Exhibit No. 21

Ameren Missouri – Exhibit 21
Ann E. Bulkley
Rebuttal Testimony
File Nos. ER-2021-0240 & GR-2021-0241

Exhibit No.: 021P
Issues: Return on Equity
Witness: Ann E. Bulkley
Exhibit Type: Rebuttal-Highly Confidential
Sponsoring Party: Ameren Missouri
File No.: ER-2021-0240
Date: October 15, 2021

MISSOURI PUBLIC SERVICE COMMISSION

FILE NO. ER-2021-0240

REBUTTAL TESTIMONY

OF

ANN E. BULKLEY

ON BEHALF OF

AMEREN MISSOURI

P

TABLE OF CONTENTS

REBUTTAL TESTIMONY

OF

ANN E. BULKLEY

FILE NO. ER-2021-0240

I. INTRODUCTION AND PURPOSE

Q. Please state your name and business address.

A. My name is Ann E. Bulkley. I am Senior Vice President of Concentric Energy Advisors, Inc. ("Concentric"). My business address is 293 Boston Post Road West, Suite 500, Marlborough, Massachusetts 01752.

Q. On whose behalf are you submitting this testimony?

A. I am submitting this testimony on behalf of Ameren Missouri ("the "Company"), a wholly-owned subsidiary of Ameren Corporation ("Ameren").

Q. Did you previously provide Direct Testimony in this proceeding?

A. Yes. I submitted Direct Testimony regarding the appropriate Return on Equity ("ROE") for Ameren Missouri in this proceeding on March 31, 2021.

Q. What is the purpose of your Rebuttal Testimony?

A. The purpose of my Rebuttal Testimony is to respond to the Cost of Service Report of the Missouri Public Service Commission Staff ("Staff") and, in particular, the section sponsored by Staff witness Peter Chari relating to the authorized return on equity ("ROE"),

and to the Direct Testimony of David Murray on behalf of the Missouri Office of Public Counsel ("OPC").

I have not attempted to respond to every argument made by the Staff and OPC witnesses. The fact that I may not have responded to any particular argument or statement made by either the Staff or OPC witnesses does not indicate my agreement with that argument or statement.

Q. Are you sponsoring any schedules as part of your Rebuttal Testimony?

A. Yes, I am sponsoring Schedule AEB-R1, Attachments 1 through 11 to support my Rebuttal Testimony, which were prepared by me or under my direction.

Q. Have you updated the ROE analyses you presented in your Direct Testimony to reflect current market conditions?

A. Yes, as discussed in more detail in Section V, I have updated my ROE analyses based on market data through August 31, 2021. These results provide additional support for the Company's requested ROE of 9.90 percent. In addition, while the analytical results of ROE estimation models provide a starting point, I continue to base my recommendation on consideration of not only the results of multiple cost of equity models, but also other factors, including capital market conditions, the capital attraction and comparable return standards, and Company-specific risks.

Q. How is the remainder of your Rebuttal Testimony organized?

A. The remainder of my Rebuttal Testimony is organized as follows:

- In Section II, I provide a summary and overview of my Rebuttal Testimony and the important factors to be considered in establishing the ROE for Ameren Missouri.

- In Section III, I respond to the capital structure recommendation of Mr. Murray.
- In Section IV, I discuss how the cost of capital recommendations of Mr. Chari and Mr. Murray compare with the authorized returns for vertically integrated electric utilities in other jurisdictions.
- In Section V, I update my ROE analysis based on market data as of August 31, 2021.
- In Section VI, I respond to Mr. Chari's and Mr. Murray's testimony regarding capital market conditions and the implications for Ameren Missouri's cost of equity.
- In Section VII, I respond to Staff witness Mr. Chari's ROE analyses and recommendations.
- In Section VIII, I respond to OPC witness Mr. Murray's ROE analyses and recommendations.
- Finally, in Section IX, I summarize my conclusions and recommendations.

II. SUMMARY AND OVERVIEW

Q. What factors should be considered in evaluating the results of ROE models and establishing the authorized ROE?

A. The primary factors that should be considered are: (i) the importance of investors' actual return requirements and the critical role of judgment in selecting the appropriate ROE; (ii) the importance of providing a return that is comparable to returns on alternative investments with commensurate risk; (iii) the need for a return that supports a utility's ability to attract needed capital at reasonable terms; and (iv) the effect of current and expected capital market conditions.

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

A. My key conclusions are as follows:

1. Although Mr. Chari and Mr. Murray devote many pages of testimony to discussing the results of their various ROE estimation models and attempting to explain why those models are producing reasonable results under current market conditions, they essentially discard their flawed analyses in favor of less drastic recommendations that are not supported by their own ROE estimation models.

2. Mr. Chari developed his recommendation of 9.50 percent by adjusting upwards the ROE of 9.25 percent authorized for Empire District Electric Company in Case No. ER-2019-0374 by 25 basis points to reflect the fact that his Two-Stage DCF analysis increased 55 basis points between 2017 and 2021. However, Mr. Chari's partial adjustment of 25 basis points is inconsistent with the adjustment he applied in the 2019 Empire rate case and the adjustment Dr. Won has proposed for Ameren Missouri's gas operations in Case No. GR-2021-0241. Mr. Chari in the 2019 rate case for Empire and Dr. Won applied the full differential between the DCF results of the two periods being examined to adjust the benchmark ROE. If Mr. Chari had applied the full increase of 55 basis points between his 2021 Two-Stage DCF results and 2019 Constant Growth DCF results, his recommendation would have been 9.80 percent.

3. Mr. Chari references the Federal Energy Regulatory Commission ("FERC") as support for his use and weighting of a short-term and long-term growth rate in his Two-Step DCF Analysis. The weightings that Mr. Chari applies; however, are not consistent with FERC's most recent determination in the MISO transmission

owners' case. In Opinion No. 569-A, the development of the average growth rates was changed from a two-thirds EPS and one-third GDP weighting structure to an 80 percent weight on EPS growth rate estimates and 20 percent on the long-term GDP growth rate.[1] If Mr. Chari had relied on the updated weighting methodology from FERC, his mean Two-Stage DCF result would increase from 8.29 percent to 8.50 percent. This change would imply that the increase in the COE from the 2019 Empire District Electric case would be 76 basis points. (8.50%-7.74%= 0.76%). Applying that full adjustment to the 9.25 percent ROE that was authorized for Empire District Electric would result in an ROE for Ameren Missouri of 10.01 percent. Therefore, reasonable adjustments to Mr. Chari's analysis show that the Company's requested ROE of 9.90 percent is reasonable.

4. Mr. Murray's Multi-Stage DCF analysis relies on a long-term growth rate range of 2.50 percent to 3.50 percent; however, current valuations of utilities are based in part on the sustainability of current projections of earnings growth. Since Mr. Murray's long-term growth rate range of 2.5 percent to 3.5 percent is much lower than current earnings growth projections, the assumption implies much lower electric utility valuations than the stock prices he relies on to calculate his Multi-Stage DCF analysis. This results in Mr. Murray's Multi-Stage DCF analysis producing cost of equity estimates that are unreasonably low.

5. The economy is in the recovery phase of the business cycle which means improving economic growth and increasing inflation and interest rates. Mr. Chari, Mr. Murray and I are in agreement that utility share prices are inversely related to

[1] Federal Energy Regulatory Commission, Opinion NO. 575, Order on Briefs and Initial Decision, May 20, 2021, at 12-13.

the yields on long-term government bonds. Therefore, since interest rates are expected to increase over the near-term, investors expect the utility sector to underperform the broader market. As a result, the DCF results presented by Mr. Chari and Mr. Murray, which rely on current share prices, are likely understating the cost of equity during the period that Ameren Missouri's rates will be in effect.

6. Updated market-based data for the proxy group companies as of August 31, 2021 supports a range of ROEs for Ameren Missouri between 9.75 percent to 10.50 percent and within that range the Company's requested ROE of 9.90 percent.

7. Recently authorized equity ratios for vertically integrated electric utilities support the Company's proposed capital structure of 51.93 percent common equity, 47.34 percent long-term debt and 0.73 percent preferred equity.

8. Mr. Murray's conclusion that Ameren Missouri can increase its leverage due to the Company's use of PISA to recover electric capital expenditure costs is inappropriate. It is reasonable to evaluate the capital structure of Ameren Missouri based on the capital structures of the companies in the proxy group and an assessment of the relative risk of Ameren Missouri to the proxy group. However, Mr. Murray has not considered the capital structures of the proxy group, nor has he determined if Ameren Missouri has greater or less risk when compared to the proxy group. It is not reasonable to adjust the capital structure of Ameren Missouri on the sole basis that the Company has a capital cost recovery mechanism.

III. CAPITAL STRUCTURE

Q. Please summarize the Staff position with respect to the capital structure that should be applied to Ameren Missouri in this case.

A. Staff proposes to use Ameren Missouri's stand-alone capital structure as of June 30, 2021, of 50.32 percent common equity, 48.92 percent long-term debt and 0.75 percent preferred equity.[2] Staff recommends the stand-alone capital structure for Ameren Missouri because the capital structure policies of the Company have not changed from the prior case. Specifically, Staff noted the following four reasons for the use of the stand-alone capital structure for Ameren Missouri: 1) Ameren is not the primary source of long-term and short-term debt financing for Ameren Missouri; 2) Credit rating agencies rate the credit quality of Ameren Missouri on a stand-alone basis; and 3) Ameren Missouri's debt is secured by the assets of the Company and not Ameren.[3]

Q. Please summarize OPC's position with respect to the appropriate capital structure for Ameren Missouri.

A. OPC witness Murray proposes that Ameren Missouri's capital structure be composed of 45 percent common equity, 54.18 percent long-term debt and 0.82 percent preferred equity.[4] Mr. Murray's recommendation is based on the capital structure target for the consolidated operations of Ameren over the long-term.[5] According to Mr. Murray, the use of the consolidated capital structure is appropriate because it represents the level of debt that Ameren believes is reasonable for its regulated utilities assets which include Ameren

---

2 Staff's Cost of Service Report, Table 1, p. 10.
3 Staff's Cost of Service Report, 21.
4 Direct Testimony of David Murray, at 30.
5 Direct Testimony of David Murray, at 30.

Missouri. Furthermore, Mr. Murray contends a higher debt level is currently appropriate for Ameren Missouri because of the reduction in business risk the Company faces as a result of the Company use of Plant-in-Service Accounting ("PISA") which allows for the timely recovery of the Company's electric capital expenditures plan between rate cases.[6]

Q. With respect to capital structure, please discuss the options that are most often considered by utility commissions when setting a regulated utility's capital structure for ratemaking purposes.

A. The three options that are most often considered by commissions when setting a regulated utility's capital structure are as follows:

- The operating company's actual (or projected) capital structure per the financial books and records of the company when this capital structure is reflective of the way the company is operated and it is generally consistent with industry norms.
- A hypothetical capital structure can be considered, especially if there are concerns that the actual per books capital structure is not reflective of the optimal capital structure for the company. The hypothetical capital structure can be based on comparable companies (e.g., set within the range of the proxy group) or determined by the Commission based on other risk factors.
- Third, the parent company's consolidated capital structure may be used. This occurs most often when the operating company represents the vast majority of the parent holding company's operations, and therefore the financing for the operating company and the holding company would be similar.

---

[6] Direct Testimony of David Murray, at 30.

Q. In recent cases, has this Commission considered the use of the stand-alone operating company capital structure versus the holding company's consolidated capital structure that Mr. Murray recommends?

A. Yes, it has. Similar to the current case, in Case Nos. GR-2017-0215 and GR-2017-0216 for Spire Missouri, Mr. Murray, who was the witness for Staff at that time, proposed relying on the consolidated capital structure, and thus using an equity ratio of 45.56 percent.[7] In its decision in that case, the Commission noted that it had formerly relied on the consolidated capital structure for Laclede Gas Company (the Missouri operating company prior to the Spire merger), when the operating company made up almost the entirety of the holding company; but that same capital structure was no longer appropriate in the 2017 case. The Commission explained that, since the merger, the parent company now had five operating utilities in three states in addition to other investments and therefore it was not appropriate to use consolidated capital structure as the utility-specific capital structure.[8]

Q. Does Ameren Missouri's electric operations represent the vast majority of Ameren's operations?

A. No. In fact, Ameren Missouri's electric operations represented only 51 percent of Ameren's operating revenue in 2020.[9] In additional to the electric operations in Missouri, Ameren has natural gas operations in Missouri, natural gas and electric operations in

---

7 In the Matter of the Laclede Gas Company's Request to Increase its Revenue for Gas Service, Missouri Public Service Commission File No. GR-2017-0215, Amended Report and Order, March 17, 2018 at p. 40.

8 In the Matter of Laclede Gas Company d/b/a Missouri Gas Energy's Request to Increase its Revenues for Gas Service, Missouri Public Service Commission GR-2017-0216, YG-2017-0196, February 21, 2018. 2018 WL 1315107 (Mo.P.S.C.), at 19.

9 Ameren Corporation, 2020 Form 10-K, at 8.

Illinois and a transmission segment that is regulated by FERC. As a result, it is not appropriate to recommend, as Mr. Murray has, the use of Ameren's consolidated capitalization as the utility-specific capital structure for Ameren Missouri's electric operations. Furthermore, the use of the Company's actual capital structure is consistent with the Commission's decision in Spire Missouri's 2017 rate case.

Q. Has Staff proposed to use the parent company's consolidated capital structure?

A. No. As noted above, Mr. Chari has proposed to use Ameren Missouri's stand-alone capital structure (which as of June 30, 2021, consisted of 50.32 percent common equity, 48.93 percent long-term debt and 0.75 percent preferred equity – it is my understanding that Ameren Missouri's actual capital structure as of the true-up date in this case will be very close to the Company's projected capital structure as of September 30, 2021 of 51.93 percent common equity, 47.34 percent long-term debt and 0.73 percent preferred equity as shown in the Direct Testimony of Ameren Missouri witness Darryl Sagel).[10] Mr. Chari believes that the stand-alone capital structure is appropriate because Ameren Missouri operates as an independent entity with its own credit rating and has debt issuances that are secured by the Company and not Ameren.

Q. Is the Company's capital structure consistent with industry norms and therefore reasonable for ratemaking purposes?

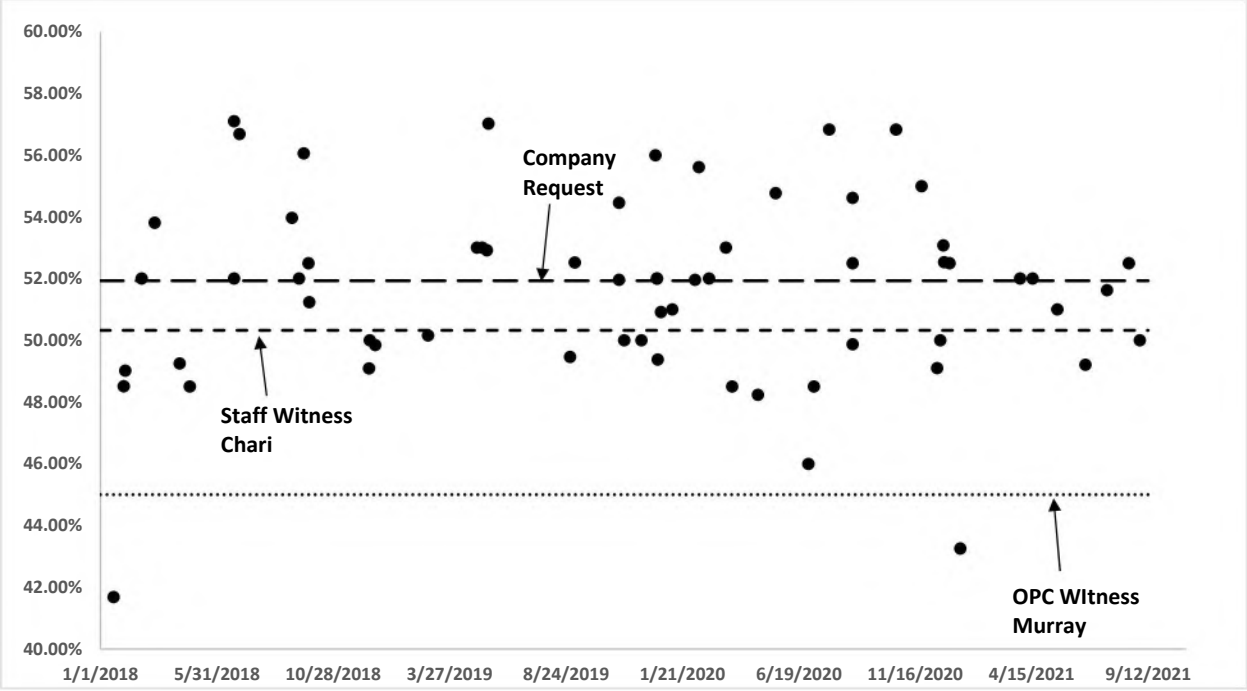
A. Yes, it is for several reasons. First, the Company's capital structure is reflective of the way the Company is operated.[11] Second, I also examined the capital structures that have

[10] Direct Testimony of Daryl T. Sagel, 11.

[11] Direct Testimony of Daryl T. Sagel, 10-11.

recently been authorized for electric utilities. As shown in Figure 1 below, the majority of the recently authorized equity ratios for electric utilities are in the range of 50-55 percent. Ameren Missouri's proposed equity ratio of 51.93 percent is well within the range of authorized equity ratios for companies of comparable risk. In contrast, Mr. Murray's proposed equity ratio of 45.00 percent is at the very low end of authorized equity ratios over this time-period. Consequently, there is no reason to employ a capitalization that is different from the actual capital structure that Ameren Missouri employs to finance its electric operations in Missouri.

Figure 1: Average Authorized Equity Ratios for Electric Utilities – January 2018 through August 2021[12]



[12] Source: S&P Capital IQ Pro. Chart excludes jurisdictions that include zero cost items in the capital structure: Arkansas, Indiana, Michigan and Florida.

Q. Do you agree with Mr. Murray that the Company can increase its leverage due to the reduction in business risk associated with Ameren Missouri's use of PISA?

No, I do not. The stand-alone principle of ratemaking holds that regulated rates should be based on the risks and benefits of the regulated utility, not its investors, parent or affiliates.[13] Since the stand-alone principle requires that Ameren Missouri's authorized cost of capital be based on the business and financial risk of the Company individually, it is necessary to establish a group of companies that are both publicly traded and comparable to Ameren Missouri in certain fundamental business and financial respects to serve as a "proxy" for determining the ROE and evaluating the Company's proposed capital structure. Therefore, it is not appropriate to conclude that because a company has a cost recovery mechanism that the Company can increase its leverage and therefore its financial risk.

The analysis of the ROE for a regulated utility is based on market data for a proxy group of publicly traded proxy companies that are reasonably comparable to the subject utility. The returns that result from that analysis represent the risk profile of the proxy group as a whole. In order to determine the appropriate return for the subject company, it is necessary to consider the risks of the subject as compared with the proxy group companies. Those risks include business risks and the risk related to the capitalization of the company. If the company is determined to have greater risk than proxy group based on that comparison, then an ROE or equity ratio towards the higher end of the proxy group results may be warranted. An increase in the equity ratio adjusts the risk to equity holders because it reduces the leverage in the company's capital structure.

---

[13] New Regulatory Finance, Roger A. Morin Ph.D., Public Utility Reports, 2006, at 215-216.

Q. Did Mr. Murray evaluate his proxy group to determine if the companies included in his proxy group had capital cost recovery mechanisms?

A. No, he did not. Mr. Murray inappropriately concludes that because Ameren Missouri utilizes PISA to recover a portion of the Company's electric capital expenditures costs, the business risk for the Company is reduced indicating the Company could increase its leverage.

Q. Did you conduct any analysis to determine if the companies included in your proxy group had capital cost recovery mechanisms?

A. Yes, I did. However. First, it is important to note as I did in my Direct Testimony, that Ameren Missouri will be very close to the compound annual growth rate cap of 2.85 percent associated with PISA at the conclusion of this rate proceeding; therefore, Ameren Missouri will no longer benefit from PISA if the Company exceeds the rate cap.[14] Second, as shown in shown in Schedule AEB-D2, Attachment 10, of my Direct Testimony, 81.5 percent of the operating companies of the proxy group have some form of capital cost recovery mechanism and/or are allowed to include CWIP in rate base. Thus, the use of PISA does not reduce the Company's regulatory risk, relative to its peers. Rather, the implementation of PISA moves the Company closer to the risk profile of the operating utilities of the proxy group companies.

[14] Direct Testimony of Ann E. Bulkley, at 64.

Q. Did you consider any other business risks when evaluating the relative risk of Ameren Missouri to the proxy group?

A. Yes, I did. As discussed in my Direct Testimony, I considered the regulatory risk of the Company which included the review of capital cost recovery mechanisms and the size of the Company's capital expenditures plan as compared to the companies in the proxy group.[15] Ultimately, I concluded that the Company faced increased business risk when compared to the proxy group as a result of: 1) Ameren Missouri's capital expenditures plan; 2) the fact that many of the companies in the proxy group have more timely cost recovery mechanisms than Ameren Missouri has in Missouri and 3) the RRA jurisdictional and S&P credit supportive ranking for Missouri indicates greater risk for Ameren Missouri than the proxy group average.

Q. How does the elevated level of business risk affect Ameren Missouri's capital structure?

A. The increased risk of the Company relative to the proxy group indicates that the Company's equity ratio should be greater than the proxy group average equity ratio. As discussed in the Rebuttal Testimony of Company Witness Darryl Sagel, the median authorized equity ratio for the companies contained my proxy group as of 2020 was 51.62 percent which is consistent with the equity ratio proposed by the Company of 51.93 percent.[16] Thus, the Company's proposed equity ratio is conservative when compared to the proxy group considering the business risk of Ameren Missouri. Conversely, the equity ratio proposed by Mr. Murray of 45 percent is well below the average authorized equity

[15] Direct Testimony of Ann E. Bulkley, at 52-68.
[16] Rebuttal Testimony of Darryl Sagel, at 30.

ratio for proxy group and is therefore not reasonable as it would result in a substantial increase in the financial risk of the Company.

IV. OVERVIEW OF RETURN ON EQUITY RECOMMENDATIONS AND COMPARABLE RETURN STANDARD

Q. Please provide an overview of the other ROE witnesses' recommendations in this proceeding.

A. Figure 2 summarizes the results of the ROE analyses presented by the other witnesses in this proceeding and their final recommendations. Staff witness Mr. Chari's Two-Step DCF analysis, CAPM analysis and Bond Yield Risk Premium analysis indicate a cost of equity from 6.49 percent to 9.53 percent, while OPC witness Mr. Murray's Multi-Stage DCF, CAPM and Rule of Thumb results suggest a cost of equity of 5.75 percent to 7.33 percent. It is interesting that while Mr. Chari and Mr. Murray abandon the results of their models when establishing their recommendations, neither of these witnesses reconsider the validity of the inputs and assumptions used in their respective models. Rather, Mr. Chari simply recommends an ROE for Ameren Missouri of 9.50 percent, which is 121 basis points higher than the average results of his Two-Step DCF model and 267 basis points higher than the midpoint results of his CAPM analyses. Similarly, Mr. Murray's ROE recommendation of 9.00 percent is 167 to 222 basis points higher than his Multi-Stage DCF model results and 196 to 260 basis points higher than his CAPM results.

Figure 2: Recommended Capital Structures, ROE Ranges and Point Estimates of the Other ROE Witnesses

Witness	Mr. Chari (Staff)	Mr. Murray (OPC)
Equity Ratio	50.32%[17]	45.00%
Two Step/Multi-Stage DCF	6.84%-9.52% Mean: 8.29%[18]	All: 7.33% Less than 10% Non-Reg: 7.21% Common Since 2012/14: 7.08%
Multi-Stage (AEE only)	N/A	6.78%-7.12%
CAPM	6.15%-7.75% Mean: 6.83%[19]	6.40% - 7.04%
Rule of Thumb/ Bond Yield Risk Premium	6.49%-8.49%[20]	5.75%
Recommendation	9.50%	9.00%
Weighted Equity Return	4.78%	4.05%
Difference between recommendation and model results	1.31%-2.67%	1.67%-3.25%

[17] Approximately 51.93% when trued-up.
[18] Schedule PC-9-1.
[19] Schedule PC-10.
[20] Staff Report, at 27.

Q. Are authorized returns in other jurisdictions a relevant benchmark to evaluate the reasonableness of the ROE recommendations of Staff and the OPC?

A. Yes. The *Hope* and *Bluefield* cases establish that authorized ROEs be comparable to other investments of commensurate risk. Therefore, the regulatory decisions of other commissions provide a basic test 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. In your opinion, are the equity return recommendations of OPC witness Mr. Murray and Staff witness Mr. Chari consistent with the comparable return standard?

A. No, they are not. Both Mr. Chari and Mr. Murray claim that one of the economic guidelines they used in determining the cost of equity for Ameren Missouri was the comparable return standard established by the Court in *Hope* and *Bluefield*.[21] While Mr. Chari considers the authorized ROEs for electric utilities in other jurisdiction across the U.S., he relies on the simple average of all authorized ROE for 2020 and 2021 to support his recommended ROE of 9.50 percent.[22] However, he does not evaluate the differences between vertically integrated and distribution only authorized ROEs nor does he review the authorized ROE data to determine if individual cases should be excluded from the average due to lack of comparability (i.e., authorized ROEs which reflect penalties, authorized ROEs determined using formula rate plans, etc.). Mr. Murray claims he considered "recent average allowed ROEs for electric utilities" in the development of his recommended range; however, Mr. Murray does not provide any support to indicate that authorized ROEs would support his

[21] Staff Cost of Service Report, at 10 and Direct Testimony of David Murray, at 5.
[22] Staff Cost of Service Report, at 28.

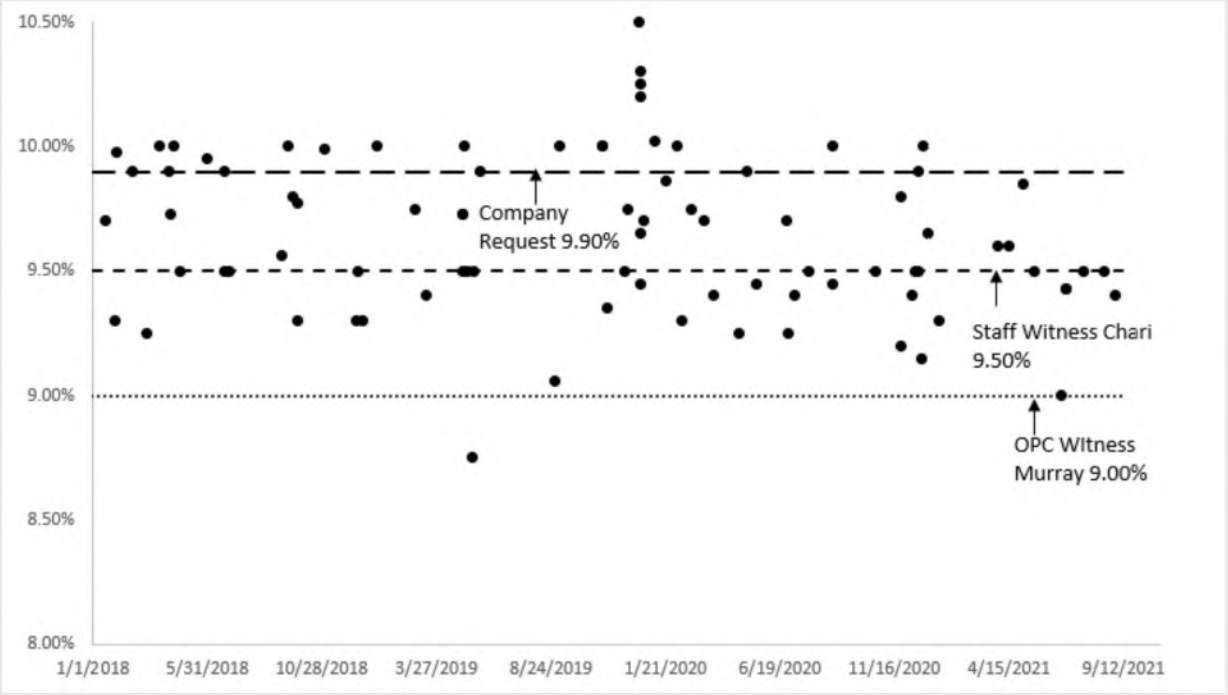
recommended range of 8.50 percent to 9.9.25 percent.[23] Further, Mr. Murray sets his return at 9.00 percent and proposes that this ROE should be reduced if the Commission were to adopt an equity ratio that is higher than his proposal. Therefore, neither witness has developed an appropriate comparison of their recommendation and the recent ROEs awarded to vertically integrated electric utilities across the U.S.

Q. Have you developed a comparison of the recommended ROEs of Mr. Chari and Mr. Murray to the ROEs authorized by other utility regulatory commissions across the U.S.?

A. Yes. Figure 3 shows the authorized returns for vertically integrated electric utilities in other jurisdictions since January 2018, compared to the return recommended by Mr. Chari of 9.50 percent and the 9.00 percent recommendation from Mr. Murray.

[23] Direct Testimony of David Murray, at 5.

Figure 3: U.S. Authorized ROEs – Vertically Integrated Electric Utilities – January 2018 through August 2021[24]



Recent comparable authorized ROEs range from 8.75 percent to 10.50 percent, with an average of 9.64 percent.[25] Figure 3 demonstrates that the low end of Mr. Murray's range, 8.50 percent is well below any comparable return that has been authorized for a vertically integrated electric utility over this time-period. Therefore, Mr. Murray is selecting an ROE from a range that is inconsistent with the comparable return standard.

The majority of authorized returns for vertically integrated electric utilities (45 out of 85 decisions) from 2018 through August 2021 have been greater than 9.55 percent. This range is consistent with the Company's requested ROE of 9.90 percent in this proceeding

[24] Source: S&P Capital IQ. Data through September 15, 2021.

[25] Figure 3 provides authorized ROEs for vertically integrated electric utilities. This figure excludes the most recent decision for Green Mountain Power of 8.2 percent, because it was a formula rate plan and not a market determined cost of equity.

and higher than the ROE recommendations of Mr. Chari and Mr. Murray. The recommendations offered by Mr. Chari and Mr. Murray are both below the average of comparable authorized ROEs for vertically integrated electric utilities over the past three years. This would indicate that both Mr. Chari and Mr. Murray believe Ameren Missouri has less risk than other comparable vertically integrated electric utilities across the U.S. However, neither Mr. Chari nor Mr. Murray provide any evidence to support this conclusion because they do not consider the relative risk of Ameren Missouri. Finally, neither witness has considered their recommendations and recently authorized ROEs in the context of current market conditions. As discussed in more detail in Section VI of my Rebuttal Testimony, in determining the appropriate ROE for Ameren Missouri it is necessary to consider current inflationary pressures and the expectations for rising interest rates over the near-term which will increase the cost of equity for utilities going forward.

Q. Are you aware of any utilities that have experienced a credit downgrade related to the financial effects of a rate case decision?

A. Yes. Credit rating agencies take the authorized ROE into consideration in the overall risk analysis of a company. For example, Moody's downgraded ALLETE, Inc. in 2019 from A3 to Baa1 for reasons that included the less than favorable outcome in Minnesota Power's last rate case in Minnesota. Moody's viewed Minnesota Power's recent rate case decision as credit negative for reasons which included: (1) the below average authorized ROE of 9.25 percent, which resulted in a reduction of approximately $20 million between the requested and approved revenue requirement; (2) the disallowance of certain expenses such as prepaid pension expenses; and (3) the decision to not adopt the annual

rate review mechanism which, if adopted, would have mitigated the effect of industrial customers scaling back production in response to changes in economic conditions.[26]

The credit rating agencies also reacted negatively to the recent rate case decision for Puget Sound Energy ("PSE") in Washington. In July 2020, PSE received a rate determination that included an authorized ROE of 9.40 percent, which represented a 10 basis point decrease in the prior authorized ROE and a common equity ratio of 48.5 percent, resulting in an overall rate of return of 7.39 percent (and an equity rate of 4.559 percent). Each of the rating agencies responded negatively to this decision. FitchRatings downgraded the outlook on PSE and its parent company Puget Energy ("PE") to negative, indicating that the rate order would:

> [s]ignificantly impair PE's consolidated credit metrics, raising FFO leverage to be approximately 6.0x through 2021, exceeding the downgrade guideline ratio of 5.5x. PE and PSE could be downgraded if mitigating actions are not forthcoming or **insufficient** to strengthen their credit metrics. Sustained lack of constructive regulatory relationship will also be a catalyst for a downgrade.[27]

S&P's ratings outlook for PSE and PE is negative, reflecting expectations that the FFO to debt ratio for PE would be 13 percent. S&P also stated that "[t]he decision is inconsistent with our current assessment and should the company continue to exhibit substantial

---

[26] Moody's Investors Service, Credit Opinion: ALLETE, Inc. Update following downgrade, at 3 (April 3, 2019).

[27] FitchRatings, Rating Action Commentary, "Fitch Affirms Puget Energy and Puget Sound Energy; Outlook Revised to Negative, July 27, 2020. Emphasis added.

regulatory lag, we would likely revise our assessment of the company's business risk profile downward."28 Moody's indicated that the outcome of the rate case was credit negative, recognizing a below average return on equity that was lower than the prior authorized ROE.[29]

Q. What is your conclusion based on these facts?

A. Based on these facts, Mr. Chari's and Mr. Murray's ROE recommendations of 9.50 percent and 9.00 percent, respectively, would not meet the comparable return standard of *Hope* and *Bluefield*.

V. UPDATED RETURN ON EQUITY MARKET DATA

Q. Have you updated your ROE analyses?

A. Yes, I have updated my ROE analyses using market data as of August 31, 2021. As part of updating the analyses for current market conditions, I have also made one modification. OGE Energy Corporation no longer met the screening criteria described in my Direct Testimony due the sale of its ownership in Enable Midstream Partners L.P., and therefore the updated results exclude this company. Figure 4 below (see also Schedule AEB-R1, Attachments 1 through 7 summarizes the results of my updated analyses for the proxy group.

---

[28] S&P Global Market Intelligence, S&P removes Puget Energy, Puget Sound Energy from CreditWatch, August 24, 2020.

[29] Moody's Investor Service, Puget Sound Energy, Inc. Puget Sound Energy's rate case outcome is credit negative, July 17, 2020.

Figure 4: Summary of Updated Cost of Equity Results

Constant Growth DCF			
	Mean Low	Mean	Mean High
30-Day Average Price	8.09%	9.16%	10.12%
90-Day Average Price	8.16%	9.22%	10.18%
180-Day Average Price	8.30%	9.36%	10.32%
Capital Asset Pricing Model			
	Current Risk-Free Rate (1.91%)	Q4 2021 – Q4 2022 Projected Risk-Free Rate (2.42%)	2023-2027 Projected Risk-Free Rate (3.50%)
Value Line Beta	13. 19%	13.24%	13.36%
Bloomberg Beta	12.15%	12.25%	12.46%
Long-term Avg. Beta	11.13%	11.27%	11.56%
Empirical Capital Asset Pricing Model			
Value Line Beta	13.53%	13.57%	13.66%
Bloomberg Beta	12.76%	12.83%	12.98%
Long-term Avg. Beta	11.99%	12.09%	12.31%
Bond Yield Plus Risk Premium			
	Current Risk-Free Rate (1.91%)	Q4 2021 – Q4 2022 Projected Risk-Free Rate (2.42%)	2023-2027 Projected Risk-Free Rate (3.50%)
Risk Premium Analysis	9.50%	9.71%	10.17%

Q. Do the updated results support the Company's requested ROE of 9.90 percent in this proceeding?

A. Yes. The results of the cost of equity estimation models have generally increased since the analysis in my Direct Testimony was performed using market data through January 31, 2021. Therefore, in addition to all of the other factors that I have considered, the updated results reflecting market data through August 31, 2021, provide additional support for my recommended ROE range of 9.75 percent to 10.50 percent and within that range the Company's requested ROE of 9.90 percent.

VI. UPDATED CAPITAL MARKET CONDITIONS

Q. Please summarize the other ROE witnesses' positions on capital market conditions and the implications for the cost of equity.

A. Mr. Chari provides a summary of macroeconomic indicators comparing level of these indicators currently to the period surrounding the Empire District Electric case as well as noting general observations about current market conditions and providing a review of current conditions more generally. Mr. Chari notes that recent market conditions have been volatile, inflation is increasing and unemployment is high. While several of the articles that Mr. Chari relies on as sources for macroeconomic data are from the first and second quarter of this year, in general, he concludes that several indicators demonstrate that the cost of equity has increased. This is consistent with the conclusions that he draws from the results of his DCF analyses.[30]

[30] Staff Cost of Service Report at 14-16.

In contrast, Mr. Murray notes that while the yields on long-term government bonds and utility bonds have increased and are close to the levels achieved prior to the pandemic, yields are still at historically low levels indicating that investors still expect authorized ROEs to be reduced.[31] Additionally, Mr. Murray notes that careful interpretation must be made of the recent underperformance of LDC and electric utility stocks relative to the broader market. He contends that utility stocks rebounded recently but have not increased to the levels reached prior to the pandemic. Further he notes that "while the utility industry can issue bonds at an even lower cost than shortly before the pandemic, the utility equity market data has not been as conclusive about the direction of utility equity costs".[32] Mr. Murray recognizes that the results of the CAPM indicate a higher cost of equity whereas he suggests that valuation ratios for electric utilities are only slightly lower than prior to the pandemic.

Q. Do you agree with Messrs. Chari and Murray that utility share prices have a strong inverse correlation to changes in the yields of long-term government bonds?

A. Yes, I do. Mr. Chari and Mr. Murray have acknowledged that interest rates and utility share prices are inversely correlated which means, for example, that an increase in interest rates will result in a decline in the share prices of utilities.[33]

---

[31] Direct Testimony of David Murray, at 8 and 13.

[32] *Id.*, at 9.

[33] Staff Cost of Service Report, at 9-10 and Direct Testimony of David Murray, at 13-14.

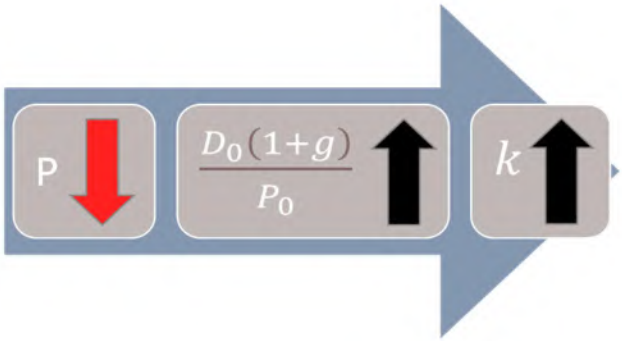
Q. What is the significance of the inverse relationship between interest rates and utility share prices in the current market environment?

A. As discussed in my Direct Testimony, the economy is currently in the recovery phase of the business cycle, which is characterized by improving economic growth, increasing inflation and increasing interest rates.[34] If interest rates increase as expected then the share prices of utilities will decline. Therefore, the DCF model, which relies on historical averages of share prices, is likely to understate the cost of equity. For example, Equation [1] below is the Constant Growth DCF model where the first term is the expected dividend yield and the second term is the expected long-term growth rate:

$$k = \frac{D_0(1+g)}{P_0} + g \quad [1]$$

As shown in Figure 5, a decline in stock prices will increase the dividend yields and thus the estimate of the ROE produced by the Constant Growth DCF model.

Figure 5: The Effect of a decline in Stock Prices on the Constant Growth DCF model



Q. What have equity analysts said about long-term government bond yields?

A. Several equity analysts have noted that they expect economic conditions to continue to improve and thus the yields on long-term government bonds to continue to increase

[34] *Id.*, at 16-20.

through the end of 2021 and into 2022. For example, Bloomberg recently noted that forecasters were projecting the yield on the 10-year Treasury Bond will increase to approximately 1.8 percent by the end of 2021.[35] Similarly, strategists at CitiGroup Inc. recently noted that they expect the yield of the 10-year Treasury Bond to increase to 2 percent in 2022.[36]

In terms of equity recommendations considering the expected increase in long-term government bond yields, Federated Hermes prefers cyclical industries such as financials and industrials. When cyclical stocks are favored, historically the utility sector underperforms.

> "We like financials and industrials and materials and small cap and yes, international stocks in that environment," he [Federated Hermes' Steve Chiavarone] said. "But I think the overall equity index will have every ability to move higher in that pro-cyclical, higher inflationary environment just like it did last September through April."[37]

Q. Have you considered any additional indicators which may imply long-term interest rates are expected to increase?

A. Yes, I have. I considered the net position of commercials (i.e., banks) in U.S. Treasury Bond futures contracts as reported in the Commitment of Traders ("COT") Report

---

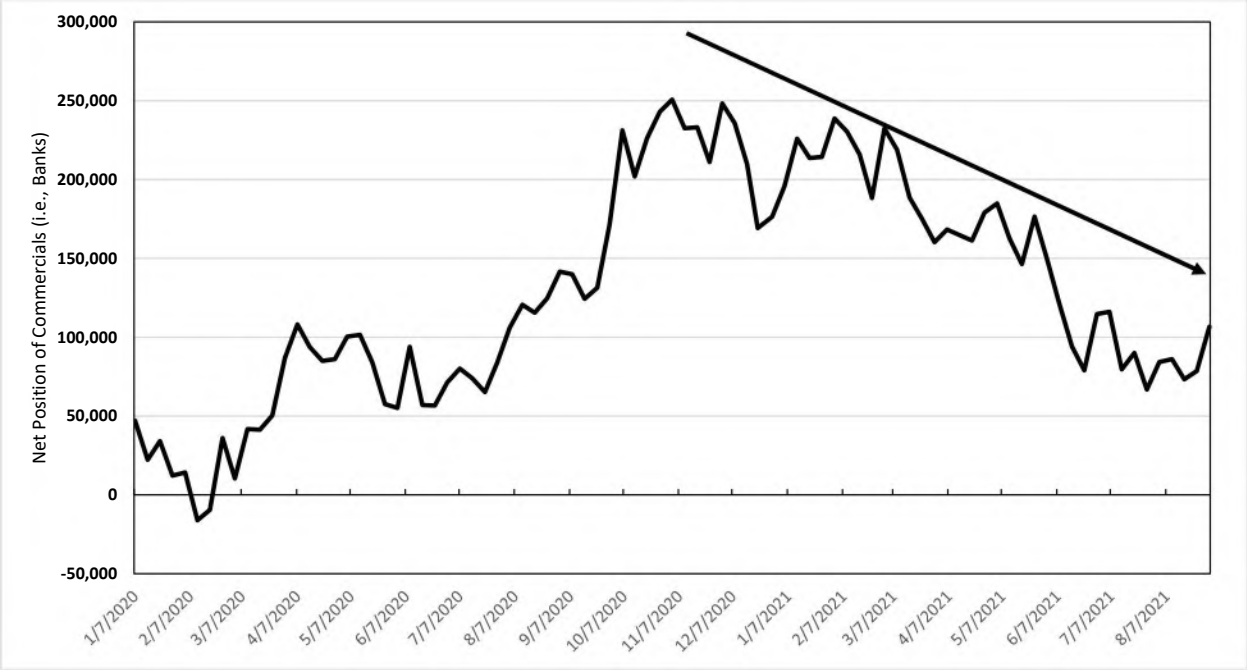
[35] Galouchko , Ksenia. "Citi Cuts Tech-Heavy U.S. Stocks on Treasury Yield Surge Call." Bloomberg.com, Bloomberg, 4 Aug. 2021, https://www.bloomberg.com/news/articles/2021-08-04/citi-cuts-tech-heavy-u-s-stocks-on-treasury-yield-surge-call.

[36] *Ibid.*

[37] Gurdus, Lizzy. "Citi Calls for 10-Year at 2%. Here Are Ways to Play a High-Rate Environment." CNBC, CNBC, 5 Aug. 2021, www.cnbc.com/2021/08/05/citi-calls-for-10-year-at-2percent-here-are-ways-to-play-a-high-rate-environment.html.

produced by the Commodity Futures Trading Commission ("CFTC"). A net position is defined as the total number of long positions in a futures contract minus the total number of short positions in a futures contract. A long position means that an investor agrees to purchase an asset in the future at a specified price today and therefore profits if the price of the underlying asset increases. Conversely, short position is when an investor agrees to sell an asset at a time in the future at a specified price today and profits if the price of the asset declines. Therefore, if banks are increasing the number of short positions and thus have a declining net position, the banks are assuming that the price of the asset will decline. As shown in Figure 6, the net position of banks in U.S. Treasury Bonds has been decreasing since the end of 2020. Therefore, banks are forecasting a decrease in the price of long-term government bonds and thus the yields (which are inversely related to the price) to increase over the near-term.

Figure 6: Commitment of Traders Report – Net Position of Commercials (i.e., Banks) in U.S. Treasury Bond Futures Contracts[38]



Q. How do equity analysts expect the utility sector to perform in an increasing interest rate environment?

A. Equity analysts project that utilities are expected to continue to underperform the broader market as interest rates increase. For example, Fidelity recently recommended underweighting the utility sector and ranked the utility sector towards the low-end of its relative strength rankings, which measure each sector's performance relative to the broader market.[39] Moreover, as noted above, Charles Schwab has continued to classify

[38] Commitment of Traders Report, as of August 31, 2021 - https://www.cftc.gov/MarketReports/CommitmentsofTraders/HistoricalCompressed/index.htm

[39] Fidelity, "Q3 2021 sector scorecard: Real estate, energy, and tech led in Q2 as the recovery gathered steam," July 28, 2021.

the utility sector as "Underperform".[40] Finally, in its 2021 Midyear Outlook, Well Fargo classified the utility sector as "most unfavorable" as economic growth continues to rebound.[41]

The outlook of equity analysts is important because the unfavorable outlook of utilities over the near-term shows that economic growth and increasing interest rates will result in declining valuations of utilities. Therefore, the underperformance of utilities over the near-term will be due to conditions that are unfavorable for the sector and not because accommodative monetary and fiscal policy are causing the S&P 500 to outperform the utility sector as Mr. Murray contends.[42]

Q. Do you agree with Mr. Murray that investors expect authorized ROEs to decline because of the low interest rate environment?

No, Mr. Chari and I agree that market conditions suggest an increase in the cost of equity. As discussed in Mr. Chari's testimony, betas for the proxy group companies have increased as compared with prior periods, and volatility and inflation have increased, all of which suggest an increase in the cost of equity. Furthermore, the yield on the 30-year Treasury Bond reached a low in August 2020 of 1.32 percent[43]; however, yields have increased to 1.91 percent as of August 31, 2021. Finally, the average authorized ROE for vertically integrated electric utilities was 9.55 percent in 2020.[44] Therefore, the average authorized ROE for vertically integrated electric utilities was 9.55 percent at the low point

---

40 Charles Schwab, "Schwab Sector Insights: A view on 11 Equity Sectors," August 19, 2021.

41 Well Fargo Investment Institute, 2021 Midyear Outlook, June 2021.

42 Direct Testimony of David Murray, at 12-13.

43 Bloomberg Professional, as of August 31, 2021.

44 S&P Capital IQ, "RRA Regulatory Focus – Major Rate Case Decisions – January – June 2021, " July 27, 2021.

of the yield on the 30-year Treasury bond. Since, interest rates have increased since August 2020 and are expected to increase over the near-term as the economy recovers from the COVID-19 pandemic, investors will not expect authorized ROEs for vertically integrated electric utilities to decline.

Q. Is an increase in regulatory commission approved ROEs consistent with the Mr. Murray's positions regarding capital markets?

A. Yes, it is. For example, Mr. Murray has acknowledged that the share prices of utilities are inversely related with interest rates:

> Therefore, changes in utility stock valuation levels typically have a strong inverse correlation to changes in bond yields, i.e. as bond yields decline, utility stock prices increase.[45]

Therefore, since interest rates are expected to increase over the near-term, the cost of equity for utilities will also increase.

Q. What are your conclusions regarding the effect of capital market conditions on the cost of equity for Ameren Missouri?

A. There are a few important conclusions regarding the effect of capital market conditions for Ameren Missouri:

1) The share prices of utilities are inversely related with the interest rates. Investors expect interest rate to increase over the near-term which will likely result in a decline in the share prices of utilities. A decline in share prices will increase the dividend yield and thus the cost of equity estimate of the DCF model. Therefore,

---

[45] Direct Testimony of David Murray, at 10.

current DCF results are likely understating the cost of equity during the period that Ameren Missouri's rates will be in effect.

2) Market conditions have affected the results of the ROE estimation models requiring consideration of the results of multiple models and exercised judgment.

3) While the ROE estimation models use some historical data (i.e., stock prices and dividends in the DCF model, and bond yields in the CAPM), based on the expectation that interest rates will increase, I believe it is also appropriate to consider near-term projections in the ROE estimation models.

4) Mr. Murray's assumption that the cost of equity is lower than authorized ROEs causes him to inappropriately conclude that the authorized ROE should decline even though interest rates have increased since August 2020 and are expected to increase over the near term.

VII. STAFF WITNESS MR. PETER CHARI'S ROE ANALYSIS

Q. Please provide an overview of Mr. Chari's ROE analyses.

A. Mr. Chari develops multiple methodologies including the DCF, CAPM and Bond Yield Risk Premium methodologies and estimates a range of results from each methodology. Figure 7 summarizes the results of Mr. Chari's ROE estimation methodologies and compares the ROE results to the ROE results that were filed by Staff in the 2019 case for Empire District Electric.

Figure 7:Comparison of Mr. Chari's ROE Results to Staff's Estimation in Empire District Electric Missouri's 2019 case

Methodology	Staff 2019 Case Range	Mr. Chari's Range
DCF[46]	7.34%-8.14% Mean: 7.74%	6.84%-9.52% Mean: 8.29%[47]
CAPM[48]	4.63%-5.43	6.15%-7.75% Mean: 6.83%[49]
Bond Yield Plus Risk Premium	NA	6.49%-8.49%[50]
Recently Authorized ROEs for Electric Utilities[51]	2019 Fully Litigated: 9.36%	2021 Fully Litigated: 9.44% 2021 Settled: 9.48% 2021 All: 9.46%

Q. Is Mr. Chari's ROE recommendation based on the results of his ROE estimation models?

A. No, it is not. As shown in Figure 7, Mr. Chari's ROE estimation models suggest a range of 6.15 percent to 9.52 percent, therefore, he essentially disregards the results of his ROE estimation methodologies when he establishes a recommended range from 9.25 percent

---

46 Staff Cost of Service Report, Schedule PC-9-1 and Case No. ER-2019-0374, January 15, 2020, Schedule PC-10-1.
47 Schedule PC-9-1.
48 Staff Cost of Service Report, at 23 and Case No. ER-2019-0374, Staff Cost of Service Report, January 2020, at 17.
49 Schedule PC-10.
50 Staff Report, at 27.
51 Staff Cost of Service Report, at 28, Table 1 and Case No. ER-2019-0374, Staff Cost of Service Report, January 2020, at 18.

to 9.75 percent.[52] Staff's recommended range appears to be based on the authorized ROE in the Empire District case at the low end, adding the 55 basis point increase determined from his comparative analysis approach to derive the high end of 9.80 percent.[53]

Mr. Chari's recommendation of 9.50 percent was determined by adding 25 basis points (rather than the 55 basis points that resulted from his comparative analysis) to the 9.25 percent ROE that was authorized in the 2019 Empire District Electric case.

Q. What are the principal areas of disagreement with the methodologies that Mr. Chari uses as the basis for his modeling?

A. I have many areas of disagreement on the technical aspects of Mr. Chari's analysis and the assumptions he relies on in each of these methodologies. As a practical matter, however, Mr. Chari does not actually rely on any of those analyses to support his recommendation for Ameren Missouri, as they all produce results that are significantly below his recommended ROE range and point estimate 9.50 percent. Rather, Mr. Chari's ROE recommendation is based on a comparison of the results of his Two-step DCF model in this case to the results of the model that he relied on in Empire District Electric's 2019 case. While I disagree with many aspects of Mr. Chari's DCF, CAPM and other benchmarking analyses, the fact is that Mr. Chari has not relied on those models in the development of his recommendation. Therefore, my response to Mr. Chari will address

---

[52] Staff's recommended range is somewhat unclear. While it is identified as 9.25 percent to 9.80 percent in Schedule PC-11, in the Staff Cost of Service Report at page 29, Mr. Chari suggests the high end of the range is 9.75 percent.

[53] Schedule PC-11.

each methodology at a high level, and I will focus more specifically on the Two-Step DCF methodology and the comparison underlying his recommended return.

A. Response to Mr. Chari's Two-Step DCF Analysis

Q. Please summarize Mr. Chari's specification of the Two-Step DCF model.

A. Mr. Chari's DCF analysis is a two-stage model where he relies on projected earnings growth rates from Value Line and S&P Market Intelligence as the estimate of the short-term growth rate, and projected GDP growth as the long-term growth rate.[54] In support for his position that it is common practice for ROR witnesses to combine analysts' projected growth rates with projected long-term GDP growth rates to estimate a reasonable growth rate in the DCF model, Mr. Chari cites to the Federal Energy Regulatory Commission ("FERC"). Mr. Chari relies on the three-month average of the high and low stock prices for his electric utility proxy companies for three months ending July 30, 2021.[55] For the long-term growth rate, Mr. Chari notes that the Federal Open Market Committee ("FOMC") is projecting long-run nominal Gross Domestic Product ("GDP") growth of 3.80 percent and the Congressional l Budget Office ("CBO") projects 3.70 percent.[56] Mr. Chari relies on the lower estimate from the CBO of 3.70 percent. As shown in Schedule PC-8-2 Mr. Chari's combined growth rate is the result of assigning a two-thirds weight to the average EPS growth rates and a one-third weight to the long-term GDP growth rate.[57] Schedule

---

54 Staff Cost of Service Report, at Schedule PC-8-2.

55 *Id.,* at Schedule PC-9-1.

56 Staff Cost of Service Report, at 25.

57 Staff Cost of Service Report, at 25. It is important to note that Staff Witness Chari does not specify a FERC Order in his reference, however, recent FERC precedent is to weight the short-term growth rates 80% and the long-term growth rates 20%, which, if applied to Mr. Chari's analysis would increase the growth rate used in the DCF model.

PC-9-1 shows the results of Mr. Chari's Two-Step DCF analysis, which range from 6.84 percent to 9.52 percent, with an average DCF result of 8.29 percent.

Q. Are the results of Mr. Chari's Two-Step DCF model reasonable?

A. No, they are not. The results of Mr. Chari's Two-Step DCF analysis understate the cost of equity when compared with the observed authorized equity returns for vertically integrated electric utilities in other jurisdictions. The mean result of Mr. Chari's Two-Stage DCF analysis is 8.29 percent which is well below what Mr. Chari notes have been the recently authorized ROEs for all electric utilities of 9.44 percent. The *Hope* and *Bluefield* decisions, which Mr Chari acknowledges are standards to be followed in setting a just and reasonable return,[58] require the authorized return to be comparable to other returns available to investors in companies with similar risk. Mr. Chari's Two-Step DCF results clearly violate this standard.

Q. Does Mr. Chari's Two-Step DCF analysis follow FERC's current methodology?

A. No, it does not. Mr. Chari relies on the FERC for support that it is appropriate and common to weight EPS and GDP growth rates to establish the long-term growth rate in the Constant Growth DCF model. The weightings that Mr. Chari applies however are not consistent with FERC's most recent determination in the MISO transmission owners' case. In Opinion No. 569-A, FERC adjusted its application of the two-stage DCF model. In particular, the development of the average growth rates was changed from a two-thirds EPS and one-third GDP weighting structure to an 80 percent weight on EPS growth rate estimates and 20 percent on the long-term GDP growth rate.[59]

---

[58] Staff Cost of Service Report, at 10.

[59] Federal Energy Regulatory Commission, Opinion NO. 575, Order on Briefs and Initial Decision, May 20, 2021, at 12-13.

Q. Have you calculated the results of Mr. Chari's DCF analysis using the current FERC weightings to establish the growth rate?

A. Yes. As shown in Schedule AEB-R1, Attachment 8, the combination of this change would increase Mr. Chari's 2021 growth rate from 4.80 percent to 5.01 percent and his mean ROE from 8.29 percent to 8.50 percent.

Q. What are the primary drivers of the unreasonably low results of Mr. Chari's Two-Step DCF analyses?

A. There are two main factors that contribute to the unreasonably low results of Mr. Chari's Two-Step DCF model: 1) the dividend yield; and 2) the long-term growth rate. As discussed in my Direct Testimony, dividend yields are currently at historically low levels due to current market conditions.[60] One assumption of the DCF model is that the P/E ratio will remain constant in perpetuity. Industry analysts have commented that current valuations for utilities are clearly not sustainable. As such, it is not reasonable to set the forward-looking cost of equity for Ameren Missouri based entirely on the DCF model when the underlying assumptions of that model are being violated.

In my Direct Testimony, I note that several analysts are reporting the expectation for the utilities sector to underperform.[61] This data suggests that utility stock valuations will decline, and thus, the dividend yield in the DCF model, while measurable using current market data, may not be a reliable indicator of the future performance of these stocks.

---

60 Direct Testimony of Ann E. Bulkley, at 22.

61 *Id*., at 22-23.

Q. Please summarize Staff Witness Chari's comparative DCF analysis.

A. Staff witness Chari compares the results from his Two-Stage DCF model using data through July 2021 with the results of a single stage DCF model that he created in the 2019 Empire District Electric case.

Q. Did Staff rely on the analysis that was presented to the Commission in the 2019 Empire District Electric case in his comparison?

A. Yes. Staff witness Chari was the witness in the 2019 Empire District Electric case and he developed the DCF model for the Staff Report.

Q. Is the model that Mr. Chari developed in this proceeding consistent with the model that he developed in the 2019 Empire District Electric proceeding?

A. No, it is not. In the 2019 Empire District Electric proceeding, Mr. Chari relied on a constant growth DCF model, however several inputs of that model differ from the model he developed for the current case. Specifically, Mr. Chari's 2019 DCF model was based on different growth rate assumptions, using dividend growth rates as the basis for his growth rate range. Further, Mr. Chari did not make an adjustment to reflect that the long-term growth would revert to GDP growth and therefore did not include any weighting of short-term and long-term growth rates to develop the range of growth rates relied on in that case.

Q. Do you agree with the comparison that Mr. Chari performs between the analysis he prepared in the 2019 Empire District Electric case and the analysis he relied on in this proceeding?

A. No, I do not. As shown on Schedule PC-11, Mr. Chari compares the mean results from the 2019 DCF analysis, of 7.74 percent to the mean result of his current analysis.

However, because the methodologies that he used to develop these analyses are not consistent, the comparison is invalid. In the Empire District Electric case, Mr. Chari relied on DPS growth rates to establish his growth rate range. In the current proceeding, Mr. Chari's approach to estimate the growth rate relies on EPS growth rates and an estimate of long-term GDP growth. The methodologies differ substantially, therefore it is not reasonable to compare the results of the two models and conclude that the difference represents the difference in market conditions.

Q. Did Mr. Chari develop a comparative analysis that informed his recommendation in the 2019 Empire District Electric case?

A. Yes, he did. In that case, he compared the results of his analyses to the results of the analyses in the 2017 Spire Missouri case.[62]

Q. Is Mr. Chari's decision to make a 25-basis point adjustment to the authorized ROE from the Empire District Electric consistent with the way he applied his comparative analysis in the Empire District Case?

A. No, it is not. Mr. Chari's adjustments in this case are inconsistent with the Empire District Electric case and have the effect of understating the ROE. While I do not agree with all aspects of Mr. Chari's comparative analysis, his conclusion from the comparison of the 2019 DCF from the Empire District Electric case and his analysis in this case is that the COE had increased by 55 basis points. However, Mr. Chari makes a 25-basis point adjustment to the 9.25 percent ROE that he recommended and that was approved by the Commission in the Empire District Electric Case. Mr. Chari does not offer any meaningful explanation as to why it is appropriate to limit the increase to 25-basis points. Furthermore,

---

[62] Staff Cost of Service Report, Case No. ER-2019-0374, January 2020, at 5.

this approach is inconsistent with the adjustment that Mr. Chari made in the comparative analysis that he prepared in developing his recommendation in the 2019 Empire District Electric case. In that case, Mr. Chari concluded that there was a 55-basis point decrease in the cost of equity from the Spire case to the Empire District Electric case using the electric proxy group and he applied the entirety of that *decrease* to the ROE that was authorized in the Spire case.[63]

Further, Mr. Chari's decision in the Ameren Missouri electric case to make a partial adjustment for the concluded change in the COE in his ROE recommendation is inconsistent with Dr. Won's approach in the Ameren Missouri gas case that is ongoing contemporaneously with this proceeding. In his analysis, Dr. Won conducted a comparative analysis similar to that performed by Mr. Chari in this case, using the authorized ROE established by the Commission in the 2017 Spire natural gas case as the reference case. Dr. Won suggests that his comparative analysis resulted a decrease in the COE. In that circumstance, Dr. Won applied the entire amount of the decrease he calculated to the authorized ROE from the Spire case.

Therefore, it appears that Staff Witness Chari is electing substantially different approaches to adjusting the benchmark ROE when he concludes that the current COE has decreased than when he concludes it has increased.

---

[63] Staff Cost of Service Report, Case No. ER-2019-0374, January 2020, at 5, footnote 2. Mr. Chari's calculations, which were based on the comparison of model results for natural gas utilities, resulted in a 75 basis point difference in the cost of equity, which he adjusted by 20 basis points to account for the difference between electric and natural gas ROEs. Mr. Chari ultimately concluded that his analysis demonstrated a decrease in the cost of equity for Empire of 55 basis points.

Q. What would Mr. Chari's ROE recommendation have been if he had applied the full amount of his COE adjustment to the authorized ROE in the 2019 Empire District Electric case?

A. In the 2019 Empire District Electric case, the Commission authorized a 9.25 percent ROE. Simply applying the full amount of Mr. Chari's adjustment, which is consistent with Dr Won's approach in the Ameren Missouri natural gas utility proceeding, would result in an ROE of 9.80 percent, which is only slightly lower than the Company's requested ROE in this case of 9.90 percent.

Q. Earlier in your testimony, you adjusted Mr. Chari's Two-Stage DCF results to reflect the current FERC weightings on short and long-term growth rates. Have you conducted any analysis as to how that would affect Mr. Chari's comparative analysis?

A. Yes, I have. Using the adjusted ROE of 8.50 percent, reflecting the FERC growth rate weighting, the difference in the COE from the 2019 Empire District Electric case would be 76 basis points. (8.50%-7.74%= 0.76%). Consistent with Mr. Chari's approach in the Empire District Electric Case, applying that full adjustment to the 9.25 percent ROE that was authorized for Empire District Electric would result in an ROE for Ameren Missouri electric of 10.01 percent.

B. Capital Asset Pricing Model

Q. Please summarize Mr. Chari's application of the CAPM.

A. Mr. Chari states that he develops the CAPM as a test of the reasonableness of his DCF results.[64] Mr. Chari notes that his CAPM analysis uses a risk-free rate based on the average yield on the 30-year Treasury bond for the three months ending May 2021 of 2.32 percent,[65] Market Intelligence generated betas of 0.67 and two measures of the market risk premium. The first, (6.07 percent) is the long-term arithmetic average of historical return differences from 1926- 2020. The second risk premium (4.62 percent) is based on the long-term geometric average of historical returns over the same time-period.[66] The results of Mr. Chari's his CAPM analyses range from 6.15 percent to 7.75 percent, with a mean of 6.83 percent. Mr. Chari concludes that because the results of his CAPM analysis overlap the results from his DCF analysis, the CAPM "confirms the reasonableness of Staff's COE estimates".[67]

Q. Is Mr. Chari's testimony summarizing his CAPM analysis consistent with the analysis that is provided in Appendix 2?

A. No, it is not. Reviewing Schedule PC-10, which is Mr. Chari's CAPM analysis (although incorrectly named a Constant Growth DCF analysis), it appears that Mr. Chari's results are not based on May data, but rather are based on a risk-free rate that is the average yield on the 30-year Treasury bond for three months ending April 2021. Further, it appears

---

64 Missouri Public Service Commission Staff Cost of Service Report, at 26.
65 *Id.,* at 26.
66 *Id.,* at 27.
67 *Ibid*.

that the Betas relied upon in this analysis are from the Value Line publications dated January 22, 2021, February 12, 2021 and May 14, 2021. Finally, the market risk premium is based on the average of the arithmetic and geometric averages of the historical returns.[68]

Q. Does Mr. Chari rely on his CAPM analysis to establish his recommended ROE for Ameren Missouri?

A. No, he does not. While he suggests that the results of this analysis are supportive of his COE estimates, Mr. Chari's recommendation is based on the benchmarking analysis performed using the results of his Two-Step DCF model and the DCF model prepare for the 2019 Empire District Electric case.

Q. Do you agree with the range and point estimate resulting from Mr. Chari's CAPM analysis?

A. No. Mr. Chari's CAPM analysis results in a range of between 6.15 percent and 7.75 percent. Returns at this level are too low to be considered reasonable. Comparing to recently authorized ROEs, there are no authorized returns for vertically integrated electric utilities that have been in this range.[69]

Q. What risk-free rate does Mr. Chari use in his CAPM analysis?

A. As shown in Schedule PC-10 of Appendix 2, Mr. Chari uses a risk-free rate of 2.14 percent, which is the average yield on the 30-year Treasury bond for the three months ended April 2021.

---

[68] Schedule PC-10.

[69] Excludes formula rate plans which are not specific Commission determinations, but rather the application of a formula that was set in an earlier time period and therefore cannot reflect the market environment or the investor required return at the time of the rate period.

Q. Do you agree with this estimate of the risk-free rate?

A. Not entirely. First, the data is dated, given that his testimony was filed in September 2021. However, my primary concern with Mr. Chari's risk-free rate is that the estimation of the cost of equity is a forward-looking analysis. Financial markets are expecting interest rates on 30-year government bonds to increase over the period that rates will be in effect, therefore it would be appropriate to consider in addition to a current estimate of the yield on the 30-year Treasury bond, an estimate of the projected Treasury bond yield. As of the fourth quarter 2022, the expected yield on the 30-year Treasury bond is 2.60 percent,[70] and is expected to continue to increase for the period from 2023 through 2027 to 3.5 percent.[71] As equity investors consider their return requirements, they must factor in expectations for higher interest rates on government bonds. Mr. Chari's exclusive reliance on government bond yields from the first half of this year does not reflect the market's expectations regarding interest rates over the rate period. I also question why Mr. Chari used the average risk-free rate for the three months ending in April when more recent market data was available.

Q. What MRP does Mr. Chari use in his CAPM analysis?

A. Mr. Chari estimates a MRP range of 4.62 percent to 6.07 percent using two separate estimates of the historical MRP. The two estimates of the MRP are the long-term geometric and arithmetic average MRPs of 4.62 percent and 6.07 percent, respectively, calculated as the difference between the return on large company stocks and long-term government bonds from 1926 to 2020.[72]

---

[70] Blue Chip Financial Forecasts, Vol. 40, No 9, September 1, 2021, at 2.
[71] Blue Chip Financial Forecasts, Vol. 40, No 6, June 1, 202, at 14.
[72] Staff Cost of Service Report, at 27.

Q. Why do you disagree with Mr. Chari's estimated MRP range of 4.62 percent to 6.07 percent?

A. It is important to note that because Mr. Chari does not rely on his CAPM methodology, and the result of this approach demonstrates that his assumptions are unreasonable, I do not address in detail the concerns I have for the methodology that Mr. Chari used to estimate the MRP. Further, many of the assumptions Mr. Chari uses to estimate his MRP were also relied upon by OPC witness Murray and are addressed in my response to this witness. However, I do believe it is important to note a practical concern I have with the range of MRPs relied on by Mr. Chari. In the two MRP scenarios Mr. Chari has relied on a long-term historical average of the MRP. However, given the current low yields on Treasury bonds, and the inverse relationship between interest rates and the MRP that is shown in the Bond Yield Plus Risk Premium analysis that I presented in Direct Testimony, Mr. Chari's use of a historical MRP will understate the MRP in the current market environment. For example, the historical income-only return on government bonds over the period 1926 to 2020 (which is the same period Mr. Chari used to estimate his estimates of the MRP) has been approximately 4.91 percent[73], while the 30-day average risk-free rate on long-term government bonds as of August 31, 2021 is 1.91 percent. Because interest rates on long-term government bonds are well below the historical average of 4.91 percent, the inverse relationship between interest rates and the MRP implies that the MRP should be well above the long-term historical averages of 4.62 percent to 6.07 percent that Mr. Chari calculates. Therefore, Mr. Chari's incorrect use of the historical MRP given current market conditions is the primary reason his CAPM analysis produced estimates of

[73] Duff &Phelps, Valuation Handbook: Guide to Cost of Capital, 2021.

the cost of equity that are below any authorized ROE for a vertically integrated electric utility in the last 40 years.

C. Bond Yield Plus Risk Premium Approach

Q. Please summarize Mr. Chari's Bond Yield- Plus Risk Premium analysis.

A. In this analysis Mr. Chari adds an equity risk premium to the yield-to-maturity on a company's long-term debt. The yield-to-maturity relied upon in this case is the average of the three-month average yields on Moody's A- and Baa rated utility bonds as of May 31, 2021. The average yield is 3.49%. Mr. Chari establishes his COE range by adding to this yield a range of risk premiums from 3% to 5%. Mr. Chari provides no source for these risk premiums. The result of his bond-yield risk premium approach is a range for the COE of 6.49 percent to 8.49 percent. [74]

Q. Do you agree with this methodology?

A. I agree that it is generally appropriate to rely on properly-specified risk premium methodologies. However, similar to his CAPM analysis, Mr. Chari's specification of this risk premium approach rely on unsupported estimates of the market risk premium, which he attempts to qualify by stating that this range is "considered acceptable". In addition to lacking support for the critical assumption in this analysis, Mr. Chari's analysis relies on a three-month average yield on utility bonds that is outdated and does not reflect the expectation of rising interest rates. As such, this methodology is not reflective of investor return requirements over the rate period.

---

[74] Missouri Public Service Commission Staff Cost of Service Report, at 27.

D. Authorized Returns in Other Jurisdictions

Q. Please summarize Mr. Chari's analysis of authorized returns in other jurisdictions.

A. Mr. Chari summarizes the authorized returns for all rate cases, fully litigated rate cases only and settled rate cases only for electric utilities in other jurisdictions from 2010 to 2021.[75] Mr. Chari's data indicate that the average authorized ROE for electric utilities in both fully litigated and settled proceedings has been in the range of 9.44 percent to 10.37 percent over this period.

Q. What are your conclusions about these authorized returns?

A. Mr. Chari should have only reviewed the authorized returns for vertically integrated electric utilities from 2010 through 2021. As Moody's has noted generation ownership causes vertically integrated electric utilities to have higher business risk than electric transmission and distribution companies.[76] Mr. Chari's recommended ROE of 9.50 percent is 43 basis points below the average authorized ROE for vertically integrated electric utilities from 2010-2020 of 9.93 percent and 338 basis points below the highest ROE award during this period for a vertically integrated utility. Additionally, as shown in Figure 3, Mr. Chari's recommendation is towards the low-end of the authorized ROEs for vertically integrated electric utilities since 2018. As noted above, 45 out of 85 decisions from 2018 through August 2021 have been greater than 9.55 percent.[77]

---

75 Staff Cost of Service Report, at 27-28.

76 Moody's Investors Service, Rating Methodology: Regulated Electric and Gas Utilities, at 21. The Commission itself has relied on authorized ROEs for vertically integrated electric utilities in deciding the appropriate ROE because of its recognition that vertically integrated electric utilities have more business risk than distribution only utilities. See *In the Matter of Union Electric Company*, File No. ER-2014-0258, Report and Order, 320 P.U.R.4th 330 (Apr. 29 2014) (Finding of Fact 11 in the Return on Equity section of the Order).

77 This excludes the most recent decision for Green Mountain Power of 8.2 percent, because it was a formula rate plan and not a market determined cost of equity.

Q. Has Mr. Chari provided any evidence to suggest that Ameren Missouri is a below-average risk utility?

A. No. Mr. Chari has presented no evidence regarding the relative risk of Ameren Missouri and other vertically integrated electric utilities across the U.S., or his proxy group companies.

Q. Is it important to conduct an analysis of the relative risk of Ameren Missouri and the proxy companies?

A. Yes, it is, and the Commission has specifically considered relative risk in assessing the sufficiency of ROE recommendations. In its decision in Spire Missouri's 2017 rate case, the Commission concluded that the ROE recommendation of 9.20 percent proposed by the OPC was too low because the OPC did not consider the fact that Spire Missouri faced increased business risk when compared to OPC's proxy group.[78]

Q. Have you conducted a risk analysis for Ameren Missouri?

A. Yes, as discussed in my Direct Testimony, I considered the regulatory risk of the Company and the size of the Company's capital expenditures plan as compared to the companies in the proxy group. I concluded that Ameren Missouri had greater business risk than the proxy group.[79] Based on this analysis, authorizing an ROE that is below the average authorized ROE for vertically integrated electric utilities since 2018, would not sufficiently compensate investors for the added risk faced by the Company.

---

[78] *In the Matter of Laclede Gas Company's Request to increase its Revenues for Gas Service*, File No. ER-2017-0215 and File No. GR-2017-0216, Report and Order (Feb. 21, 2018), at 31.

[79] Direct Testimony of Ann E. Bulkley, at 52-68.

VIII. OPC WITNESS MR. MURRAY'S ROE ANALYSIS

Q. Please summarize Mr. Murray's ROE analyses.

A. Mr. Murray also develops several cost of equity analyses including the multi-stage DCF and the CAPM. In these analyses, Mr. Murray relies on a proxy group of comparable companies and separately calculates the ROE for Ameren. In addition, Mr. Murray also develops a Rule of Thumb approach and considers recently authorized ROEs. As shown in Figure 8, the results of Mr. Murray's ROE estimation methodologies range from 5.75 percent to 7.33 percent.

Figure 8: Results of Mr. Murray's ROE Estimation Methodologies

Methodology	Range
Multi-Stage DCF (AEE, 3.5% long-term growth rate)[80]	7.12%
Multi-Stage DCF (AEE, 3.0% long-term growth rate)[81]	6.95%-6.96%
Multi-Stage DCF (AEE, 2.5% long-term growth rate)[82]	6.78%-6.79%
Multi-Stage DCF (Electric Utility Group, 3.0% long-term growth rate)[83]	All: 7.33% Less than 10% Non-Reg: 7.21% Common Since 2012/14: 7.08%
CAPM[84]	6.40%-7.04%
Rule of Thumb[85]	5.75%

Q. Is Mr. Murray's ROE recommendation based on the results of his ROE models?

A. As a practical matter, not at all. Mr. Murray establishes a range that he suggests the Commission consider in this case of 8.50 percent to 9.25 percent, however he provides no basis for that range in his testimony or workpapers. Within that range, Mr. Murray's recommendation of an ROE of 9.00 percent is based on the Commission's acceptance of his proposed 45 percent equity ratio[86] While Mr. Murray suggests that he considers his COE estimates, the results of Mr. Murray's models do not support his recommended

[80] Direct Testimony of David Murray, at DM-D-2-1 and DM-D-2-2.
[81] Direct Testimony of David Murray, at DM-D-2-1 and DM-D-2-2.
[82] Direct Testimony of David Murray, at DM-D-2-1 and DM-D-2-2.
[83] Direct Testimony of David Murray, at 24.
[84] Direct Testimony of David Murray, DM-D-5-1, DM-D-5-2, DM-D-5-3.
[85] Direct Testimony of David Murray, at 28.
[86] Direct Testimony of David Murray, at 5.

range. Mr. Murray's recommendation of 9.00 percent is 200 to 250 basis points above the COE range that he determines based on his models of 6.50 percent to 7.00 percent. Mr. Murray states that his recommendation is also based on consideration of the Commission's authorized ROE for Empire District Electric, the expected authorized ROE for Ameren Illinois' electric utility operations, capital market conditions, and an approximation of the "Zone of Reasonableness" that the Commission would consider.

Q. How does Mr. Murray factor his ROE model results into his ROE recommendation?

A. Mr. Murray relies on his essentially discarded Multi-Stage DCF analysis to conclude that the cost of equity is low and therefore, authorized ROEs should be reduced.[87] Thus, Mr. Murray recommends an ROE of 9.00 percent, which he incorrectly suggests is the midpoint of the range of his unsupported zone of reasonableness,[88] and is lower than the ROE range of 9.40 percent to 9.80 percent that was outlined as reasonable in the Settlement Agreement approved by the Commission in the Company's last rate case proceeding in 2020.[89] Therefore, Mr. Murray defaults to the incorrect concept that authorized ROEs are greater than the cost of equity in order to claim that he has considered his results because he cannot ultimately rely on his Multi-Stage DCF analysis due to the unreasonably low results produced by the model. The irrationality and arbitrary nature of the recommendation is however readily apparent.

---

87 Direct Testimony of David Murray, at 7.

88 *Id*., at 5.

89 File No. ER-2019-0335, *In the Matter of Union Electric Company d/b/a Ameren Missouri's Tariffs to Decrease Its Revenues for Electric Service,* March 18, 2020, at 4.

Q. What are your primary conclusions regarding Mr. Murray's analyses and conclusions?

A. While there are many assumptions and methodologies relied on by Mr. Murray with which I disagree, that will be discussed in the remainder of my Rebuttal Testimony, it is important to recognize that, as was the case with Mr. Chari, because Mr. Murray's models produce results that are 167 to 325 basis points below his recommended ROE of 9.00 percent. it is unreasonable to suggest that he has relied on any of his analyses. Therefore, Mr. Murray's recommendation is essentially his unsupported view of the ROE for Ameren Missouri.

Q. Are Mr. Murray's recommended ROE and equity ratio in this proceeding consistent with his recommendations in the 2019 Ameren Missouri electric rate proceeding?

A. No, they are not. Figure 9 below, compares Mr. Murray's model results, COE range, recommended ROE and recommended equity ratio developed in this proceeding to the model results and recommendations that he offered in the 2019 Ameren Missouri electric rate proceeding. As shown in Figure 9, the results of his models in this proceeding indicate an increase in the cost of equity from the time of the 2019 Ameren Missouri electric rate proceeding of between 29 and 102 basis points. This range is generally supportive of the range of increases concluded by Mr. Chari of 55 basis points and 76 basis points that I developed in my response to Mr. Chari.

While I disagree with many aspects of Mr. Murray's analyses, which I will discuss in the remainder of my rebuttal testimony, simply evaluating the differences in his model results from 2019 and the current case demonstrates that his recommendation in this case is inconsistent with the facts that result from a comparison of his own work.

- Mr. Murray's DCF and CAPM model results are 25-102 basis points higher today than in the 2019 Ameren Missouri case.
- Mr. Murray's estimate of the cost of equity is 50-100 basis points higher today than in the 2019 Ameren Missouri case.
- Mr. Murray is recommending higher leverage in the current case by 300 basis points than in the 2019 Ameren Missouri case. Higher leverage increases the risk to equity holders and therefore the COE.
- Despite these facts, Mr. Murray's recommended ROE for Ameren Missouri has decreased by 25 basis points.

Figure 9: Comparison of Mr. Murray's ROE Estimation Methodologies 2021 vs. 2019 Ameren Missouri testimonies

Methodology	Range	Ameren Missouri Case No. ER-2019-0335	Increase/Decrease from Prior Case
Multi-Stage DCF (AEE, 3.5% long-term growth rate) [90]	7.12%	6.83%	+0.29%
Multi-Stage DCF (AEE, 3.0% % long-term [91] growth rate)	6.95%	6.65%	+0.30%
Multi-Stage DCF (AEE, 2.5% long-term growth rate) [92]	6.78%	6.48%	+0.30%
Multi-Stage DCF (Electric Utility Group, 3.0% long-term [93] growth rate)	7.08%-7.33%	6.50%-6.75%	+0.58%
CAPM[94]	6.40%-7.04%	5.38%-6.06%	+0.98%/+1.02%
Rule of Thumb[95]	5.75%	6.25%	(0.50%)
Cost of Equity Range[96]	6.50%-7.00%	5.50%-6.50%	+1.00%/+0.50%
ROE recommendation[97]	9.0%	9.25%	(0.25%)
Equity Ratio[98]	45%	48%	(3.00%)

A. Proxy Group Composition

Q. Please summarize the composition of Mr. Murray's proxy group.

A. Mr. Murray relies on a broad proxy group of utilities classified as "regulated and "mostly regulated" as compiled by Edison Electric Institute ("EEI").[99] In addition he develops model scenarios that consider the subsets of this broad proxy group that have less than 10 percent of their operations exposed to competitive markets and also the companies that he has consistently followed in electric rate cases since 2012. The specific companies that compose these two smaller proxy groups is not disclosed in his testimony.

Q. What is your conclusion regarding Mr. Murray's proxy group for Ameren Missouri?

A. My primary conclusion is that the composition of the proxy group is not a significant driver in the current proceeding in the development of Mr. Murray's ROE estimation models. While the proxy group relied upon is broad and includes companies that may be less comparable to Ameren Missouri, particularly those that are only distribution companies, I

---

90 Direct Testimony of David Murray, DM-D-2-2. File No. ER-2019-0335, December 4, 2019, Direct Testimony of David Murray, DM-D-2-2.

91 Direct Testimony of David Murray, at 20. File No. ER-2019-0335, December 4, 2019, Direct Testimony of David Murray, at 19.

92 Direct Testimony of David Murray, at 20. File No. ER-2019-0335, December 4, 2019, Direct Testimony of David Murray, at 19.

93 Direct Testimony of David Murray, at 20. File No. ER-2019-0335, December 4, 2019, Direct Testimony of David Murray, at 22.

94 Direct Testimony of David Murray, DM-D-5-1, DM-D-5-2, DM-D-5-3. File No. ER-2019-0335, December 4, 2019, Direct Testimony of David Murray, Schedule DM-D-4 through DM-D-6.

95 Direct Testimony of David Murray, at 22. File No. ER-2019-0335, December 4, 2019, Direct Testimony of David Murray, at 26.

96 Direct Testimony of David Murray, at 5. File No. ER-2019-0335, December 4, 2019, Direct Testimony of David Murray, at 4.

97 Direct Testimony of David Murray, at 5. File No. ER-2019-0335, December 4, 2019, Direct Testimony of David Murray, at 3.

98 Direct Testimony of David Murray, at 5. File No. ER-2019-0335, December 4, 2019, Direct Testimony of David Murray, at 3.

99 Direct Testimony of David Murray, at 23.

do not believe that the proxy group is the primary driver of the differences in our results. Therefore, I have limited my response on this issue to narrow the issues to those that are causing the unreasonably low ROE results of Mr. Murray's Multi-Stage DCF and CAPM analyses.

B. Response to Mr. Murray's Multi-Stage DCF Analysis

Q. Please explain how Mr. Murray conducts his Multi-Stage DCF analysis.

A. Mr. Murray's Multi-Stage DCF analysis 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 relies on analyst estimates of annual dividends per share ("DPS") and earnings per share ("EPS") which were available for the next three to four years. In the final year of the first stage (i.e., 2025), Mr. Murray calculates the estimated dividend payout ratio based on the analysts' estimated annual DPS and EPS. His second stage then models an equal percentage change in the dividend payout ratio from the end of the first stage until the terminal year (i.e., 2035), where Mr. Murray assumes a payout ratio that retains sufficient earnings to ensure each company in his group maintains a perpetual growth rate of 3.0 percent.[100] Mr. Murray's Multi-Stage DCF results for the proxy group are 7.08 percent to 7.33 percent depending on the proxy group considered.[101]

Mr. Murray conducts scenarios on the long-term growth rate in his DCF analysis for Ameren ranging from 2.5 percent to 3.5 percent. Mr. Murray's Multi-Stage DCF analysis produces an ROE estimate for Ameren of 6.78 percent to 7.12 percent. [102]

---

[100] Direct Testimony of David Murray, at 24.

[101] Direct Testimony of David Murray, DM-D-3-1.

[102] Direct Testimony of David Murray, at DM-D-2-1 and DM-D-2-2.

Q. Does Mr. Murray's Multi-Stage DCF analysis indicate increased risk for utilities?

A. Yes, it does. Mr. Murray compares the average Beta Coefficient for his proxy group for Ameren Missouri to the average Beta Coefficient for his proxy groups for Empire District Electric Company ("Empire") in Docket No. ER-2019-0374 and for Ameren Missouri in Docket No. ER-2019-0335. Mr. Murray noted that the betas used in the CAPM are higher in the analysis for Ameren Missouri than in the analyses prepared in the prior cases for Empire and Ameren Missouri.[103] Further, Mr. Murray recognizes that the increase in Betas implies a higher cost of equity.[104] Additionally, while I do not agree with the specification of Mr. Murray's Multi-Stage DCF model, had Mr. Murray also compared the results of his Multi-Stage DCF analysis in the current proceeding to the Multi-Stage DCF analysis he presented in Empire's 2019 rate case and Ameren Missouri's 2019 rate case, he would have concluded that the cost of equity has increased. As shown in Figure 10, comparing the results of his analyses to the analyses prepared in the 2019 Empire case and the 2019 Ameren Missouri case suggests an increase in the cost of equity of approximately 100 basis points. Despite the change in his model results, and his recognition that changes in capital market conditions indicate the cost of equity has increased since Empire's 2019 rate case,[105] Mr. Murray recommends an ROE of 9.00 percent for Ameren Missouri which is lower than his recommendation of 9.25 percent in Empire's 2019 rate case.

---

[103] Direct Testimony of David Murray, at 27.

[104] *Id*., at 9.

[105] Direct Testimony of David Murray, at 2.

Figure 10: Comparison of Mr. Murray's Multi-Stage DCF Results and Beta Coefficients

Methodology	Ameren Missouri's 2019 Rate Case	Empire's 2019 Rate Case	Ameren Missouri Rate Case Range
Multi-Stage DCF	6.5% - 6.75%[106]	6.5% - 6.75%[107]	7.45% - 7.62%
Proxy Group Beta	0.556[108]	0.50[109]	0.784

Q. Did Staff witness Mr. Chari conclude that the cost of equity has increased since Empire's 2019 rate case?

A. Yes, he did. As noted above, Mr. Chari estimated a cost of equity using the DCF model of 8.29 percent[110] for Ameren Missouri which was much lower than the average authorized ROE for electric utilities that he referenced of 9.43 percent in 2020 and 9.44 percent in 2021.[111] However, Mr. Chari compared the DCF result at the time of the 2019 rate case for Empire District Electric Company to the current DCF result for Ameren to develop his recommendation for Ameren Missouri's electric operations. Since the DCF result increased 55 basis points, Mr. Chari concluded that the authorized ROE for Ameren Missouri should increase from the 9.25 percent ROE that was authorized for Empire District Electric Company.[112] If Mr. Murray had developed a similar comparison of his DCF results which as noted above, he did for his Beta coefficients, he would have also

[106] File No. ER-2019-0335, December 4, 2019, Direct Testimony of David Murray, at 22.
[107] Docket No. ER-2019-0374, Direct Testimony of David Murray, January 15, 2020, at 35.
[108] Docket No. ER-2019-0374, Direct Testimony of David Murray, December 4, 2019, at 15.
[109] Docket No. ER-2019-0374, Direct Testimony of David Murray, January 15, 2020, at 39.
[110] Staff Cost of Service Report, at Schedule PC-9-1.
[111] Staff Cost of Service Report, at 28.
[112] Staff Cost of Service Report, at 8-9.

concluded that his Multi-Stage DCF analysis indicates that the cost of equity has increased since Empire's 2019 rate case.

Q. Are the results of Mr. Murray's Multi-Stage DCF model reasonable?

A. No. The results of Mr. Murray's Multi-Stage DCF analysis are so low as to be unreasonable and are not reflective of the cost of equity. Not a single regulatory jurisdiction has authorized an ROE as low as the results of Mr. Murray's Multi-Stage DCF model, which provides reasonable context that he has either failed to consider or rejected. The *Hope* and *Bluefield* decisions, which Mr. Murray acknowledges are standards to be upheld, require the authorized return to be just and reasonable, as well as comparable to other returns available to investors in companies with similar risk. [113] Mr. Murray's Multi-Stage DCF results clearly violate this standard.

Q. Please summarize Mr. Murray's opinion as to the difference between authorized ROEs and the cost of equity.

A. Mr. Murray attempts to reconcile the difference between the results of his ROE estimation models and his recommendation by suggesting that average allowed ROEs have been greater than the cost of equity. Therefore, according to Mr. Murray, the results of the modern financial models must be reconciled with the principles of *Hope* and *Bluefield* which require the return to be just and reasonable and commensurate to the return available to investors in assets of similar risk.[114] Thus, Mr. Murray develops a zone of reasonableness based on recent authorized returns and prior Commission guidance.

---

[113] Direct Testimony of David Murray, at 4.

[114] *Ibid*.

Q. Do you agree with Mr. Murray that allowed ROEs are overstating the cost of equity?

A. No, I do not. Mr. Murray's conclusion is solely reliant on the assumption that he has appropriately specified the Multi-Stage DCF model, the result of which he does not use in setting his recommended ROE. Mr. Murray's specification of and reliance on the Multi-Stage DCF model to estimate the cost of equity is, however, incorrect for several reasons. First, as Mr. Murray and I have both acknowledged utility share prices are inversely related to interest rates.[115] For example, as interest rates increase, which, as discussed in Section VI, is expected over the near-term, the share prices of utility stocks will decline. A decline in share prices will result in an increase in the cost of equity estimate of the DCF model. Therefore, Mr. Murray's Multi-Stage DCF results are likely understating the cost of equity during the period that Ameren Missouri's rate will be in effect.

Second, Mr. Murray references equity analyst reports as support for the inputs in his Multi-Stage DCF model such as the long-term growth rate. However, equity analysts' current views on the valuation of utilities are strongly based on the projections of earnings growth which are in turn based in part on the ROEs that are authorized for the operating subsidiaries of the utility. **[116] ** As noted above a decline in the valuation of the company would result in an increase in the DCF results. Had Mr. Murray

[115] Direct Testimony of David Murray, at 10.

[116] Julien Dumoulin-Smith, et. al, "Long-term transmission opportunities abound: catching up with management," June 21, 2021, Bank of America Merrill Lynch

P

assumed a growth rate greater than his long-term growth rate assumption of 2.5 percent to 3.5 percent, he would have arrived a higher estimate of the cost of equity for Ameren. ** [redacted] [117] ** Investors would not pay for the current valuation of Ameren for a growth rate that is well below the growth rate they expect.

Q. What are equity analysts' current recommendations regarding electric utility stocks given the current market environment?

A. Since utility share prices are inversely related to interest rates and interest rates are expected to increase, investors expect utilities to underperform over the near term. In fact, as noted above, the utility sector was rated as underperform by Fidelity, Charles Schwab and Well Fargo. This is consistent with Zacks Investment Research ("Zacks") which has specifically ranked the electric utility industry as 157 out of 251 industries ranked by Zacks.[118] As Zacks notes a ranking in the bottom half of the industry rankings indicates that Zacks expects the electric utility industry to underperform over the next three to six months.[119] Furthermore, as shown in Schedule AEB-R1, Attachment 9, Zacks' recommendation for investors is "hold" for 71.79 percent of the electric utilities included in Mr. Murray's proxy group with an average combined Value, Growth, and Momentum ("VGM") rating from Zacks of "D". While Zacks has noted that stocks ranked as "Hold" have historically only slightly underperformed the S&P 500, the combination of the "Hold"

[117] James M. Thalaker, et. al, "AEE 2Q20 – Guidance Unchanged, Reiterate Outperform," August 9, 2020, BMO Capital Markets.

[118] Zacks Investment Research, "Utility – Electric Power," September 29, 2021.

[119] *Ibid.*

rating with a low VGM rating indicates Zacks expects Mr. Murray's proxy group to underperform over the near-term.[120]

Q. What is your opinion of the long-term growth rate used in Mr. Murray's Multi-Stage DCF model?

Mr. Murray relies on a long-term growth rate range of 2.5 percent to 3.5 percent, which he notes is based on his review of historical growth rate data from the Moody's electric utility index, a sample of electric utility companies whose data is available from Value Line and reports from equity analysts.[121] This long-term growth rate range appears to be similar to the range relied on by Evercore ISI in the calculation of their Dividend Discount Model ("DDM") for the regulated utilities covered by the bank.[122] Mr. Murray's long-term growth rate assumption, however, is not consistent with the stock prices that he relies on to calculate his Multi-Stage DCF model. In fact, the basis for the current valuation of utilities is the expectation that utilities will sustain current earnings growth rates for the foreseeable future. ** [redacted] [123] [redacted] ** If equity

[120] Zacks Investment Research, "The Zacks Rank Guide," 2021.

[121] Direct Testimony of David Murray, at 21.

[122] Durgesh Chopra, et al., "Reshuffling the Deck – Changing Ratings," Evercore ISI, April 19, 2020, at 16.

[123] Julien Dumoulin-Smith, et. al, "MISO & The Transmission Story Bolter Improving Backdrop: Upgrade to Buy," Bank of America Securities, April 13, 2021.

analysts expected the long-term growth rate to decline to a range 2.5 percent to 3.5 percent, then they would likely reduce their estimated price targets.

Q. Do you have any concerns with Evercore ISI's DDM, which Mr. Murray cites as a source for his long-term growth rate estimate?

A. Yes, I do. **_____

_____

_____[124] **

Furthermore, as shown in Schedule AEB-R1, Attachment 10, the average P/E multiple of 2022 EPS for Mr. Murray's proxy group using 30-day average share prices as of August 31, 2021 is 18.67. Therefore, the long-term growth assumption assumed in Evercore ISI's DDM of 2.50 percent would not support the current valuation multiple for Ameren or Mr. Murray's proxy group. This means that investors expect the long-term growth rate to exceed the growth rate assumed by Evercore ISIS and Mr. Murray.

Q. What is the effect of Mr. Murray's long-term growth rate assumption on his Multi-Stage DCF results?

A. Mr. Murray acknowledged, in his testimony on behalf of Staff in File No. ER-2014-0258 for Ameren Missouri, "[c]ost of equity estimates using multi-stage DCF methodologies are **extremely sensitive** to the assumed perpetual growth rate".[125] As I have demonstrated above, investors expect the long-term growth rate for Mr. Murray's proxy group and Ameren 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. This is important to note because in his Multi-Stage DCF analysis, Mr. Murray is assuming this low long-term growth rate with the

[124] Durgesh Chopra, et. al, "Ameren Corp. – Bang for Your Buck," Evercore ISI, April 19, 2020, at 16.
[125] File No. ER-2014-0258, Staff Cost of Service Report (December 5, 2014), at 34.

P

current prices of Ameren and the companies in his proxy group. This results in an understated cost of equity estimate. If Mr. Murray were to assume a long-term growth rate more consistent with current earnings growth projections, he would have obtained a much higher ROE estimate for Ameren and the proxy group.

Q. **

A.

[126]

[127]

[126] Direct Testimony of David Murray, at 21.

[127] Ameren Dividend Policy Considerations, Ameren Finance Committee, October 2017, p. 5-10.

P

Q. _____

A. _____

_____

_____

_____

_____

_____t

_____.**

Q. Please summarize your conclusions regarding Mr. Murray's Multi-Stage DCF analysis.

A. Mr. Murray abandons his Multi-Stage DCF analysis due to the unreasonably low results produced by the model. However, despite his lack of confidence in his own model results, he is asking the Commission to accept that it is appropriate to use these results to demonstrate changes in the cost of equity between time periods and to generally support a lower overall ROE. It stands to reason that if the results of the model are unreliable and cannot be used to estimate the ROE, then the results are unreliable for any other attempt to measure the cost of equity, including Mr. Murray's comparisons to historical model results from other proceedings and his comparison to recently authorized ROEs.

Reviewing Mr. Murray's Multi-Stage Model specification identifies two primary flaws: 1) the growth rates that Mr. Murray relies on of 2.5 percent to 3.5 percent are significantly understated based on analysts' projections, depressing the results of his DCF analysis; and 2) while Mr. Murray acknowledges that share prices are related to interest rates, he fails to consider the effect of a rising interest rate environment on the valuations of electric utilities, which also contributes to his unreasonably low DCF results. Thus, I conclude that Mr. Murray's Multi-Stage DCF model is neither providing reasonable estimates of the cost

of equity for utilities nor does it support his conclusion that the cost of equity for utilities is much lower than recently authorized ROEs.

C. Capital Asset Pricing Model

Q. Please summarize Mr. Murray's application of the CAPM.

A. Mr. Murray develops three separate specifications of the CAPM analysis. The first CAPM analysis uses a risk-free rate that is based on the average yield on the 20-year Treasury bond for the eight months ending August 31, 2021,[128] recalculated Betas for Ameren and the electric utility proxy group, and a MRP of 6.00 percent, which Mr. Murray contends is "similar to historical spreads and estimates provided by sources, such as Duff & Phelps".[129] The second CAPM analysis uses a risk-free rate based on the average yield on the 30-year Treasury bond for the eight months ending August 31, 2021,[130] recalculated Betas for Ameren and the electric utility proxy group, and a MRP of 6.00 percent, which Mr. Murray contends is "similar to historical spreads and estimates provided by sources, such as Duff & Phelps".[131] Finally, the third CAPM analysis uses the normalized risk-free rate reported by Duff and Phelps, recalculated Betas for Ameren and the electric utility proxy group, and a MRP of 5.50 percent as reported by Duff and Phelps.[132] The results of

---

[128] DM-D-5-1 note for Column 1 cites to the St. Louis Federal Reserve for the GS20 series. The eight-month average of the 20-year Treasury yield as of August 31, 2021, based on that series is 2.00 percent, which compares most closely to Mr. Murray's estimate of 2.00 percent.

[129] DM-D-5-1 note for Column 3.

[130] DM-D-5-2 note for Column 1 cites to the St. Louis Federal Reserve for the GS30 series. The three-month average of the 30-year Treasury yield as of August 31, 2021, based on that series is 2.11 percent, which compares most closely with Mr. Murray's estimate of 2.11 percent.

[131] DM-D-5-2 note for Column 3.

[132] DM-D-5-3 note for Column 1 cites to the D&P Most Recent Guidance on Normalized Risk-free Rate as of June 30, 2020.

Mr. Murray's CAPM analyses range from 6.40 percent to 7.04 percent.[133] Ultimately, Mr. Murray concludes that his CAPM analyses support a COE range of 6.5 percent to 7.0 percent.[134]

Q. Do you agree with the risk-free rate that Mr. Murray uses in his CAPM analysis?

A. While I do not specifically dispute the normalized risk-free rate of 2.50 percent that Mr. Murray relies on in one of his CAPM analyses, I do not agree with Mr. Murray's reliance on the eight-month average 20-year and 30-year Treasury Bond yields in his remaining CAPM analyses. The cost of equity is being estimated for the forward-looking period when the Company's rates will be in effect. Therefore, it is equally important that the risk-free rate be reflective of the expected risk-free rate during Ameren Missouri's rate period. As discussed in Section VI of my Rebuttal Testimony, the economy is in the early expansion phase of the business cycle, which means government bond yields are expected to increase over the near-term and, in fact, have increased since the low reached in August 2020. Considering the demonstrated increases in the bond yields since August 2020, resulting from the pandemic, and the forward-looking nature of the analysis that is being performed, I believe Mr. Murray should have placed primary weight on the normalized risk-free rate of 2.50 percent, which is Duff and Phelps' estimate of the expected long-term risk-free rate.[135] Furthermore, I believe it is also important to rely on, as I have in my Direct Testimony, interest rate projections that reflect the views of economists regarding the interest rates that are expected to prevail during the period that the Company's rates will be in effect.

---

[133] DM-D-5-1, DM-D-5-2, DM-D-5-3.

[134] Direct Testimony of David Murray, at 28.

[135] Duff and Phelps, Cost of Capital Navigator.

Q. Do you have any other concerns with the risk-free rate relied on by Mr. Murray?

A. Yes. In addition to the yield on the 30-year Treasury bond, Mr. Murray has also relied on the yield on the 20-year Treasury bonds as the estimate of the risk-free rate. However, in determining the security most relevant to the application of the CAPM, it is important to select the term (or maturity) that best matches the life of the underlying investment. As noted by Morningstar:

> 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… 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.[136]

Because utility assets represent long-duration investments, it is appropriate to use yields on long-term Treasury bonds as the risk-free rate component of the CAPM. In my view, the 30-year Treasury bond is the appropriate security for that purpose. Therefore, I do not agree with Mr. Murray's consideration of the yields on 20-year Treasury bonds as an estimate of the risk-free rate in his CAPM analysis.

Q. What Beta coefficients are relied on by Mr. Murray?

A. Mr. Murray calculates raw Beta coefficients for Ameren and the companies in his electric utility proxy group using a template provided by S&P Market Intelligence, and then

---

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

attempts to adjust those Betas using the Blume formula. The result of that analysis suggests a Beta for Ameren of 0.734 and for the proxy group of 0.780 to 0.823 depending on the subset of the proxy group considered.[137]

Q. What is your response to Mr. Murray's calculation of the Beta coefficients using a template provided by S&P?

A. Mr. Murray has relied on Value Line as the source of his Beta coefficients in his CAPM analysis for many years. Mr. Murray offers no explanation as to why he has decided not to rely on Value Line and to instead recalculate his own estimates of Beta in this proceeding. Furthermore, while Mr. Murray indicates that he calculated the Beta coefficients for his proxy group companies based on Value Line's approach, his electric proxy group average Beta is 0.823 which is much lower than the electric proxy group average Value Line Beta coefficient of 0.901 as of August 31, 2021, as shown in Schedule AEB-R1, Attachment 11.

Q. What MRP does Mr. Murray use in his CAPM analysis?

A. Mr. Murray uses two estimates of the MRP in his CAPM analysis: (a) a MRP of 6.00 percent, which he contends is "similar to historical spreads and estimates provided by sources, such as Duff & Phelps"[138]; and (b) a MRP of 5.5 percent, as reported by Duff and Phelps.[139]

---

137 DM-D-5-1, DM-D-5-2, and DM-D-5-3.

138 DM-D-5-2 note for Column 3.

139 Direct Testimony of David Murray, at 26.

Q. What is your concern with Mr. Murray's MRP estimates?

A. Given the current low yields on Treasury bonds, and the inverse relationship between interest rates and the MRP, and the higher Betas for the proxy group, Mr. Murray's range of MRPs from 5.50 percent to 6.00 percent is understated. First, from a practical standpoint, the results of his CAPM analysis are significantly below any return that has been authorized by any U.S. regulatory jurisdiction in at least 40 years. The primary reason for the unreasonably low results from Mr. Murray's CAPM is due to his selection of the MRP. Based on historical data from Duff & Phelps, the market risk premium from 1926-2020 is 7.25 percent.[140] The historical income-only return on government bonds used to calculate the historical MRP over the same period has been approximately 4.91 percent, while the 30-day average risk-free rate on long-term government bonds as of August 31, 2021 is 1.91 percent. Because interest rates on long-term government bonds are well below the historical average of 4.91 percent, the inverse relationship between interest rates and the MRP implies that the MRP should be well above the long-term historical average of 7.25 percent. The MRP range used by Mr. Murray of 5.50 percent to 6.00 percent suggests that the expected MRP is currently 125 to 175 basis points lower than the historical average MRP of 7.25 percent.

Q. Do you have any other concerns with the MRPs relied on by Mr. Murray?

A. Yes. As shown in Figure 11, the implied market returns for the MRPs cited by Mr. Murray range from 8.00 percent to 8.11 percent. These returns are unreasonably low especially when compared to the recent historical returns for large company stocks. As shown in

[140] The market risk premium from 1926-2020 is calculated as the average return on large company stocks from 1926-2020 minus the average income only return on long-term government bonds from 1926-2020 (i.e., 12.16 percent – 4.91 percent = 7.25 percent). Source: Duff &Phelps, Valuation Handbook: Guide to Cost of Capital, 2021.

Figure 12, the actual average market return for large company stocks from 2009 to 2020 (i.e., the period after the Great Recession of 2008/09) was 15.53 percent, as reported by Duff & Phelps. Therefore, the range of implied market returns considered by Mr. Murray of 8.00 percent to 8.11 percent is well below and cannot be reconciled with recent returns for the market.

Figure 11: Mr. Murray's Implied Market Returns[141]

Source	Implied MRP	Risk-Free Rate	Implied Market Return
Historical MRP & 20-year Treasury Bond yield	6.00%	2.00%	8.00%
Historical MRP & 30-year Treasury Bond yield	6.00%	2.11%	8.11%
Duff & Phelps MRP and Normalized Risk-free Rate	5.50%	2.50%	8.00%

[141] Source: DM-D-5-1 through DM-D-5-3.

Figure 12: Duff and Phelps – Total Return for Large Company Stocks – 2009-2020[142]

Year	Large Company Stock Total Return
2009	26.46%
2010	15.06%
2011	2.11%
2012	16.00%
2013	32.39%
2014	13.69%
2015	1.38%
2016	11.96%
2017	21.83%
2018	-4.38%
2019	31.49%
2020	18.40%
Average	**15.53%**

[142] Source: Duff and Phelps, Cost of Capital Navigator.

Q. What is your conclusion regarding Mr. Murray's CAPM analysis?

A. My conclusion is that Mr. Murray's CAPM results of 6.40 percent to 7.04 percent are not reasonable estimates of the cost of equity for Ameren Missouri. Similar to his Multi-Stage DCF analysis, Mr. Murray's mis-specification of the CAPM has resulted in the incorrect conclusion that the cost of equity is well below recently authorized ROEs for vertically integrated electric utilities. In particular, Mr. Murray's CAPM analysis fails to take into consideration the inverse relationship between interest rates and the MRP. This results in: 1) an MRP that is well below the historical MRP using large company stocks (7.25 percent); and 2) an implied market return that is well below the long-term average total return for large company stocks since 1926, as reported by Duff & Phelps, of 12.16 percent and recent market returns for large company stocks since 2009 of 15.61 percent. As such, the results of Mr. Murray's CAPM analysis are not representative of the forward-looking cost of equity for Ameren Missouri in this proceeding and thus, I recommend the Commission place zero weight on Mr. Murray's CAPM analysis.

D. Rule of Thumb Methodology

Q. Please summarize Mr. Murray's "Rule of Thumb" analysis.

A. The "Rule of Thumb" methodology that Mr. Murray relies on is another risk premium methodology. This methodology relies on an estimated MRP of 3.0 percent to 4.0 percent plus Ameren Missouri's long-term bond yield. However, Mr. Murray selects the low end of the risk premium range of 3.0 percent because he contends that investors view utilities as bond "surrogates/substitutes".[143] Mr. Murray notes that the current yield on Ameren

[143] Direct Testimony of David Murray, at 28.

Missouri's long-term bonds is approximately 2.75 percent, which when combined with the 3.0 percent risk premium, results in a ROE estimate for Ameren Missouri of 5.75 percent.[144] While Mr. Murray reports the result of this analysis, he has recommended an ROE that is 325 basis points higher than his Rule of Thumb approach

Q. Do you agree with this methodology?

A. As discussed in my response to Mr. Chari, this specification of the risk premium approach relies on historical estimates of the MRP and does not take into consideration the effect on the MRP of current market conditions. There are a number of studies which have shown that the MRP is inversely related to the level of interest rates. For example, in a March 1998 article titled *Interest Rate Risk and Utility Risk Premia During 1982-93* in Managerial and Decision Economics, Dr. S. Keith Berry used a regression approach to analyze the relationship between authorized returns on equity for regulated utilities and utility bond yields. The author found that there was an inverse relationship between utility risk premia and interest rates.[145] Similarly, in a Spring 1986 article in Financial Management, Dr. Robert S. Harris also showed that there was a negative relationship between utility risk premia and interest rates.[146]

Adding a risk premium based on a historical average interest rate level to the current yield on Ameren Missouri's long-term bonds, which is significantly below historical averages, results in a vastly understated estimate of the current cost of equity for Ameren Missouri. Finally, the use of the current yield on Ameren Missouri's long-term bonds does not reflect

---

144 *Ibid*.

145 S. Keith Berry, Interest Rate Risk and Utility Risk Premia during 1982-93, Managerial and Decision Economics, Vol. 19, No. 2 (March, 1998), at 7.

146 Robert S. Harris, Using Analysts' Growth Forecasts to Estimate Shareholders Required Rates of Return, Financial Management, Spring 1986, at 66.

the expectation of rising interest rates. As such, this methodology is not reflective of investor return requirements over the rate period.

E. Conclusions

Q. Please summarize your conclusions about the way in which Mr. Murray arrives at his recommended ROE for Ameren Missouri.

A. While I have responded to each of the methodologies presented by Mr. Murray, it is important to recognize that his own ROE recommendation is not based on the results of any of the models that he develops. Instead, Mr. Murray's ROE recommendation is based on his establishment of a "zone of reasonableness" of 8.50 percent to 9.25 percent. Nothing in Mr. Murray's testimony supports the selection of the range of reasonableness from which he selects his final ROE recommendation. Mr. Murray states that he has developed his range based on recently authorized ROEs for electric utilities with specific consideration to Ameren Illinois' (a distribution only utility) allowed ROE for its electric utility operations. Notably, none of Mr. Murray's ROE estimation models result in ROEs that fall within this established range. While Mr. Murray discards his ROE analyses for the purposes of setting his recommended ROE, he asks the Commission to rely on the results of his models to conclude that the cost of capital for utilities remains low. Further, he suggests that these model results somehow support his recommended ROE of 9.00 percent. Reliance on his mis-specified models has resulted in Mr. Murray understating the cost of equity for Ameren Missouri. The critical assumptions that I have identified in Mr. Murray's models that result in understated results include:

1) failure to consider that interest rates are expected to increase, which will result in a decline in the valuations of electric utilities over the near -term;

2) reliance on an unreasonably low long-term growth rates in the Multi-Stage DCF analysis, which does not support the current valuation premium for electric utilities which assumes electric utilities will maintain current earnings growth projections for the long-term;

3) understated MRP estimates in his CAPM and "Rule of Thumb" analyses that do not reflect the inverse relationship between interest rates and the MRP.

If Mr. Murray had specified his models appropriately, he would have concluded, as Staff Witness Chari did, that the cost of equity for electric utilities has increased, not decreased, since the last Ameren Missouri case and since the 2019 Empire District Electric case. As a result, I do not believe it is reasonable to rely on Mr. Murray's final recommended ROE.

IX. SUMMARY AND RECOMMENDATIONS

Q. Please summarize your conclusions and recommendations regarding the appropriate ROE for Ameren Missouri in this proceeding.

A. The results of my ROE analysis, which are updated using market data through August 31, 2021, continue to support a reasonable range of ROE for Ameren Missouri between 9.75 percent and 10.50 percent. While the analytical results of ROE estimation models provide a starting point, my recommendation also considers other factors, including company-specific risk factors, capital market conditions and the capital attraction standard. Considering the financial and business risk factors facing Ameren Missouri, and the expectation that interest rates will increase over the near term as the economy recovers from COVID-19, I continue to believe the Company's requested ROE of 9.90 percent is reasonable and appropriate.

- Nothing in the other ROE witnesses' testimony has caused me to change my recommended range of results.

- Neither Mr. Chari nor Mr. Murray rely on the results of any of their models to underlie or inform their respective ROE recommendations of 9.50 percent and 9.00 percent.

- Mr. Chari's reliance on a comparison of his Two-Step DCF results for Ameren Missouri in this proceeding to those for the same model at the time of Empire's 2019 rate case does not provide sufficient support for his ROE recommendation. In fact, had Mr. Chari simply applied the entire difference in the Two-Step DCF results between the current proceeding and Empire's 2019 rate case, he would have arrived at an ROE of 9.80 percent which is more consistent with the Company's requested ROE of 9.90 percent than his recommended ROE of 9.50 percent.

- Similarly, Mr. Murray's DCF, CAPM and Rule of Thumb methods do not support his ultimate recommendation.

- Finally, recently authorized ROEs for vertically integrated electric companies are within the range established in my Direct Testimony.

Q. What is your recommendation regarding a reasonable capital structure for Ameren Missouri in this proceeding?

A. I support the Company's proposed actual capital structure as of September 30, 2021, of 51.93 percent common equity, 47.34 percent long-term debt and 0.73 percent preferred equity. This capital structure represents the manner in which the Company is actually

capitalized. Moreover, the proposed equity ratio of 51.93 percent is reasonable when compared to the authorized equity ratios of the proxy group.

Q. Does this conclude your Rebuttal Testimony?

A. Yes, it does.

SUMMARY OF ROE ANALYSES RESULTS

Constant Growth DCF			
	Mean Low	Mean	Mean High
30-Day Average	8.09%	9.16%	10.12%
90-Day Average	8.16%	9.22%	10.18%
180-Day Average	8.30%	9.36%	10.32%
CAPM			
	Current 30-day Average Treasury Bond Yield	Near-Term Blue Chip Forecast Yield	Long-Term Blue Chip Forecast Yield
Value Line Beta	13.19%	13.24%	13.36%
Bloomberg Beta	12.15%	12.25%	12.46%
Long-term Avg. Beta	11.13%	11.27%	11.56%
ECAPM			
Value Line Beta	13.53%	13.57%	13.66%
Bloomberg Beta	12.76%	12.83%	12.98%
Long-term Avg. Beta	11.99%	12.09%	12.31%
Treasury Yield Plus Risk Premium			
	Current 30-day Average Treasury Bond Yield	Near-Term Blue Chip Forecast Yield	Long-Term Blue Chip Forecast Yield
Risk Premium Results	9.50%	9.71%	10.17%
Risk Premium Mean Result	9.79%		

30-DAY CONSTANT GROWTH DCF -- AMEREN MISSOURI ELECTRIC PROXY GROUP

Company	Ticker	[1] Annualized Dividend	[2] Stock Price	[3] Dividend Yield	[4] Expected Dividend Yield	[5] Value Line Earnings Growth	[6] Yahoo! Finance Earnings Growth	[7] Zacks Earnings Growth	[8] Average Growth Rate	[9] Low ROE	[10] Mean ROE	[11] High ROE
ALLETE, Inc.	ALE	$2.52	$70.25	3.59%	3.69%	5.00%	5.67%	6.00%	5.56%	8.68%	9.24%	9.69%
Alliant Energy Corporation	LNT	$1.61	$60.22	2.67%	2.75%	5.50%	5.10%	5.60%	5.40%	7.84%	8.15%	8.35%
American Electric Power Company, Inc.	AEP	$2.96	$88.93	3.33%	3.43%	6.50%	6.03%	5.70%	6.08%	9.12%	9.51%	9.94%
Duke Energy Corporation	DUK	$3.94	$105.87	3.72%	3.83%	7.00%	5.45%	5.30%	5.92%	9.12%	9.75%	10.85%
Entergy Corporation	ETR	$3.80	$107.87	3.52%	3.57%	3.00%	3.85%	1.40%	2.75%	4.95%	6.32%	7.44%
Evergy, Inc.	EVRG	$2.14	$67.13	3.19%	3.29%	8.00%	5.70%	5.80%	6.50%	8.98%	9.79%	11.32%
NextEra Energy, Inc.	NEE	$1.54	$81.28	1.89%	1.98%	10.50%	8.13%	8.30%	8.98%	10.10%	10.96%	12.49%
NorthWestern Corporation	NWE	$2.48	$63.01	3.94%	4.02%	3.00%	4.50%	4.80%	4.10%	6.99%	8.12%	8.83%
Otter Tail Corporation	OTTR	$1.56	$52.62	2.96%	3.07%	7.00%	9.00%	4.70%	6.90%	7.73%	9.97%	12.10%
Pinnacle West Capital Corporation	PNW	$3.32	$80.74	4.11%	4.18%	5.00%	0.10%	5.00%	3.37%	4.21%	7.55%	9.21%
Portland General Electric Company	POR	$1.72	$50.02	3.44%	3.58%	8.50%	7.10%	8.60%	8.07%	10.66%	11.64%	12.19%
Xcel Energy Inc.	XEL	$1.83	$68.85	2.66%	2.74%	6.00%	6.30%	6.10%	6.13%	8.74%	8.87%	9.04%
Mean				3.25%	3.34%	6.25%	5.58%	5.61%	5.81%	8.09%	9.16%	10.12%

Notes:
[1] Source: Bloomberg Professional
[2] Source: Bloomberg Professional, equals 30-day average as of August 31, 2021.
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [8])
[5] Source: Value Line
[6] Source: Yahoo! Finance
[7] Source: 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])

90-DAY CONSTANT GROWTH DCF -- AMEREN MISSOURI ELECTRIC PROXY GROUP

Company	Ticker	[1] Annualized Dividend	[2] Stock Price	[3] Dividend Yield	[4] Expected Dividend Yield	[5] Value Line Earnings Growth	[6] Yahoo! Finance Earnings Growth	[7] Zacks Earnings Growth	[8] Average Growth Rate	[9] Low ROE	[10] Mean ROE	[11] High ROE
ALLETE, Inc.	ALE	$2.52	$69.82	3.61%	3.71%	5.00%	5.67%	6.00%	5.56%	8.70%	9.27%	9.72%
Alliant Energy Corporation	LNT	$1.61	$58.15	2.77%	2.84%	5.50%	5.10%	5.60%	5.40%	7.94%	8.24%	8.45%
American Electric Power Company, Inc.	AEP	$2.96	$86.78	3.41%	3.51%	6.50%	6.03%	5.70%	6.08%	9.21%	9.59%	10.02%
Duke Energy Corporation	DUK	$3.94	$102.73	3.84%	3.95%	7.00%	5.45%	5.30%	5.92%	9.24%	9.87%	10.97%
Entergy Corporation	ETR	$3.80	$106.09	3.58%	3.63%	3.00%	3.85%	1.40%	2.75%	5.01%	6.38%	7.50%
Evergy, Inc.	EVRG	$2.14	$64.15	3.34%	3.44%	8.00%	5.70%	5.80%	6.50%	9.13%	9.94%	11.47%
NextEra Energy, Inc.	NEE	$1.54	$76.61	2.01%	2.10%	10.50%	8.13%	8.30%	8.98%	10.22%	11.08%	12.62%
NorthWestern Corporation	NWE	$2.48	$63.40	3.91%	3.99%	3.00%	4.50%	4.80%	4.10%	6.97%	8.09%	8.81%
Otter Tail Corporation	OTTR	$1.56	$49.79	3.13%	3.24%	7.00%	9.00%	4.70%	6.90%	7.91%	10.14%	12.27%
Pinnacle West Capital Corporation	PNW	$3.32	$83.37	3.98%	4.05%	5.00%	0.10%	5.00%	3.37%	4.08%	7.42%	9.08%
Portland General Electric Company	POR	$1.72	$48.99	3.51%	3.65%	8.50%	7.10%	8.60%	8.07%	10.74%	11.72%	12.26%
Xcel Energy Inc.	XEL	$1.83	$69.17	2.65%	2.73%	6.00%	6.30%	6.10%	6.13%	8.73%	8.86%	9.03%
Mean				3.31%	3.40%	6.25%	5.58%	5.61%	5.81%	8.16%	9.22%	10.18%

Notes:
[1] Source: Bloomberg Professional
[2] Source: Bloomberg Professional, equals 90-day average as of August 31, 2021.
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [8])
[5] Source: Value Line
[6] Source: Yahoo! Finance
[7] Source: 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])

180-DAY CONSTANT GROWTH DCF -- AMEREN MISSOURI ELECTRIC PROXY GROUP

Company	Ticker	[1] Annualized Dividend	[2] Stock Price	[3] Dividend Yield	[4] Expected Dividend Yield	[5] Value Line Earnings Growth	[6] Yahoo! Finance Earnings Growth	[7] Zacks Earnings Growth	[8] Average Growth Rate	[9] Low ROE	[10] Mean ROE	[11] High ROE
ALLETE, Inc.	ALE	$2.52	$67.69	3.72%	3.83%	5.00%	5.67%	6.00%	5.56%	8.82%	9.38%	9.83%
Alliant Energy Corporation	LNT	$1.61	$54.53	2.95%	3.03%	5.50%	5.10%	5.60%	5.40%	8.13%	8.43%	8.64%
American Electric Power Company, Inc.	AEP	$2.96	$84.41	3.51%	3.61%	6.50%	6.03%	5.70%	6.08%	9.31%	9.69%	10.12%
Duke Energy Corporation	DUK	$3.94	$97.61	4.04%	4.16%	7.00%	5.45%	5.30%	5.92%	9.44%	10.07%	11.18%
Entergy Corporation	ETR	$3.80	$101.41	3.75%	3.80%	3.00%	3.85%	1.40%	2.75%	5.17%	6.55%	7.67%
Evergy, Inc.	EVRG	$2.14	$60.23	3.55%	3.67%	8.00%	5.70%	5.80%	6.50%	9.35%	10.17%	11.70%
NextEra Energy, Inc.	NEE	$1.54	$77.14	2.00%	2.09%	10.50%	8.13%	8.30%	8.98%	10.21%	11.06%	12.60%
NorthWestern Corporation	NWE	$2.48	$61.85	4.01%	4.09%	3.00%	4.50%	4.80%	4.10%	7.07%	8.19%	8.91%
Otter Tail Corporation	OTTR	$1.56	$46.64	3.34%	3.46%	7.00%	9.00%	4.70%	6.90%	8.12%	10.36%	12.50%
Pinnacle West Capital Corporation	PNW	$3.32	$81.00	4.10%	4.17%	5.00%	0.10%	5.00%	3.37%	4.20%	7.53%	9.20%
Portland General Electric Company	POR	$1.72	$46.73	3.68%	3.83%	8.50%	7.10%	8.60%	8.07%	10.91%	11.90%	12.44%
Xcel Energy Inc.	XEL	$1.83	$66.89	2.74%	2.82%	6.00%	6.30%	6.10%	6.13%	8.82%	8.95%	9.12%
Mean				3.45%	3.55%	6.25%	5.58%	5.61%	5.81%	8.30%	9.36%	10.32%

Notes:
[1] Source: Bloomberg Professional
[2] Source: Bloomberg Professional, equals 180-day average as of August 31, 2021.
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [8])
[5] Source: Value Line
[6] Source: Yahoo! Finance
[7] Source: 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])

CAPITAL ASSET PRICING MODEL -- CURRENT RISK-FREE RATE & VL BETA

$K = Rf + \beta \times (Rm - Rf)$
$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$

Company	Ticker	[1] Current 30-day average of 30-year U.S. Treasury bond yield	[2] Beta (β)	[3] Market Return (Rm)	[4] Market Risk Premium (Rm − Rf)	[5] CAPM ROE (K)	[6] ECAPM ROE (K)
ALLETE, Inc.	ALE	1.91%	0.90	14.56%	12.64%	13.29%	13.61%
Alliant Energy Corporation	LNT	1.91%	0.85	14.56%	12.64%	12.66%	13.14%
American Electric Power Company, Inc.	AEP	1.91%	0.75	14.56%	12.64%	11.40%	12.19%
Duke Energy Corporation	DUK	1.91%	0.90	14.56%	12.64%	13.29%	13.61%
Entergy Corporation	ETR	1.91%	0.95	14.56%	12.64%	13.93%	14.08%
Evergy, Inc.	EVRG	1.91%	0.95	14.56%	12.64%	13.93%	14.08%
NextEra Energy, Inc.	NEE	1.91%	0.95	14.56%	12.64%	13.93%	14.08%
NorthWestern Corporation	NWE	1.91%	0.95	14.56%	12.64%	13.93%	14.08%
Otter Tail Corporation	OTTR	1.91%	0.90	14.56%	12.64%	13.29%	13.61%
Pinnacle West Capital Corporation	PNW	1.91%	0.90	14.56%	12.64%	13.29%	13.61%
Portland General Electric Company	POR	1.91%	0.90	14.56%	12.64%	13.29%	13.61%
Xcel Energy Inc.	XEL	1.91%	0.80	14.56%	12.64%	12.03%	12.66%
Mean						13.19%	13.53%

Notes:
[1] Source: Bloomberg Professional, as of August 31, 2021
[2] Source: Value Line
[3] Source: Schedule AEB-R1, 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 & VL BETA

$K = Rf + \beta \times (Rm - Rf)$
$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$

Company	Ticker	[1] Near-term projected 30-year U.S. Treasury bond yield (Q4 2021 - Q4 2022)	[2] Beta (β)	[3] Market Return (Rm)	[4] Market Risk Premium (Rm − Rf)	[5] CAPM ROE (K)	[6] ECAPM ROE (K)
ALLETE, Inc.	ALE	2.42%	0.90	14.56%	12.14%	13.34%	13.65%
Alliant Energy Corporation	LNT	2.42%	0.85	14.56%	12.14%	12.74%	13.19%
American Electric Power Company, Inc.	AEP	2.42%	0.75	14.56%	12.14%	11.52%	12.28%
Duke Energy Corporation	DUK	2.42%	0.90	14.56%	12.14%	13.34%	13.65%
Entergy Corporation	ETR	2.42%	0.95	14.56%	12.14%	13.95%	14.10%
Evergy, Inc.	EVRG	2.42%	0.95	14.56%	12.14%	13.95%	14.10%
NextEra Energy, Inc.	NEE	2.42%	0.95	14.56%	12.14%	13.95%	14.10%
NorthWestern Corporation	NWE	2.42%	0.95	14.56%	12.14%	13.95%	14.10%
Otter Tail Corporation	OTTR	2.42%	0.90	14.56%	12.14%	13.34%	13.65%
Pinnacle West Capital Corporation	PNW	2.42%	0.90	14.56%	12.14%	13.34%	13.65%
Portland General Electric Company	POR	2.42%	0.90	14.56%	12.14%	13.34%	13.65%
Xcel Energy Inc.	XEL	2.42%	0.80	14.56%	12.14%	12.13%	12.74%
Mean						13.24%	13.57%

Notes:
[1] Source: Blue Chip Financial Forecasts, Vol. 40, No. 9, September 1, 2021, at 2
[2] Source: Value Line
[3] Source: Schedule AEB-R1, 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 & VL BETA

$K = Rf + \beta \times (Rm - Rf)$
$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Projected 30-year U.S. Treasury bond yield (2023 - 2027)	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE (K)	ECAPM ROE (K)
ALLETE, Inc.	ALE	3.50%	0.90	14.56%	11.06%	13.45%	13.73%
Alliant Energy Corporation	LNT	3.50%	0.85	14.56%	11.06%	12.90%	13.31%
American Electric Power Company, Inc.	AEP	3.50%	0.75	14.56%	11.06%	11.79%	12.48%
Duke Energy Corporation	DUK	3.50%	0.90	14.56%	11.06%	13.45%	13.73%
Entergy Corporation	ETR	3.50%	0.95	14.56%	11.06%	14.01%	14.14%
Evergy, Inc.	EVRG	3.50%	0.95	14.56%	11.06%	14.01%	14.14%
NextEra Energy, Inc.	NEE	3.50%	0.95	14.56%	11.06%	14.01%	14.14%
NorthWestern Corporation	NWE	3.50%	0.95	14.56%	11.06%	14.01%	14.14%
Otter Tail Corporation	OTTR	3.50%	0.90	14.56%	11.06%	13.45%	13.73%
Pinnacle West Capital Corporation	PNW	3.50%	0.90	14.56%	11.06%	13.45%	13.73%
Portland General Electric Company	POR	3.50%	0.90	14.56%	11.06%	13.45%	13.73%
Xcel Energy Inc.	XEL	3.50%	0.80	14.56%	11.06%	12.35%	12.90%
Mean						13.36%	13.66%

Notes:
[1] Source: Blue Chip Financial Forecasts, Vol. 40, No. 6, June 1, 2021, at 14
[2] Source: Value Line
[3] Source: Schedule AEB-R1, 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 & BLOOMBERG BETA

$K = Rf + \beta \times (Rm - Rf)$
$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Current 30-day average of 30-year U.S. Treasury bond yield	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE (K)	ECAPM ROE (K)
ALLETE, Inc.	ALE	1.91%	0.84	14.56%	12.64%	12.58%	13.07%
Alliant Energy Corporation	LNT	1.91%	0.80	14.56%	12.64%	11.98%	12.63%
American Electric Power Company, Inc.	AEP	1.91%	0.77	14.56%	12.64%	11.68%	12.40%
Duke Energy Corporation	DUK	1.91%	0.71	14.56%	12.64%	10.91%	11.83%
Entergy Corporation	ETR	1.91%	0.85	14.56%	12.64%	12.61%	13.10%
Evergy, Inc.	EVRG	1.91%	0.78	14.56%	12.64%	11.81%	12.50%
NextEra Energy, Inc.	NEE	1.91%	0.78	14.56%	12.64%	11.73%	12.44%
NorthWestern Corporation	NWE	1.91%	0.92	14.56%	12.64%	13.53%	13.79%
Otter Tail Corporation	OTTR	1.91%	0.89	14.56%	12.64%	13.13%	13.49%
Pinnacle West Capital Corporation	PNW	1.91%	0.84	14.56%	12.64%	12.55%	13.05%
Portland General Electric Company	POR	1.91%	0.81	14.56%	12.64%	12.15%	12.75%
Xcel Energy Inc.	XEL	1.91%	0.73	14.56%	12.64%	11.18%	12.02%
Mean						12.15%	12.76%

Notes:
[1] Source: Bloomberg Professional, as of August 31, 2021
[2] Source: Bloomberg Professional, as of August 31, 2021
[3] Source: Schedule AEB-R1, 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 & BLOOMBERG BETA

$K = Rf + \beta \times (Rm - Rf)$
$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Near-term projected 30-year U.S. Treasury bond yield (Q4 2021 - Q4 2022)	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE (K)	ECAPM ROE (K)
ALLETE, Inc.	ALE	2.42%	0.84	14.56%	12.14%	12.66%	13.13%
Alliant Energy Corporation	LNT	2.42%	0.80	14.56%	12.14%	12.09%	12.70%
American Electric Power Company, Inc.	AEP	2.42%	0.77	14.56%	12.14%	11.80%	12.49%
Duke Energy Corporation	DUK	2.42%	0.71	14.56%	12.14%	11.06%	11.93%
Entergy Corporation	ETR	2.42%	0.85	14.56%	12.14%	12.69%	13.16%
Evergy, Inc.	EVRG	2.42%	0.78	14.56%	12.14%	11.92%	12.58%
NextEra Energy, Inc.	NEE	2.42%	0.78	14.56%	12.14%	11.84%	12.52%
NorthWestern Corporation	NWE	2.42%	0.92	14.56%	12.14%	13.57%	13.82%
Otter Tail Corporation	OTTR	2.42%	0.89	14.56%	12.14%	13.19%	13.53%
Pinnacle West Capital Corporation	PNW	2.42%	0.84	14.56%	12.14%	12.63%	13.11%
Portland General Electric Company	POR	2.42%	0.81	14.56%	12.14%	12.25%	12.82%
Xcel Energy Inc.	XEL	2.42%	0.73	14.56%	12.14%	11.31%	12.12%
Mean						12.25%	12.83%

Notes:
[1] Source: Blue Chip Financial Forecasts, Vol. 40, No. 9, September 1, 2021, at 2
[2] Source: Bloomberg Professional, as of August 31, 2021
[3] Source: Schedule AEB-R1, 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 & BLOOMBERG BETA

$K = Rf + \beta \times (Rm - Rf)$
$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Projected 30-year U.S. Treasury bond yield (2023 - 2027)	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE (K)	ECAPM ROE (K)
ALLETE, Inc.	ALE	3.50%	0.84	14.56%	11.06%	12.83%	13.26%
Alliant Energy Corporation	LNT	3.50%	0.80	14.56%	11.06%	12.31%	12.87%
American Electric Power Company, Inc.	AEP	3.50%	0.77	14.56%	11.06%	12.04%	12.67%
Duke Energy Corporation	DUK	3.50%	0.71	14.56%	11.06%	11.37%	12.17%
Entergy Corporation	ETR	3.50%	0.85	14.56%	11.06%	12.85%	13.28%
Evergy, Inc.	EVRG	3.50%	0.78	14.56%	11.06%	12.16%	12.76%
NextEra Energy, Inc.	NEE	3.50%	0.78	14.56%	11.06%	12.08%	12.70%
NorthWestern Corporation	NWE	3.50%	0.92	14.56%	11.06%	13.66%	13.88%
Otter Tail Corporation	OTTR	3.50%	0.89	14.56%	11.06%	13.31%	13.62%
Pinnacle West Capital Corporation	PNW	3.50%	0.84	14.56%	11.06%	12.80%	13.24%
Portland General Electric Company	POR	3.50%	0.81	14.56%	11.06%	12.45%	12.98%
Xcel Energy Inc.	XEL	3.50%	0.73	14.56%	11.06%	11.60%	12.34%
Mean						12.46%	12.98%

Notes:
[1] Source: Blue Chip Financial Forecasts, Vol. 40, No. 6, June 1, 2021, at 14
[2] Source: Bloomberg Professional, as of August 31, 2021
[3] Source: Schedule AEB-R1, 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 AVERAGE BETA

CAPM: $K = R_f + \beta (R_m - R_f)$ / ECAPM: K = Rf + 0.25(Rm − Rf) + 0.75β (Rm − Rf)

	[4]	[5]	[6]	[7]	[8]	[9]
	Risk-Free Rate (R_f)	Beta (β)	Market Return (R_m)	Market Risk Premium ($R_m - R_f$)	CAPM (K)	ECAPM (K)
Current 30-day average of 30-year U.S. Treasury bond yield [1]	1.91%	0.729	14.56%	12.64%	11.13%	11.99%
Near-term projected 30-year U.S. Treasury bond yield (Q4 2021 - Q4 2022) [2]	2.42%	0.729	14.56%	12.14%	11.27%	12.09%
Projected 30-year U.S. Treasury bond yield (2023 - 2027) [3]	3.50%	0.729	14.56%	11.06%	11.56%	12.31%
				Average:	**11.32%**	**12.13%**

Notes:
[1] Source: Bloomberg Professional, as of August 31, 2021
[2] Source: Blue Chip Financial Forecasts, Vol. 40, No. 9, September 1, 2021, at 2
[3] Source: Blue Chip Financial Forecasts, Vol. 40, No. 6, June 1, 2020, at 14
[4] See Notes [1], [2], and [3]
[5] Source: Schedule AEB-R1, Attachment 5
[6] Source: Schedule AEB-R1, Attachment 6
[7] Equals [6] − [4]
[8] Equals [4] + [5] x [7]
[9] Equals [4] + 0.25 x ([7]) + 0.75 x ([5] x [7])

HISTORICAL BETA - 2011 - 2020

Company	Ticker	[1] 12/31/2011	[2] 12/31/2012	[3] 12/31/2013	[4] 12/31/2014	[5] 12/31/2015	[6] 12/31/2016	[7] 12/31/2017	[8] 12/31/2018	[9] 12/31/2019	[10] 12/31/2020	[11] Average
ALLETE, Inc.	ALE	0.70	0.70	0.75	0.80	0.80	0.75	0.80	0.65	0.65	0.85	0.75
Alliant Energy Corporation	LNT	0.75	0.70	0.75	0.80	0.80	0.70	0.70	0.60	0.60	0.85	0.73
American Electric Power Company, Inc.	AEP	0.70	0.65	0.70	0.70	0.70	0.65	0.65	0.55	0.55	0.75	0.66
Duke Energy Corporation	DUK	0.65	0.60	0.65	0.60	0.65	0.60	0.60	0.50	0.50	0.85	0.62
Entergy Corporation	ETR	0.70	0.70	0.70	0.70	0.70	0.65	0.65	0.60	0.60	0.95	0.70
Evergy, Inc.	EVRG								NMF	NMF	1.00	1.00
NextEra Energy, Inc.	NEE	0.75	0.70	0.70	0.70	0.75	0.65	0.65	0.55	0.55	0.90	0.69
NorthWestern Corporation	NWE		0.70	0.70	0.70	0.70	0.70	0.70	0.60	0.60	0.90	0.70
Otter Tail Corporation	OTTR	0.90	0.90	0.95	0.90	0.85	0.85	0.90	0.75	0.70	0.85	0.86
Pinnacle West Capital Corporation	PNW	0.70	0.70	0.70	0.70	0.75	0.70	0.70	0.60	0.55	0.85	0.70
Portland General Electric Company	POR	0.75	0.75	0.75	0.80	0.80	0.70	0.70	0.60	0.60	0.85	0.73
Xcel Energy Inc.	XEL	0.65	0.65	0.65	0.70	0.65	0.60	0.60	0.55	0.50	0.80	0.64
Mean		0.73	0.70	0.73	0.74	0.74	0.69	0.70	0.60	0.58	0.87	0.73

Notes:
[1] Value Line, dated November 4, 2011, November 25, 2011, and Dcember 23, 2011.
[2] Value Line, dated November 2, 2012, November 23, 2012, and December 21, 2012.
[3] Value Line, dated November 1, 2013, November 22, 2013, and December 20, 2013.
[4] Value Line, dated October 31, 2014, November 21, 2014, and December 19, 2014.
[5] Value Line, dated October 30,2015, November 20, 2015, and December 18, 2015.
[6] Value Line, dated October 28, 2016, November 18, 2016, and December 16, 2016.
[7] Value Line, dated October 27, 2017, November 17, 2017, and December 15, 2017.
[8] Value Line, dated October 18, 2018, November 16, 2018, and Decenber 14, 2018.
[9] Value Line, dated October 25, 2019, November 15, 2019, and December 13, 2019.
[10] Value Line, dated October 23, 2020, November 13, 2020, and December 11, 2020.
[11] Average ([1] - [10])

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

[1] Estimated Weighted Average Dividend Yield	1.34%
[2] Estimated Weighted Average Long-Term Growth Rate	13.13%
[3] S&P 500 Estimated Required Market Return	14.56%

STANDARD AND POOR'S 500 INDEX

Name	Ticker	[4] Weight in Index	[5] Current Dividend Yield	[6] Cap-Weighted Dividend Yield	[7] Value Line Long-Term Growth Est.	[8] Cap-Weighted Long-Term Growth Est.
LyondellBasell Industries NV	LYB	0.09%	4.50%	0.00%	8.00%	0.01%
American Express Co	AXP	0.36%	1.04%	0.00%	8.50%	0.03%
Verizon Communications Inc	VZ	0.62%	4.56%	0.03%	3.50%	0.02%
Broadcom Inc	AVGO	0.55%	2.90%	0.02%	27.00%	0.15%
Boeing Co/The	BA	0.00%	n/a	n/a	0.00%	0.00%
Caterpillar Inc	CAT	0.31%	2.11%	0.01%	9.00%	0.03%
JPMorgan Chase & Co	JPM	1.29%	2.25%	0.03%	6.50%	0.08%
Chevron Corp	CVX	0.51%	5.54%	0.03%	23.50%	0.12%
Coca-Cola Co/The	KO	0.66%	2.98%	0.02%	7.00%	0.05%
AbbVie Inc	ABBV	0.58%	4.31%	0.02%	6.50%	0.04%
Walt Disney Co/The	DIS	0.89%	n/a	n/a	14.00%	0.12%
FleetCor Technologies Inc	FLT	0.06%	n/a	n/a	11.00%	0.01%
Extra Space Storage Inc	EXR	0.07%	2.68%	0.00%	5.00%	0.00%
Exxon Mobil Corp	XOM	0.00%	6.38%	0.00%	0.00%	0.00%
Phillips 66	PSX	0.08%	5.06%	0.00%	20.00%	0.02%
General Electric Co	GE	0.31%	0.30%	0.00%	15.00%	0.05%
HP Inc	HPQ	0.10%	2.61%	0.00%	14.00%	0.01%
Home Depot Inc/The	HD	0.93%	2.02%	0.02%	8.00%	0.07%
Monolithic Power Systems Inc	MPWR	0.06%	0.48%	0.00%	17.50%	0.01%
International Business Machines Corp	IBM	0.34%	4.67%	0.02%	1.50%	0.01%
Johnson & Johnson	JNJ	1.23%	2.45%	0.03%	10.00%	0.12%
McDonald's Corp	MCD	0.48%	2.17%	0.01%	10.50%	0.05%
Merck & Co Inc	MRK	0.52%	3.41%	0.02%	7.50%	0.04%
3M Co	MMM	0.30%	3.04%	0.01%	4.50%	0.01%
American Water Works Co Inc	AWK	0.09%	1.32%	0.00%	8.50%	0.01%
Bank of America Corp	BAC	0.95%	2.01%	0.02%	6.00%	0.06%
Baker Hughes Co	BKR	0.00%	3.16%	0.00%	0.00%	0.00%
Pfizer Inc	PFE	0.70%	3.39%	0.02%	8.00%	0.06%
Procter & Gamble Co/The	PG	0.94%	2.44%	0.02%	7.00%	0.07%
AT&T Inc	T	0.53%	7.59%	0.04%	2.50%	0.01%
Travelers Cos Inc/The	TRV	0.11%	2.20%	0.00%	8.00%	0.01%
Raytheon Technologies Corp	RTX	0.35%	2.41%	0.01%	1.00%	0.00%
Analog Devices Inc	ADI	0.24%	1.69%	0.00%	8.50%	0.02%
Walmart Inc	WMT	1.12%	1.49%	0.02%	7.50%	0.08%
Cisco Systems Inc/Delaware	CSCO	0.67%	2.51%	0.02%	6.00%	0.04%
Intel Corp	INTC	0.59%	2.57%	0.02%	7.00%	0.04%
General Motors Co	GM	0.19%	n/a	n/a	11.00%	0.02%
Microsoft Corp	MSFT	6.14%	0.74%	0.05%	17.00%	1.04%
Dollar General Corp	DG	0.14%	0.75%	0.00%	10.50%	0.01%
Cigna Corp	CI	0.19%	1.89%	0.00%	10.00%	0.02%
Kinder Morgan Inc	KMI	0.10%	6.64%	0.01%	19.00%	0.02%
Citigroup Inc	C	0.39%	2.84%	0.01%	5.00%	0.02%
American International Group Inc	AIG	0.13%	2.35%	0.00%	28.50%	0.04%
Altria Group Inc	MO	0.25%	7.17%	0.02%	6.00%	0.02%
HCA Healthcare Inc	HCA	0.22%	0.76%	0.00%	12.00%	0.03%
Under Armour Inc	UAA	0.01%	n/a	n/a	11.00%	0.00%
International Paper Co	IP	0.06%	3.41%	0.00%	11.00%	0.01%
Hewlett Packard Enterprise Co	HPE	0.05%	3.10%	0.00%	6.50%	0.00%
Abbott Laboratories	ABT	0.61%	1.42%	0.01%	11.50%	0.07%
Aflac Inc	AFL	0.10%	2.33%	0.00%	8.50%	0.01%
Air Products and Chemicals Inc	APD	0.16%	2.23%	0.00%	12.00%	0.02%
Royal Caribbean Cruises Ltd	RCL	0.00%	n/a	n/a	0.00%	0.00%
Hess Corp	HES	0.00%	1.45%	0.00%	0.00%	0.00%
Archer-Daniels-Midland Co	ADM	0.09%	2.47%	0.00%	8.50%	0.01%
Automatic Data Processing Inc	ADP	0.24%	1.78%	0.00%	9.00%	0.02%
Verisk Analytics Inc	VRSK	0.09%	0.57%	0.00%	8.00%	0.01%
AutoZone Inc	AZO	0.09%	n/a	n/a	14.50%	0.01%
Avery Dennison Corp	AVY	0.05%	1.21%	0.00%	9.00%	0.00%
Enphase Energy Inc	ENPH	0.06%	n/a	n/a	40.00%	0.03%
MSCI Inc	MSCI	0.14%	0.66%	0.00%	16.00%	0.02%
Ball Corp	BLL	0.08%	0.83%	0.00%	22.00%	0.02%
Carrier Global Corp	CARR	0.00%	0.83%	0.00%	0.00%	0.00%
Bank of New York Mellon Corp/The	BK	0.13%	2.46%	0.00%	5.00%	0.01%
Otis Worldwide Corp	OTIS	0.00%	1.04%	0.00%	0.00%	0.00%
Baxter International Inc	BAX	0.10%	1.47%	0.00%	8.50%	0.01%
Becton Dickinson and Co	BDX	0.20%	1.32%	0.00%	7.50%	0.01%
Berkshire Hathaway Inc	BRK/B	1.03%	n/a	n/a	6.00%	0.06%
Best Buy Co Inc	BBY	0.08%	2.40%	0.00%	8.50%	0.01%
Boston Scientific Corp	BSX	0.17%	n/a	n/a	17.50%	0.03%
Bristol-Myers Squibb Co	BMY	0.40%	2.93%	0.01%	12.50%	0.05%
Fortune Brands Home & Security Inc	FBHS	0.04%	1.07%	0.00%	10.00%	0.00%
Brown-Forman Corp	BF/B	0.06%	1.02%	0.00%	11.00%	0.01%
Cabot Oil & Gas Corp	COG	0.02%	2.77%	0.00%	14.50%	0.00%
Campbell Soup Co	CPB	0.03%	3.55%	0.00%	5.00%	0.00%
Kansas City Southern	KSU	0.07%	0.77%	0.00%	10.50%	0.01%
Hilton Worldwide Holdings Inc	HLT	0.00%	n/a	n/a	0.00%	0.00%
Carnival Corp	CCL	0.00%	n/a	n/a	0.00%	0.00%
Qorvo Inc	QRVO	0.06%	n/a	n/a	19.50%	0.01%
Lumen Technologies Inc	LUMN	0.04%	8.13%	0.00%	2.50%	0.00%
UDR Inc	UDR	0.04%	2.68%	0.00%	6.00%	0.00%
Clorox Co/The	CLX	0.06%	2.76%	0.00%	6.00%	0.00%

STANDARD AND POOR'S 500 INDEX

Name	Ticker	[4] Weight in Index	[5] Current Dividend Yield	[6] Cap-Weighted Dividend Yield	[7] Value Line Long-Term Growth Est.	[8] Cap-Weighted Long-Term Growth Est.
Paycom Software Inc	PAYC	0.08%	n/a	n/a	19.50%	0.02%
CMS Energy Corp	CMS	0.05%	2.71%	0.00%	7.50%	0.00%
Newell Brands Inc	NWL	0.00%	3.62%	0.00%	0.00%	0.00%
Colgate-Palmolive Co	CL	0.18%	2.31%	0.00%	4.50%	0.01%
Comerica Inc	CMA	0.03%	3.68%	0.00%	2.50%	0.00%
IPG Photonics Corp	IPGP	0.02%	n/a	n/a	17.00%	0.00%
Conagra Brands Inc	CAG	0.04%	3.77%	0.00%	5.00%	0.00%
Consolidated Edison Inc	ED	0.07%	4.11%	0.00%	4.00%	0.00%
Corning Inc	GLW	0.09%	2.40%	0.00%	20.00%	0.02%
Cummins Inc	CMI	0.09%	2.46%	0.00%	7.00%	0.01%
Caesars Entertainment Inc	CZR	0.00%	n/a	n/a	0.00%	0.00%
Danaher Corp	DHR	0.63%	0.26%	0.00%	18.00%	0.11%
Target Corp	TGT	0.33%	1.46%	0.00%	13.00%	0.04%
Deere & Co	DE	0.32%	1.11%	0.00%	17.00%	0.05%
Dominion Energy Inc	D	0.17%	3.24%	0.01%	12.00%	0.02%
Dover Corp	DOV	0.07%	1.15%	0.00%	7.00%	0.00%
Alliant Energy Corp	LNT	0.04%	2.65%	0.00%	5.50%	0.00%
Duke Energy Corp	DUK	0.22%	3.76%	0.01%	7.00%	0.02%
Regency Centers Corp	REG	0.03%	3.47%	0.00%	10.00%	0.00%
Eaton Corp PLC	ETN	0.18%	1.81%	0.00%	5.50%	0.01%
Ecolab Inc	ECL	0.17%	0.85%	0.00%	6.00%	0.01%
PerkinElmer Inc	PKI	0.06%	0.15%	0.00%	11.00%	0.01%
Emerson Electric Co	EMR	0.17%	1.91%	0.00%	10.50%	0.02%
EOG Resources Inc	EOG	0.11%	2.44%	0.00%	12.50%	0.01%
Aon PLC	AON	0.18%	0.71%	0.00%	7.00%	0.01%
Entergy Corp	ETR	0.06%	3.44%	0.00%	3.00%	0.00%
Equifax Inc	EFX	0.09%	0.57%	0.00%	10.50%	0.01%
IQVIA Holdings Inc	IQV	0.13%	n/a	n/a	14.00%	0.02%
Gartner Inc	IT	0.07%	n/a	n/a	18.50%	0.01%
FedEx Corp	FDX	0.19%	1.13%	0.00%	12.00%	0.02%
FMC Corp	FMC	0.03%	2.05%	0.00%	9.50%	0.00%
Ford Motor Co	F	0.14%	n/a	n/a	47.50%	0.07%
NextEra Energy Inc	NEE	0.45%	1.83%	0.01%	10.50%	0.05%
Franklin Resources Inc	BEN	0.04%	3.45%	0.00%	11.50%	0.01%
Freeport-McMoRan Inc	FCX	0.14%	0.82%	0.00%	36.50%	0.05%
Gap Inc/The	GPS	0.03%	1.80%	0.00%	25.00%	0.01%
Dexcom Inc	DXCM	0.14%	n/a	n/a	34.00%	0.05%
General Dynamics Corp	GD	0.15%	2.38%	0.00%	5.00%	0.01%
General Mills Inc	GIS	0.09%	3.53%	0.00%	3.00%	0.00%
Genuine Parts Co	GPC	0.05%	2.67%	0.00%	7.00%	0.00%
Atmos Energy Corp	ATO	0.03%	2.56%	0.00%	7.00%	0.00%
WW Grainger Inc	GWW	0.06%	1.49%	0.00%	5.50%	0.00%
Halliburton Co	HAL	0.05%	0.90%	0.00%	9.00%	0.00%
L3Harris Technologies Inc	LHX	0.00%	1.75%	0.00%	0.00%	0.00%
Healthpeak Properties Inc	PEAK	0.05%	3.33%	0.00%	-12.00%	-0.01%
Catalent Inc	CTLT	0.06%	n/a	n/a	21.00%	0.01%
Fortive Corp	FTV	0.07%	0.38%	0.00%	6.00%	0.00%
Hershey Co/The	HSY	0.07%	2.03%	0.00%	5.50%	0.00%
Synchrony Financial	SYF	0.08%	1.77%	0.00%	4.50%	0.00%
Hormel Foods Corp	HRL	0.07%	2.15%	0.00%	9.00%	0.01%
Arthur J Gallagher & Co	AJG	0.08%	1.34%	0.00%	12.50%	0.01%
Mondelez International Inc	MDLZ	0.23%	2.26%	0.01%	8.00%	0.02%
CenterPoint Energy Inc	CNP	0.04%	2.55%	0.00%	8.00%	0.00%
Humana Inc	HUM	0.14%	0.69%	0.00%	12.00%	0.02%
Willis Towers Watson PLC	WLTW	0.08%	1.45%	0.00%	8.00%	0.01%
Illinois Tool Works Inc	ITW	0.20%	2.10%	0.00%	11.00%	0.02%
CDW Corp/DE	CDW	0.07%	0.80%	0.00%	10.00%	0.01%
Trane Technologies PLC	TT	0.00%	1.19%	0.00%	0.00%	0.00%
Interpublic Group of Cos Inc/The	IPG	0.04%	2.90%	0.00%	12.00%	0.00%
International Flavors & Fragrances Inc	IFF	0.10%	2.09%	0.00%	7.50%	0.01%
Jacobs Engineering Group Inc	J	0.05%	0.62%	0.00%	15.00%	0.01%
Generac Holdings Inc	GNRC	0.07%	n/a	n/a	23.50%	0.02%
NXP Semiconductors NV	NXPI	0.15%	1.05%	0.00%	11.00%	0.02%
Hanesbrands Inc	HBI	0.02%	3.21%	0.00%	6.50%	0.00%
Kellogg Co	K	0.06%	3.67%	0.00%	3.50%	0.00%
Broadridge Financial Solutions Inc	BR	0.05%	1.49%	0.00%	8.50%	0.00%
Perrigo Co PLC	PRGO	0.01%	2.34%	0.00%	-2.00%	0.00%
Kimberly-Clark Corp	KMB	0.13%	3.31%	0.00%	5.50%	0.01%
Kimco Realty Corp	KIM	0.04%	3.12%	0.00%	-2.00%	0.00%
Oracle Corp	ORCL	0.67%	1.44%	0.01%	10.00%	0.07%
Kroger Co/The	KR	0.09%	1.82%	0.00%	5.00%	0.00%
Leggett & Platt Inc	LEG	0.02%	3.47%	0.00%	10.00%	0.00%
Lennar Corp	LEN	0.08%	0.93%	0.00%	9.00%	0.01%
Eli Lilly & Co	LLY	0.67%	1.32%	0.01%	11.00%	0.07%
Bath & Body Works Inc	BBWI	0.05%	0.89%	0.00%	23.50%	0.01%
Charter Communications Inc	CHTR	0.41%	n/a	n/a	26.50%	0.11%
Lincoln National Corp	LNC	0.03%	2.45%	0.00%	9.00%	0.00%
Loews Corp	L	0.04%	0.45%	0.00%	12.50%	0.00%
Lowe's Cos Inc	LOW	0.38%	1.57%	0.01%	14.00%	0.05%
IDEX Corp	IEX	0.05%	0.96%	0.00%	8.00%	0.00%
Marsh & McLennan Cos Inc	MMC	0.22%	1.36%	0.00%	11.00%	0.02%
Masco Corp	MAS	0.04%	1.55%	0.00%	9.00%	0.00%
S&P Global Inc	SPGI	0.29%	0.69%	0.00%	10.50%	0.03%
Medtronic PLC	MDT	0.49%	1.89%	0.01%	9.00%	0.04%
Viatris Inc	VTRS	0.00%	3.01%	0.00%	0.00%	0.00%
CVS Health Corp	CVS	0.31%	2.32%	0.01%	6.00%	0.02%
DuPont de Nemours Inc	DD	0.00%	1.62%	0.00%	0.00%	0.00%
Micron Technology Inc	MU	0.22%	0.54%	0.00%	11.50%	0.03%
Motorola Solutions Inc	MSI	0.11%	1.16%	0.00%	7.00%	0.01%
Cboe Global Markets Inc	CBOE	0.04%	1.52%	0.00%	12.00%	0.00%
Laboratory Corp of America Holdings	LH	0.08%	n/a	n/a	5.50%	0.00%

STANDARD AND POOR'S 500 INDEX

Name	Ticker	[4] Weight in Index	[5] Current Dividend Yield	[6] Cap-Weighted Dividend Yield	[7] Value Line Long-Term Growth Est.	[8] Cap-Weighted Long-Term Growth Est.
Newmont Corp	NEM	0.13%	3.79%	0.00%	14.50%	0.02%
NIKE Inc	NKE	0.57%	0.67%	0.00%	24.00%	0.14%
NiSource Inc	NI	0.03%	3.57%	0.00%	9.50%	0.00%
Norfolk Southern Corp	NSC	0.17%	1.72%	0.00%	10.00%	0.02%
Principal Financial Group Inc	PFG	0.05%	3.77%	0.00%	5.50%	0.00%
Eversource Energy	ES	0.08%	2.66%	0.00%	6.50%	0.01%
Northrop Grumman Corp	NOC	0.16%	1.71%	0.00%	7.00%	0.01%
Wells Fargo & Co	WFC	0.51%	1.75%	0.01%	-0.50%	0.00%
Nucor Corp	NUE	0.09%	1.38%	0.00%	8.00%	0.01%
PVH Corp	PVH	0.02%	n/a	n/a	12.50%	0.00%
Occidental Petroleum Corp	OXY	0.06%	0.16%	0.00%	36.50%	0.02%
Omnicom Group Inc	OMC	0.04%	3.82%	0.00%	6.00%	0.00%
ONEOK Inc	OKE	0.06%	7.12%	0.00%	9.50%	0.01%
Raymond James Financial Inc	RJF	0.05%	0.74%	0.00%	6.50%	0.00%
Parker-Hannifin Corp	PH	0.10%	1.39%	0.00%	13.00%	0.01%
Rollins Inc	ROL	0.05%	0.82%	0.00%	11.50%	0.01%
PPL Corp	PPL	0.06%	5.66%	0.00%	-7.00%	0.00%
ConocoPhillips	COP	0.20%	3.10%	0.01%	13.50%	0.03%
PulteGroup Inc	PHM	0.04%	1.04%	0.00%	11.00%	0.00%
Pinnacle West Capital Corp	PNW	0.02%	4.32%	0.00%	5.00%	0.00%
PNC Financial Services Group Inc/The	PNC	0.22%	2.62%	0.01%	10.00%	0.02%
PPG Industries Inc	PPG	0.10%	1.48%	0.00%	3.00%	0.00%
Progressive Corp/The	PGR	0.15%	0.42%	0.00%	5.00%	0.01%
Public Service Enterprise Group Inc	PEG	0.09%	3.19%	0.00%	3.50%	0.00%
Robert Half International Inc	RHI	0.03%	1.47%	0.00%	7.50%	0.00%
Edison International	EIX	0.00%	4.58%	0.00%	0.00%	0.00%
Schlumberger NV	SLB	0.11%	1.78%	0.00%	8.50%	0.01%
Charles Schwab Corp/The	SCHW	0.36%	0.99%	0.00%	7.00%	0.02%
Sherwin-Williams Co/The	SHW	0.22%	0.72%	0.00%	10.50%	0.02%
West Pharmaceutical Services Inc	WST	0.09%	0.15%	0.00%	17.00%	0.02%
J M Smucker Co/The	SJM	0.04%	3.20%	0.00%	4.00%	0.00%
Snap-on Inc	SNA	0.03%	2.19%	0.00%	4.50%	0.00%
AMETEK Inc	AME	0.09%	0.59%	0.00%	10.00%	0.01%
Southern Co/The	SO	0.19%	4.02%	0.01%	6.00%	0.01%
Truist Financial Corp	TFC	0.21%	3.36%	0.01%	7.00%	0.01%
Southwest Airlines Co	LUV	0.08%	n/a	n/a	34.50%	0.03%
W R Berkley Corp	WRB	0.04%	0.69%	0.00%	14.50%	0.01%
Stanley Black & Decker Inc	SWK	0.09%	1.64%	0.00%	6.00%	0.01%
Public Storage	PSA	0.15%	2.47%	0.00%	2.50%	0.00%
Arista Networks Inc	ANET	0.08%	n/a	n/a	4.50%	0.00%
Sysco Corp	SYY	0.11%	2.36%	0.00%	10.00%	0.01%
Corteva Inc	CTVA	0.00%	1.27%	0.00%	0.00%	0.00%
Texas Instruments Inc	TXN	0.48%	2.14%	0.01%	8.50%	0.04%
Textron Inc	TXT	0.04%	0.11%	0.00%	8.00%	0.00%
Thermo Fisher Scientific Inc	TMO	0.59%	0.19%	0.00%	14.50%	0.09%
TJX Cos Inc/The	TJX	0.24%	1.43%	0.00%	12.00%	0.03%
Globe Life Inc	GL	0.03%	0.82%	0.00%	8.00%	0.00%
Johnson Controls International plc	JCI	0.14%	1.44%	0.00%	8.50%	0.01%
Ulta Beauty Inc	ULTA	0.06%	n/a	n/a	12.50%	0.01%
Union Pacific Corp	UNP	0.38%	1.97%	0.01%	10.00%	0.04%
Keysight Technologies Inc	KEYS	0.09%	n/a	n/a	17.00%	0.02%
UnitedHealth Group Inc	UNH	1.06%	1.39%	0.01%	12.00%	0.13%
Unum Group	UNM	0.01%	4.51%	0.00%	3.50%	0.00%
Marathon Oil Corp	MRO	0.03%	1.70%	0.00%	69.00%	0.02%
Bio-Rad Laboratories Inc	BIO	0.05%	n/a	n/a	11.50%	0.01%
Ventas Inc	VTR	0.06%	3.22%	0.00%	4.50%	0.00%
VF Corp	VFC	0.08%	2.56%	0.00%	5.50%	0.00%
Vornado Realty Trust	VNO	0.02%	5.06%	0.00%	-19.00%	0.00%
Vulcan Materials Co	VMC	0.07%	0.80%	0.00%	10.00%	0.01%
Weyerhaeuser Co	WY	0.07%	1.89%	0.00%	21.00%	0.02%
Whirlpool Corp	WHR	0.04%	2.53%	0.00%	5.50%	0.00%
Williams Cos Inc/The	WMB	0.08%	6.64%	0.01%	10.50%	0.01%
WEC Energy Group Inc	WEC	0.08%	2.87%	0.00%	6.50%	0.01%
Adobe Inc	ADBE	0.86%	n/a	n/a	15.50%	0.13%
AES Corp/The	AES	0.04%	2.52%	0.00%	24.00%	0.01%
Amgen Inc	AMGN	0.35%	3.12%	0.01%	5.50%	0.02%
Apple Inc	AAPL	6.79%	0.58%	0.04%	14.50%	0.98%
Autodesk Inc	ADSK	0.18%	n/a	n/a	18.00%	0.03%
Cintas Corp	CTAS	0.11%	0.96%	0.00%	12.50%	0.01%
Comcast Corp	CMCSA	0.75%	1.65%	0.01%	11.00%	0.08%
Molson Coors Beverage Co	TAP	0.03%	2.86%	0.00%	41.00%	0.01%
KLA Corp	KLAC	0.14%	1.24%	0.00%	18.00%	0.03%
Marriott International Inc/MD	MAR	0.12%	n/a	n/a	17.50%	0.02%
McCormick & Co Inc/MD	MKC	0.06%	1.58%	0.00%	6.00%	0.00%
PACCAR Inc	PCAR	0.08%	1.66%	0.00%	5.50%	0.00%
Costco Wholesale Corp	COST	0.54%	0.69%	0.00%	10.50%	0.06%
First Republic Bank/CA	FRC	0.10%	0.44%	0.00%	13.50%	0.01%
Stryker Corp	SYK	0.28%	0.91%	0.00%	11.00%	0.03%
Tyson Foods Inc	TSN	0.06%	2.27%	0.00%	6.00%	0.00%
Lamb Weston Holdings Inc	LW	0.03%	1.44%	0.00%	2.50%	0.00%
Applied Materials Inc	AMAT	0.33%	0.71%	0.00%	16.00%	0.05%
American Airlines Group Inc	AAL	0.00%	n/a	n/a	0.00%	0.00%
Cardinal Health Inc	CAH	0.04%	3.74%	0.00%	12.00%	0.00%
Cerner Corp	CERN	0.06%	1.15%	0.00%	11.00%	0.01%
Cincinnati Financial Corp	CINF	0.05%	2.04%	0.00%	13.50%	0.01%
ViacomCBS Inc	VIAC	0.07%	2.32%	0.00%	7.00%	0.00%
DR Horton Inc	DHI	0.09%	0.84%	0.00%	14.50%	0.01%
Electronic Arts Inc	EA	0.11%	0.47%	0.00%	12.50%	0.01%
Expeditors International of Washington Inc	EXPD	0.06%	0.93%	0.00%	10.00%	0.01%
Fastenal Co	FAST	0.09%	2.01%	0.00%	9.00%	0.01%
M&T Bank Corp	MTB	0.05%	3.14%	0.00%	8.00%	0.00%

STANDARD AND POOR'S 500 INDEX

Name	Ticker	[4] Weight in Index	[5] Current Dividend Yield	[6] Cap-Weighted Dividend Yield	[7] Value Line Long-Term Growth Est.	[8] Cap-Weighted Long-Term Growth Est.
Xcel Energy Inc	XEL	0.10%	2.66%	0.00%	6.00%	0.01%
Fiserv Inc	FISV	0.21%	n/a	n/a	13.00%	0.03%
Fifth Third Bancorp	FITB	0.07%	2.78%	0.00%	8.00%	0.01%
Gilead Sciences Inc	GILD	0.25%	3.90%	0.01%	3.50%	0.01%
Hasbro Inc	HAS	0.04%	2.77%	0.00%	12.50%	0.00%
Huntington Bancshares Inc/OH	HBAN	0.06%	3.86%	0.00%	8.50%	0.01%
Welltower Inc	WELL	0.10%	2.79%	0.00%	-1.50%	0.00%
Biogen Inc	BIIB	0.14%	n/a	n/a	7.00%	0.01%
Northern Trust Corp	NTRS	0.07%	2.36%	0.00%	7.00%	0.00%
Packaging Corp of America	PKG	0.04%	2.64%	0.00%	5.00%	0.00%
Paychex Inc	PAYX	0.11%	2.31%	0.00%	7.00%	0.01%
People's United Financial Inc	PBCT	0.02%	4.44%	0.00%	4.00%	0.00%
QUALCOMM Inc	QCOM	0.45%	1.85%	0.01%	14.00%	0.06%
Roper Technologies Inc	ROP	0.14%	0.47%	0.00%	8.00%	0.01%
Ross Stores Inc	ROST	0.11%	0.96%	0.00%	7.50%	0.01%
IDEXX Laboratories Inc	IDXX	0.16%	n/a	n/a	14.50%	0.02%
Starbucks Corp	SBUX	0.37%	1.53%	0.01%	16.00%	0.06%
KeyCorp	KEY	0.05%	3.64%	0.00%	9.50%	0.00%
Fox Corp	FOXA	0.00%	1.28%	0.00%	0.00%	0.00%
Fox Corp	FOX	0.00%	1.39%	0.00%	0.00%	0.00%
State Street Corp	STT	0.09%	2.45%	0.00%	7.00%	0.01%
Norwegian Cruise Line Holdings Ltd	NCLH	0.00%	n/a	n/a	0.00%	0.00%
US Bancorp	USB	0.23%	2.93%	0.01%	6.50%	0.01%
A O Smith Corp	AOS	0.03%	1.43%	0.00%	9.50%	0.00%
NortonLifeLock Inc	NLOK	0.04%	1.88%	0.00%	7.00%	0.00%
T Rowe Price Group Inc	TROW	0.14%	1.93%	0.00%	8.00%	0.01%
Waste Management Inc	WM	0.18%	1.48%	0.00%	7.50%	0.01%
Constellation Brands Inc	STZ	0.10%	1.44%	0.00%	7.00%	0.01%
Xilinx Inc	XLNX	0.10%	n/a	n/a	7.50%	0.01%
DENTSPLY SIRONA Inc	XRAY	0.04%	0.71%	0.00%	5.50%	0.00%
Zions Bancorp NA	ZION	0.03%	2.63%	0.00%	8.50%	0.00%
Alaska Air Group Inc	ALK	0.02%	n/a	n/a	80.00%	0.02%
Invesco Ltd	IVZ	0.03%	2.69%	0.00%	15.00%	0.00%
Linde PLC	LIN	0.00%	1.35%	0.00%	0.00%	0.00%
Intuit Inc	INTU	0.42%	0.48%	0.00%	16.00%	0.07%
Morgan Stanley	MS	0.52%	2.68%	0.01%	8.50%	0.04%
Microchip Technology Inc	MCHP	0.12%	1.11%	0.00%	9.00%	0.01%
Chubb Ltd	CB	0.22%	1.74%	0.00%	12.50%	0.03%
Hologic Inc	HOLX	0.05%	n/a	n/a	25.00%	0.01%
Citizens Financial Group Inc	CFG	0.05%	3.56%	0.00%	8.50%	0.00%
O'Reilly Automotive Inc	ORLY	0.11%	n/a	n/a	11.00%	0.01%
Allstate Corp/The	ALL	0.11%	2.40%	0.00%	5.00%	0.01%
Equity Residential	EQR	0.09%	2.87%	0.00%	2.00%	0.00%
BorgWarner Inc	BWA	0.03%	1.59%	0.00%	5.50%	0.00%
Organon & Co	OGN	0.00%	3.30%	0.00%	0.00%	0.00%
Host Hotels & Resorts Inc	HST	0.03%	n/a	n/a	10.00%	0.00%
Incyte Corp	INCY	0.05%	n/a	n/a	58.50%	0.03%
Simon Property Group Inc	SPG	0.12%	4.46%	0.01%	1.50%	0.00%
Eastman Chemical Co	EMN	0.04%	2.44%	0.00%	10.50%	0.00%
Twitter Inc	TWTR	0.14%	n/a	n/a	35.00%	0.05%
AvalonBay Communities Inc	AVB	0.09%	2.77%	0.00%	1.00%	0.00%
Prudential Financial Inc	PRU	0.11%	4.34%	0.00%	4.50%	0.00%
United Parcel Service Inc	UPS	0.39%	2.09%	0.01%	10.50%	0.04%
Walgreens Boots Alliance Inc	WBA	0.12%	3.76%	0.00%	6.00%	0.01%
STERIS PLC	STE	0.06%	0.80%	0.00%	10.00%	0.01%
McKesson Corp	MCK	0.09%	0.92%	0.00%	9.00%	0.01%
Lockheed Martin Corp	LMT	0.27%	2.89%	0.01%	7.50%	0.02%
AmerisourceBergen Corp	ABC	0.07%	1.44%	0.00%	6.50%	0.00%
Capital One Financial Corp	COF	0.20%	1.45%	0.00%	5.50%	0.01%
Waters Corp	WAT	0.07%	n/a	n/a	6.00%	0.00%
Dollar Tree Inc	DLTR	0.06%	n/a	n/a	9.50%	0.01%
Darden Restaurants Inc	DRI	0.05%	2.92%	0.00%	19.00%	0.01%
Domino's Pizza Inc	DPZ	0.05%	0.73%	0.00%	15.00%	0.01%
NVR Inc	NVR	0.05%	n/a	n/a	8.00%	0.00%
NetApp Inc	NTAP	0.05%	2.25%	0.00%	6.50%	0.00%
Citrix Systems Inc	CTXS	0.03%	1.44%	0.00%	8.50%	0.00%
DXC Technology Co	DXC	0.03%	n/a	n/a	6.50%	0.00%
Old Dominion Freight Line Inc	ODFL	0.09%	0.28%	0.00%	9.50%	0.01%
DaVita Inc	DVA	0.04%	n/a	n/a	16.00%	0.01%
Hartford Financial Services Group Inc/The	HIG	0.06%	2.08%	0.00%	8.50%	0.01%
Iron Mountain Inc	IRM	0.04%	5.18%	0.00%	8.00%	0.00%
Estee Lauder Cos Inc/The	EL	0.21%	0.62%	0.00%	11.00%	0.02%
Cadence Design Systems Inc	CDNS	0.12%	n/a	n/a	9.50%	0.01%
Tyler Technologies Inc	TYL	0.05%	n/a	n/a	12.50%	0.01%
Universal Health Services Inc	UHS	0.03%	0.51%	0.00%	11.00%	0.00%
Skyworks Solutions Inc	SWKS	0.08%	1.22%	0.00%	13.50%	0.01%
NOV Inc	NOV	0.00%	n/a	n/a	0.00%	0.00%
Quest Diagnostics Inc	DGX	0.05%	1.62%	0.00%	7.50%	0.00%
Activision Blizzard Inc	ATVI	0.17%	0.57%	0.00%	13.00%	0.02%
Rockwell Automation Inc	ROK	0.10%	1.32%	0.00%	6.50%	0.01%
Kraft Heinz Co/The	KHC	0.12%	4.45%	0.01%	1.50%	0.00%
American Tower Corp	AMT	0.36%	1.74%	0.01%	9.50%	0.03%
Regeneron Pharmaceuticals Inc	REGN	0.19%	n/a	n/a	12.50%	0.02%
Amazon.com Inc	AMZN	4.76%	n/a	n/a	30.00%	1.43%
Jack Henry & Associates Inc	JKHY	0.04%	1.04%	0.00%	9.50%	0.00%
Ralph Lauren Corp	RL	0.02%	2.37%	0.00%	6.00%	0.00%
Boston Properties Inc	BXP	0.05%	3.47%	0.00%	-2.00%	0.00%
Amphenol Corp	APH	0.12%	0.76%	0.00%	10.50%	0.01%
Howmet Aerospace Inc	HWM	0.04%	0.25%	0.00%	12.00%	0.00%
Pioneer Natural Resources Co	PXD	0.10%	1.50%	0.00%	20.00%	0.02%
Valero Energy Corp	VLO	0.07%	5.91%	0.00%	13.00%	0.01%

STANDARD AND POOR'S 500 INDEX

Name	Ticker	[4] Weight in Index	[5] Current Dividend Yield	[6] Cap-Weighted Dividend Yield	[7] Value Line Long-Term Growth Est.	[8] Cap-Weighted Long-Term Growth Est.
Synopsys Inc	SNPS	0.14%	n/a	n/a	12.50%	0.02%
Western Union Co/The	WU	0.02%	4.34%	0.00%	6.00%	0.00%
Etsy Inc	ETSY	0.07%	n/a	n/a	30.00%	0.02%
CH Robinson Worldwide Inc	CHRW	0.03%	2.27%	0.00%	8.00%	0.00%
Accenture PLC	ACN	0.58%	1.05%	0.01%	10.00%	0.06%
TransDigm Group Inc	TDG	0.09%	n/a	n/a	11.00%	0.01%
Yum! Brands Inc	YUM	0.10%	1.53%	0.00%	10.50%	0.01%
Prologis Inc	PLD	0.27%	1.87%	0.01%	8.50%	0.02%
FirstEnergy Corp	FE	0.06%	4.01%	0.00%	11.50%	0.01%
VeriSign Inc	VRSN	0.07%	n/a	n/a	8.50%	0.01%
Quanta Services Inc	PWR	0.04%	0.24%	0.00%	12.50%	0.00%
Henry Schein Inc	HSIC	0.03%	n/a	n/a	6.50%	0.00%
Ameren Corp	AEE	0.06%	2.51%	0.00%	6.50%	0.00%
ANSYS Inc	ANSS	0.09%	n/a	n/a	8.00%	0.01%
NVIDIA Corp	NVDA	1.51%	0.07%	0.00%	15.50%	0.23%
Sealed Air Corp	SEE	0.02%	1.31%	0.00%	13.50%	0.00%
Cognizant Technology Solutions Corp	CTSH	0.11%	1.26%	0.00%	6.50%	0.01%
SVB Financial Group	SIVB	0.09%	n/a	n/a	8.00%	0.01%
Intuitive Surgical Inc	ISRG	0.34%	n/a	n/a	15.00%	0.05%
Take-Two Interactive Software Inc	TTWO	0.05%	n/a	n/a	12.00%	0.01%
Republic Services Inc	RSG	0.11%	1.48%	0.00%	7.50%	0.01%
eBay Inc	EBAY	0.14%	0.94%	0.00%	16.50%	0.02%
Goldman Sachs Group Inc/The	GS	0.38%	1.93%	0.01%	7.00%	0.03%
SBA Communications Corp	SBAC	0.11%	0.65%	0.00%	45.00%	0.05%
Sempra Energy	SRE	0.11%	3.32%	0.00%	10.00%	0.01%
Moody's Corp	MCO	0.19%	0.65%	0.00%	8.50%	0.02%
Booking Holdings Inc	BKNG	0.26%	n/a	n/a	14.00%	0.04%
F5 Networks Inc	FFIV	0.03%	n/a	n/a	7.00%	0.00%
Akamai Technologies Inc	AKAM	0.05%	n/a	n/a	9.50%	0.00%
Charles River Laboratories International Inc	CRL	0.06%	n/a	n/a	7.00%	0.00%
MarketAxess Holdings Inc	MKTX	0.05%	0.55%	0.00%	14.00%	0.01%
Devon Energy Corp	DVN	0.05%	1.49%	0.00%	20.00%	0.01%
Bio-Techne Corp	TECH	0.05%	0.26%	0.00%	13.00%	0.01%
Alphabet Inc	GOOGL	0.00%	n/a	n/a	0.00%	0.00%
Teleflex Inc	TFX	0.05%	0.34%	0.00%	14.50%	0.01%
Allegion plc	ALLE	0.03%	1.00%	0.00%	8.50%	0.00%
Netflix Inc	NFLX	0.68%	n/a	n/a	23.50%	0.16%
Agilent Technologies Inc	A	0.14%	0.44%	0.00%	11.50%	0.02%
Trimble Inc	TRMB	0.06%	n/a	n/a	14.00%	0.01%
Anthem Inc	ANTM	0.25%	1.20%	0.00%	13.00%	0.03%
CME Group Inc	CME	0.20%	1.78%	0.00%	8.50%	0.02%
Juniper Networks Inc	JNPR	0.03%	2.76%	0.00%	7.00%	0.00%
BlackRock Inc	BLK	0.39%	1.75%	0.01%	9.50%	0.04%
DTE Energy Co	DTE	0.06%	2.74%	0.00%	6.00%	0.00%
Celanese Corp	CE	0.05%	1.72%	0.00%	6.50%	0.00%
Nasdaq Inc	NDAQ	0.09%	1.10%	0.00%	6.50%	0.01%
Philip Morris International Inc	PM	0.43%	4.66%	0.02%	6.50%	0.03%
Ingersoll Rand Inc	IR	0.00%	n/a	n/a	0.00%	0.00%
salesforce.com Inc	CRM	0.70%	n/a	n/a	20.00%	0.14%
Huntington Ingalls Industries Inc	HII	0.02%	2.23%	0.00%	7.00%	0.00%
MetLife Inc	MET	0.14%	3.10%	0.00%	6.50%	0.01%
Under Armour Inc	UA	0.00%	n/a	n/a	0.00%	0.00%
Tapestry Inc	TPR	0.03%	2.48%	0.00%	1.50%	0.00%
CSX Corp	CSX	0.20%	1.14%	0.00%	11.50%	0.02%
Edwards Lifesciences Corp	EW	0.20%	n/a	n/a	13.00%	0.03%
Ameriprise Financial Inc	AMP	0.08%	1.66%	0.00%	13.50%	0.01%
Zebra Technologies Corp	ZBRA	0.08%	n/a	n/a	12.50%	0.01%
Zimmer Biomet Holdings Inc	ZBH	0.09%	0.64%	0.00%	8.50%	0.01%
CBRE Group Inc	CBRE	0.09%	n/a	n/a	10.50%	0.01%
Mastercard Inc	MA	0.92%	0.51%	0.00%	12.50%	0.11%
CarMax Inc	KMX	0.06%	n/a	n/a	12.50%	0.01%
Intercontinental Exchange Inc	ICE	0.18%	1.10%	0.00%	8.00%	0.01%
Fidelity National Information Services Inc	FIS	0.21%	1.22%	0.00%	28.00%	0.06%
Chipotle Mexican Grill Inc	CMG	0.14%	n/a	n/a	22.00%	0.03%
Wynn Resorts Ltd	WYNN	0.03%	n/a	n/a	27.00%	0.01%
Live Nation Entertainment Inc	LYV	0.00%	n/a	n/a	0.00%	0.00%
Assurant Inc	AIZ	0.03%	1.55%	0.00%	11.50%	0.00%
NRG Energy Inc	NRG	0.03%	2.85%	0.00%	-1.50%	0.00%
Monster Beverage Corp	MNST	0.14%	n/a	n/a	11.50%	0.02%
Regions Financial Corp	RF	0.05%	3.33%	0.00%	9.50%	0.01%
Mosaic Co/The	MOS	0.03%	0.93%	0.00%	33.50%	0.01%
Expedia Group Inc	EXPE	0.00%	n/a	n/a	0.00%	0.00%
Evergy Inc	EVRG	0.04%	3.13%	0.00%	8.00%	0.00%
Discovery Inc	DISCA	0.01%	n/a	n/a	13.50%	0.00%
CF Industries Holdings Inc	CF	0.03%	2.64%	0.00%	19.50%	0.01%
APA Corp	APA	0.02%	0.51%	0.00%	72.50%	0.01%
Leidos Holdings Inc	LDOS	0.04%	1.47%	0.00%	9.00%	0.00%
Alphabet Inc	GOOG	2.52%	n/a	n/a	21.00%	0.53%
Cooper Cos Inc/The	COO	0.06%	0.01%	0.00%	14.50%	0.01%
TE Connectivity Ltd	TEL	0.13%	1.33%	0.00%	9.00%	0.01%
Discover Financial Services	DFS	0.10%	1.56%	0.00%	16.00%	0.02%
Visa Inc	V	1.05%	0.56%	0.01%	12.00%	0.13%
Mid-America Apartment Communities Inc	MAA	0.06%	2.13%	0.00%	0.50%	0.00%
Xylem Inc/NY	XYL	0.07%	0.82%	0.00%	10.50%	0.01%
Marathon Petroleum Corp	MPC	0.00%	3.91%	0.00%	0.00%	0.00%
Advanced Micro Devices Inc	AMD	0.36%	n/a	n/a	26.50%	0.10%
Tractor Supply Co	TSCO	0.06%	1.07%	0.00%	10.00%	0.01%
ResMed Inc	RMD	0.11%	0.58%	0.00%	8.50%	0.01%
Mettler-Toledo International Inc	MTD	0.10%	n/a	n/a	12.00%	0.01%
Copart Inc	CPRT	0.09%	n/a	n/a	10.00%	0.01%
Fortinet Inc	FTNT	0.14%	n/a	n/a	20.00%	0.03%

STANDARD AND POOR'S 500 INDEX

Name	Ticker	[4] Weight in Index	[5] Current Dividend Yield	[6] Cap-Weighted Dividend Yield	[7] Value Line Long-Term Growth Est.	[8] Cap-Weighted Long-Term Growth Est.
Albemarle Corp	ALB	0.07%	0.66%	0.00%	6.50%	0.00%
Moderna Inc	MRNA	0.00%	n/a	n/a	0.00%	0.00%
Essex Property Trust Inc	ESS	0.06%	2.53%	0.00%	-0.50%	0.00%
Realty Income Corp	O	0.08%	3.91%	0.00%	6.00%	0.00%
Westrock Co	WRK	0.04%	1.84%	0.00%	8.00%	0.00%
IHS Markit Ltd	INFO	0.13%	0.66%	0.00%	10.50%	0.01%
Westinghouse Air Brake Technologies Corp	WAB	0.05%	0.53%	0.00%	9.50%	0.00%
Pool Corp	POOL	0.05%	0.65%	0.00%	15.00%	0.01%
Western Digital Corp	WDC	0.05%	n/a	n/a	1.00%	0.00%
PepsiCo Inc	PEP	0.58%	2.75%	0.02%	6.50%	0.04%
Diamondback Energy Inc	FANG	0.00%	2.33%	0.00%	0.00%	0.00%
ServiceNow Inc	NOW	0.35%	n/a	n/a	44.50%	0.15%
Church & Dwight Co Inc	CHD	0.06%	1.21%	0.00%	8.00%	0.00%
Duke Realty Corp	DRE	0.05%	1.94%	0.00%	-1.00%	0.00%
Federal Realty Investment Trust	FRT	0.03%	3.51%	0.00%	-2.00%	0.00%
MGM Resorts International	MGM	0.06%	0.02%	0.00%	25.00%	0.01%
American Electric Power Co Inc	AEP	0.12%	3.30%	0.00%	6.50%	0.01%
PTC Inc	PTC	0.00%	n/a	n/a	0.00%	0.00%
JB Hunt Transport Services Inc	JBHT	0.05%	0.68%	0.00%	8.00%	0.00%
Lam Research Corp	LRCX	0.23%	0.99%	0.00%	17.50%	0.04%
Mohawk Industries Inc	MHK	0.04%	n/a	n/a	6.50%	0.00%
Pentair PLC	PNR	0.03%	1.04%	0.00%	11.00%	0.00%
Vertex Pharmaceuticals Inc	VRTX	0.14%	n/a	n/a	17.00%	0.02%
Amcor PLC	AMCR	0.00%	3.66%	0.00%	0.00%	0.00%
Facebook Inc	FB	2.45%	n/a	n/a	18.50%	0.45%
T-Mobile US Inc	TMUS	0.46%	n/a	n/a	8.50%	0.04%
United Rentals Inc	URI	0.07%	n/a	n/a	10.50%	0.01%
Alexandria Real Estate Equities Inc	ARE	0.09%	2.17%	0.00%	13.00%	0.01%
Honeywell International Inc	HON	0.43%	1.60%	0.01%	9.50%	0.04%
ABIOMED Inc	ABMD	0.04%	n/a	n/a	9.50%	0.00%
Delta Air Lines Inc	DAL	0.07%	n/a	n/a	49.00%	0.03%
United Airlines Holdings Inc	UAL	0.00%	n/a	n/a	0.00%	0.00%
Seagate Technology Holdings PLC	STX	0.05%	3.06%	0.00%	4.00%	0.00%
News Corp	NWS	0.00%	0.91%	0.00%	0.00%	0.00%
Centene Corp	CNC	0.10%	n/a	n/a	9.50%	0.01%
Martin Marietta Materials Inc	MLM	0.06%	0.64%	0.00%	6.00%	0.00%
Teradyne Inc	TER	0.05%	0.33%	0.00%	13.00%	0.01%
PayPal Holdings Inc	PYPL	0.92%	n/a	n/a	16.00%	0.15%
Tesla Inc	TSLA	0.00%	n/a	n/a	0.00%	0.00%
DISH Network Corp	DISH	0.03%	n/a	n/a	2.50%	0.00%
Penn National Gaming Inc	PENN	0.03%	n/a	n/a	30.00%	0.01%
Dow Inc	DOW	0.00%	4.45%	0.00%	0.00%	0.00%
Everest Re Group Ltd	RE	0.03%	2.34%	0.00%	10.50%	0.00%
Teledyne Technologies Inc	TDY	0.06%	n/a	n/a	14.50%	0.01%
News Corp	NWSA	0.00%	0.89%	0.00%	0.00%	0.00%
Exelon Corp	EXC	0.13%	3.12%	0.00%	5.50%	0.01%
Global Payments Inc	GPN	0.13%	0.61%	0.00%	16.50%	0.02%
Crown Castle International Corp	CCI	0.23%	2.73%	0.01%	8.50%	0.02%
Aptiv PLC	APTV	0.11%	n/a	n/a	15.50%	0.02%
Advance Auto Parts Inc	AAP	0.03%	1.97%	0.00%	11.00%	0.00%
Align Technology Inc	ALGN	0.15%	n/a	n/a	17.00%	0.03%
Illumina Inc	ILMN	0.19%	n/a	n/a	14.00%	0.03%
LKQ Corp	LKQ	0.04%	n/a	n/a	12.00%	0.01%
Nielsen Holdings PLC	NLSN	0.00%	1.12%	0.00%	0.00%	0.00%
Garmin Ltd	GRMN	0.09%	1.54%	0.00%	9.00%	0.01%
Zoetis Inc	ZTS	0.26%	0.49%	0.00%	10.50%	0.03%
Digital Realty Trust Inc	DLR	0.13%	2.83%	0.00%	7.00%	0.01%
Equinix Inc	EQIX	0.20%	1.36%	0.00%	17.00%	0.03%
Las Vegas Sands Corp	LVS	0.09%	n/a	n/a	17.50%	0.02%
Discovery Inc	DISCK	0.00%	n/a	n/a		0.00%

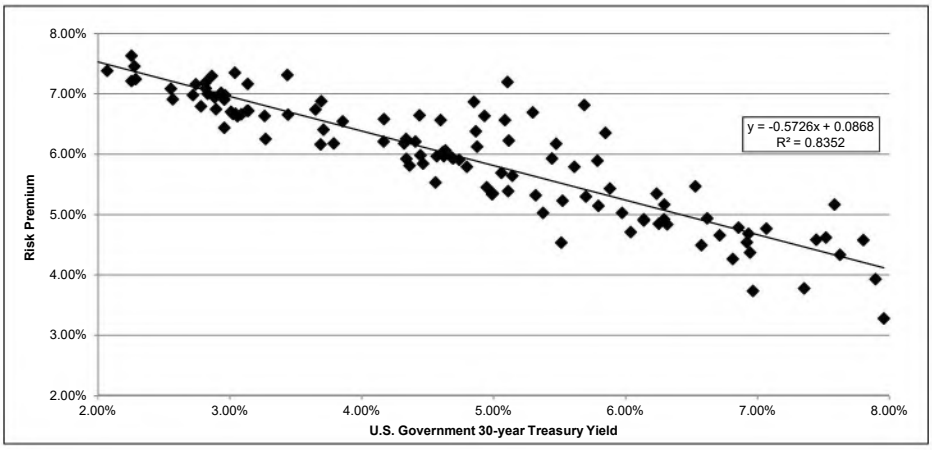
Notes:
[1] Equals Sum ([6])
[2] Equals Sum ([8])
[3] Equals ([1] x (1 + (0.5 x [2]))) + [2]
[4] Equals weight in S&P 500 based on market capitalization
[5] Source: Bloomberg Professional
[6] Equals [4] x [5]
[7] Source: Value Line
[8] Equals [4] x [8]

Risk Premium -- Vertically Integrated Electric Utilities

	[1]	[2]	[3]
	Average Authorized VI Electric ROE	U.S. Govt. 30-year Treasury	Risk Premium
1992.1	12.38%	7.80%	4.58%
1992.2	11.83%	7.89%	3.93%
1992.3	12.03%	7.45%	4.59%
1992.4	12.14%	7.52%	4.62%
1993.1	11.84%	7.07%	4.77%
1993.2	11.64%	6.86%	4.79%
1993.3	11.15%	6.31%	4.84%
1993.4	11.04%	6.14%	4.90%
1994.1	11.07%	6.57%	4.49%
1994.2	11.13%	7.35%	3.78%
1994.3	12.75%	7.58%	5.17%
1994.4	11.24%	7.96%	3.28%
1995.1	11.96%	7.63%	4.34%
1995.2	11.32%	6.94%	4.37%
1995.3	11.37%	6.71%	4.66%
1995.4	11.58%	6.23%	5.35%
1996.1	11.46%	6.29%	5.17%
1996.2	11.46%	6.92%	4.54%
1996.3	10.70%	6.96%	3.74%
1996.4	11.56%	6.62%	4.94%
1997.1	11.08%	6.81%	4.27%
1997.2	11.62%	6.93%	4.68%
1997.3	12.00%	6.53%	5.47%
1997.4	11.06%	6.14%	4.92%
1998.1	11.31%	5.88%	5.43%
1998.2	12.20%	5.85%	6.35%
1998.3	11.65%	5.47%	6.18%
1998.4	12.30%	5.10%	7.20%
1999.1	10.40%	5.37%	5.03%
1999.2	10.94%	5.79%	5.15%
1999.3	10.75%	6.04%	4.71%
1999.4	11.10%	6.25%	4.85%
2000.1	11.21%	6.29%	4.92%
2000.2	11.00%	5.97%	5.03%
2000.3	11.68%	5.79%	5.89%
2000.4	12.50%	5.69%	6.81%
2001.1	11.38%	5.44%	5.93%
2001.2	11.00%	5.70%	5.30%
2001.3	10.76%	5.52%	5.23%
2001.4	11.99%	5.30%	6.70%
2002.1	10.05%	5.51%	4.54%
2002.2	11.41%	5.61%	5.79%
2002.3	11.65%	5.08%	6.57%
2002.4	11.57%	4.93%	6.64%
2003.1	11.72%	4.85%	6.87%
2003.2	11.16%	4.60%	6.56%
2003.3	10.50%	5.11%	5.39%
2003.4	11.34%	5.11%	6.23%
2004.1	11.00%	4.88%	6.12%
2004.2	10.64%	5.32%	5.32%
2004.3	10.75%	5.06%	5.69%
2004.4	11.24%	4.86%	6.38%
2005.1	10.63%	4.69%	5.93%
2005.2	10.31%	4.47%	5.85%
2005.3	11.08%	4.44%	6.65%
2005.4	10.63%	4.68%	5.95%
2006.1	10.70%	4.63%	6.06%
2006.2	10.79%	5.14%	5.65%
2006.3	10.35%	4.99%	5.35%
2006.4	10.65%	4.74%	5.91%
2007.1	10.59%	4.80%	5.80%
2007.2	10.33%	4.99%	5.34%
2007.3	10.40%	4.95%	5.45%
2007.4	10.65%	4.61%	6.04%
2008.1	10.62%	4.41%	6.21%
2008.2	10.54%	4.57%	5.97%
2008.3	10.43%	4.44%	5.98%
2008.4	10.39%	3.65%	6.74%
2009.1	10.75%	3.44%	7.31%
2009.2	10.75%	4.17%	6.58%
2009.3	10.50%	4.32%	6.18%
2009.4	10.59%	4.34%	6.26%
2010.1	10.59%	4.62%	5.97%
2010.2	10.18%	4.36%	5.82%
2010.3	10.40%	3.86%	6.55%
2010.4	10.38%	4.17%	6.21%
2011.1	10.09%	4.56%	5.53%
2011.2	10.26%	4.34%	5.92%
2011.3	10.57%	3.69%	6.88%
2011.4	10.39%	3.04%	7.35%

Risk Premium -- Vertically Integrated Electric Utilities

	[1]	[2]	[3]
	Average Authorized VI Electric ROE	U.S. Govt. 30-year Treasury	Risk Premium
2012.1	10.30%	3.14%	7.17%
2012.2	9.95%	2.93%	7.02%
2012.3	9.90%	2.74%	7.16%
2012.4	10.16%	2.86%	7.30%
2013.1	9.85%	3.13%	6.72%
2013.2	9.86%	3.14%	6.72%
2013.3	10.12%	3.71%	6.41%
2013.4	9.97%	3.79%	6.18%
2014.1	9.86%	3.69%	6.17%
2014.2	10.10%	3.44%	6.66%
2014.3	9.90%	3.26%	6.64%
2014.4	9.94%	2.96%	6.98%
2015.1	9.64%	2.55%	7.08%
2015.2	9.83%	2.88%	6.94%
2015.3	9.40%	2.96%	6.44%
2015.4	9.86%	2.96%	6.90%
2016.1	9.70%	2.72%	6.98%
2016.2	9.48%	2.57%	6.91%
2016.3	9.74%	2.28%	7.46%
2016.4	9.83%	2.83%	7.00%
2017.1	9.72%	3.04%	6.67%
2017.2	9.64%	2.90%	6.75%
2017.3	10.00%	2.82%	7.18%
2017.4	9.91%	2.82%	7.09%
2018.1	9.69%	3.02%	6.66%
2018.2	9.75%	3.09%	6.66%
2018.3	9.69%	3.06%	6.63%
2018.4	9.52%	3.27%	6.25%
2019.1	9.72%	3.01%	6.71%
2019.2	9.58%	2.78%	6.79%
2019.3	9.53%	2.29%	7.24%
2019.4	9.89%	2.25%	7.63%
2020.1	9.72%	1.89%	7.83%
2020.2	9.58%	1.38%	8.20%
2020.3	9.30%	1.37%	7.93%
2020.4	9.56%	1.62%	7.94%
2021.1	9.45%	2.07%	7.38%
2021.2	9.47%	2.25%	7.21%
2021.3	9.50%	1.93%	7.57%
AVERAGE	10.65%	4.62%	6.03%
MEDIAN	10.59%	4.63%	6.18%



SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.913887
R Square	0.835190
Adjusted R Square	0.833781
Standard Error	0.004212
Observations	119

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.010516	0.010516	592.907723	0.000000
Residual	117	0.002075	0.000018		
Total	118	0.012592			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.0868	0.00115	75.22	0.000000	0.084488	0.089058	0.084488	0.089058
U.S. Govt. 30-year Treasury	(0.5726)	0.02352	(24.35)	0.000000	(0.619194)	(0.526047)	(0.619194)	(0.526047)

	[7] U.S. Govt. 30-year Treasury	[8] Risk Premium	[9] ROE
Current 30-day average of 30-year U.S. Treasury bond yield [4]	1.91%	7.58%	9.50%
Blue Chip Near-Term Projected Forecast (Q4 2021 - Q4 2022) [5]	2.42%	7.29%	9.71%
Blue Chip Long-Term Projected Forecast (2023-2027) [6]	3.50%	6.67%	10.17%
AVERAGE			9.79%

Notes:
[1] Source: Regulatory Research Associates, rate cases through August 31, 2021
[2] Source: Bloomberg Professional, quarterly bond yields are the average of each trading day in the quarter
[3] Equals Column [1] − Column [2]
[4] Source: Bloomberg Professional, 30-day average as of August 31, 2021
[5] Source: Blue Chip Financial Forecasts, Vol. 40, No. 9, September 1, 2021, at 2
[6] Source: Blue Chip Financial Forecasts, Vol. 40, No. 6, June 1, 2021, at 14
[7] See notes [4], [5] & [6]
[8] Equals 0.086773 + (-0.572621 x Column [7])
[9] Equals Column [7] + Column [8]

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	)	Case No. ER-2021-0240
Its Revenues for Electric Service.	)	

AFFIDAVIT OF ANN E. BULKLEY

COMMONWEALTH OF MASSACHUSETTS)
) ss
TOWN OF SHREWSBURY)

Ann E. Bulkley, being first duly sworn on her oath, states:

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

/s/ Ann E. Bulkley
Ann E. Bulkley

Sworn to me this 15th day of October, 2021.