Exhibit No.:
Issue(s): *Rate of Return*
Witness: *Seoung Joun Won, PhD*
Sponsoring Party: *MoPSC Staff*
Type of Exhibit: *Rebuttal Testimony*
Case No.: *GR-2021-0320*
Date Testimony Prepared: *March 17, 2022*

MISSOURI PUBLIC SERVICE COMMISSION

FINANCIAL AND BUSINESS ANALYSIS DIVISION

FINANCIAL ANALYSIS DEPARTMENT

REBUTTAL TESTIMONY

OF

SEOUNG JOUN WON, PhD

THE EMPIRE DISTRICT GAS COMPANY, d/b/a Liberty (Empire)

CASE NO. GR-2021-0320

Jefferson City, Missouri
March 2022

TABLE OF CONTENTS OF

REBUTTAL TESTIMONY OF

SEOUNG JOUN WON, PhD

THE EMPIRE DISTRICT GAS COMPANY,
d/b/a Liberty (Empire)

CASE NO. GR-2021-0320

REBUTTAL TESTIMONY

OF

SEOUNG JOUN WON, PhD

THE EMPIRE DISTRICT GAS COMPANY,
d/b/a Liberty (Empire)

CASE NO. GR-2021-0320

Q. Please state your name and business address.

A. My name is Seoung Joun Won and my business address is P.O. Box 360, Jefferson City, Missouri 65102.

Q. Who is your employer and what is your present position?

A. I am employed by the Missouri Public Service Commission ("Commission") as a member of Commission Staff ("Staff") and my title is Regulatory Compliance Manager for the Financial Analysis Department, in the Financial and Business Analysis Division.

Q. Are you the same Seoung Joun Won who filed Direct Testimony on January 24, 2022, in this case?

A. Yes, I am.

Q. What is the purpose of your rebuttal testimony?

A. The purpose of my rebuttal testimony is to respond to the direct testimonies of John J. Reed and Todd Mooney filed on behalf of Empire District Gas Company, d/b/a Liberty (Empire) ("EDG"), a subsidiary of Empire District Electric Company ("EDE" or the "parent") and an indirect, wholly-owned subsidiary of Algonquin Power & Utilities Corp. ("APUC"). Mr. Reed sponsored return on equity ("ROE") and rate of return ("ROR") testimony and Mr. Mooney sponsored capital structure testimony.

Within this testimony, Staff will address issues related to a just and reasonable ROR to be applied to EDG's gas utility rate base for ratemaking purposes in this proceeding. Staff's analyses and conclusions are supported by the data presented in Staff's rebuttal workpapers.

I. EXECUTIVE SUMMARY

Q. Please provide an overview of your responses to the testimonies of Mr. Reed and Mr. Mooney.

A. Staff's rebuttal will focus on Mr. Reed's recommended ROE and Mr. Mooney's capital structure and recommended ROR for EDG. Mr. Reed recommends the Commission authorize an ROE of 10.00% within a range of 9.50% to 10.40%.[1] Mr. Mooney recommended the Commission authorize a ROR of 7.12% based on a consolidated capital structure consisting of 46.16% long-term debt and 53.84% common equity with a cost of debt of 3.76% as of September 30, 2021.[2]

During the audit review process, Staff determined Mr. Reed used a series of upwardly--biased estimates for his cost of equity ("COE") to recommend an overstated ROE for EDG. Mr. Reed overestimated COE by using inflated input data and improper estimation methods in his direct testimony. In this rebuttal testimony, Staff will provide a detailed explanation on how Mr. Reed used unreasonable upwardly-biased input data in the Constant-Growth Discounted Cash Flow ("DCF") model, the Multi-Stage DCF model, the Capital Asset Pricing Model ("CAPM"), the Empirical Capital Asset Pricing Model ("ECAPM"), the Bond Yield Plus Risk Premium ("BYPRP") methodology, and an Expected Earnings analysis.

[1] On page 7, lines 5-6, Reed's Direct Testimony.
[2] EDG's response to Staff's Data Request No. 187.1.

Mr. Mooney's proposed ROR is based on EDE's consolidated capital structure and cost of debt as of September 30, 2021, with Mr. Reed's recommended ROE.[3] At this time, Staff will not address any major issues with the consolidated capital structure of EDE that Mr. Mooney recommended for ratemaking in this proceeding. Staff will keep monitoring EDG, EDE, and other parent companies' capital structure during this proceeding and will make a final recommendation in later testimony filings.

II. RESPONSE TO TESTIMONY OF MR. REED

Q. What specific areas will Staff respond to in Mr. Reed's direct testimony?

A. Listed below are the specific areas Staff will respond to in Mr. Reed's direct testimony:

1. Recommended ROE,
2. Proxy Group Criteria,
3. Growth Rates for DCF Models,
4. Market Risk Premium for CAPM,
5. BYPRP Analysis,
6. Expected Earning Analysis, and
7. Regulatory and Business Risks.

Staff will discuss each in turn, as follows.

1. Recommended ROE

Q. How did Mr. Reed determine his recommended ROE?

A. Mr. Reed recommended an ROE of 10.00% within a range of 9.50% to 10.40%, based on his analysis of COE estimates in the range of 8.02% to 12.46%.[4] For his ROE

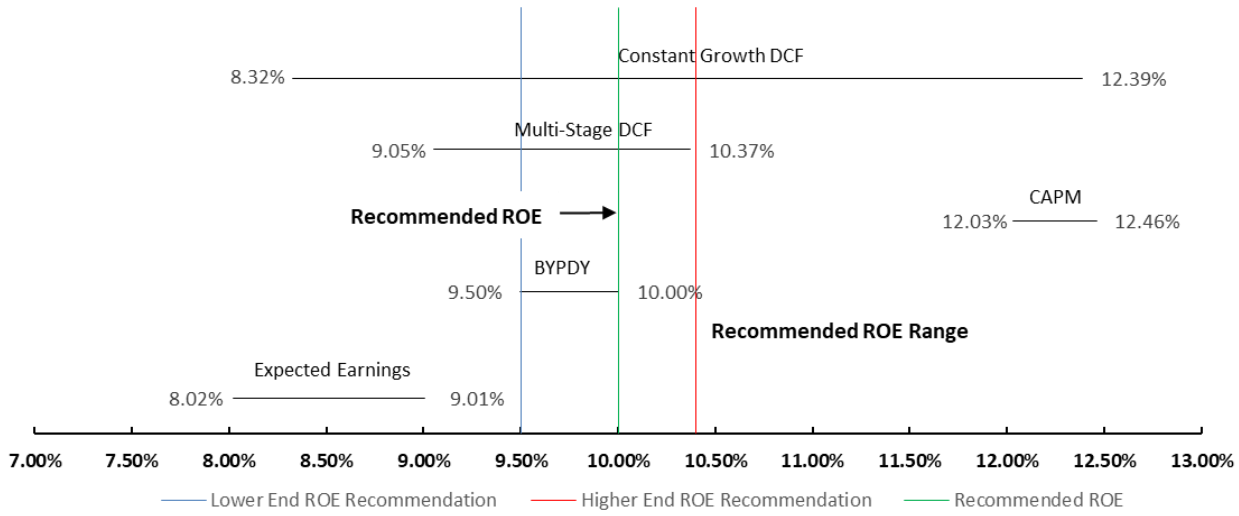
[3] EDG's response to Staff's Data Request No. 187.1.
[4] On page 5, Figure 1, Reed's Direct Testimony.

recommendation, Mr. Reed considered company-specific risk factors and current and prospective capital market conditions but did not precisely state the procedure for selecting the recommended point estimation of 10.00%.[5]

Q. How did Mr. Reed estimate his COE?

A. Mr. Reed applied COE estimate models such as the constant-growth DCF, the multi-stage DCF model, the CAPM, the ECAPM, and the BYPRP to a natural gas distribution utility ("NGU") proxy group.[6] Mr. Reed's COE estimates for each analysis method and recommended ROE are summarized in Figure 1:[7]

Figure 1. Mr. Reed's COE Estimates and ROE Recommendation



Q. What is Staff's concern with Mr. Reed's recommended ROE?

A. Staff's concern is that Mr. Reed's recommended ROE of 10.00% is too high compared to the average authorized ROE of 9.57% in gas utility rate cases completed in 2021.[8]

[5] On page 6, lines 15-17, Reed's Direct Testimony.
[6] On page 7, Reed's Direct Testimony.
[7] 1 Summary, Won's Rebuttal Workpaper.
[8] S&P Capital IQ Pro, Retrieved January 2, 2021.

Mr. Reed's recommended ROE is based on his overstated COE estimates. Mr. Reed employed unreasonable COE estimation procedures using exaggerated input values for his COE estimation models. Mr. Reed utilized a variety of data sources and analysis methods to produce inflated input values. The following summarizes the steps that led to Mr. Reed's overestimation of his COE:

1. Selecting inappropriate biased data,
2. Producing overestimated input values, and
3. Utilizing inadequate estimation methods.

Staff will describe how each of Mr. Reed's COE estimates are overstated by presenting detailed investigation results later in this testimony.

2. Proxy Group Criteria

Q. What are Mr. Reed's proxy groups for estimating EDG's COE?

A. Mr. Reed selected seven NGU companies for his proxy group for EDG's COE estimation. The NGU proxy group was selected from ten publicly-traded natural gas distribution utility companies classified by Value Line as gas utilities.[9] The following is the list of Mr. Reed's natural gas utility proxy group and associated ticker symbols:

Table 1. Natural Gas Utility Proxy Group and Ticker

	Natural Gas Utility Proxy	Ticker
1	Atmos Energy Company	ATO
2	NiSource, Inc.	NI
3	Northwest Natural Gas Company	NWN
4	ONE Gas, Inc.	OGS
5	South Jersey Industries, Inc.	SJI
6	Southwest Gas Corporation	SWX
7	Spire, Inc.	SR

Q. What are Staff's concerns with Mr. Reed's proxy group?

[9] On page 32, Figure 7, Reed's Direct Testimony.

A. Staff has two concerns with Figure 7, on page 32 of Mr. Reed's direct testimony. First, Mr. Reed inadvertently used an incorrect name "Atmos Energy Company" instead of "Atmos Energy Corporation" with the Ticker "ATO". Mr. Reed used the correct name of "Atmos Energy Corporation" in Schedule JJR-3 of his direct testimony. Second, the Ticker "NWN" lists the company name as "Northwest Natural Gas Company" not "Northwest Natural Holding Company" and the Ticker "SWX" lists the company name as "Southwest Gas Corporation" not "Southwest Gas Holdings, Inc." In the New York Stock Exchange, NWN is the ticker symbol for Northwest Natural Holding Company, and SWX is the ticker symbol for Southwest Gas Holdings, Inc. Northwest Natural Gas Company and Southwest Gas Corporation are owned by Northwest Natural Holding Company and Southwest Gas Holdings, Inc., respectively, and each is a private company, not a publicly traded company.[10] According to his reference of Value Line, Mr. Reed used the financial market data of Northwest Natural Holding Company and Southwest Gas Holdings, Inc., and erroneously noted the company names as Northwest Natural Gas Company and Southwest Gas Corporation, respectively.[11]

3. Growth Rates for Discounted Cash Flow Models

Q. What is Staff's concern with Mr. Reed's constant-growth DCF model?

A. Mr. Reed used unreasonably high growth rates in his constant-growth DCF model, which overstated his COE estimates. Mr. Reed assumes that his gas proxy group's dividends will grow perpetually at an average growth rate of 6.35%.[12] This is about 265 basis points higher than the estimated long-term growth rate for the general economy.[13]

[10] S&P Capital IQ Pro.
[11] Schedules JJR-4, JJR-5.1, JJR-5.2, and JJR-5.3, Reed's Direct Testimony.
[12] Schedule JJR-4 of Reed's Direct Testimony.
[13] The long-term (2026-2031) Nominal GDP Growth rate projected by Congressional Budget Office is 3.70%, https://www.cbo.gov/system/files/2021-07/57218-Outlook.pdf.

Mr. Reed exclusively used projected earnings growth rates, which he erroneously called long-term growth rates.[14] Analysts' projected growth rates are for periods of three (3) to five (5) years, which is considered short-term given the infinite investment horizon assumed in the DCF. For example, Value Line's projected earnings growth rates used by Mr. Reed in his Direct Testimony are the estimated values for the time period of 2024 to 2026.[15] Because of his reliance on overstated growth rates, Mr. Reed's DCF COE estimates are unreasonably upward biased.

Q. What is wrong with using exclusively projected earnings growth rates for Mr. Reed's constant-growth DCF COE estimates?

A. Analysts' projected earnings growth rates are not suitable for use, exclusively, in the constant-growth DCF model because the growth rates that Mr. Reed utilized are not perpetual growth rates and are often shorter than five-year projected growth rates. The constant-growth DCF model assumes a perpetual investment horizon. By exclusively using these analysts' projected growth rates in the context of the constant-growth DCF model, Mr. Reed makes an unreasonable assumption that natural gas utilities will grow at these often high and precarious shorter term growth rates, in perpetuity.

Analysts are of the consensus opinion that long-term growth rates for utilities will eventually converge to the level of long-term gross domestic product ("GDP").[16] For instance, Dr. Roger A. Morin, in his book *New Regulatory Finance*, posits, "It is useful to remember that eventually all company growth rates, especially utility service growth rates, converge to a level consistent with the growth rate of the aggregate economy [GDP growth rate]."

[14] On pages 35 - 36, Reed's Direct Testimony.
[15] Value Line.
[16] Morin, R. A. (2006). New Regulatory Finance. Public Utilities Reports (p. 302).

Staff has consistently held the view that while it is possible that a company or industry may grow at a rate faster than the GDP in the short to medium term, no company or industry may do so in perpetuity. Currently, the GDP is projected to grow at a long-term rate of 3.70% to 3.80%.[17] An example of Mr. Reed's unreasonably high growth rates is the 11.50% growth rate used to produce SJI's DCF COE estimates of 16.53%.[18] Such a high growth rate should not be used for a perpetual growth rate in constant-growth DCF COE estimates.

Q. What is Staff's concern with Mr. Reed's long-term GDP growth rates used to calculate his multi-stage DCF COE estimates?

A. Staff's concern is that the GDP growth rate estimate of 5.49% used in Mr. Reed's multi-stage DCF is too high compared to other reliable projected nominal GDP growth rates. Mr. Reed's calculated GDP growth estimate of 5.49% is around 180 basis points higher than the reliable nominal long-term GDP growth rate estimates of 3.70% and 3.80%, reported by the Congressional Budget Office ("CBO") and Federal Open Market Committee ("FOMC"), respectively.[19]

Q. How did Mr. Reed overstate his GDP growth rate compared to reliable projected long-term GDP growth rates?

A. Mr. Reed used multiple steps to inflate his projected GDP growth rate. First, when he calculated his historical GDP growth rate of 3.14%, Mr. Reed used historical real GDP[20] dollars from 1929 to 2019 to calculate a compound annual growth rate of 3.14%.[21] But

[17] Federal Open Market Committee, retrieved on January 18, 2022, (https://www.federalreserve.gov/monetarypolicy/fomcprojtabl20211215.htm).
An Update to the Economic Outlook: 2021 to 2031, Congressional Budget Office, July 2021, (https://www.cbo.gov/system/files/2021-02/56965-Economic-Outlook.pdf).
[18] Schedule JJR-4, Reed's Direct Testimony.
[19] Federal Reserve issues Federal Open Market Committee, retrieved on July 18, 2021, (https://www.federalreserve.gov/monetarypolicy/fomcprojtabl20200610.htm).
[20] Schedule JJR-5.4, Reed's Direct Testimony.
[21] Real GDP is Nominal GDP adjusted for Inflation (https://www.investopedia.com.)

Mr. Reed's historical real GDP growth rate is inappropriate when estimating a projected long-term nominal GDP growth rate.[22] For instance, the Federal Reserve ("Fed") estimates a projected long run real GDP growth rate of 1.80%,[23] which is 134 basis points lower than Mr. Reed's historical real GDP compounded growth rate of 3.14%. Mr. Reed's method of compounding historical real GDP growth rates arbitrarily increases his compound annual growth rate, which then increases his multi-stage DCF COE estimates.

Second, Mr. Reed calculated his long-term nominal GDP growth rate of 5.49% using a projected inflation rate of 2.28% and his compound annual growth rate.[24] Currently, the Fed estimates a long run inflation rate of 2.00%.[25] Mr. Reed's projected inflation rate of 2.28% is a shorter run estimation so it is not appropriate to use for a perpetual growth rate in the DCF model. Mr. Reed's inflation rate of 2.28% used to adjust his high compound historical real GDP growth rate produces an inflated GDP growth rate of 5.49% that is 169 to 179 basis points higher than the nominal long-term growth rate estimates of 3.70% to 3.80% as reported by the CBO and the FOMC, respectively. Mr. Reed's high long-term GDP growth rate is unreasonable for ratemaking purposes.

Q. What growth rates should Mr. Reed have used?

A. As Staff alluded to above, appropriate growth rates for use in the constant-growth or multi-stage DCF models should give consideration to the long-term growth rates, represented by the projected long-term GDP growth rates of 3.70%.[26] For example, the

[22] It is a common sense in economics that a country's GDP growth rate is decreasing over time because of the law of diminishing marginal returns.
[23] FOMC Summary of Economic Projections, published December 15, 2021, and retrieved March 7, 2022, (https://www.federalreserve.gov/monetarypolicy/files/fomcprojtabl20211215.pdf).
[24] Workpaper JJR-5.4, Reed's Direct Testimony, (0.0549 = (1.0314) x (1.0228) – 1).
[25] FOMC Summary of Economic Projections, published December 15, 2021, and retrieved March 7, 2022, (https://www.federalreserve.gov/monetarypolicy/files/fomcprojtabl20211215.pdf).
[26] An Update to the Economic Outlook: 2021 to 2031, Congressional Budget Office, July 2021, (https://www.cbo.gov/system/files/2021-02/56965-Economic-Outlook.pdf).

Federal Energy Regulatory Commission ("FERC") incorporates long-term GDP growth rates into calculations within the constant-growth DCF by using a ratio of 80% analyst projected long-term growth rates to 20% long-term GDP growth rates.[27] Staff stresses that this approach to get perpetual growth rate does not limit growth in the DCF model to estimates of nominal GDP growth over the long-term as expressed by Mr. Reed because it only accounts for 20% of long-term GDP growth rates.[28]

If Mr. Reed had used a similar approach with proper GDP and EPS growth rates in the constant-growth DCF model, his DCF COE estimate for the 90-day average stock price would be 9.07% instead of 10.08%.[29] If Mr. Reed had used a similar approach with a proper GDP growth rate in the multi-stage DCF model, his DCF COE estimate for the 90-day average stock price would be 8.30% instead of 9.70%.[30] Therefore, reasonable DCF COE results are significantly lower than Mr. Reed's estimations.

4. Market Risk Premium of Capital Asset Pricing Models

Q. Please explain Mr. Reed's CAPM COE estimation methods.

A. Mr. Reed employed the CAPM using the average Beta coefficients for the proxy group companies as reported by Value Line and Bloomberg with three different risk-free rates of 2.30% (the 30-day of May 2022 average yield on 30-year U.S. Treasury bonds), 2.64% (the projected 30-year U.S. Treasury bond yield for Q4 2021 through Q4 2022), and 3.50% (the projected 30-year U.S. Treasury bond yield for 2023 through 2027) and a total

[27] *Ass'n of Bus. Advocating Tariff Equity v. Midcontinent Indep. Sys. Operator, Inc.,* Opinion No. 569, 169 FERC ¶ 61,129 (2019), order on reh'g, Opinion No. 569-A, 171 FERC ¶ 61,154 (2020), Paragraph 2.
[28] On pages 36-37, Reed's Direct Testimony.
[29] 3 Constant DCF, Won's Rebuttal Workpaper.
[30] 4.1 Multi-Stage DCF, Won's Rebuttal Workpaper.

market return of 13.70% resulting in three different market risk premiums ("MRP") of 11.40%, 11.06%, and 10.20%.[31]

Q. What is Staff's concern with Mr. Reed's CAPM COE estimates?

A. Mr. Reed's CAPM COE estimates are too high. Even compared to his 90-day average COE estimate of 9.70% using multi-stage DCF, Mr. Reed's CAPM COE estimates using Bloomberg Beta and Value Line Beta of 12.21% and 12.46%, respectively, are too high.[32] Staff found that Mr. Reed's CAPM COE estimates are too high because he used unreasonably high Market Risk Premiums ("MRPs"). Mr. Reed's MRPs of 11.40%, 11.06%, and 10.20% are much higher than regular US financial service industry's MRP estimates of around 4.00% to 7.00%.[33]

Q. How were Mr. Reed's MRPs estimated?

A. Mr. Reed calculated his MRPs as the difference between the expected market return on the S&P 500 Index and the risk-free rate. For estimating expected market return, Mr. Reed conducted several steps of calculations. First, using the data of the companies on the S&P 500 Index, Mr. Reed calculated an estimated weighted average dividend yield of 1.46% and an estimated weighted average growth rate of 13.70%.[34] Second, using the constant-growth DCF model with his estimated dividend yield and growth rate, Mr. Reed estimated the expected market return of 13.70%.[35] Finally, Mr. Reed calculated implied MRPs estimated as the difference between the implied expected equity market returns and the various risk-free rates. Mr. Reed's implied MRP over the current 30-day average of the 30-year U.S. Treasury bond

[31] Page 47, Reed's Direct Testimony.
[32] 1 Summary, Won's Rebuttal Workpaper.
[33] See Figure 2, "MRP and corresponding COE"
[34] Schedule JJR-6.1, Reed's Direct Testimony.
[35] Ibid.

yield, and projected yields on the 30-year U.S. Treasury bond, ranges from 10.02% to 11.40%.[36] Table 2 shows Mr. Reed's three MRP estimates and their associated estimation methods:[37]

Table 2. Reed's Market Risk Premium Estimation

	MRP Estimate Method	(%)
[1]	Current 30-day average of 30-year U.S. Treasury bond yield	11.40
[2]	Near-term projected 30-year U.S. Treasury bond yield	11.06
[3]	Projected 30-year U.S. Treasury bond yield (2022 - 2026)	10.02
	Average	10.88

Q. What is wrong with Mr. Reed's constant-growth DCF model estimation of market return of 13.70%?

A. Mr. Reed's constant-growth DCF procedure has two main faults. First, when Mr. Reed calculated his expected total return using the DCF, he included companies that have unreasonably high or low projected earnings per share ("EPS") growth rates. For example, Mr. Reed included Delta Air Lines Inc.'s unreasonably high projected EPS growth rate of 49.00% for his expected total return.[38] To calculate a reasonable total market expected return using the DCF, companies with extremely low or high growth rates should be excluded. FERC found that S&P 500 companies with growth rates that are negative or in excess of 20% should be excluded because such extremely low or high growth rates are not representative of sustainable growth rates.[39]

Second, for his expected total market return estimation using the DCF model, Mr. Reed's data set included companies that do not pay dividends or for which dividend information was not available.[40] Dividend yield information is essential to utilizing the

[36] On page 48, lines 10-11, Reed's Direct Testimony.
[37] Schedule JJR-6.2, Reed's Direct Testimony.
[38] Schedule JJR-6.1, Reed's Direct Testimony.
[39] *Ass'n of Bus. Advocating Tariff Equity v. Midcontinent Indep. Sys. Operator, Inc.,* Opinion No. 569, 169 FERC ¶ 61,129 (2019).
[40] Schedule JJR-6.1, Reed's Direct Testimony.

DCF model.[41] Consistent with Staff's position that the DCF model assumes a long-term investment horizon, Staff further finds that the growth rates that Mr. Reed used are short-term in horizon, which makes them unsuitable for the constant-growth DCF model he used to estimate his expected market return. Staff recalculated an expected total return based on the FERC's DCF model and criteria, including only companies with available dividend yields, and found a reasonable total market return of 11.48%. Taking into account Mr. Reed's risk-free rates results in an average of Mr. Reed's estimated MRP of less than 9%.[42]

Q. What are other financial institutions' current MRP estimates?

A. Other financial institutions' MRP estimates range from 4.63% to 6.43%.[43] According to 2020 survey research based on 1,946 responses from business and economic professors, the U.S. average and median MRP estimates are 5.6% and 5.4%, respectively.[44] The American Appraisal Risk Premium Quarterly, Value Line, and Duff & Phelps calculated MRPs of 6.0%, 5.5%, and 5.0%, respectively.[45] Duff and Phelps' current MRPs range from 4.43% (geometric average) to 6.07% (arithmetic average) using historical data from 1926 to 2020.[46] Professor Aswath Damodaran of the New York University ("NYU") Stern School of Business, a noted equity valuation professor, currently estimates MRPs in the range of 4.84% to 6.43%.[47]

[41] David C. Parcell in The Cost of Capital – A Practitioner's Guide prepared for SURFA.
[42] 6.2 CAPM, Won's Rebuttal Workpaper.
[43] 6 CAPM, Won's Rebuttal Workpaper.
[44] Fernandez, P., de Apellániz, E., & F Acín, J. (2020). Survey: Market Risk Premium and Risk-Free Rate used for 81 countries in 2020.
[45] FERC Opinion No. 569, 169 FERC ¶ 61,129
[46] 2020 Cost of Capital: Annual U.S. Guidance and Examples, Duff and Phelps.
[47] Risk Premium, Damodaran Online, Stern School of Business, NYU.

Figure 2. MRP and corresponding COE

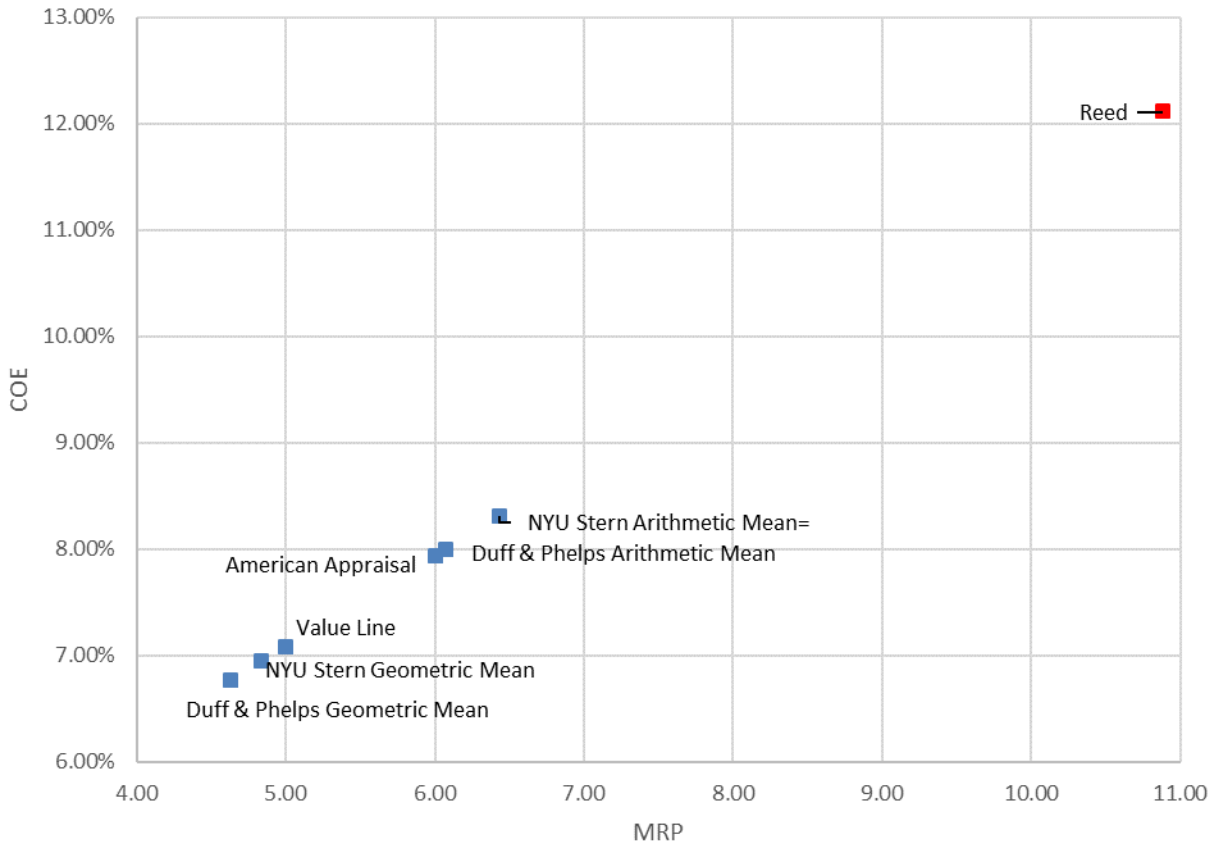


Figure 2 compares COE estimates with their corresponding MRPs for Mr. Reed's natural gas proxy group (calculated with reasonable MRPs and Mr. Reed's unreasonable MRPs) assuming the same 30-day average of 30-Year U.S Treasury bond yields used in Mr. Reed's estimation.[48] As shown in Figure 2, Mr. Reed's CAPM COE estimate of 12.11%, with its corresponding average MRP of 10.88%, is an extreme outlier when compared with the other estimates. This clearly indicates that Mr. Reed's MRPs are too high and, consequently, his COE estimates are too high as well.

Q. Please summarize your concern with Mr. Reed's MRPs.

[48] 5 CAPM, Won's Rebuttal Workpaper.

A. As presented in Table 2, Mr. Reed used three MRP estimates. As Staff already pointed out, all of Mr. Reed's MRP estimates are too high compared to other widely-accepted MRP estimates in the financial industry.

Q. What would Mr. Reed's CAPM COE estimates be if he had used proper input data?

A. With more reasonable assumptions, such as an MRP of 5.50% and the risk-free rates used by Mr. Reed, his average CAPM COE estimate would be 7.62%.[49] This is well within the range of Staff's COE estimates of 7.09% to 9.20%, which are much lower than Mr. Reed's average CAPM COE estimate of 12.25%.[50]

5. Bond Yield Plus Risk Premium Analysis

Q. What is Mr. Reed's BYPRP method?

A. The conventional BYPRP method is based on the idea that since investors in stocks take greater risks than investors in bonds, the former expect to earn a return on a stock investment that reflects a premium over and above the return they expect to earn on a bond investment.[51] This premium required by investors for an investment in common stock over an investment in corresponding debt is called the risk premium.[52] Multiple approaches have been developed to determine the risk-premium for a utility.

Mr. Reed's BYPRP is different from the conventional method. Mr. Reed's BYPRP used a regression analysis based on authorized ROEs for utility companies relative to risk-free rates (Treasury yields).[53] Mr. Reed used monthly data of risk-free rates and authorized ROEs

[49] 5 CAPM, Won's Rebuttal Workpaper.
[50] 1 Summary, Won's Rebuttal Workpaper.
[51] Brigham, E. F., Shome, D. K., & Vinson, S. R. (1985). The risk premium approach to measuring a utility's cost of equity. Financial Management, 33-45.
[52] Morin, R. A. (2006). New Regulatory Finance. Public Utilities Reports. p.108.
[53] On page 51, lines 1-4, Reed's Direct Testimony.

derived from 673 natural gas utility rate cases from 1992 through May 2021 as reported by Regulatory Research Associates ("RRA").[54] Because Mr. Reed defined the risk premium as the authorized ROE minus the risk-free rate, Mr. Reed's BYPRP analysis method can directly estimate the authorized ROE, while in contrast, his DCF and CAPM are only able to directly estimate COE. Mr. Reed's regression analysis result is the following equation:

Risk Premium (%) = 8.53 – 0.578 Risk-Free Rate (%).[55]

Q. What are Mr. Reed's BYPRP ROE estimates?

A. Mr. Reed's BYPRP ROE estimates range from 9.50% to 10.00%, with a mean of 9.71%.[56] For his BYPRP ROE estimation, Mr. Reed used three risk-free rates: the 30-day average of the 30-year U.S. Treasury bond yield as of May 28, 2021 (i.e., 2.30%), the near-term (2021-2022) projections of the 30-year U.S. Treasury bond yield (i.e., 2.64%), and a longer-term (2023-2027) projections of the 30-year U.S. Treasury bond yield (i.e., 3.50%). Mr. Reed used his projections of the 30-year U.S. Treasury bond yields from Blue Chip Financial Forecasts, Vol. 40, No. 6, June 1, 2021.[57]

Q. What is Staff's concern with Mr. Reed's BYPRP ROE estimates?

A. Staff has a major concern with Mr. Reed's BYPRP ROE estimates because all of his BYPRP ROE estimates do not follow his regression model assumption. As explained above, Mr. Reed developed his BYPRP regression model based on the relationship between the monthly authorized ROE and the 30-year Treasury bond yield as the risk-free rate. In other words, Mr. Reed used an irrelevant risk-free rate measure and an incorrect time-period so that

[54] On page 51, lines 16-17, Reed's Direct Testimony.
[55] Figure 12, Reed's Direct Testimony.
[56] Schedule JJR-7, Reed's Direct Testimony.
[57] On page 52, lines 4-11, Reed's Direct Testimony.

his estimated authorized ROE is invalid. This means Mr. Reed's regression model is only able to properly estimate authorized ROE when he uses the proper input variable at the associated time (i.e., the 30-year Treasury bond yield at the corresponding time period). If the input values are not proper, Mr. Reed's BRPRP regression model produces irrelevant output. The use of Blue Chip forecast yields by Mr. Reed is improper, because the yields are neither government bond yields nor do the time period of the yields correspond to the time period of Mr. Reed's analysis. Blue Chip forecast yields are not interchangeable with the actual government bond yields. The failure of Mr. Reed to properly choose valid inputs for use in his regression model renders most of his BYPRP ROE estimates to be useless. In Mr. Reed's direct testimony, the only properly updated BYPRP ROE estimate would be 9.50% using current 30-day average of the 30-year U.S. Treasury bond yield.

Q. What would Mr. Reed's BYPRP COE estimates be if he had used proper input data?

A. Staff recalculated Mr. Reed's BYPRP ROE estimate using a risk-free rate of 2.10% (the 30-year Treasury bond at yields as of January 2022), resulting in an estimated ROE of 9.41% which is 9 basis points lower than Staff's recommended authorized ROE of 9.50%.

6. Expected Earnings Analysis

Q. What is Mr. Reed's Expected Earnings Analysis and its result?

A. Mr. Reed's Expected Earnings methodology is a comparable earnings analysis that calculates the earnings an investor expects to receive on the book value of a stock. Mr. Reed relied primarily on the projected ROE for each of the proxy companies as reported by Value Line for the period from 2024-2026 and then adjusted those projected ROEs to account for the fact that the ROEs reported by Value Line are calculated on the basis of common

shares outstanding at the end of the period, as opposed to the average shares outstanding over the entire period. Mr. Reed's Expected Earnings analysis results in a mean ROE estimate of 9.01% and a median ROE estimate of 8.02%.

Q. What are Staff's concerns with Mr. Reed's Expected Earnings analysis?

A. Staff has some concerns with Mr. Reed's Expected Earnings analysis. Expected Earnings analysis is not a market-based model. Appropriate COE models for estimation of a recommended authorized ROE should be based on the market value, not on the book value of an enterprise or utility. Mr. Reed's expected earnings analysis relied on the expected book value ROEs of his gas proxy group for what investors would expect to receive on the stock for their investment in EDG.[58]

In a determination in FERC Opinion 569 and 569-A, FERC found that expected earnings models rely on an enterprise's book value instead of the market value, in violation of the *Hope* ruling. *Hope* ruled that the return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks.[59] The FERC added in its explanation rejecting the expected earnings model that, "[T]he return on book value is not indicative of what return an investor requires to invest in the utility's equity or what return an investor receives on the equity investment, because those returns are determined with respect to the current market price that an investor must pay in order to invest in the equity."[60]

More fundamentally, Mr. Reed erroneously assumed that the net book value of EDG's rate base is comparable to his gas proxy group's equity values in 2020 with certain regulatory

[58] On page 53, lines 9-10, Reed's Direct Testimony.
[59] Paragraph 116, Opinion No. 569-A, *Ass'n. of Businesses Advocating Tariff Equity v. Midcontinent Indep. Sys. Operator, Inc*., 171 FERC ¶ 61,154 (2020).
[60] Paragraph 117, Ibid.

adjustments.[61] Although Mr. Reed's Expected Earnings analysis produced a reasonable COE estimate of 9.01%, Staff recommends that the Commission not consider his Expected Earnings analysis as a proper methodology to estimate a just and reasonable authorized ROE because his Expected Earnings analysis is based on a false premise.

7. Regulatory and Business Risks

Q. What adjustments did Mr. Reed make to his COE regarding EDG's business and regulatory risks?

A. Mr. Reed did not make specific adjustments to his COE while he estimated the effect of EDG's business and regulatory risks on the ROE. Mr. Reed considered other risks such as small size risk and regulatory risk to determine where EDG's required ROE falls within the range of his analytic results.

Q. Does Staff agree with Mr. Reed that EDG's authorized ROE should be higher than the mean results for the proxy group because of the risk associated with small size?[62]

A. No. Mr. Reed insisted that EDG's natural gas distribution operations are substantially smaller than the median for the proxy group companies in terms of market capitalization. Mr. Reed cites the small size of EDG, EDG's higher capital expenditures, and regulatory risks as factors, relative to the proxy group, that elevate EDG's business risk. While Staff acknowledges that EDG is smaller, in terms of implied market capitalization, than the average size of the proxy group, it would be naïve to ignore the fact that EDG is not viewed as a standalone company in the market. EDG is viewed as part of the larger Algonquin Power and

[61] Schedule JJR-8, Reed's Direct Testimony.
[62] Page 54-57, Reed's Direct Testimony.

Utility Corp. ("APUC") family. APUC has a market capitalization of about $9.6 billion, which puts it at number three out of seven in Mr. Reed's proxy group.[63]

Q. Does Staff agree with Mr. Reed that EDG has higher regulatory risk than the proxy group companies in terms of cost recovery and regulatory lag?[64]

A. No. Mr. Reed considered only limited risk factors when he examined the regulatory risk of EDG compared to his proxy group. According to a recently published S&P Global Ratings' article, Updated Views On North American Utility Regulatory Jurisdictions - June 2021, Missouri is classified in the category of "Very Credit Supportive," with a "Strong and Adequate" utility regulatory environment in jurisdictions among U.S. states and Canadian provinces.[65]

Furthermore, the Commission has allowed several favorable regulatory mechanisms for EDG's gas utility service. EDG has cost recovery mechanisms consisting of the Purchased Gas Adjustment ("PGA") and the Actual Cost Adjustment ("ACA").[66] In addition, EDG has an opportunity to use a capital tracking mechanism consisting of an Infrastructure System Replacement Surcharge ("ISRS") rider that allows it to recover a portion of capital investment costs between rate cases. In this rate case, EDG requests the Commission approve a Weather Normalization Adjustment Rider ("WNAR") for its revenue stabilization. Currently, Liberty (Midstates) (Case No. GR-2018-0013), Spire (Case No. GR-2021-0108), and Ameren Missouri (Case No. GR-2021-0241) have WNARs.

[63] https://www.capitaliq.spglobal.com/web/client?auth=inherit#company/profile?id=4142273.
[64] Page 57-58, Reed's Direct Testimony.
[65] S&P Global Ratings, Updated Views On North American Utility Regulatory Jurisdictions - June 2021, (https://www.spglobal.com/ratings/en/research/articles/210629-updated-views-on-north-american-utility-regulatory-jurisdictions-june-2021-11998892).
[66] GR-2020-0124 and YG-2020-0074.

Currently, EDG may use various and considerable protections against business risks that may be granted to it by the Commission. For example, although it was withdrawn by EDG, EDG applied for the authority to track and defer into a regulatory asset the incremental costs caused by the COVID-19 pandemic.[67] Considering the series of favorable regulatory mechanisms and accounting authority orders granted by the Commission to EDG, Mr. Reed's arguments alleging unusually high regulatory risk for the Company are baseless.

Q. What is Staff's recalculated COE estimate for EDG with proper inputs and models?

A. Staff's recalculated average estimates with proper inputs and models are summarized in Table 3:

Table 3. Reed's Estimation and Staff's Recalculation[68]

	Cost of Equity	
COE Estimation Methods	Reed Estimate	Staff Recalculation
Discounted Cash Flow	9.99%	8.93%
Capital Asset Pricing Model	12.25%	7.62%
	Return on Equity	
ROE Estimation Method	Reed Estimate	Staff Recalculation
Bond Yield Plus Risk Premium Analysis	9.71%	9.41%

As is evident in Table 3, Mr. Reed's COE estimates are too high compared to Staff's recalculated COE. In addition, Mr. Reed's ROE estimation based on his BYPRP analysis is also higher than Staff's. Considering his upwardly-biased input data, Staff recommends that Mr. Reed's DCF and CAPM COE estimates should not be utilized for calculating a just and reasonable authorized ROE.

[67] Notice of Dismissal, January 5, 2021, Case No. GU-2021-0146.
[68] 1 Summary, Won's Rebuttal Workpaper.

III. RESPONSE TO TESTIMONY OF MR. MOONEY

Q. What capital structure and ROR did Mr. Mooney recommend in his Direct Testimony for EDG's ratemaking in this proceeding?

A. Mr. Mooney recommended a capital structure of 52.44% common equity and 47.56% long-term debt based on EDE's consolidated actual capital structure at December 31, 2020, and pro forma adjustments to common equity through September 30, 2021.[69] Mr. Mooney recommended an authorized ROR of 8.51%, calculated using Mr. Reed's recommended ROE of 10.00% and EDG's pro forma cost of debt of 6.87% which reflects the outstanding long-term debt for EDG at December 31, 2020 and the pro forma debt at September 30, 2021.[70]

Q. Why did Mr. Mooney recommend the use of EDE's consolidated capital structure?

A. To comply with the Merger Order in File No. EM-2016-0213 that the Commission approved when EDE was acquired by Liberty Utilities, Co. ("LUCo"), which is wholly-owned by APUC. The Merger stipulation provisions 4 and 5 from the 2016 Order require a comparison of EDE, LUCo, and APUC's capital structures to determine the most economical, fair and reasonable allowed rate of return for EDE.[71] EDE's consolidated capital structure is more economical than its indirect parent company's capital structure after making pro forma adjustments to common equity through September 30, 2021.[72] LUCo's actual per books capital structure is 61.37% total equity and 38.63% long-term debt and its pro forma

[69] Page 4, lines 12-14, Mooney's Direct Testimony.
[70] Schedule TM-4, Mooney's Direct Testimony.
[71] Appendix A, Stipulation and Agreement (filed on August 23, 2016), Case No. EM-2016-0213.
[72] Page 4, lines 15-17, Mooney's Direct Testimony.

adjustment capital structure is 61.95% total equity and 38.05% long-term debt.[73] APUC's actual per books capital structure is 52.23% total equity, 1.75% preferred stock, 2.91% redeemable non-controlling interest (held by a related party) and 43.11% long-term debt while its pro forma adjustment capital structure is 52.09% total equity, 1.46% preferred stock, 2.43% redeemable non-controlling interest (held by a related party) and 44.03% long-term debt.[74]

Q. Does Staff have concerns with the capital structure and ROR recommended by Mr. Mooney in his Direct Testimony?

A. Yes. First, Mr. Mooney based his comparison analysis of the consolidated actual capital structure of its parents companies (EDE, LUCo, and APUC) at December 31, 2020, and pro forma adjustments to common equity through September 30, 2021. However, current data as of September 30, 2021, is available so the recommended capital structure should use the updated comparison analysis. Second, Mr. Mooney used EDG's cost of debt even though he recommends use of EDE's capital structure. If EDE's capital structure is used for calculating ROR for EDG, EDE's embedded cost of debt should be used for calculating EDG's cost of capital in this proceeding.

Q. Did Staff request Mr. Mooney to update his analysis?

A. Yes.

Q. What is the result of the updated comparison analysis and Mr. Mooney's revised recommendation?

A. As of September 30, 2021, EDE's consolidated capital structure of 53.84% common equity and 46.16% long-debt debt is more economical than EDG's indirect parent

[73] Schedule TM-2, Mooney's Direct Testimony.
[74] Schedule TM-3, Mooney's Direct Testimony.

company, LUCo, and APUC's.[75] Mr. Mooney revised his ROR for EDG, which now consists of EDE's long-term debt cost rate of 3.76% and Mr. Reed's recommended ROE of 10.00%.[76] Mr. Mooney now recommends a ROR for EDG of 7.12%

IV. SUMMARY AND CONCLUSIONS

Q. Please summarize the conclusions of your rebuttal testimony.

A. Mr. Reed's recommended ROE of 10.00% for EDG is not just and reasonable considering his inappropriate reliance on unreasonable inputs to his DCF, CAPM, and BYPRP analyses. Overall, Mr. Reed's analysis on economic and capital conditions is typical cherry picking. Mr. Reed focused on a period of time or economic data that supports his position of a higher COE on a claim and ignores any information that goes against his defense. On the one hand, for supporting his overestimated CAPM COE, Mr. Reed insisted on utilizing a projected Treasury bond yield of 3.5% over a period from 2023 to 2027 according to Blue Chip Financial Forecasts.[77] On the other hand, to explain the relative underperformance of the utilities sector, Mr. Reed used 2020 data affected by COVID-19.[78]

It is true that many economic and capital conditions have experienced mixed signals and indicators because of the global COVID-19 pandemic. Staff could not agree more with Mr. Reed that investors do not expect current market conditions to be sustained in the future. However, Mr. Reed accepted evidence if it supported his position and rejected it if it did not. To determine a just and reasonable authorized ROE, a cherry-picking analysis is not acceptable.

[75] EDG's response to Staff Data Request No. 0187.
[76] EDG's response to Staff Data Request No. 0187.1.
[77] On page 24, lines 10-11, and page and 47, line 8, Reed's Direct Testimony.
[78] On pages 27-28, Ibid.

Staff recommends that the reasonable authorized ROE to use in this proceeding is 9.50%, in a reasonable range of 9.25% to 9.75%.

Staff recommends that the appropriate capital structure to use to set EDG's allowed ROR of 6.85% in this proceeding is EDE's consolidated capital structure consisting of 46.16% long-term debt and 53.84% common equity with 3.76% cost of debt, as of September 30, 2021. Staff will keep monitoring changes to EDG's and its parents companies' capital components because Staff's capital structure recommendation is subject to change depending on true-up data that may be provided by the Company.[79]

Q. Does this conclude your rebuttal testimony?

A. Yes.

[79] On page 4, paragraph 3, Order Setting Procedural Schedule and Adopting Test Year.

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of The Empire District Gas Company's d/b/a Liberty Request to File Tariffs to Change its Rates for Natural Gas Service	)))	Case No. GR-2021-0320

AFFIDAVIT OF SEOUNG JOUN WON, PhD

STATE OF MISSOURI	)	
	)	ss.
COUNTY OF COLE	)	

COMES NOW SEOUNG JOUN WON, PhD and on his oath declares that he is of sound mind and lawful age; that he contributed to the foregoing *Rebuttal Testimony of Seoung Joun Won, PhD;* and that the same is true and correct according to his best knowledge and belief.

Further the Affiant sayeth not.

SEOUNG JOUN WON, PhD

JURAT

Subscribed and sworn before me, a duly constituted and authorized Notary Public, in and for the County of Cole, State of Missouri, at my office in Jefferson City, on this 16th day of March, 2022.

Notary Public

D. SUZIE MANKIN
Notary Public - Notary Seal
State of Missouri
Commissioned for Cole County
My Commission Expires: April 04, 2025
Commission Number: 12412070