] Equals weight in S&P 500 based on market capitalization [6] if Growth Rate >0% and ≤20%
[8] Bloomberg Professional, as of November 30, 2024
[9] Equals [7] x [8]
[10] Bloomberg Professional, as of November 30, 2024
[11] Equals [7] x [10]

BOND YIELD PLUS RISK PREMIUM

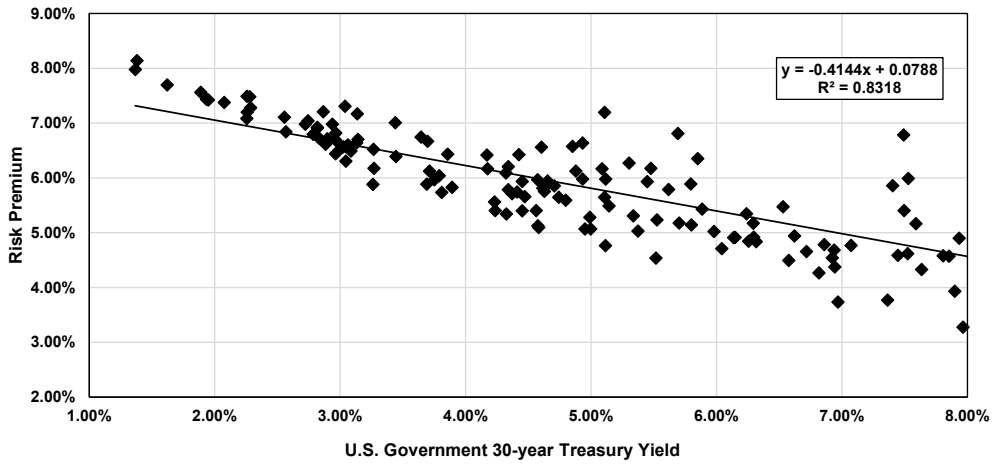
Quarter	[1] Average Authorized Electric ROE	[2] U.S. Govt. 30-year Treasury	[3] Risk Premium
1980.1	13.97%	11.66%	2.31%
1980.2	14.25%	10.52%	3.73%
1980.3	14.30%	10.85%	3.45%
1980.4	14.32%	12.10%	2.23%
1981.1	14.82%	12.53%	2.28%
1981.2	15.05%	13.24%	1.81%
1981.3	15.31%	14.13%	1.17%
1981.4	15.59%	13.85%	1.74%
1982.1	15.71%	13.96%	1.75%
1982.2	15.60%	13.52%	2.08%
1982.3	15.85%	12.79%	3.06%
1982.4	16.03%	10.75%	5.28%
1983.1	15.54%	10.71%	4.83%
1983.2	15.13%	10.65%	4.48%
1983.3	15.39%	11.62%	3.77%
1983.4	15.37%	11.74%	3.63%
1984.1	15.06%	12.04%	3.02%
1984.2	15.18%	13.18%	2.00%
1984.3	15.38%	12.69%	2.69%
1984.4	15.69%	11.70%	3.99%
1985.1	15.48%	11.58%	3.90%
1985.2	15.27%	11.00%	4.27%
1985.3	14.91%	10.55%	4.36%
1985.4	15.11%	10.04%	5.07%
1986.1	14.42%	8.77%	5.65%
1986.2	14.27%	7.49%	6.78%
1986.3	13.26%	7.40%	5.86%
1986.4	13.52%	7.53%	5.99%
1987.1	12.90%	7.49%	5.40%
1987.2	13.17%	8.53%	4.64%
1987.3	13.14%	9.06%	4.08%
1987.4	12.76%	9.23%	3.53%
1988.1	12.74%	8.63%	4.11%
1988.2	12.70%	9.06%	3.63%
1988.3	12.78%	9.18%	3.60%
1988.4	12.97%	8.97%	4.00%
1989.1	13.02%	9.04%	3.99%
1989.2	13.22%	8.70%	4.52%
1989.3	12.38%	8.12%	4.26%
1989.4	12.83%	7.93%	4.90%
1990.1	12.62%	8.44%	4.19%
1990.2	12.85%	8.65%	4.20%
1990.3	12.54%	8.79%	3.75%
1990.4	12.68%	8.56%	4.12%
1991.1	12.66%	8.20%	4.46%
1991.2	12.67%	8.31%	4.36%
1991.3	12.49%	8.19%	4.30%
1991.4	12.42%	7.85%	4.57%
1992.1	12.38%	7.81%	4.58%
1992.2	11.83%	7.90%	3.93%
1992.3	12.03%	7.45%	4.59%
1992.4	12.14%	7.52%	4.62%
1993.1	11.84%	7.07%	4.76%
1993.2	11.64%	6.86%	4.78%
1993.3	11.15%	6.32%	4.84%
1993.4	11.04%	6.14%	4.91%
1994.1	11.07%	6.58%	4.49%
1994.2	11.13%	7.36%	3.77%
1994.3	12.75%	7.59%	5.16%
1994.4	11.24%	7.96%	3.28%
1995.1	11.96%	7.63%	4.33%
1995.2	11.32%	6.94%	4.37%
1995.3	11.37%	6.72%	4.65%
1995.4	11.58%	6.24%	5.35%
1996.1	11.46%	6.29%	5.17%
1996.2	11.46%	6.92%	4.54%

BOND YIELD PLUS RISK PREMIUM

Quarter	[1] Average Authorized Electric ROE	[2] U.S. Govt. 30-year Treasury	[3] Risk Premium
1996.3	10.70%	6.97%	3.73%
1996.4	11.56%	6.62%	4.94%
1997.1	11.08%	6.82%	4.26%
1997.2	11.62%	6.94%	4.68%
1997.3	12.00%	6.53%	5.47%
1997.4	11.06%	6.15%	4.91%
1998.1	11.31%	5.88%	5.43%
1998.2	12.20%	5.85%	6.35%
1998.3	11.65%	5.48%	6.17%
1998.4	12.30%	5.11%	7.19%
1999.1	10.40%	5.37%	5.03%
1999.2	10.94%	5.80%	5.14%
1999.3	10.75%	6.04%	4.71%
1999.4	11.10%	6.26%	4.84%
2000.1	11.21%	6.30%	4.92%
2000.2	11.00%	5.98%	5.02%
2000.3	11.68%	5.79%	5.89%
2000.4	12.50%	5.69%	6.81%
2001.1	11.38%	5.45%	5.93%
2001.2	10.88%	5.70%	5.17%
2001.3	10.76%	5.53%	5.23%
2001.4	11.57%	5.30%	6.27%
2002.1	10.05%	5.52%	4.53%
2002.2	11.41%	5.62%	5.79%
2002.3	11.25%	5.09%	6.16%
2002.4	11.57%	4.93%	6.63%
2003.1	11.43%	4.85%	6.57%
2003.2	11.16%	4.60%	6.56%
2003.3	9.88%	5.11%	4.76%
2003.4	11.09%	5.11%	5.98%
2004.1	11.00%	4.88%	6.12%
2004.2	10.64%	5.34%	5.30%
2004.3	10.75%	5.11%	5.64%
2004.4	10.91%	4.93%	5.98%
2005.1	10.56%	4.71%	5.85%
2005.2	10.13%	4.47%	5.65%
2005.3	10.85%	4.42%	6.42%
2005.4	10.59%	4.65%	5.94%
2006.1	10.38%	4.63%	5.75%
2006.2	10.63%	5.14%	5.49%
2006.3	10.06%	5.00%	5.07%
2006.4	10.39%	4.74%	5.64%
2007.1	10.39%	4.80%	5.59%
2007.2	10.27%	4.99%	5.28%
2007.3	10.02%	4.95%	5.07%
2007.4	10.43%	4.61%	5.81%
2008.1	10.15%	4.41%	5.74%
2008.2	10.54%	4.57%	5.96%
2008.3	10.38%	4.45%	5.93%
2008.4	10.39%	3.64%	6.74%
2009.1	10.45%	3.44%	7.01%
2009.2	10.58%	4.17%	6.41%
2009.3	10.41%	4.32%	6.09%
2009.4	10.54%	4.34%	6.20%
2010.1	10.45%	4.62%	5.82%
2010.2	10.08%	4.37%	5.71%
2010.3	10.29%	3.86%	6.43%
2010.4	10.34%	4.17%	6.17%
2011.1	9.96%	4.56%	5.40%
2011.2	10.12%	4.34%	5.78%

BOND YIELD PLUS RISK PREMIUM

	[1]	[2]	[3]
Quarter	Average Authorized Electric ROE	U.S. Govt. 30-year Treasury	Risk Premium
2011.3	10.36%	3.70%	6.66%
2011.4	10.34%	3.04%	7.31%
2012.1	10.30%	3.14%	7.17%
2012.2	9.92%	2.94%	6.98%
2012.3	9.78%	2.74%	7.04%
2012.4	10.07%	2.86%	7.21%
2013.1	9.77%	3.13%	6.64%
2013.2	9.84%	3.14%	6.70%
2013.3	9.83%	3.71%	6.12%
2013.4	9.82%	3.79%	6.04%
2014.1	9.57%	3.69%	5.88%
2014.2	9.83%	3.44%	6.39%
2014.3	9.79%	3.27%	6.52%
2014.4	9.78%	2.96%	6.81%
2015.1	9.66%	2.55%	7.11%
2015.2	9.50%	2.88%	6.61%
2015.3	9.40%	2.96%	6.44%
2015.4	9.65%	2.96%	6.69%
2016.1	9.70%	2.72%	6.98%
2016.2	9.41%	2.57%	6.84%
2016.3	9.76%	2.28%	7.48%
2016.4	9.55%	2.83%	6.72%
2017.1	9.61%	3.05%	6.57%
2017.2	9.61%	2.90%	6.71%
2017.3	9.73%	2.82%	6.91%
2017.4	9.74%	2.82%	6.92%
2018.1	9.59%	3.02%	6.57%
2018.2	9.57%	3.09%	6.49%
2018.3	9.66%	3.06%	6.60%
2018.4	9.44%	3.27%	6.17%
2019.1	9.57%	3.01%	6.55%
2019.2	9.58%	2.78%	6.79%
2019.3	9.57%	2.29%	7.28%
2019.4	9.74%	2.26%	7.49%
2020.1	9.45%	1.89%	7.56%
2020.2	9.52%	1.38%	8.14%
2020.3	9.34%	1.37%	7.98%
2020.4	9.32%	1.62%	7.69%
2021.1	9.45%	2.07%	7.38%
2021.2	9.46%	2.26%	7.20%
2021.3	9.37%	1.93%	7.43%
2021.4	9.37%	1.95%	7.42%
2022.1	9.34%	2.25%	7.08%
2022.2	9.35%	3.05%	6.30%
2022.3	9.14%	3.26%	5.88%
2022.4	9.72%	3.89%	5.83%
2023.1	9.71%	3.75%	5.96%
2023.2	9.54%	3.81%	5.73%
2023.3	9.63%	4.23%	5.40%
2023.4	9.68%	4.58%	5.09%
2024.1	9.66%	4.32%	5.34%
2024.2	9.70%	4.58%	5.12%
2024.3	9.79%	4.23%	5.56%
2024.4	9.85%	4.45%	5.40%
AVERAGE	11.42%	6.05%	5.38%
MEDIAN	10.92%	5.22%	5.52%



SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.9120048
R Square	0.8317528
Adjusted R Square	0.8308076
Standard Error	0.0056940
Observations	180

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.02853	0.02853	879.96732	0.00000
Residual	178	0.00577	0.00003		
Total	179	0.03430			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.0788	0.00	83.39	0.0000	0.0770	0.0807	0.0770	0.0807
U.S. Govt. 30-year Treasury	(0.4144)	0.01	(29.66)	0.0000	(0.4419)	(0.3868)	(0.4419)	(0.3868)

	U.S. Govt. 30-year Treasury [7]	Risk Premium [8]	ROE [9]
Current 30-day average of 30-year U.S. Treasury bond yield [4]	4.52%	6.01%	10.53%
Blue Chip Near-Term Projected Forecast (Q1 2025 - Q1 2026) [5]	4.42%	6.05%	10.47%
Blue Chip Long-Term Projected Forecast (2026-2030) [6]	4.30%	6.10%	10.40%
AVERAGE			10.47%

Notes:
[1] Regulatory Research Associates, rate cases through November 30, 2024
[2] S&P Capital IQ Pro, quarterly bond yields are the average of each trading day in the quarter
[3] Equals Column [1] − Column [2]
[4] S&P Capital IQ Pro, 30-day average as of November 30, 2024
[5] Blue Chip Financial Forecasts, Vol. 43, No. 12, November 27, 2024, at 2
[6] Blue Chip Financial Forecasts, Vol. 43, No. 12, November 27, 2024, at 14
[7] See notes [4], [5] & [6]
[8] Equals 0.078824 + (-0.414361 x Column [7])
[9] Equals Column [7] + Column [8]

Dr. Won's DCF Analysis
Stock Prices

As Filed

		[1]	[2]	[3]	[4]	[5]	[6]	[7]
		April 2024		May 2024		June 2024		
Company	Ticker	Max Stock Price	Min Stock Price	Max Stock Price	Min Stock Price	Max Stock Price	Min Stock Price	Aveage Stock Price
Alliant Energy Corporation	LNT	$ 50.61	$ 47.23	$ 52.31	$ 49.05	$ 52.03	$ 49.25	$ 50.08
American Electric Power Co. Inc.	AEP	$ 88.30	$ 79.16	$ 93.44	$ 85.70	$ 91.00	$ 85.93	$ 87.26
Avista Corporation	AVA	$ 36.12	$ 33.00	$ 38.91	$ 35.84	$ 37.24	$ 33.58	$ 35.78
CMS Energy Corporation	CMS	$ 60.97	$ 56.61	$ 63.70	$ 60.16	$ 63.44	$ 58.54	$ 60.57
Duke Energy Corporation	DUK	$ 99.61	$ 92.75	$104.60	$ 97.49	$104.87	$ 99.30	$ 99.77
Entergy Corporation	ETR	$108.45	$100.38	$114.28	$105.04	$112.49	$ 105.35	$ 107.67
Evergy, Inc.	EVRG	$ 53.42	$ 49.55	$ 56.34	$ 52.11	$ 54.97	$ 52.10	$ 53.08
IDACORP, Inc.	IDA	$ 95.88	$ 88.70	$ 99.21	$ 92.18	$ 96.01	$ 90.64	$ 93.77
Northwestern Corporation	NWE	$ 51.02	$ 47.48	$ 53.03	$ 49.99	$ 52.39	$ 48.91	$ 50.47
OGE Energy Corp.	OGE	$ 34.76	$ 32.37	$ 37.30	$ 34.18	$ 36.70	$ 34.84	$ 35.03
Pinnacle West Capital Corp	PNW	$ 75.28	$ 70.73	$ 78.89	$ 73.14	$ 78.86	$ 74.45	$ 75.23
Portland General Electric Co	POR	$ 44.75	$ 40.10	$ 45.49	$ 42.60	$ 44.74	$ 41.86	$ 43.26
PPL Corporation	PPL							
The Southern Company	SO	$ 74.85	$ 67.53	$ 80.23	$ 73.20	$ 80.84	$ 77.18	$ 75.64
Xcel Energy Inc.	XEL	$ 55.69	$ 52.17	$ 56.79	$ 52.85	$ 56.54	$ 52.68	$ 54.45

[1] Schedule SJW-d11

Dr. Won's DCF Analysis
Stock Prices

Updated to Reflect Most Current Data as of the Filing of Dr. Won's Testimony

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
		April 2024		May 2024		June 2024		July 2024		August 2024		September 2024		
Company	Ticker	Max Stock Price	Min Stock Price	Max Stock Price	Min Stock Price	Max Stock Price	Min Stock Price	Max Stock Price	Min Stock Price	Max Stock Price	Min Stock Price	Max Stock Price	Min Stock Price	6 Month Average Stock Price
Alliant Energy Corporation	LNT	$ 49.06	$ 46.16	$ 51.26	$ 48.54	$ 55.21	$ 48.80	$ 55.21	$ 49.90	$ 57.80	$ 54.78	$ 60.25	$ 58.11	$ 52.92
American Electric Power Co. Inc.	AEP	$ 84.42	$ 77.28	$ 90.95	$ 85.67	$ 96.32	$ 85.28	$ 96.32	$ 85.49	$ 99.90	$ 95.63	$ 103.94	$ 99.77	$ 91.75
Avista Corporation	AVA	$ 34.68	$ 31.91	$ 37.05	$ 35.17	$ 38.58	$ 32.89	$ 38.58	$ 32.76	$ 38.68	$ 36.81	$ 38.67	$ 37.17	$ 36.08
CMS Energy Corporation	CMS	$ 59.20	$ 55.56	$ 62.27	$ 59.42	$ 64.12	$ 58.04	$ 64.12	$ 57.80	$ 67.35	$ 64.01	$ 70.10	$ 67.50	$ 62.46
Duke Energy Corporation	DUK	$ 96.22	$ 90.24	$ 102.44	$ 96.50	$ 107.86	$ 97.98	$ 107.86	$ 97.50	$ 112.87	$ 108.95	$ 116.59	$114.05	$ 104.09
Entergy Corporation	ETR	$ 104.52	$ 97.79	$ 112.21	$ 104.83	$ 114.29	$ 103.95	$ 114.29	$ 102.91	$ 119.72	$ 113.48	$ 130.55	$120.65	$ 111.60
Evergy, Inc.	EVRG	$ 51.29	$ 47.95	$ 54.45	$ 51.22	$ 56.77	$ 51.51	$ 56.77	$ 51.35	$ 58.89	$ 57.25	$ 61.37	$ 59.08	$ 54.83
IDACORP, Inc.	IDA	$ 92.56	$ 86.96	$ 97.38	$ 91.01	$ 97.01	$ 89.63	$ 97.01	$ 90.55	$ 102.47	$ 99.56	$ 103.78	$101.40	$ 95.78
Northwestern Corporation	NWE	$ 49.41	$ 46.73	$ 51.56	$ 48.86	$ 53.14	$ 48.49	$ 53.14	$ 48.11	$ 53.75	$ 50.89	$ 57.27	$ 53.40	$ 51.23
OGE Energy Corp.	OGE	$ 33.89	$ 31.77	$ 36.38	$ 34.19	$ 38.42	$ 34.34	$ 38.42	$ 34.58	$ 39.37	$ 38.04	$ 40.76	$ 39.19	$ 36.61
Pinnacle West Capital Corp	PNW	$ 72.50	$ 68.92	$ 77.24	$ 73.40	$ 83.83	$ 73.07	$ 83.83	$ 73.96	$ 87.31	$ 84.34	$ 90.37	$ 86.89	$ 79.64
Portland General Electric Co	POR	$ 42.73	$ 39.66	$ 44.30	$ 41.82	$ 47.37	$ 41.49	$ 47.37	$ 42.00	$ 47.61	$ 45.59	$ 48.58	$ 47.04	$ 44.63
PPL Corporation	PPL	$ 27.06	$ 25.57	$ 29.33	$ 27.45	$ 29.73	$ 27.43	$ 29.73	$ 27.14	$ 31.66	$ 29.81	$ 33.08	$ 31.79	$ 29.15
The Southern Company	SO	$ 72.51	$ 66.06	$ 78.83	$ 72.64	$ 82.15	$ 76.30	$ 82.15	$ 75.74	$ 87.13	$ 85.04	$ 89.78	$ 87.69	$ 79.67
Xcel Energy Inc.	XEL	$ 54.30	$ 51.56	$ 55.69	$ 52.31	$ 58.13	$ 52.66	$ 58.13	$ 51.66	$ 60.93	$ 57.36	$ 65.30	$ 61.98	$ 56.67

[1] - [12] Bloomberg Professional; adjusted closing prices. Note, the prices for April 2024, May 2024, and June 2024 differ from shown on Schedule SJW-d11 because Dr. Won reflects intraday high/low prices instead of high/low closing prices.

Dr. Won Growth Rate Estimates

As Filed

Company	Ticker	[1] Projected EPS	[2] Projected DPS	[3] Projected BVPS	[4] Average	[5] Projected GDP Growth	[6] DCF Growth
				Weight:	20%	80%	
Data through June 30, 2024							
Alliant Energy Corporation	LNT	6.00%	6.00%	4.00%	5.33%	3.90%	4.19%
American Electric Power Company, Inc.	AEP	6.50%	5.50%	6.00%	6.00%	3.90%	4.32%
Avista Corporation	AVA	6.00%	4.50%	3.50%	4.67%	3.90%	4.05%
CMS Energy Corporation	CMS	5.00%	4.00%	4.00%	4.33%	3.90%	3.99%
Duke Energy Corporation	DUK	5.00%	2.00%	2.50%	3.17%	3.90%	3.75%
Entergy Corporation	ETR	0.50%	3.50%	4.00%	2.67%	3.90%	3.65%
Evergy, Inc.	EVRG	7.50%	7.00%	3.50%	6.00%	3.90%	4.32%
IDACORP, Inc.	IDA	5.00%	5.50%	4.00%	4.83%	3.90%	4.09%
Northwestern Corporation	NWE	4.00%	2.00%	3.00%	3.00%	3.90%	3.72%
OGE Energy Corp.	OGE	6.50%	3.00%	5.50%	5.00%	3.90%	4.12%
Pinnacle West Capital Corporation	PNW	4.50%	1.50%	4.50%	3.50%	3.90%	3.82%
Portland General Electric Company	POR	6.00%	5.50%	4.00%	5.17%	3.90%	4.15%
PPL Corporation	PPL	*** DID NOT INCLUDE ***					
The Southern Company	SO	6.50%	3.50%	3.50%	4.50%	3.90%	4.02%
Xcel Energy Inc.	XEL	6.00%	6.50%	5.00%	5.83%	3.90%	4.29%
Average		**5.36%**	**4.29%**	**4.07%**	**4.57%**	**3.90%**	**4.03%**

Notes:
[1] The Value Line Investment Survey
[2] The Value Line Investment Survey
[3] The Value Line Investment Survey
[4] Average of [1], [2], [3]
[5] Congress Budget Office, Budget Economic Outlook
[6] Equals ([5] x 80%) + ([4] x 20%)

Dr. Won Growth Rate Estimates

Updated to Reflect Most Current Data as of the Filing of Dr. Won's Testimony and to Include PPL Corporation in Proxy Group

Company	Ticker	[1] Projected EPS	[2] Projected DPS	[3] Projected BVPS	[4] Average	[5] Projected GDP Growth	[6] DCF Growth
				Weight:	20%	80%	
Data through September 30, 2024							
Alliant Energy Corporation	LNT	6.00%	6.00%	4.00%	5.33%	3.90%	4.19%
American Electric Power Company, Inc.	AEP	6.50%	5.50%	6.00%	6.00%	3.90%	4.32%
Avista Corporation	AVA	5.00%	4.00%	2.00%	3.67%	3.90%	3.85%
CMS Energy Corporation	CMS	6.00%	5.00%	5.00%	5.33%	3.90%	4.19%
Duke Energy Corporation	DUK	5.00%	2.00%	2.50%	3.17%	3.90%	3.75%
Entergy Corporation	ETR	0.50%	3.50%	5.00%	3.00%	3.90%	3.72%
Evergy, Inc.	EVRG	7.50%	7.00%	3.50%	6.00%	3.90%	4.32%
IDACORP, Inc.	IDA	5.50%	5.50%	4.00%	5.00%	3.90%	4.12%
Northwestern Corporation	NWE	4.00%	2.00%	3.00%	3.00%	3.90%	3.72%
OGE Energy Corp.	OGE	6.50%	3.00%	5.50%	5.00%	3.90%	4.12%
Pinnacle West Capital Corporation	PNW	4.50%	1.50%	4.50%	3.50%	3.90%	3.82%
Portland General Electric Company	POR	6.00%	5.50%	4.00%	5.17%	3.90%	4.15%
PPL Corporation	PPL	7.50%	n/a	3.00%	5.25%	3.90%	4.17%
The Southern Company	SO	6.50%	3.50%	3.50%	4.50%	3.90%	4.02%
Xcel Energy Inc.	XEL	7.00%	5.50%	5.50%	6.00%	3.90%	4.32%
Average		**5.60%**	**4.25%**	**4.07%**	**4.66%**	**3.90%**	**4.05%**

Notes:
[1] The Value Line Investment Survey
[2] The Value Line Investment Survey
[3] The Value Line Investment Survey
[4] Average of [1], [2], [3]
[5] Congress Budget Office, Budget Economic Outlook
[6] Equals ([4] x 80%) + ([5] x 20%)

Dr. Won Growth Rate Estimates

Updated to Reflect Most Current Data as of the Filing of Dr. Won's Testimony and to Include PPL Corporation in Proxy Group, and Corrected to Reflect FERC Weighting

Company	Ticker	[1] Projected EPS	[2] Projected GDP Growth	[3] DCF Growth
Corrected FERC Weight:		80%	20%	
Data through September 30, 2024				
Alliant Energy Corporation	LNT	6.00%	3.90%	5.58%
American Electric Power Company, Inc.	AEP	6.50%	3.90%	5.98%
Avista Corporation	AVA	5.00%	3.90%	4.78%
CMS Energy Corporation	CMS	6.00%	3.90%	5.58%
Duke Energy Corporation	DUK	5.00%	3.90%	4.78%
Entergy Corporation	ETR	0.50%	3.90%	1.18%
Evergy, Inc.	EVRG	7.50%	3.90%	6.78%
IDACORP, Inc.	IDA	5.50%	3.90%	5.18%
Northwestern Corporation	NWE	4.00%	3.90%	3.98%
OGE Energy Corp.	OGE	6.50%	3.90%	5.98%
Pinnacle West Capital Corporation	PNW	4.50%	3.90%	4.38%
Portland General Electric Company	POR	6.00%	3.90%	5.58%
PPL Corporation	PPL	7.50%	3.90%	6.78%
The Southern Company	SO	6.50%	3.90%	5.98%
Xcel Energy Inc.	XEL	7.00%	3.90%	6.38%
Average		**5.60%**	**3.90%**	**5.26%**

Notes:
[1] The Value Line Investment Survey
[2] Congress Budget Office, Budget Economic Outlook
[3] Equals ([4] x 80%) + ([5] x 20%)

Calculation of Long-Term GDP Growth Rate
Consistent with *Ibbotson* Methodology

Description	Notes	Year	Amount
Change in Real GDP			
Real GDP ($ Billions)	[1]	1929	$ 1,191.1
Real GDP ($ Billions)	[1]	2023	$ 22,671.1
Compound Annual Growth Rate			**3.18%**
Projected Inflation			
Consumer Price Index (YoY % Change)	[2]	2031-2035	2.20%
Consumer Price Index (All-Urban)	[3]	2035	3.96
Consumer Price Index (All-Urban)	[3]	2050	5.54
Compound Annual Growth Rate			2.26%
GDP Chain-type Price Index (2012=1.000)	[3]	2035	1.73
GDP Chain-type Price Index (2012=1.000)	[3]	2050	2.43
Compound Annual Growth Rate			2.30%
Average Inflation Forecast	[4]		**2.25%**
Long-Term GDP Growth Rate	[5]		**5.51%**

Notes:
[1] Bureau of Economic Analysis, September 26, 2024
[2] Blue Chip Financial Forecasts, Vol. 43, No. 12, November 27, 2024, at 14
[3] Energy Information Administration, Annual Energy Outlook 2023 at Table 20, March 16, 2023
[4] Average of 3 inflation sources
[5] Equals (1+3.18%) x (1+2.25%)-1

Dr. Won's Two-Step DCF Analysis

As Filed

Company	Ticker	[1] 2023 Dividend per Share	[2] Stock Price	[3] Dividend Yield	[4] Expected Dividend Yield	[5] Projected *Value Line* EPS, DPS & BVPS Gwth Rate	[6] Projected Long Term Gwth Rate	[7] Wgtd. Average Gwth Rate	[8] Cost of Equity
					Weight:	80%	20%		
Data through June 30, 2024									
Alliant Energy Corporation	LNT	$ 1.81	$ 50.08	3.61%	3.71%	5.33%	3.90%	5.05%	8.75%
American Electric Power Company, Inc.	AEP	$ 3.37	$ 87.26	3.86%	3.97%	6.00%	3.90%	5.58%	9.55%
Avista Corporation	AVA	$ 1.84	$ 35.78	5.14%	5.26%	4.67%	3.90%	4.51%	9.77%
CMS Energy Corporation	CMS	$ 1.95	$ 60.57	3.22%	3.29%	4.33%	3.90%	4.25%	7.53%
Duke Energy Corporation	DUK	$ 4.06	$ 99.77	4.07%	4.14%	3.17%	3.90%	3.31%	7.45%
Entergy Corporation	ETR	$ 4.34	$ 107.67	4.03%	4.09%	2.67%	3.90%	2.91%	7.00%
Evergy, Inc.	EVRG	$ 2.48	$ 53.08	4.67%	4.80%	6.00%	3.90%	5.58%	10.38%
IDACORP, Inc.	IDA	$ 3.20	$ 93.77	3.41%	3.49%	4.83%	3.90%	4.65%	8.14%
Northwestern Corporation	NWE	$ 2.52	$ 50.47	4.99%	5.07%	3.00%	3.90%	3.18%	8.25%
OGE Energy Corp.	OGE	$ 1.66	$ 35.03	4.74%	4.85%	5.00%	3.90%	4.78%	9.63%
Pinnacle West Capital Corporation	PNW	$ 3.49	$ 75.23	4.64%	4.72%	3.50%	3.90%	3.58%	8.30%
Portland General Electric Company	POR	$ 1.88	$ 43.26	4.35%	4.45%	5.17%	3.90%	4.91%	9.37%
PPL Corporation	PPL								
The Southern Company	SO	$ 2.78	$ 75.64	3.68%	3.76%	4.50%	3.90%	4.38%	8.14%
Xcel Energy Inc.	XEL	$ 2.08	$ 54.45	3.82%	3.92%	5.83%	3.90%	5.45%	9.37%
								Average:	8.69%

Dr. Won Outlier Methodology

Lower Bound:	7.49%
Upper Bound:	9.70%
Cost of Equity / Avg. of Lower & Upper Bound:	**8.60%**

FERC Outlier Methodology (Lower Bound):

30-Day Average Yield on Moody's Baa-rated Corporate Bonds:	5.46%
Avg. of Dr. Won's Market Risk Premia in the CAPM:	5.63%
FERC Percent of Market Risk Premium in CAPM for Outlier Test:	20.00%
Lower Bound Threshold:	6.58%

FERC Outlier Methodology (Upper Bound):

Median DCF Result:	8.53%
Upper Bound Threshold (200% of Median DCF Result):	17.05%

Notes:
[1] - [8] Schedule SJW-d12

Dr. Won's Two-Step DCF Analysis

Corrected Short Term Growth Rates and Updated to Reflect Data through September 2024

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Company	**Ticker**	**2024 Dividend per Share**	**Stock Price**	**Dividend Yield**	**Expected Dividend Yield**	***Value Line* Projected EPS Gwth Rate**	**Projected Long Term Gwth Rate**	**Wgtd. Average Gwth Rate**	**Cost of Equity**
					Weight:	80%	20%		
Data through September 30, 2024									
Alliant Energy Corporation	LNT	$ 1.92	$ 52.92	3.63%	3.73%	6.00%	3.90%	5.58%	9.31%
American Electric Power Company, Inc.	AEP	$ 3.60	$ 91.75	3.92%	4.04%	6.50%	3.90%	5.98%	10.02%
Avista Corporation	AVA	$ 1.95	$ 36.08	5.41%	5.53%	5.00%	3.90%	4.78%	10.31%
CMS Energy Corporation	CMS	$ 2.08	$ 62.46	3.33%	3.42%	6.00%	3.90%	5.58%	9.00%
Duke Energy Corporation	DUK	$ 4.14	$ 104.09	3.98%	4.07%	5.00%	3.90%	4.78%	8.85%
Entergy Corporation	ETR	$ 4.56	$ 111.60	4.09%	4.11%	0.50%	3.90%	1.18%	5.29%
Evergy, Inc.	EVRG	$ 2.61	$ 54.83	4.76%	4.92%	7.50%	3.90%	6.78%	11.70%
IDACORP, Inc.	IDA	$ 3.36	$ 95.78	3.51%	3.60%	5.50%	3.90%	5.18%	8.78%
Northwestern Corporation	NWE	$ 2.60	$ 51.23	5.08%	5.18%	4.00%	3.90%	3.98%	9.16%
OGE Energy Corp.	OGE	$ 1.69	$ 36.61	4.62%	4.75%	6.50%	3.90%	5.98%	10.73%
Pinnacle West Capital Corporation	PNW	$ 3.55	$ 79.64	4.46%	4.56%	4.50%	3.90%	4.38%	8.94%
Portland General Electric Company	POR	$ 1.98	$ 44.63	4.44%	4.56%	6.00%	3.90%	5.58%	10.14%
PPL Corporation	PPL	$ 1.03	$ 29.15	3.53%	3.65%	7.50%	3.90%	6.78%	10.43%
The Southern Company	SO	$ 2.86	$ 79.67	3.59%	3.70%	6.50%	3.90%	5.98%	9.68%
Xcel Energy Inc.	XEL	$ 2.19	$ 56.67	3.86%	3.99%	7.00%	3.90%	6.38%	10.37%
								Average:	9.51%

Dr. Won Outlier Methodology

Lower Bound:	8.82%
Upper Bound:	10.58%
Cost of Equity (Avg. of Lower & Upper Bound):	**9.70%**

FERC Outlier Methodology

Average Cost of Equity:	**9.82%**

Notes:
[1] *Value Line* ; most current as of 9/30/24
[2] Schedule AEB-1R, Attachment 8, p. 2
[3] Equals [1] / [2]
[4] Equals [3] x (1+[7]x50%)
[5] *Value Line* ; most current as of 9/30/24
[6] Schedule SJW-d15
[7] Equals ([5] x 80%) + ([6] x 20%)
[8] Equals [4] + [7]

Dr. Won's Two-Step DCF Analysis

Corrected Short Term and Long Term Growth Rates, and Updated to Reflect Data through September 2024

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Company	**Ticker**	**2024 Dividend per Share**	**Stock Price**	**Dividend Yield**	**Expected Dividend Yield**	***Value Line* Projected EPS Gwth Rate**	**Projected Long Term Gwth Rate**	**Wgtd. Average Gwth Rate**	**Cost of Equity**
					Weight:	80%	20%		
Data through September 30, 2024									
Alliant Energy Corporation	LNT	$ 1.92	$ 52.92	3.63%	3.74%	6.00%	5.51%	5.90%	9.64%
American Electric Power Company, Inc.	AEP	$ 3.60	$ 91.75	3.92%	4.05%	6.50%	5.51%	6.30%	10.35%
Avista Corporation	AVA	$ 1.95	$ 36.08	5.41%	5.54%	5.00%	5.51%	5.10%	10.64%
CMS Energy Corporation	CMS	$ 2.08	$ 62.46	3.33%	3.43%	6.00%	5.51%	5.90%	9.33%
Duke Energy Corporation	DUK	$ 4.14	$ 104.09	3.98%	4.08%	5.00%	5.51%	5.10%	9.18%
Entergy Corporation	ETR	$ 4.56	$ 111.60	4.09%	4.12%	0.50%	5.51%	1.50%	5.62%
Evergy, Inc.	EVRG	$ 2.61	$ 54.83	4.76%	4.93%	7.50%	5.51%	7.10%	12.03%
IDACORP, Inc.	IDA	$ 3.36	$ 95.78	3.51%	3.60%	5.50%	5.51%	5.50%	9.11%
Northwestern Corporation	NWE	$ 2.60	$ 51.23	5.08%	5.18%	4.00%	5.51%	4.30%	9.49%
OGE Energy Corp.	OGE	$ 1.69	$ 36.61	4.62%	4.76%	6.50%	5.51%	6.30%	11.06%
Pinnacle West Capital Corporation	PNW	$ 3.55	$ 79.64	4.46%	4.56%	4.50%	5.51%	4.70%	9.26%
Portland General Electric Company	POR	$ 1.98	$ 44.63	4.44%	4.57%	6.00%	5.51%	5.90%	10.47%
PPL Corporation	PPL	$ 1.03	$ 29.15	3.53%	3.66%	7.50%	5.51%	7.10%	10.76%
The Southern Company	SO	$ 2.86	$ 79.67	3.59%	3.70%	6.50%	5.51%	6.30%	10.00%
Xcel Energy Inc.	XEL	$ 2.19	$ 56.67	3.86%	3.99%	7.00%	5.51%	6.70%	10.70%
								Average:	9.84%

Dr. Won Outlier Methodology

Lower Bound:	9.14%
Upper Bound:	10.91%
Cost of Equity (Avg. of Lower & Upper Bound):	**10.03%**

FERC Outlier Methodology

Average Cost of Equity:	**10.14%**

Notes:
[1] *Value Line*; most current as of 9/30/24
[2] Schedule AEB-1R, Attachment 8, p. 2
[3] Equals [1] / [2]
[4] Equals [3] x (1+[7]x50%)
[5] *Value Line*; most current as of 9/30/24
[6] Schedule AEB-1R, Attachment 9
[7] Equals ([5] x 80%) + ([6] x 20%)
[8] Equals [4] + [7]

Dr. Won's Adjusted CAPM Analysis

Company	Ticker	[1] Risk-Free Rate	[2] Historical Arithmetic Avg. Return on Lg. Cap Stocks (1926-2023)	[3] Historical Arithmetic Avg. Income-Only Return on LT Govt. Bonds (1926-2023)	[4] Historical Market Risk Premium	[5] *Value Line* Beta	[6] Cost of Equity
Alliant Energy Corporation	LNT	4.23%	12.04%	4.23%	7.81%	0.90	11.26%
American Electric Power Company, Inc.	AEP	4.23%	12.04%	4.23%	7.81%	0.85	10.87%
Avista Corporation	AVA	4.23%	12.04%	4.23%	7.81%	0.95	11.65%
CMS Energy Corporation	CMS	4.23%	12.04%	4.23%	7.81%	0.85	10.87%
Duke Energy Corporation	DUK	4.23%	12.04%	4.23%	7.81%	0.90	11.26%
Entergy Corporation	ETR	4.23%	12.04%	4.23%	7.81%	1.00	12.04%
Evergy, Inc.	EVRG	4.23%	12.04%	4.23%	7.81%	0.95	11.65%
IDACORP, Inc.	IDA	4.23%	12.04%	4.23%	7.81%	0.85	10.87%
Northwestern Corporation	NWE	4.23%	12.04%	4.23%	7.81%	0.95	11.65%
OGE Energy Corp.	OGE	4.23%	12.04%	4.23%	7.81%	1.05	12.43%
Pinnacle West Capital Corporation	PNW	4.23%	12.04%	4.23%	7.81%	0.95	11.65%
Portland General Electric Company	POR	4.23%	12.04%	4.23%	7.81%	0.90	11.26%
PPL Corporation	PPL	4.23%	12.04%	4.23%	7.81%	1.15	13.21%
The Southern Company	SO	4.23%	12.04%	4.23%	7.81%	0.90	11.26%
Xcel Energy Inc.	XEL	4.23%	12.04%	4.23%	7.81%	0.85	10.87%
						Average (incl. PPL):	**11.57%**
						Average (excl. PPL):	**11.40%**

[1] 3-month average 30-year Treasury bond yield ending September 30, 2024
[2] Kroll, Cost of Capital Navigator
[3] Assumes historical arithmetic avg. income-only return on long-term government bonds equals the current risk-free rate in [1]
[4] Equals [2] - [3]
[5] *Value Line*
[6] Equals [1] + ([4] x [5])

BOND YIELD PLUS RISK PREMIUM

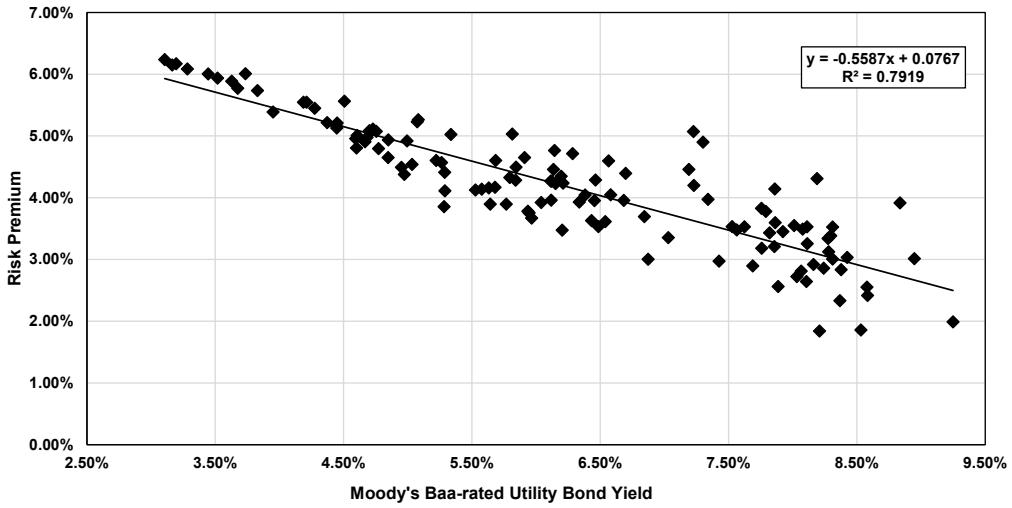
	[1]	[2]	[3]
Quarter	Average Authorized Electric ROE	Avg. Baa-Rated Utiliity Bond Yield	Risk Premium
1993.1	11.84%	8.31%	3.53%
1993.2	11.64%	8.11%	3.53%
1993.3	11.15%	7.62%	3.53%
1993.4	11.04%	7.56%	3.48%
1994.1	11.07%	7.86%	3.21%
1994.2	11.13%	8.58%	2.55%
1994.3	12.75%	8.83%	3.92%
1994.4	11.24%	9.25%	1.99%
1995.1	11.96%	8.95%	3.01%
1995.2	11.32%	8.31%	3.01%
1995.3	11.37%	8.11%	3.26%
1995.4	11.58%	7.76%	3.83%
1996.1	11.46%	7.86%	3.60%
1996.2	11.46%	8.42%	3.04%
1996.3	10.70%	8.37%	2.33%
1996.4	11.56%	8.01%	3.55%
1997.1	11.08%	8.16%	2.92%
1997.2	11.62%	8.27%	3.34%
1997.3	12.00%	7.86%	4.14%
1997.4	11.06%	7.53%	3.53%
1998.1	11.31%	7.34%	3.97%
1998.2	12.20%	7.30%	4.90%
1998.3	11.65%	7.19%	4.46%
1998.4	12.30%	7.23%	5.07%
1999.1	10.40%	7.43%	2.97%
1999.2	10.94%	7.76%	3.18%
1999.3	10.75%	8.11%	2.64%
1999.4	11.10%	8.24%	2.86%
2000.1	11.21%	8.38%	2.84%
2000.2	11.00%	8.58%	2.42%
2000.3	11.68%	8.30%	3.38%
2000.4	12.50%	8.19%	4.31%
2001.1	11.38%	7.92%	3.45%
2001.2	10.88%	8.06%	2.81%
2001.3	10.76%	8.03%	2.72%
2001.4	11.57%	8.08%	3.49%
2002.1	10.05%	8.21%	1.84%
2002.2	11.41%	8.28%	3.13%
2002.3	11.25%	7.82%	3.43%
2002.4	11.57%	7.79%	3.78%
2003.1	11.43%	7.23%	4.20%
2003.2	11.16%	6.57%	4.60%
2003.3	9.88%	6.87%	3.00%
2003.4	11.09%	6.70%	4.39%
2004.1	11.00%	6.28%	4.72%
2004.2	10.64%	6.68%	3.96%
2004.3	10.75%	6.46%	4.29%
2004.4	10.91%	6.14%	4.77%
2005.1	10.56%	5.91%	4.65%
2005.2	10.13%	5.84%	4.29%
2005.3	10.85%	5.81%	5.03%
2005.4	10.59%	6.14%	4.46%
2006.1	10.38%	6.15%	4.23%
2006.2	10.63%	6.58%	4.05%
2006.3	10.06%	6.43%	3.63%
2006.4	10.39%	6.11%	4.27%
2007.1	10.39%	6.12%	4.27%
2007.2	10.27%	6.34%	3.93%
2007.3	10.02%	6.49%	3.53%
2007.4	10.43%	6.38%	4.05%
2008.1	10.15%	6.54%	3.61%

BOND YIELD PLUS RISK PREMIUM

Quarter	[1] Average Authorized Electric ROE	[2] Avg. Baa-Rated Utiliity Bond Yield	[3] Risk Premium
2008.2	10.54%	6.84%	3.69%
2008.3	10.38%	7.03%	3.35%
2008.4	10.39%	8.53%	1.86%
2009.1	10.45%	7.88%	2.56%
2009.2	10.58%	7.69%	2.90%
2009.3	10.41%	6.45%	3.95%
2009.4	10.54%	6.19%	4.35%
2010.1	10.45%	6.21%	4.24%
2010.2	10.08%	6.12%	3.96%
2010.3	10.29%	5.68%	4.60%
2010.4	10.34%	5.84%	4.50%
2011.1	9.96%	6.04%	3.92%
2011.2	10.12%	5.79%	4.33%
2011.3	10.36%	5.34%	5.02%
2011.4	10.34%	5.08%	5.26%
2012.1	10.30%	5.07%	5.23%
2012.2	9.92%	4.99%	4.92%
2012.3	9.78%	4.85%	4.94%
2012.4	10.07%	4.51%	5.56%
2013.1	9.77%	4.71%	5.06%
2013.2	9.84%	4.73%	5.11%
2013.3	9.83%	5.26%	4.57%
2013.4	9.82%	5.22%	4.60%
2014.1	9.57%	5.03%	4.54%
2014.2	9.83%	4.75%	5.08%
2014.3	9.79%	4.70%	5.09%
2014.4	9.78%	4.70%	5.08%
2015.1	9.66%	4.45%	5.21%
2015.2	9.50%	4.85%	4.65%
2015.3	9.40%	5.29%	4.11%
2015.4	9.65%	5.53%	4.13%
2016.1	9.70%	5.29%	4.41%
2016.2	9.41%	4.60%	4.81%
2016.3	9.76%	4.21%	5.55%
2016.4	9.55%	4.59%	4.96%
2017.1	9.61%	4.60%	5.01%
2017.2	9.61%	4.44%	5.17%
2017.3	9.73%	4.28%	5.45%
2017.4	9.74%	4.19%	5.55%
2018.1	9.59%	4.37%	5.22%
2018.2	9.57%	4.67%	4.91%
2018.3	9.66%	4.68%	4.98%
2018.4	9.44%	4.95%	4.49%
2019.1	9.57%	4.77%	4.80%
2019.2	9.58%	4.45%	5.13%
2019.3	9.57%	3.83%	5.74%
2019.4	9.74%	3.74%	6.01%
2020.1	9.45%	3.67%	5.77%
2020.2	9.52%	3.63%	5.89%
2020.3	9.34%	3.11%	6.24%
2020.4	9.32%	3.16%	6.15%
2021.1	9.45%	3.44%	6.01%
2021.2	9.46%	3.52%	5.94%
2021.3	9.37%	3.20%	6.17%
2021.4	9.37%	3.28%	6.09%
2022.1	9.34%	3.95%	5.39%
2022.2	9.35%	4.97%	4.38%
2022.3	9.14%	5.28%	3.86%
2022.4	9.72%	5.93%	3.78%
2023.1	9.71%	5.58%	4.14%
2023.2	9.54%	5.64%	3.90%

BOND YIELD PLUS RISK PREMIUM

	[1]	[2]	[3]
Quarter	Average Authorized Electric ROE	Avg. Baa-Rated Utiliity Bond Yield	Risk Premium
2023.3	9.63%	5.97%	3.67%
2023.4	9.68%	6.20%	3.47%
2024.1	9.66%	5.77%	3.90%
2024.2	9.70%	5.94%	3.75%
2024.3	9.79%	5.63%	4.16%
2024.4	9.85%	5.68%	4.17%
AVERAGE	10.41%	6.22%	4.19%
MEDIAN	10.34%	6.14%	4.18%



SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.889879247
R Square	0.791885074
Adjusted R Square	0.790233368
Standard Error	0.004513222
Observations	128

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.00976569	0.00976569	479.4347113	8.99038E-45
Residual	126	0.002566516	2.03692E-05		
Total	127	0.012332207			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.076651801	0.001636868	46.82832233	1.49109E-81	0.073412486	0.079891115	0.073412486	0.079891115
X Variable 1	-0.558736527	0.025517747	-21.89599761	8.99038E-45	-0.609235398	-0.508237656	-0.609235398	-0.508237656

	Moody's Baa-Rated Utility Bond Yld [7]	Risk Premium [8]	ROE [9]
Current 30-day average of Baa-rated utility bond yield [4]	5.73%	4.46%	10.19%

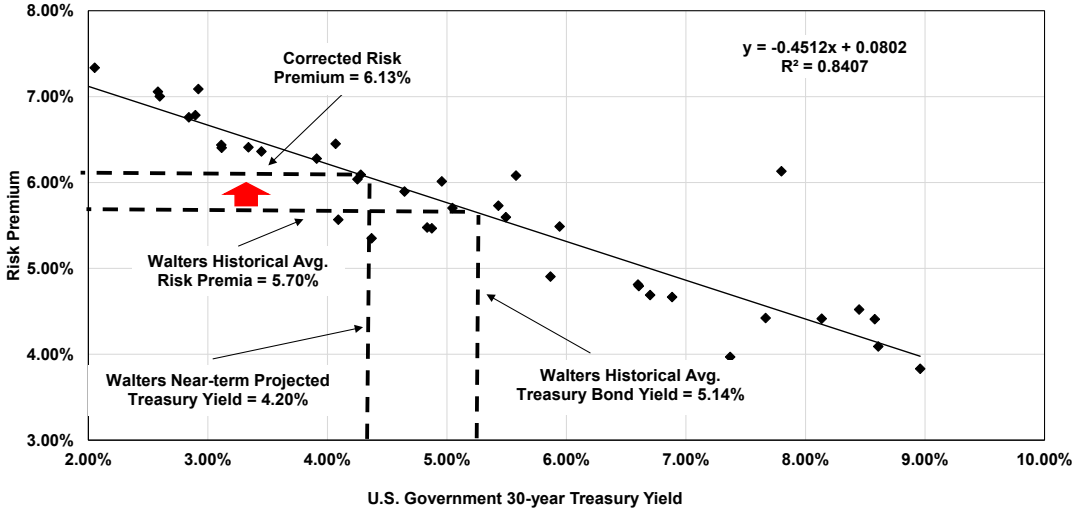
Notes:
[1] Regulatory Research Associates, rate cases through November 30, 2024
[2] S&P Capital IQ Pro, quarterly bond yields are the average of each trading day in the quarter
[3] Equals Column [1] − Column [2]
[4] S&P Capital IQ Pro, 30-day average as of November 30, 2024
[5] Blue Chip Financial Forecasts, Vol. 43, No. 12, November 27, 2024, at 2
[6] Blue Chip Financial Forecasts, Vol. 43, No. 12, November 27, 2024, at 14
[7] See notes [4], [5] & [6]
[8] Equals 0.076652 + (-0.558737 x Column [7])
[9] Equals Column [7] + Column [8]

Walters Risk Premium Analysis
As-Adjusted Treasury Bond Approach

Year	Authorized Electric Returns	30 yr. Treasury Bond Yld	Indicated Risk Premium
1986	13.93%	7.80%	6.13%
1987	12.99%	8.58%	4.41%
1988	12.79%	8.96%	3.83%
1989	12.97%	8.45%	4.52%
1990	12.70%	8.61%	4.09%
1991	12.55%	8.14%	4.41%
1992	12.09%	7.67%	4.42%
1993	11.41%	6.60%	4.81%
1994	11.34%	7.37%	3.97%
1995	11.55%	6.88%	4.67%
1996	11.39%	6.70%	4.69%
1997	11.40%	6.61%	4.79%
1998	11.66%	5.58%	6.08%
1999	10.77%	5.87%	4.90%
2000	11.43%	5.94%	5.49%
2001	11.09%	5.49%	5.60%
2002	11.16%	5.43%	5.73%
2003	10.97%	4.96%	6.01%
2004	10.75%	5.05%	5.70%
2005	10.54%	4.65%	5.89%
2006	10.34%	4.87%	5.47%
2007	10.31%	4.83%	5.48%
2008	10.37%	4.28%	6.09%
2009	10.52%	4.07%	6.45%
2010	10.29%	4.25%	6.04%
2011	10.19%	3.91%	6.28%
2012	10.01%	2.92%	7.09%
2013	9.81%	3.45%	6.36%
2014	9.75%	3.34%	6.41%
2015	9.60%	2.84%	6.76%
2016	9.60%	2.60%	7.00%
2017	9.68%	2.90%	6.79%
2018	9.55%	3.11%	6.44%
2019	9.64%	2.58%	7.06%
2020	9.39%	1.56%	7.83%
2021	9.39%	2.05%	7.34%
2022	9.52%	3.12%	6.41%
2023	9.66%	4.09%	5.57%
2024	9.72%	4.37%	5.35%
Average	10.84%	5.14%	5.70%

Note: 2024 data represents January-September, 2024

Walters Risk Premium Analysis
As-Adjusted Treasury Bond Approach



SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.91693734
R Square	0.840774085
Adjusted R Square	0.836470682
Standard Error	0.004077958
Observations	39

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.003249022	0.003249022	195.3742341	2.44194E-16
Residual	37	0.0006153	1.66297E-05		
Total	38	0.003864323			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.080223527	0.001784211	44.96303354	6.74528E-34	0.076608372	0.083838681	0.076608372	0.083838681
U.S. 30-year Treasury Yield	-0.451527116	0.032303546	-13.97763335	2.44194E-16	-0.516980317	-0.386073915	-0.516980317	-0.386073915

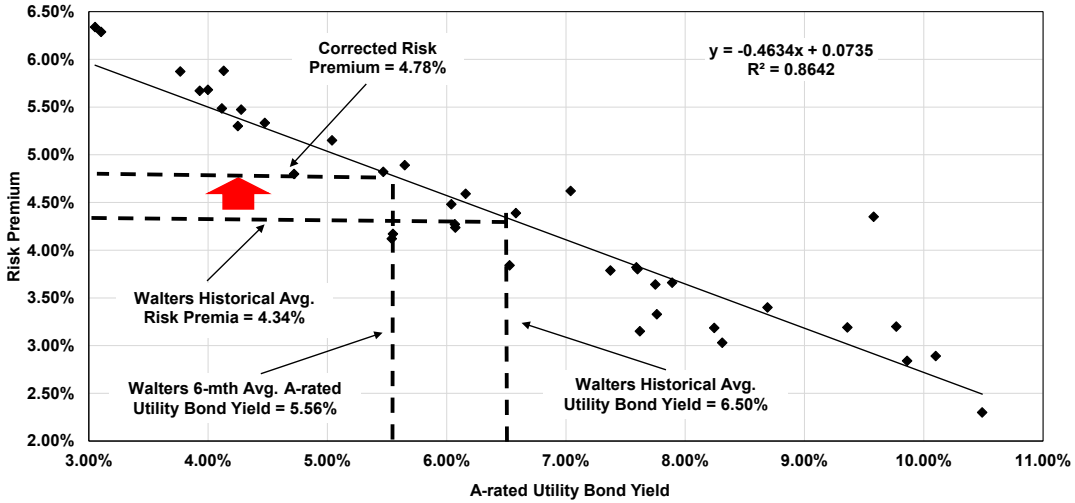
	U.S. Govt. 30-year Treasury	Risk Premium	ROE
Near-Term Projected 30-Year Treasury Bond Yield (as of Noivember 1, 2024)	4.20%	6.13%	10.33%

Walters Risk Premium Analysis
As-Adjusted Utility Bond Approach

Year	Authorized Electric Returns	A-rated Utility Bond Yld Annual	Indicated Risk Premium
1986	13.93%	9.58%	4.35%
1987	12.99%	10.10%	2.89%
1988	12.79%	10.49%	2.30%
1989	12.97%	9.77%	3.20%
1990	12.70%	9.86%	2.84%
1991	12.55%	9.36%	3.19%
1992	12.09%	8.69%	3.40%
1993	11.41%	7.59%	3.82%
1994	11.34%	8.31%	3.03%
1995	11.55%	7.89%	3.66%
1996	11.39%	7.75%	3.64%
1997	11.40%	7.60%	3.80%
1998	11.66%	7.04%	4.62%
1999	10.77%	7.62%	3.15%
2000	11.43%	8.24%	3.19%
2001	11.09%	7.76%	3.33%
2002	11.16%	7.37%	3.79%
2003	10.97%	6.58%	4.39%
2004	10.75%	6.16%	4.59%
2005	10.54%	5.65%	4.89%
2006	10.34%	6.07%	4.27%
2007	10.31%	6.07%	4.24%
2008	10.37%	6.53%	3.84%
2009	10.52%	6.04%	4.48%
2010	10.29%	5.47%	4.82%
2011	10.19%	5.04%	5.15%
2012	10.01%	4.13%	5.88%
2013	9.81%	4.48%	5.33%
2014	9.75%	4.28%	5.47%
2015	9.60%	4.12%	5.48%
2016	9.60%	3.93%	5.67%
2017	9.68%	4.00%	5.68%
2018	9.55%	4.25%	5.30%
2019	9.64%	3.77%	5.87%
2020	9.39%	3.05%	6.34%
2021	9.39%	3.10%	6.29%
2022	9.52%	4.72%	4.80%
2023	9.66%	5.54%	4.12%
2024	9.72%	5.55%	4.17%
Average	10.84%	6.50%	4.34%

Note: 2024 data represents January-September, 2024

Walters Risk Premium Analysis
As-Adjusted Utility Bond Approach



SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.929658
R Square	0.864263997
Adjusted R Square	0.860595456
Standard Error	0.003916048
Observations	39

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.003612844	0.003612844	235.5879586	1.25808E-17
Residual	37	0.000567411	1.53354E-05		
Total	38	0.004180255			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.073533747	0.002060804	35.68206452	2.89554E-30	0.069358161	0.077709333	0.069358161	0.077709333
A-rated Utility Bond Yields	-0.463464771	0.030195358	-15.34887483	1.25808E-17	-0.524646377	-0.402283164	-0.524646377	-0.402283164

	Walters Utility Bond Yield	Risk Premium	ROE
3-month Avg. A-rated Utility Bond Yield as of September 30, 2024	5.41%	4.85%	10.26%
3-month Avg. Baa-rated Utility Bond Yield as of September 30, 2024	5.62%	4.75%	10.37%
6-month Avg. A-rated Utility Bond Yield as of September 30, 2024	5.56%	4.78%	10.34%
6-month Avg. Baa-rated Utility Bond Yield as of September 30, 2024	5.78%	4.67%	10.45%

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of Union Electric Company d/b/a Ameren Missouri's Tariffs to Adjust Its Revenues for Electric Service.	)))	Case No. ER-2024-0319

AFFIDAVIT OF ANN E. BULKLEY

COMMOMWEALTH OF MASSACHUSETTS)
) **ss**
CITY OF BOSTON)

Ann E. Bulkley, being first duly sworn states:

My name is Ann E. Bulkley, and on my oath declare that I am of sound mind and lawful age; that I have prepared the foregoing *Correct Rebuttal Testimony*; and further, under the penalty of perjury, that the same is true and correct to the best of my knowledge and belief.

Ann E. Bulkley

Sworn to me this 20th day of February, 2025.