Exhibit No. 124

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Seoung Joun Won
Rebuttal Testimony
File No. GR-2021-0108

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MISSOURI PUBLIC SERVICE COMMISSION

FINANCIAL AND BUSINESS ANALYSIS DIVISION

FINANCIAL ANALYSIS DEPARTMENT

REBUTTAL TESTIMONY

OF

SEOUNG JOUN WON, PhD

SPIRE MISSOURI INC., d/b/a SPIRE
SPIRE EAST and SPIRE WEST
GENERAL RATE CASE

CASE NO. GR-2021-0108

Jefferson City, Missouri
June 2021

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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") 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 prepared the Rate of Return section of Staff's Cost of Service Report ("COS Report"), filed May 12, 2021?

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 Dylan W. D'Ascendis, Wesley E. Selinger, and David Murray. Mr. D'Ascendis sponsored return on equity ("ROE") testimony on behalf of Spire Missouri Inc. ("Spire Missouri" or the "Company"). Mr. Selinger sponsored rate of return ("ROR") and capital structure testimony on behalf of Spire Missouri. Mr. Murray sponsored ROE, ROR, and capital structure testimony on behalf of the Office of the Public Counsel ("OPC"). Within this testimony, Staff will address issues related to a just and reasonable ROR to be applied to Spire Missouri'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. What is the overview of your response to the testimonies of Mr. D'Ascendis and Mr. Selinger?

A. Staff's rebuttal will focus on Mr. D'Ascendis' recommended ROE and Mr. Selinger's recommended ROR and capital structure. Mr. D'Ascendis recommended an ROE of 9.95% within a range of 9.94% to 12.07%, and Mr. Selinger estimated a cost of debt of 4.00% and proposed a pro forma capital structure consisting of 45.75 percent long-term debt and 54.25 percent common equity, adjusted to account for Spire Missouri's long-term debt issuance in May 20, 2021.[1]

During the review process, Staff discerned that Mr. D'Ascendis introduced a series of biased estimates for his cost of equity ("COE") to recommend his overstated ROE. Mr. D'Ascendis overestimated COE by using inflated input data and improper estimation methods in his direct testimony. In this rebuttal testimony, Staff will provide detailed explanation on how Mr. D'Ascendis' COE estimates are incorrectly calculated, one by one.

The overview of Mr. D'Ascendis' overestimation methods is following. First, Mr. D'Ascendis inadequately applied COE estimation methods to his gas company proxy group. When he applied the single-stage constant growth form of the Discounted Cash Flow ("DCF") model, the Capital Asset Pricing Model ("CAPM"), and the Risk Premium Model ("RPM") to his utility proxy group, Mr. D'Ascendis used unreasonable upward-biased input data for each estimation model. Second, Mr. D'Ascendis unconventionally utilized non-price regulated proxy

[1] Staff's Data Request No. 0357.1.

group data to his DCF, RPM and CAPM analysis resulting in overstated COE estimation of 11.87%.[2] Using a non-price regulated proxy group is fundamentally against the consensus of the regulated utility COE estimation methodologies. Third, Staff's analysis also found that Mr. D'Ascendis made some unsuitable company-specific adjustments, which introduced more upward bias for his COE estimation. The detailed issues will be explained later in this rebuttal testimony.

For Mr. Selinger's proposed capital structure and cost of debt, Staff does not have any major issues at this time. However, Staff will keep monitoring Spire Missouri and Spire Inc. ("Spire" or the "parent Company")'s capital structure during this proceeding and will make final recommendation based on the true-up capital structure of Spire Missouri.

Q. What is the overview of your response to the testimony of Mr. Murray?

A. Mr. Murray recommended a ROE of 9.25% within a range of 8.5% to 9.5% and a ROR of 6.27% based on his recommended capital structure of 47.36 percent common equity, 45.35 percent long-term debt, and 7.28 percent short-term debt, and applying cost of long-term debt of 4.12% and cost of short-term debt of 0.2%.[3] Although it is lower than Staff's recommended authorized ROE of 9.37%, Mr. Murray's point recommendation ROE of 9.25% still lies within Staff's reasonable range values of 9.12% and 9.62%.

Mr. Murray's recommended equity ratio of 47.36 percent is 684 basis points lower than the Commission authorized common equity ratio of 54.20 percent, for Spire Missouri in the rate cases in 2018.[4] Mr. Murray's recommended common equity ratio is based on a 5-quarter average proportion of equity contained in Spire Inc.'s capital structure for the end-of-quarter balances for

[2] On page 7, D'Ascendis' Direct Testimony.
[3] On pages 54-55, Murray's Direct Testimony.
[4] On page 45, Amended Report and Order issued March 7, 2018, in Case Nos. GR-2017-0215 and GR-2017-0216.

the period September 30, 2019 through September 30, 2020.[5] Staff expresses concern with Mr. Murray's recommended capital structure using Spire Inc.'s instead of Spire Missouri's. Staff did not find any reason in this proceeding to disagree with the Commission's order to use Spire Missouri's capital structure in Spire Missouri's last rate case in 2018.

II RESPONSE TO TESTIMONY OF SPIRE MISSOURI'S WITNESSES

Q. What are the specific areas in which Staff is responding to the Spire Missouri's witnesses?

A. Staff is responding to the testimonies of Mr. D'Ascendis and Mr. Selinger. The areas in which Staff disagrees with Mr. D'Ascendis include:

- Recommended ROE,
- Non-Price Regulated Proxy Group,
- Projected Short-Term Growth Rates for DCF,
- Equity Risk Premium for RPM,
- Market Risk Premium for CAPM,
- Empirical CAPM Method, and
- Adjustment of Cost of Equity.

Then, Staff will address Mr. Selinger's recommended capital structure and ROR. Staff will discuss each in turn, below.

1. Recommended ROE

Q. What is Mr. D'Ascendis' recommended ROE for Spire Missouri in this proceeding?

A. Mr. D'Ascendis recommended an ROE of 9.95%, within a range of 9.94% to 12.07%, for use in this proceeding.[6]

[5] On page 3, lines 12-14, Murray's Direct Testimony.
[6] On page 5, D'Ascendis' Direct Testimony.

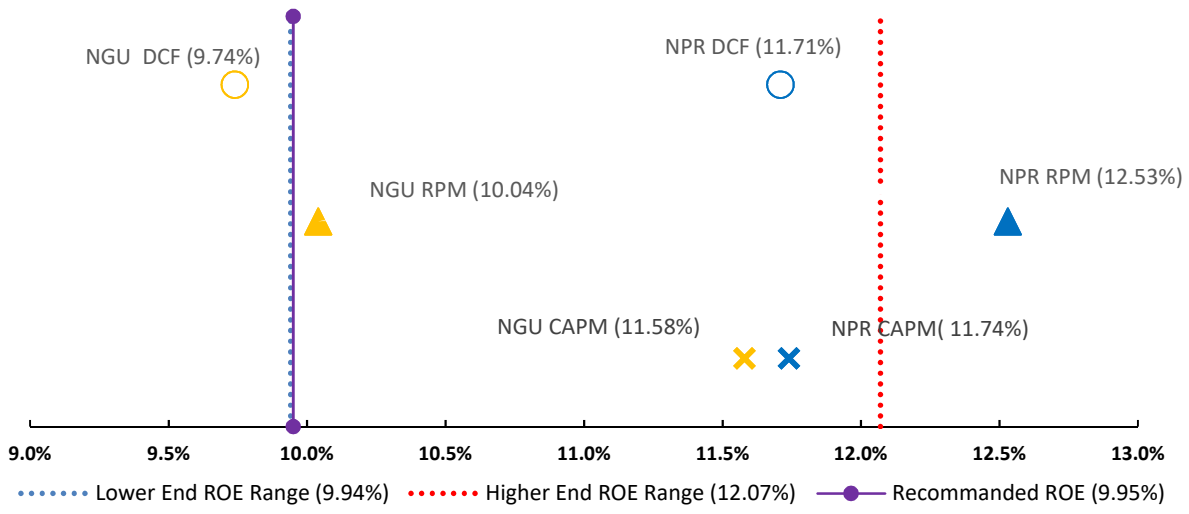
Q. How did Mr. D'Ascendis determine his recommended ROE?

A. Mr. D'Ascendis determined his recommended ROE from a range of the results of his COE estimates and the Company-specific adjustments. Mr. D'Ascendis calculated a COE estimate range of 9.74% to11.87%, and made a net upward adjustment of 20 basis points to both endpoints of his range considering size, credit risk and flotation cost.[7] Mr. D'Ascendis did not precisely state the basis for the point estimation of 9.95% from the low or high end of his range of COE estimates of 9.94% to 12.07%.

Q. How did Mr. D'Ascendis estimate his COE?

A. Mr. D'Ascendis applied COE estimation models such as constant-growth DCF, RPM, and CAPM to natural gas utility ("NGU") proxy group and also applied the COE estimation models to non-price regulated ("NPR") companies.[8] Mr. D'Ascendis' COE estimates for each analysis method and recommended ROE are summarized in Figure 1:[9]

Figure 1. Mr. D'Ascendis' COE Estimates and ROE Recommendation



[7] On page 6, Ibid.
[8] On page 7, Ibid.
[9] Spire COE, Staff's Rebuttal Workpaper.

Q. What is Staff's concerns with Mr. D'Ascendis' recommended ROE?

A. Staff's concern is that Mr. D'Ascendis' recommended ROE of 9.95% is too high compared to the average authorized ROE of 9.44% in fully litigated gas utility rate cases completed in 2020.[10] Mr. D'Ascendis' recommended ROE is based on overstated COE estimates. Mr. D'Ascendis presented unreasonable COE estimation procedures using exaggerated input values for his COE estimation models. Mr. D'Ascendis utilized a variety of data sources and analysis methods to produce inflated input values in complex procedures that gave an illusion of supporting his COE estimation, to conceal his unreasonably overvalued inputs. The following summarizes the steps that led to Mr. D'Ascendis' overestimation of his COE:

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

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

2. Non-Price Regulated Proxy Group

Q. What are Mr. D'Ascendis' proxy groups for estimating Spire Missouri's COE?

A. Mr. D'Ascendis selected two separate proxy groups. One is a natural gas utility proxy group and the other is a non-price regulated proxy group. The utility proxy group consists of eight natural gas distribution utility companies classified by Value Line as gas utilities.[11] The following is the list of Mr. D'Ascendis' natural gas utility proxy group and associated ticker symbols.

[10] S&P Global Market Intelligence.
[11] On pages 12-14, Ibid.

Table 1. Natural Gas Utility Proxy Group and Ticker

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

Mr. D'Ascendis' non-price regulated proxy group consists of 41 domestic, non-price regulated firms. Mr. D'Ascendis claims that his non-price regulated proxy group is comparable, in total risk, to his natural gas utility proxy group.[12]

Q. What is Staff's concern with Mr. D'Ascendis' proxy groups?

A. Staff's major concern is that Mr. D'Ascendis' non-price regulated proxy group is not reasonably comparable to Spire Missouri or price regulated natural gas utilities and, therefore should not be used for estimating the COE of a natural gas utility. Because non-price regulated companies are included in Mr. D'Ascendis COE estimates, his COE estimates are significantly overstated compared to regular natural gas utilities' COEs.[13]

Q. Why does Staff disagree with Mr. D'Ascendis' claim that non-price regulated companies are comparable to price regulated gas utilities?

A. Mr. D'Ascendis thinks that because gas utility proxy group and non-price regulated proxy group share similar Betas, they have the same business risk. Beta is defined as the volatility of a security compared to the volatility of a market as a whole. While Mr. D'Ascendis argument on Betas appears persuasive, the truth is that Beta alone cannot explain all business risks.

[12] On pages 36-38, Ibid.
[13] See Figure 1.

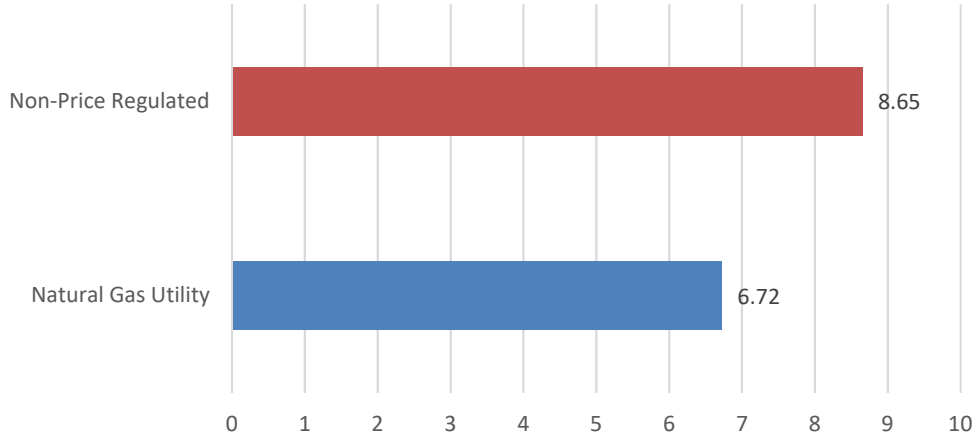
Staff found that the earnings per share ("EPS") growth rates and equity risk premiums ("ERP") for the non-price regulated companies are significantly higher than the growth rates and ERPs for price regulated natural gas utilities. The big difference in growth rates and ERPs between the non-price regulated companies and price regulated natural gas utilities is evidence that the two proxy groups are not reasonably comparable for purposes of estimating COE. It is common sense that non-price regulated companies have significantly higher business risk than price-regulated natural gas utilities.

Q. Please present the evidence of significantly higher ERPs and EPS growth rates.

A. Figure 2 and 3 present the comparison of ERPs and EPS growth rates, between the two proxy groups used by Mr. D'Ascendis. The non-price regulated proxy group shows a 193 basis points higher ERP than natural gas proxy group, and the difference in average EPS growth rates between the two groups is 348 basis points.[14] Significantly higher ERPs and growth rates in the non-price regulated companies means that non-price regulated companies are not comparable to price regulated natural gas utilities. As shown in Figure 2 below, ERPs of the two groups, non-price regulated companies and natural gas utilities, are significantly different. This is clear evidence that non-price regulated companies have a much higher business risk compared to natural gas utilities although two groups have similar Betas. The risk/return relationship entails that the higher the risk, the higher the return; therefore, because of the higher risk in non-price regulated companies, required return and ultimately, COE, is higher in non-price regulated companies than regulated gas utilities. The higher COE in non-price regulated companies led to the unreasonably high recommended authorized ROE in Mr. D'Ascendis' estimation.

[14] NPR, Staff/s Rebuttal Workpaper.

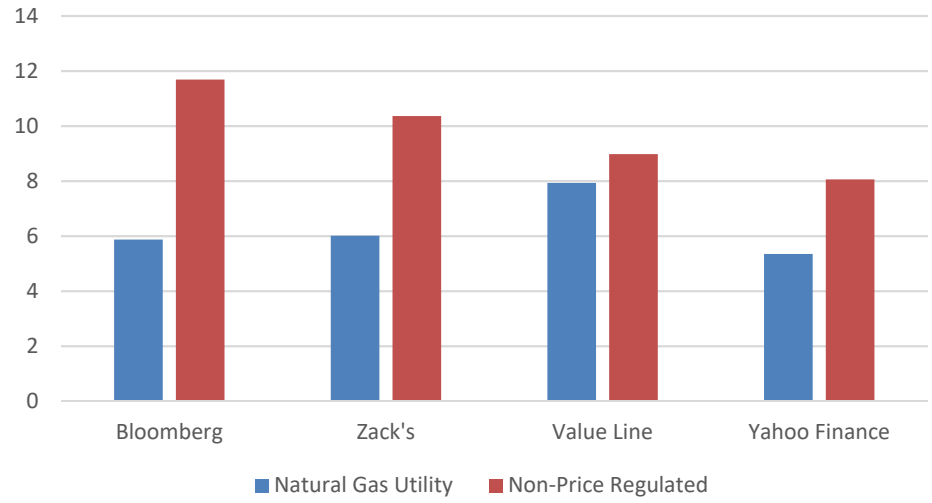
Figure 2. Comparison of Equity Risk Premiums (%)



The effects of the unreasonably high EPS growth rates and ERPs are pronounced in the calculations for the DCF and Risk Premium models, respectively. When estimating COE using DCF model, one of the important input variables that has a significant impact on the estimation result is an EPS growth rate utilized by Mr. D'Ascendis' DCF model.[15] As shown in Figure 3 below, four different EPS growth rates published by Bloomberg, Zacks, Value Line and Yahoo! Finance, consistently show significantly higher EPS growth rates for non-price regulated companies than for price regulated natural gas utilities. This huge input values difference in Mr. D'Ascendis' two proxy groups resulted in DCF COE estimate of 9.74% for gas utility proxy group and 11.71% for non-price regulated proxy group.[16]

[15] On page 17, D'Ascendis' Direct Testimony.
[16] See Figure 1.

Figure 3. The Comparison of EPS Growth Rate (%)



Q. Please show the evidence that higher growth rates and ERPs led to overestimated COEs

A. Table 2 below shows a summary of Mr. D'Ascendis' COE estimates comparison between non-price regulated companies and price regulated natural gas utilities. As seen in Figure 3, because of the 348 basis points difference in EPS growth rates between non-price regulated companies and price regulated utilities, DCF COE estimate for non-price regulated companies is 197 basis points higher than DCF COE estimate for price regulated natural gas utilities.[17]

Table 2. COE Comparison: Natural Gas Utility vs. Non-Price Regulated

	Proxy Group		
	Natural Gas Utility	Non-Price Regulated	Difference
DCF	9.74%	11.71%	1.97%
RPM	10.04%	12.53%	2.49%
CAPM	11.58%	11.74%	0.16%
Average	10.45%	11.99%	1.54%

[17] See Table 2.

As seen in Figure 2, the ERP difference of 193 basis points between the non-price regulated companies and price regulated utilities led to 249 basis points higher RPM COE estimates for the non-price regulated companies than price regulated companies.[18] The combined effect of including the non-price regulated companies in Mr. D'Ascendis' COE estimation is an overestimation by 154 basis points of Mr. D'Ascendis' COE.[19] Mr. D'Ascendis' non-price regulated companies are neither comparable nor proper to use for estimation of natural gas utility's COE. Therefore, any COE estimates using non-price regulated proxy group should not be considered in calculating a just and reasonable authorized ROE in this proceeding.

3. Projected Short-Term Growth Rate for DCF

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

A. Mr. D'Ascendis used unreasonably high growth rates in his constant-growth DCF model, which overstated his COE estimates. Mr. D'Ascendis exclusively used short-term analysts' projected earnings growth rates in his constant-growth DCF model.[20]

Q. What is wrong with exclusively using analysts' short-term earnings growth rates?

A. Analysts' short-term earnings growth rates are not suitable for use, exclusively, in the constant-growth DCF model because the growth rates are short-term, often shorter than five years. The constant-growth DCF model assumes a long-term investment horizon. In using these analysts' growth rates, exclusively, in the context of the constant-growth DCF, Mr. D'Ascendis makes an unreasonable assumption that natural gas utilities will grow at these often high and precarious short-term growth rates, in perpetuity. Analysts are of the consensus that long-term growth rates for utilities will eventually converge to the level of long-term gross

[18] NPR, Staff's Rebuttal Workpaper.
[19] See Table 2.
[20] On page 17, D'Ascendis' Direct Testimony.

domestic product ("GDP").[21] 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 3.8%.[22] Compared to projected GDP growth rate, Mr. D'Ascendis' average constant-growth rate of 6.16% is too high and unrealistic.[23]

Q. What growth rates should Mr. D'Ascendis have used?

A. As Staff alluded to above, appropriate growth rates for use in the constant-growth DCF model should give consideration to the long-term growth rates, represented by the long-term projected GDP growth rates. For example, the Federal Energy Regulatory Commission ("FERC") incorporates long-term GDP growth rates into calculations within the constant-growth DCF by combining analysts' short-term growth rate estimates with long-term projected GDP growth rates at two-thirds short-term growth rates plus one-third long-term GDP growth rates.[24] If Mr. D'Ascendis would have used a similar approach, his growth rate would have been 5.37%,[25] which is 79 basis points lower than analysts' short-term growth rate of 6.16%.[26] If Mr. D'Ascendis had used 5.37% as his growth rate in the DCF model, his DCF COE estimate would be 8.43%.[27]

Q. What is Mr. D'Ascendis' justification to use short-term earnings growth rate as a perpetual growth rate for the constant-growth DCF?

A. Mr. D'Ascendis employed the business life cycle theory to justify his exclusively use of projected short-term earnings growth rate as a perpetual growth rate. Here is the summary

[21] Morin, R. A. (2006). New Regulatory Finance. Public Utilities Reports. p.302.
[22] Federal Open Market Committee, retrieved on March 18, 2021 (https://www.federalreserve.gov/monetarypolicy/fomcprojtabl20200610.htm).
[23] 3.1 DCF Summary, Staff's Data Request No. 0237.
[24] *Ass'n of Bus. Advocating Tariff Equity v. Midcontinent Indep. Sys. Operator, Inc.,* Opinion No. 569, 169 FERC ¶ 61,129 (2019).
[25] 5.37% = (2/3)*6.16% + (1/3)*3.8%.
[26] DCF, Staff's Rebuttal Workpaper.
[27] Ibid.

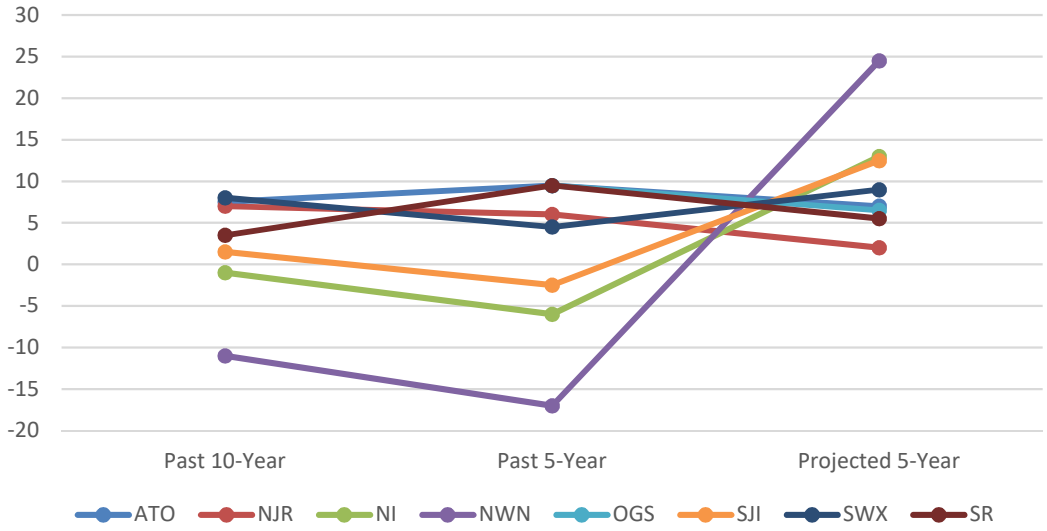
of Mr. D'Ascendis arguments. The life cycle of a company or industry can be classified into three stages: growth, transition, and maturity. The maturity (steady-state) stage is characterized by few investment opportunities and stable growth for remainder of its life.[28] Mr. D'Ascendis argues that because the utility industry is in the maturity stage of the life cycle, the exclusive use of short-term growth rates is appropriate for the constant growth DCF as the perpetual growth rate.

Q. Does Staff agree with Mr. D'Ascendis' argument of perpetual growth rate?

A. No. Mr. D'Ascendis explanation misses the point. The question is whether the use of short-term growth rates, exclusively, in the constant-growth DCF is appropriate. Staff agrees that Spire Missouri or the utility industry is in the maturity stage of the business cycle and that the constant-growth DCF is appropriate to use to estimate the COE for the utility industry. However, for the reasons given already, Staff disagrees that the exclusively use of short-term growth rates in the constant-growth DCF is appropriate. In fact, the authentic business life cycle theory does not have three stages but have five stages.[29] After the maturity stage, there is the decline stage.[30] In decline stage, company or industry growth rate will be declined.[31] Therefore, Mr. D'Ascendis' argument that a projected short-term growth rate can be used for a perpetual growth rate does not fit into the orthodox business life cycle theory.

[28] On page 15, D'Ascendis' Direct Testimony.
[29] Churchill, N. C., & Lewis, V. L. (1983). The five stages of small business growth. Harvard business review, 61(3), 30-50.
[30] Business Life Cycle - Understanding the 5 Different Stages (corporatefinanceinstitute.com)
[31] Mueller, D. C. (1972). A life cycle theory of the firm. The Journal of Industrial Economics, 199-219.

Figure 4. Comparison of Annual Earnings Growth Rate



In addition, Mr. D'Ascendis' argument is a false statement proven by utilities' historical and projective earnings growth data. If Mr. D'Ascendis' argument is true then annual earnings growth rate of his natural gas proxy utilities should be nearly constant for each year for some historical and projective time period. In Figure 4, Value Line's annual earnings growth rates of Mr. D'Ascendis' eight natural gas proxy utilities for past ten years, past five years and projected five years are compared. As shown in Figure 4, for each utility the annual earnings growth rates vary depending on the time periods. This is a clear evidence that Mr. D'Ascendis' statement is not true that short-term growth projection is perpetually constant. For perpetual growth rate for his DCF COE estimation, Mr. D'Ascendis used five-year projected earnings growth rates that is relatively higher than others. Therefore, reasonable DCF COE results should be much lower than Mr. D'Ascendis' estimation.

4. Equity Risk Premium for Risk Premium Model

Q. What is Mr. D'Ascendis' RPM COE estimation method?

A. The RPM method is based on the idea that since investors in stocks take greater risk 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.[32] This premium required by investors for an investment in common stock over an investment in corresponding debt is called the ERP.[33] Multiple approaches have been developed to determine the ERP for a utility. Mr. D'Ascendis used two risk premium methods: the Predictive Risk Premium Model ("PRPM") and a RPM using a total market approach ("TMA"). The PRPM estimates the risk-return relationship directly, while the TMA RPM indirectly derives a risk premium by using known metrics as a proxy for risk.[34]

4.1 Predictive Risk Premium Model

Q. What is Mr. D'Ascendis' PRPM COE estimates?

A. Mr. D'Ascendis PRPM COE estimates range from 6.52% to 12.75%, with a mean of 9.81% and a median of 9.77%.[35] Mr. D'Ascendis' indicated PRPM COE estimate is 9.79%, the average of the mean and the median. Mr. D'Ascendis estimated his PRPM COE by adding a forecasted 30-year U.S Treasury bond yield to projected ERPs of each company in the natural gas utility proxy group. Mr. D'Ascendis calculated each natural gas utility proxy group company's projected ERP using a generalized autoregressive conditional heteroscedasticity ("GARCH") model.[36] Mr. D'Ascendis added the forecasted 30-year U.S. Treasury bond yield of 2.11% to each company's PRPM-derived ERP of a range of 5.93% to 10.64% to arrive at an indicated COE.[37]

Q. What is Staff's concern with Mr. D'Ascendis' PRPM COE estimates?

A. Mr. D'Ascendis' PRPM COE estimates are too high because of overstated input variables. Mr. D'Ascendis used unreasonably high ERP and risk free rate to calculate his PRPM

[32] Morin, R. A. (2006). New Regulatory Finance. Public Utilities Reports. p.108.
[33] Staff Data Request No. 0381.
[34] On page 18, D'Ascendis' Direct Testimony.
[35] 4.2 Ind. PRPM Results, Staff's Data Request No. 0237.
[36] Schedule DWD-D4, D'Ascendis' Direct Testimony.
[37] 4.2 Ind. PRPM Results, Staff's Data Request No. 0237.

COE estimates. Based on general U.S. capital-market experience and regulated utilities, the typical ERP is in the 3% to 5% range.[38] Most research results indicated ERP to be nothing higher than 7%.[39] According to Mr. D'Ascendis' GARCH model, among the eight companies in the natural gas utility proxy group, three companies have ERPs greater than 9%. That is unreasonably high. Estimated risk premiums for Mr. D'Ascendis' gas proxy utility group are unstable and vary widely, even though natural gas utilities have relatively similar risk.[40] If the unreasonable ERPs are excluded from Mr. D'Ascendis' PRPM estimation, the mean of PRPM COE estimate would be 8.67%, the median, 9.26%, and the average of the two would be 8.97%.[41] In addition, Mr. D'Ascendis' risk free rate, the consensus forecast 30-year Treasury yield, is also too high compared to current market risk-free rate. Mr. D'Ascendis used the 30-year U.S. Treasury bond yield consensus forecast derived from Blue Chip Financial Services ("Blue Chip") of 2.11%.[42] The average yield on 30-year U.S. Treasury bonds for the three-month period ending December 31, 2020 is 1.62%, 49 basis points lower. Because of his use of a higher projected risk free rate, Mr. D'Ascendis' PRPM COE is inflated by an additional 49 basis points.

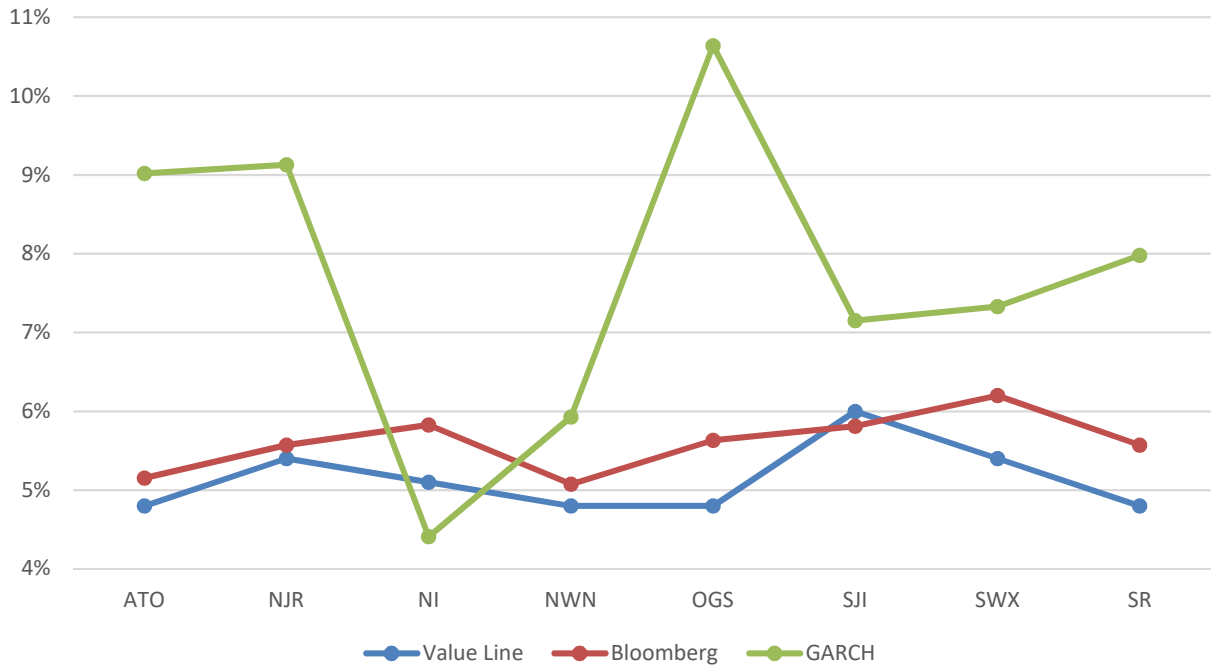
Q. Why is the estimated ERP using Mr. D'Ascendis' GARCH model too high and unstable?

A. For proper estimation using GARCH model, it requires a substantial time series history on stock returns data to develop stable estimates of risk premium.[43] Mr. D'Ascendis' stock data comes from a very short period of time. For example, One Gas, Inc. (Ticker: OGS), one of

[38] CFA Institute, retrieved on March 18, 2021, (https://www.cfainstitute.org/en/programs/cfa/policies)
[39] Roger A. Morin, New Regulatory Finance (Public Utilities Reports, Inc. 2006).
[40] Value Line and Bloomberg.
[41] PRPM, Staff Rebuttal Workpaper.
[42] On page 20, D'Ascendis' Direct Testimony.
[43] Ahern, P. M., Hanley, F. J., & Michelfelder, R. A. (2011). New approach to estimating the cost of common equity capital for public utilities. Journal of Regulatory Economics, 40(3), 261-278.

the utility companies in Mr. D'Ascendis' proxy group, has only 7 years of historical data, compared to Spire Inc. (Ticker: SR)'s historical data of 94 years.[44] With an unreasonably high ERP of 10.64%, One Gas, Inc.'s short period data series inject unreliability to Mr. D'Ascendis' entire GARCH model. Also, a reliable GARCH model requires, conventionally, at least more than 1,000 samples.[45] Interestingly, all three companies showing overstated ERP (greater than 9%) estimated by GARCH model used less than 600 data points.[46] Figure 5 is a comparison of Mr. D'Ascendis' ERP for the gas utility proxy group:

Figure 5. Comparison of ERPs



As shown in Figure 4, ERPs estimated by Beta reported by Value Line and Bloomberg are very stable, between 4% and 6%, compared to the ERP estimates in Mr. D'Ascendis' GARCH model which are scattered, with some unreasonably high. This shows that Mr. D'Ascendis' GARCH

[44] PRPM WP1, Staff's Data Request No. 0237.
[45] NG, H. R., & Lam, K. P. (2006, October). How does sample size affect GARCH Models?. In 9th Joint International Conference on Information Sciences (JCIS-06). Atlantis Press.
[46] PRPM WP1, Staff's Data Request No. 0237.

model ERP estimates are unreliable. Staff emphasizes that Mr. D'Ascendis' GARCH analysis is faulty because it ignored the statistically recommended minimum input data size needed to conduct a sound GARCH analysis.

Q. What is Staff's conclusion regarding Mr. D'Ascendis' PRPM COE estimate?

A. Mr. D'Ascendis' ERP estimates calculated by GARCH model are not statistically reliable. Using natural gas proxy companies' ERP based on Betas of Value Line and Bloomberg, PRPM COE estimates should be 7.16% and 7.72%, respectively. Therefore, with Mr. D'Ascendis' risk free rate of 2.11%, Staff's recalculated PRPM COE estimate is 7.44%.[47]

4.2 Total Market Approach of Risk Premium Model

Q. Please explain Mr. D'Ascendis' TMA RPM COE estimation method.

A. Mr. D'Ascendis' TMA RPM adds a prospective public utility bond yield of 3.56% to 6.72% to an average of: 1) a Beta-adjusted ERP of 8.46% that is derived from an average of total market ERPs of 9.51%, 2) an ERP of 5.86% calculated based on the S&P Utilities Index, and 3) an ERP of 5.84% calculated based on authorized ROEs for gas utilities.[48]

Q. What is Staff's concern with Mr. D'Ascendis' TMA RPM COE estimates?

A. Staff's concern with Mr. D'Ascendis' TMA RPM COE estimation method is that the inputs of the ERP for TMA RPM are too high. Table 3 presents Mr. D'Ascendis' six ERPs based on Ibbotson's historical data:[49]

[47] PRPM, Staff's Rebuttal Workpaper.
[48] 4.7 ERP Determination, Staff's Data Request No. 0237.
[49] On page 26, D'Ascendis' Direct Testimony.

Table 3. Ibbotson-Based ERPs

	ERP Measure	(%)
[1]	Ibbotson ERP	5.78
[2]	Regression on Ibbotson Risk Premium Data	9.42
[3]	Ibbotson ERP based on PRPM	9.54
[4]	ERP Based on Value Line Summary and Index	10.94
[5]	ERP Based on Value Line S&P 500 Companies	11.02
[6]	ERP Based on Bloomberg S&P 500 Companies	10.34
	Average	9.51

Staff found that five out of six of Mr. D'Ascendis' ERP results are unreasonably too high. The only reasonable ERP estimate is the first listed above, the Ibbotson ERP. Staff found significant flaws in the methodology used by Mr. D'Ascendis to arrive at his inflated ERPs.

[1] Ibbotson ERP

Ibbotson's estimation of ERP is based on the arithmetic mean of historical monthly returns on large company common stocks from Ibbotson® SBBI® 2020 Market Report minus the arithmetic mean monthly yield of Moody's average Aaa and Aa corporate bonds from 1928-2019.[50] Staff has no concern with Ibbotson' ERP estimate of 5.78% because it falls within the range widely accepted by the financial service industry.[51]

[2] Regression on Ibbotson Risk Premium Data

Mr. D'Ascendis conducted a linear regression analysis to get an ERP of 9.42%, using the monthly ERPs of large company common stocks relative to Moody's average Aaa and Aa rated corporate bond yields from 1928-2019 referenced in Ibbotson data sets.[52] Staff expresses concern with the low R-squared value in Mr. D'Ascendis' regression model. A low R-squared value of

[50] 4.8-4.9 Beta Adjusted ERP, Staff's Data Request No. 0237.
[51] Duff & Phelps, 2020 Valuation Handbook: Guide to Cost of Capital.
[52] 4.8-4.9 Beta Adjusted ERP, Staff's Data Request No. 0237.

0.025 means that only 2.5% of movements in ERP is explained by movement in corporate bond yields.[53] In other words, about 97.5% of the changes in ERP is not assumed to result from a change in corporate bond yield. A low R-squared value indicates that the given regression model is not explaining much in the variation of the target dependent variable, regardless of the statistical significance.[54]

Figure 6. ERP of Aaa/Aa Rated Bond Yields

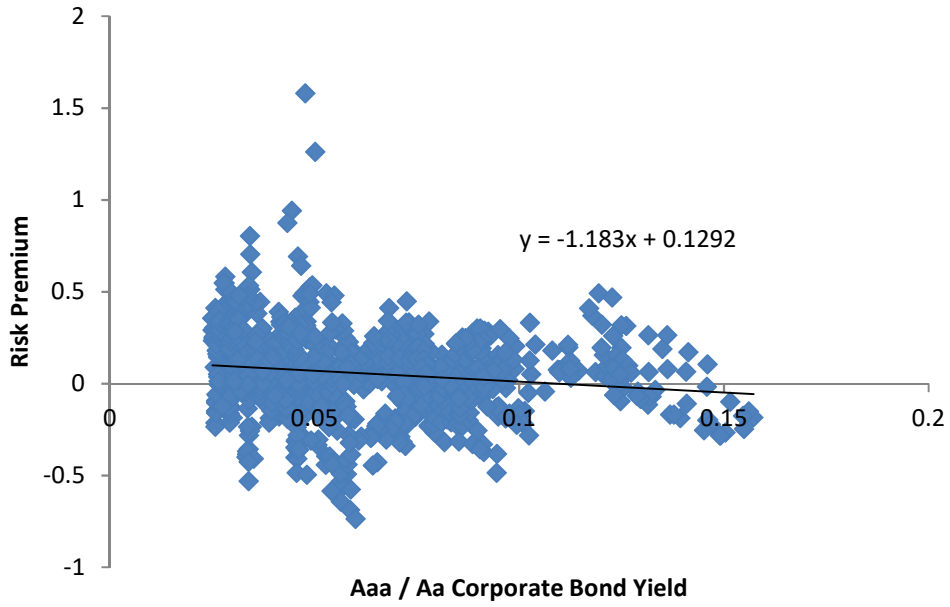


Figure 6 is a scattered graph used by Mr. D'Ascendis for the regression.[55] As shown in Figure 6, the precision of ERPs is too low for the given corporate bond yield. Due to Mr. D'Ascendis' extremely low R-squared value of the regression model, it is clear that the corporate bond yield, even though significant, is not accounting for much of the mean of ERP estimates. Therefore, the

[53] MRP ERP WP, Staff's Data Request No. 0237.
[54] Tiemann, T. K. (2010). Introductory Business Statistics with Interactive Spreadsheets: 1st Canadian Edition.
[55] MRP ERP WP, Staff's Data Request No. 0237.

ERP estimate of Mr. D'Ascendis' regression analysis is unreliable because it includes too high statistical inaccuracy for purposes of calculating a reasonable COE.[56]

[3] Ibbotson ERP based on PRPM

Mr. D'Ascendis used the GARCH model to estimate an ERP of 9.54%.[57] The ERP was derived by subtracting average Moody's Aaa and Aa corporate monthly bond yields from large company common stock monthly returns obtained from the Ibbotson's data from 1928 through September 2020.[58] It is clear that Mr. D'Ascendis' ERP of 9.54% is overestimated. First, it is 378 basis points higher than the reasonable Ibbotson's ERP estimate of 5.78% in [1].[59] Second, and interestingly, Mr. D'Ascendis's workpaper included another ERP estimation of 5.53% using GARCH model based on the monthly risk premiums between S&P 500 monthly returns and average A-rated utility monthly bond yields.[60] This proves that the 9.54% is way out of the reasonable range of ERPs accepted by the financial service industry.

[56] It is hard to say that Mr. D'Ascendis' ERP estimate using his regression model is a statistically reliable estimator. Staff clearly understand a low R-squared does not mean that the regression model is useless. The required minimum value of R-squared is depended on the research question. Even though 2.5% of R-squared is too low, if Mr. D'Ascendis would use his regression model to show a negative relationship between ERP and corporate bond yields, in that case, a low R-squared value would be not a huge issue. However, considering the current case of requiring precision, a several percent is really matter of the estimation. Therefore, the estimation using this extremely low R-squared should not be accepted.
[57] PRPM WP1, Staff's Data Request No. 0237.
[58] On page 24, D'Ascendis Direct Testimony.
[59] 4.8-4.9 Beta Adjusted ERP, Staff's Data Request No. 0237.
[60] PRPM WP1, Staff's Data Request No. 0237.

Table 4. Estimate of Expected Risk Premiums

	Mean (%)		Range (%)		Standard deviation (%)	
	Average	Spot	Average	Spot	Average	Spot
Ibbotson Associates data						
79-years	9.59	5.76	8.74–9.96	2.62–22.60	0.32	5.24
20-years	6.77	6.94	4.99–8.50	2.24–28.95	0.95	6.88
5-years	4.20	10.25	−98.49–11.62	−100.00–39.65	22.00	26.61
S&P Utility Index						
79-years	5.28	2.90	4.30–5.28	1.65–8.15	0.32	1.60
20-years	3.93	3.51	2.78–5.03	2.18–6.88	0.57	1.11
5-years	31.82	326.63	7.77–156.97	6.12–6465.74	31.47	1283.51

In addition, Staff found a fundamental deficiency in Mr. D'Ascendis' PRPM ERP estimate using the GARCH model. Mr. D'Ascendis referenced Ahern, Hanley, and Michelfelder's article published in 2011 ("AHM") to support his GARCH model.[61] However, according to AHM, ERP estimates vary depending on the source and time-period of data.[62] Using Ibbotson associated data and S&P utility index with three time-periods, AHM reported a very wide range of ERP estimates of 3.93% to 31.82% as shown in Table 4:[63] Statistical robustness is an essential characteristic for adequate financial estimation procedure. As presented in Table 4, the range of published ERP estimates is too wide to use for precise ERP estimation. Therefore, Mr. D'Ascendis' GARCH model ERP estimate of 9.54% should not be considered a reliable ERP estimate.

[4] ERP Based on Value Line Summary and Index

Mr. D'Ascendis calculated his ERP of 10.94% based on the Value Line Summary and Index data and arrived at the 10.94% ERP by subtracting the average consensus forecast of Aaa corporate bonds of 2.96% from the projected 3-5 year total annual market return of 13.90%.[64]

[61] On page 19, D'Ascendis Direct Testimony.
[62] Ahern, P. M., Hanley, F. J., & Michelfelder, R. A. (2011). New approach to estimating the cost of common equity capital for public utilities. Journal of Regulatory Economics, 40(3), 261-278.
[63] Table 3, Ibid.
[64] 13.90% is the sum of estimated median annual appreciation potential of 11.58% and estimation of median dividend yield of 2.32%. MRP WP1, Staff's Data Request No. 0237.

Mr. D'Ascendis' ERP is too high compared to the reasonable Ibbotson's ERP estimate of 5.78% in [1].[65] Several factors caused his ERP to be too high. Mr. D'Ascendis used an unreasonably lower bond yield and an unreasonably higher total annual market return. The corporate bond yield is unreasonably lower because Mr. D'Ascendis used Aaa corporate bonds yields instead of Spire Missouri's bond rating of A1. The projected bond yield for estimated Moody's bond rating A is approximately 3.71%., meaning that based on the unreasonably lower yield that Mr. D'Ascendis used, his ERP is inflated by 75 basis points.[66] The projected total annual market return of 13.90% is unreasonably high, considering that S&P historical records from 1926 to 2018 show that average annual return is approximately 10% to 11%.[67] The average annualized total return since adopting S&P 500 stocks into the index in 1957 through 2020 is roughly 9.25%.[68] Considering these historical records, there is no basis to the projected return of 13.90%. A reasonable ERP would be 6.89% if assumptions for a reasonable annual stock return of 10.5% and a reasonable bond yield of 3.71% are used.[69]

[5] ERP Based on Value Line S&P 500 Companies

Mr. D'Ascendis calculated his ERP of 11.02% by subtracting the average consensus forecast of Aaa corporate bonds of 2.96% from the S&P 500's expected total return of 13.98%. Staff expresses concern that when he calculated his expected total return using the DCF, Mr. D'Ascendis included the companies that have unreasonably high or low projected EPS growth rates. For example, D'Ascendis included Qorvo Inc's unreasonably high projected EPS growth

[65] 4.8-4.9 Beta Adjusted ERP, Staff's Data Request No. 0237.
[66] MRP WP1, Staff's Rebuttal Workpaper.
[67] https://www.investopedia.com/ask/answers/042415/what-average-annual-return-sp-500.asp#:~:text=1%EF%BB%BF%20According%20to%20historical,approximately%2010%25%E2%80%9311%25.&text=The%20average%20annual%20return%20since%20adopting%20500%20stocks%20into%20the,through%202018%20is%20roughly%208%25.
[68] http://www.moneychimp.com/features/market_cagr.htm.
[69] Beta Adjusted ERP, Staff's Rebuttal Workpaper.

rate of 65.50% for his expected total return.[70] To calculate expected return using the DCF, companies with extremely high growth rates should be excluded. The FERC found that S&P 500 companies with growth rates that are negative or in excess of 20 percent should be excluded because such extremely low or high growth rates are not representative of sustainable growth rates.[71] Staff recalculated an expected total return based on the FERC's criterion and found a reasonable total return of 12.09%. Subtracting the average consensus forecast of A-rated corporate bonds of 3.71% results in an expected ERP of 8.38%.[72]

[6] ERP Based on Bloomberg S&P 500 Companies

Mr. D'Ascendis calculated his 10.34% ERP based on Bloomberg Professional Service S&P 500, by subtracting the average consensus forecast of Aaa corporate bonds of 2.96% results from an expected S&P 500 expected total return of 13.30%. Staff expresses the same concern as above that Mr. D'Ascendis included extremely high long-term growth rates of S&P 500 Companies, such as 139.01% of Freeport-McMoRan Inc.[73] Staff recalculated expected total return based on the FERC's criterion and found a reasonable total return of 11.40%. Subtracting the average consensus forecast of A-rated corporate bonds of 3.71% results in an expected ERP of 7.69%.[74]

Q. What is Staff's conclusion on Mr. D'Ascendis' total market approach ("TMA") RPM COE estimation?

A. Two of Mr. D'Ascendis' ERP estimates using the GARCH model and a linear regression model do not qualify for reasonable COE estimation because of the statistical

[70] MRP WP3, Staff's Data Request No. 0237.
[71] *Ass'n of Bus. Advocating Tariff Equity v. Midcontinent Indep. Sys. Operator, Inc.,* Opinion No. 569, 169 FERC ¶ 61,129 (2019).
[72] Beta Adjusted ERP, Staff's Rebuttal Workpaper.
[73] MRP WP2, Staff's Data Request No. 0237.
[74] Beta Adjusted ERP, Staff's Rebuttal Workpaper.

inaccuracy of the model estimation. Excluding the GARCH and regression models' ERP estimation results, Staff's recalculated weighted average of the four remaining ERPs, based on historical, S&P, Value Line, and Bloomberg, is 7.19%.[75] The recalculated beta-adjusted ERP is 6.39%.[76] Staff used the utility proxy group average Beta coefficient, 0.89, to account for the risk of the utility proxy group. Compared to Mr. D'Ascendis' result of 6.72% to Staff's 6.03%, Mr. D'Ascendis' ERP is 69 basis points higher.[77] For the three months ended April 30, 2021, "A" rated and "Baa" rated long-term utility bonds had average yields of 3.30% and 3.57%, respectively.[78] Therefore, TMA RPM COE estimate range should be 9.33% to 9.60%.[79] Staff does not agree with Mr. D'Ascendis' use of prospective Moody's A2/A3–rated utility bond for his utility proxy group.[80] Spire Missouri's Moody's bond rating is not A2/A3 but A1. It is basic financial common sense that the risk premiums are lower for higher rated firms than lower rated firms.[81] As of April 30, 2021, the estimation of bond yield for Moody's A1–rated utility bond is 3.39% meaning that proper TMA RPM COE estimate is about 9.42%.[82] Therefore, Mr. D'Ascendis' TMA RPM COE estimate of 10.28% is overstated.

5. Market Risk Premium of Capital Asset Pricing Model

Q. Please explain Mr. D'Ascendis' CAPM COE estimation methods.

A. Mr. D'Ascendis employed the traditional CAPM and the empirical CAPM ("ECAPM") using Value Line and Bloomberg Beta with risk-free rate of 2.11% and an average market risk premium ("MRP") of 10.45%.[83] For his natural gas utility proxy group, the mean

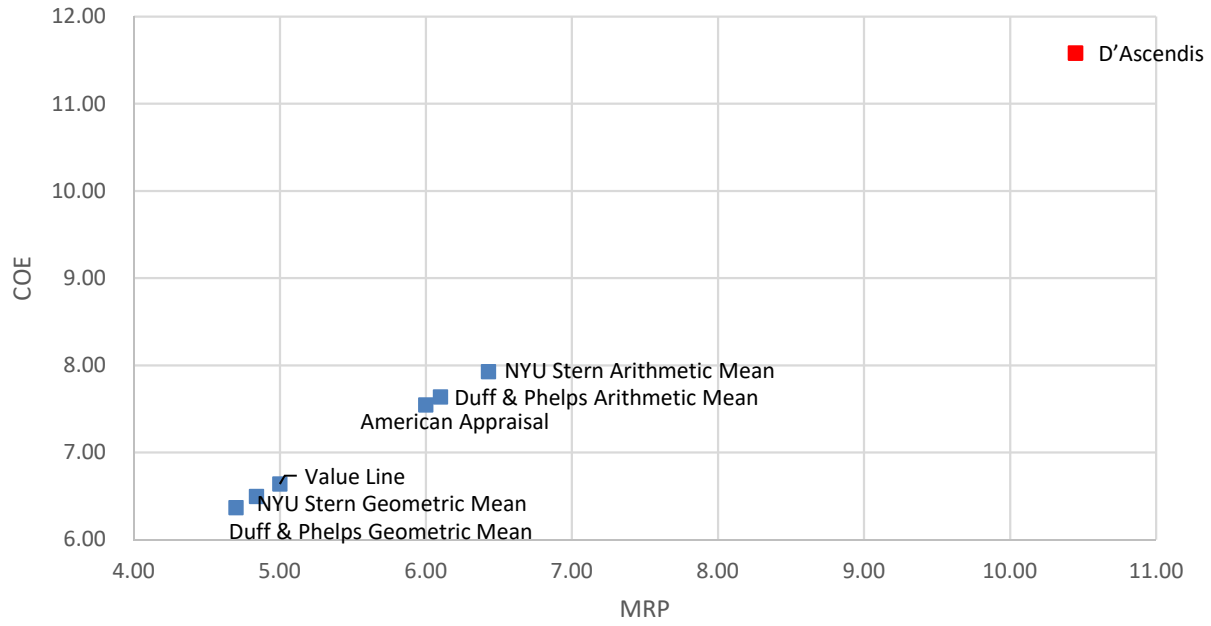
[75] Ibid.
[76] Ibid.
[77] TMA RPM, Staff's Rebuttal Workpaper.
[78] Mergent Bond Record, January 2021.
[79] TMA RPM, Staff's Rebuttal Workpaper.
[80] 4.3 Risk Premium Summary, Staff's Data Request No. 0237.
[81] Morin, R. A. (2006). New Regulatory Finance. Public Utilities Reports. p.129.
[82] TMA RPM, Staff's Rebuttal Workpaper.
[83] MRP WP1, D'Ascendis' Direct Workpaper.

result of Mr. D'Ascendis' CAPM COE estimates is 11.59%, the median is 11.56%, and the average of the two is 11.58%.[84]

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

A. Mr. D'Ascendis' CAPM COE estimate of 11.58% is too high even compared to his other COE estimates of 9.74% and 10.04% using DCF and RPM, respectively. Staff found that Mr. D'Ascendis' CAPM COE estimate is too high because he used unreasonably high MRPs. Mr. D'Ascendis' MRP of 10.45%, on average, is much higher than regular US financial service industry's MRP estimates of around 4.00% to 7.00%.[85] Mr. D'Ascendis' MRP is an average of his six MRP estimates. Like his ERP, only one of Mr. D'Ascendis' MRP estimate is close to the range of the reasonable MRPs used by US financial service industry. The other five estimates are unreasonably high.

Figure 7. MRP and corresponding COE



[84] On page 25, D'Ascendis' Direct Testimony.
[85] See Figure 7.

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

A. Other financial institutions' MRP estimates range from 4.7% to 6.43%.[86] According to 2020 survey research based on 1,946 responses from business and economic professors, the U.S. average and median of MRP estimates are 5.6% and 5.4%, respectively.[87] The American Appraisal Risk Premium Quarterly, Value Line, and Duff & Phelps calculated MRPs of 6.0%, 5.5%, and 5.0%, respectively.[88] Duff and Phelps' current MRPs range from 4.7% (geometric average), to 6.1% (arithmetic average), using historical data from 1926 to 2019.[89] Professor Aswath Damodaran of NYU Stern School of Business, a noted equity valuation professor, currently estimates MRPs in the range of 4.84% to 6.43%.[90] Figure 7 compares COE estimates with their corresponding MRPs, for Mr. D'Ascendis' natural gas proxy group, calculated with reasonable MRPs and Mr. D'Ascendis' unreasonable MRPs, assuming the same 30-day average of 30-Year U.S Treasury bond yield of 2.11% used in Mr. D'Ascendis' estimation. As shown in the figure, Mr. D'Ascendis' CAPM COE estimate of 11.58%, with its corresponding MRP of 10.45% is far removed from, and lie close to the high extreme of, other estimates. This clearly indicates that Mr. D'Ascendis' MRPs are too high and, consequently, his COE estimates are too high as well. Table 5 shows Mr. D'Ascendis' six MRP estimates and their associated estimation methods:[91]

[86] CAPM, Staff's Rebuttal Workpaper.
[87] Fernandez, P., de Apellániz, E., & F Acín, J. (2020). Survey: Market Risk Premium and Risk-Free Rate used for 81 countries in 2020.
[88] FERC Opinion No. 569, 169 FERC ¶ 61,129
[89] 2020 Cost of Capital: Annual U.S. Guidance and Examples, Duff and Phelps.
[90] Risk Premium, Damodaran Online, Stern School of Business, NYU.
[91] On pages 35-36, D'Ascendis' Direct Testimony.

Table 5. Market Risk Premium Estimation

	MRP Estimate Method	(%)
[1]	Historical Spread: Large Stock	7.01
[2]	Regression Analysis	10.18
[3]	PRPM Analysis	10.66
[4]	Prospective Spread: Value Line	11.79
[5]	Prospective Spread: S&P 500	11.87
[6]	Prospective Spread: Bloomberg	11.19
	Average	10.45

Q. Please explain in detail, your concern with Mr. D'Ascendis' MRPs.

A. As presented in Table 5, Mr. D'Ascendis used six MRP estimates. As Staff already pointed out, all six MRP estimates are too high, and will explain each, one by one.

[1] Historical Spread: Large Stock

Staff expresses concern with how Mr. D'Ascendis calculated his historical spread MRP. To get his estimated MRP of 7.01%, Mr. D'Ascendis subtracted the 5.09% income return portion of the total return of the long-term government bond from the total return, 12.10%, of large common stocks reported by SBBI in the time period 1926 – 2019.[92] The correct way of calculating the historical MRP is subtracting the total return on long-term government bond, not just the income part, from the total return on large common stocks. The total return of long-term government bond yields of 6.0 should be used rather than income return of 5.09%.[93] This is a simple principle of comparing apples to apples – total return on large cap stocks minus total return on long-term government bond. Therefore, the correct MRP estimate using historical spread is 6.10%; that is, the difference between 12.10% and 6.0%.[94] The result of Mr. D'Ascendis' incorrect calculation is overestimation of the MRP by about 91 basis points.[95]

[92] MRP WP1, Staff's Data Request No. 0237.
[93] 2020 Cost of Capital: Annual U.S. Guidance and Examples, Duff and Phelps.
[94] MRP WP1, Staff's Rebuttal Workpaper.
[95] 91 basis points = 7.01% – 6.10% = (12.10% – 5.09%) – (12.10% – 6.00%).

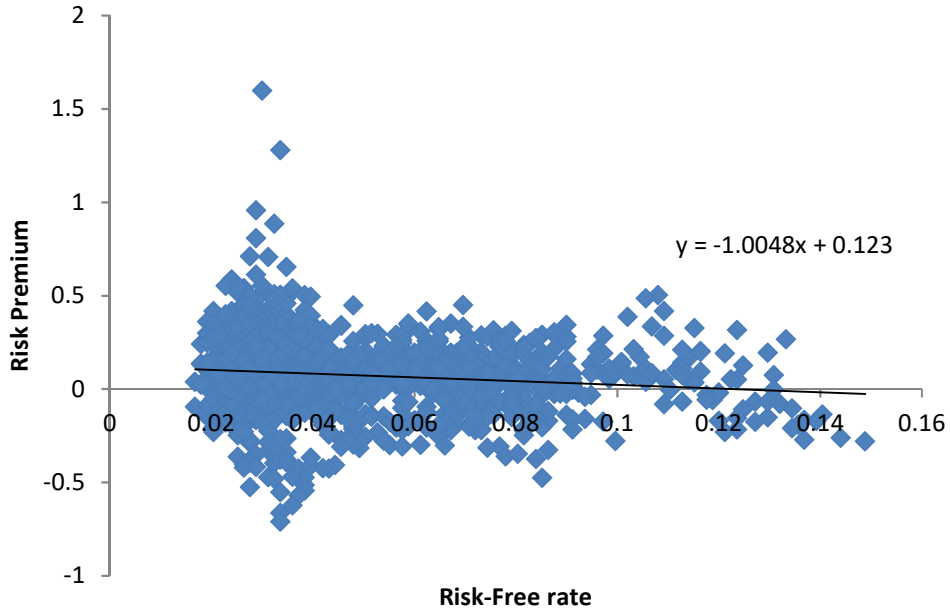
[2] Regression Analysis

Mr. D'Ascendis applied a linear regression to the monthly annualized historical returns on the S&P 500 relative to historical yields on long-term U.S. Government securities from SBBI - 2020, and that regression analysis yielded a MRP estimate of 10.18%.[96] The problem with Mr. D'Ascendis' regression analysis is that his linear regression model has too low an R-squared value. According to Mr. D'Ascendis' report, the R-squared value of his regression model is only 0.016, which means that only 1.6% movements of MRP is explained by movement in corporate bond yields.[97] Staff already explained the statistical inappropriateness of financial estimation based on a low R-squared regression model in the section under ERP estimation.[98] In addition, there is no known linear relationship between risk free rate and MRP.[99] Staff concludes that Mr. D'Ascendis' MRP estimated using this regression model is statistically unreliable. Figure 8 is a scattered graph used by Mr. D'Ascendis for the regression, which shows the unreliability of his regression analysis.[100] Interestingly, some of the data in the scattered graph Figure 8 indicated a negative risk premium of about 33%. These results mean that around one third of the monthly annualized historical returns on the S&P 500 are lower than historical yields on long-term U.S. Government securities.[101] Absurdly, some of risk premiums used by Mr. D'Ascendis for calculating the MRP are less than negative 70%.[102] Mr. D'Ascendis assumption that the MRP can be estimated using the relationship between the monthly annualized historical returns on the

[96] Page 35, D'Ascendis' Direct Testimony.
[97] MRP ERP WP, Staff's Data Request No. 0237.
[98] 4.2. [2] Regression on Ibbotson Risk Premium Data.
[99] Staff's Data Request No. 0379. Mr. D'Ascendis indicated Roger A. Morin, New Regulatory Finance, at page 175. However, Dr. Morin did not state that MRP can measured by risk free rate.
[100] MRP ERP WP, Staff's Data Request No. 0237.
[101] MRP ERP WP, Staff's Rebuttal Workpaper.
[102] MRP ERP WP, Staff's Data Request No. 0237.

S&P 500 and historical yields on long-term U.S. Government securities does not financially and economically make sense.

Figure 8. Market Risk Premium to Long-Term U.S. Treasury Yields



Interestingly, Mr. D'Ascendis referenced two peer-reviewed papers that do not indicate any relationship between risk free rate and MRP.[103] For instance, Harris and Marston's article estimate MRP for the S&P500 index using a multivariate regression model with independent variables such as the spread between yields on long-term corporate and government bonds, the yield to maturity on long-term government bonds, the consumer confidence index, and the dispersion of analysts' forecasts of earnings growth, and the volatility on the S&P500 index implied by options data.[104] Therefore, this regression model is far different from Mr. D'Ascendis' univariate estimation. In Mr. D'Ascendis' other reference paper on this topic, Brigham, Shome and Vinson actually showed that the relationship between risk premium and risk free rate keeps

[103] Staff's Data Request No. 0397.
[104] Robert S. Harris and Felicia C. Marston, The Market Risk Premium: Expectational Estimates Using Analysts' Forecasts, Journal of Applied Finance, Vol. 11, No. 1, 2001, at 11-12.

changing over the time periods of observation, and the correlations are different dependent upon data characteristics.[105] Most importantly, most of the MRPs presented in both articles are less than 7%, meaning that they are not supporting but refuting Mr. D'Ascendis' MRP estimate of 10.28%.

[3] PRPM Analysis

Mr. D'Ascendis' PRPM MRP estimate of 10.66% is unreasonably high and has the same deficiency as his PRPM ERP estimate. As Staff already explained, Mr. D'Ascendis' GARCH model lacks the robustness required for precise estimation of risk premium. The very wide range, 3.93% to 31.82%, of the GARCH model ERP estimates makes the model's results unreliable.[106] There is nothing in Mr. D'Ascendis' GARCH model approach that gives it credibility. Mr. D'Ascendis' statistical criterion of z-statistic and p-value are only about a significant relationship described by the model.[107] Staff has found no peer-reviewed paper justifying that Mr. D'Ascendis' PRPM MRP estimate has statistically reliable precision. On the contrary, the one published peer-reviewed research paper of AMH supports the lack of the statistical robustness of the GARCH model as a risk premium estimation model, as presented in Table 4.[108] According to AMH, stock market results are highly sensitive to empirical model specification.[109] Therefore, Mr. D'Ascendis' PRPM MRP estimate of 10.66% should not be considered a reliable MRP estimate.

[105] Eugene F. Brigham, Dilip K. Shome, and Steve R. Vinson, The Risk Premium Approach to Measuring a Utility's Cost of Equity, Financial Management, Spring 1985, at 33-45.
[106] See Table 4.
[107] Staff's Data Request No. 0288.4.
[108] Ahern, P. M., Hanley, F. J., & Michelfelder, R. A. (2011). New approach to estimating the cost of common equity capital for public utilities. Journal of Regulatory Economics, 40(3), 261-278.
[109] Ibid.

[4] Prospective Spread: Value Line

Mr. D'Ascendis estimated a prospective MRP of 11.79% using a projected total market return of 13.90% from Value Line Summary & Index, less projected 30-Year Treasury bond yields of 2.11%.[110] Mr. D'Ascendis' MRPs assume that U.S capital markets will achieve nominal returns of 13.90% per year, forever.[111] This is unrealistic because historical data from 1963 – 2019 shows that the geometric mean total returns for large U.S. stocks have been approximately 10.20%.[112] It is irrational to expect future returns to be greater than the historical returns under conditions of slower current economic growth. According to the Bureau of Economic Analysis, GDP declined by 5.0% and 31.7% in the first, and second quarters of 2020, respectively.[113] Nominal GDP growth in 2017, 2018, and 2019 was 4.25%, 5.47%, and 3.98%, respectively.[114] All else being constant, a rudimentary calculation assessing GDP growth and its relationship to nominal stock returns translates to the reduced GDP growth rate of 4.56% to nominal returns for stocks of 7.12% assuming a linear relationship between GDP growth rate and total return.[115] Furthermore, Mr. D'Ascendis used projected 30-Year Treasury bond yields of 2.11% instead of the total return of long-term government bonds. This is another example of comparing apples to oranges. Using only the income part of the long-term total return overestimates the MRP and ultimately, COE. Therefore, a projected total market return of 13.90% should not be used to estimate MRP estimation.

[110] On page 35, D'Ascendis' Direct Testimony.
[111] MRP = U.S capital market returns 30-year government bond yields.
[112] Duff & Phelps 2020 Valuation Handbook: A Guide to the Cost of Capital.
[113] https://www.bea.gov/data.
[114] https://fred.stlouisfed.org/series/GDP.
[115] GDP growth reducing an estimated 29.53% = ((6.48% – (4.25%+5.47%+3.98%)/3) / 6.48%). All else being constant, nominal returns reduce to 7.12% = ((1 – .2953) × 10.1%).

[5] Prospective Spread: S&P 500

Mr. D'Ascendis estimated a prospective MRP of 11.87% using measures of capital appreciation and income returns of 13.98% from Value Line for the S&P 500 less projected 30-Year Treasury bond yields of 2.11%.[116] Staff's concern is that, when Mr. D'Ascendis calculated an expected total return using DCF model, he included unreasonably high projected EPS growth rates.[117] According to the FERC criterion for use of the DCF model, when long-term earnings growth rates were used for estimating reasonable projected total returns extreme earnings growth rate should be excluded. As explained above regarding ERP estimation, the FERC found that companies with growth rates that are negative or in excess of 20 percent should be excluded. If those extreme growth rates would be included the projected market return could not represent a reasonable total market return.[118] Such extreme earnings growth rates are considered unsustainable and not representative of U.S market growth rates.[119] Staff's recalculated Value Lines' expected total return based on the FERC's criterion excluding S&P 500 companies with growth rates that are negative or in excess of 20 percent is 12.09%, resulting in a forecasted MRP of 9.98%.[120]

[6] Prospective Spread: Bloomberg

Mr. D'Ascendis estimated a prospective MRP of 11.19% using measures of capital appreciation and income returns of 13.30% from Bloomberg professional services for the S&P 500 less projected 30-Year Treasury bond yields of 2.11%.[121] Staff has the same concern that

[116] On page 35, D'Ascendis' Direct Testimony.
[117] MRP WP3, D'Ascendis' Direct Workpaper.
[118] Ass'n of Bus. Advocating Tariff Equity v. Midcontinent Indep. Sys. Operator, Inc., Opinion No. 569, 169 FERC ¶ 61,129 (2019).
[119] Richard A. Brealey and Stewart C. Myers, Principles of Corporate Finance, 68 (7th ed. 2003).
[120] MRP WP3, Staff's Rebuttal Workpaper.
[121] On page 35, D'Ascendis' Direct Testimony.

Mr. D'Ascendis included extremely high long-term growth rates of the S&P 500 Companies. Staff recalculated Bloomberg's expected total return based on the FERC's criterion, excluding S&P 500 companies with growth rates that are negative or in excess of 20 percent, and found a prospective return of 11.40%, resulting in a forecasted MRP of 9.29%.[122]

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

A. With more reasonable assumptions such as an MRP of 5.51% and a risk-free rate of 2.07%,[123] Mr. D'Ascendis' average CAPM COE estimate would be 7.06%.[124] This is well within the range of Staff's COE estimates of 6.82% to 8.61%, which is much lower than Mr. D'Ascendis' CAPM COE estimate of 11.43%.

6. Empirical Capital Asset Pricing Model

Q. What is your concern with Mr. D'Ascendis' ECAPM model?

A. Mr. D'Ascendis' ECAPM COE estimate of 11.72% has the same issues of too high an MRP as his CAPM COE estimate of 11.43%.[125] In addition, the ECAPM model itself overestimates COE because of an over-adjustment to account for the supposed tendency of the CAPM method to underestimate COE for companies with low Beta coefficients.

Q. How did Mr. D'Ascendis adjust his CAPM COE to ECAPM COE?

A. Mr. D'Ascendis multiplied 75% of his MRPs by the Beta coefficient and added the remaining 25% MRPs, unadjusted.[126] This adjustment is consistent with Dr. Roger Morin's

[122] MRP WP2, Staff's Rebuttal Workpaper.
[123] The assumption of the estimated MRP of 5.51% is average of eight MRP estimates in Figure 7, and the risk free rate of 2.07% is an average of 30-year Treasury bond at yields of three months ending March 2021.
[124] CAPM, Staff's Rebuttal Workpaper.
[125] Page 36, D'Ascendis' Direct Testimony.
[126] Original CAPM COE estimate equals Risk-Free Rate + Beta × MRP but ECAMP COE estimate equals Risk-Free Rate + 0.25 × MRP + 0.75 × Beta × MRP or Risk-Free Rate + Alpha + Beta × (MRP – Alpha) where Alpha = 0.25 × MRP.

formula.[127] Dr. Morin's formula was based on his finding, with data between 1926 and 1984, that regular CAPM underestimated returns by about 2.00%. However, there is no evidence Dr. Morin's finding that the adjustment factor of 25% would hold with data after 1984.[128] Furthermore, Dr. Morin also cited other studies that found that CAPM produced returns between - 9.61% and 13.56%, meaning that CAPM actually overestimated COE in some instances.[129] Such variations in findings do not lend credibility to Mr. D'Ascendis' use of the ECAPM.

Q. What would Mr. D'Ascendis' ECAPM COE estimates be with proper input data?

A. With a MRP of 5.51% and an actual risk-free rate of 2.07%, Mr. D'Ascendis' ECAPM COE estimate for his natural gas utility proxy group would be 7.14%.[130] This result overlaps with Staff's COE estimations, which are much lower than Mr. D'Ascendis' ECAPM COE estimates of 11.72%. Mr. D'Ascendis' ECAPM, just like his CAPM, overstates the authorized ROE.

7. Adjustment of Cost of Equity

Q. What adjustments did Mr. D'Ascendis do to his COE?

A. Mr. D'Ascendis made adjustments to his COE for size, 0.10%, credit risk, -0.14%, and flotation cost, 0.24%.[131] Staff has concerns with size and flotation costs adjustments.

[127] Morin, R. A. (2006). New Regulatory Finance. Public Utilities Reports. p.190.
[128] Staff's Data Request No. 0302. Figure 2 on page 32 of Mr. D'Ascendis' direct testimony was excerpted from Fama and French's academic article in the Journal of Economic Perspectives, The Capital Asset Pricing Model: Theory and Evidence, which was published in Summer, 2004. The premise of Fama and French's article was reiterated by Morin in 2006 in his book, New Regulatory Finance. Mr. D'Ascendis is not aware of any evidence or peer reviewed published papers that rebut the findings of Morin in his textbook or Fama and French's academic article. However, these references did not show that the adjustment factor of 25% is still correct. Actually, Dr. Morin introduced other researches using different adjustment factors in his book.
[129] Morin, R. A. (2006). New Regulatory Finance. Public Utilities Reports. p.190.
[130] CAPM, Staff's Rebuttal Workpaper.
[131] On page 7, D'Ascendis' Direct Testimony.

Q. What is Staff's concern with Mr. D'Ascendis' size adjustments?

A. For size adjustment, Mr. D'Ascendis added a size premium of 0.10% to his estimated COE based on his conjecture that the size premium spread between of Spire Missouri and the proxy group is 0.55%.[132] Mr. D'Ascendis provided no evidence to support the 0.55% size difference. Spire Missouri is the largest natural gas distribution utility in Missouri.[133] Staff found no major rate cases that the Commission allowed any size adjustments for natural gas utilities. Mr. D'Ascendis insisted that it is necessary to upwardly adjust the indicated range of common equity cost rates attributable to the utility proxy group to reflect Spire Inc.'s greater risk due to their smaller relative size.[134] If Mr. D'Ascendis argument would be true, Moody's credit rating system might incorrectly measure total risk. Although Spire Missouri has a smaller size than the average of his gas proxy group, Spire Missouri's long-term issuer ratings of A1 from Moody's Investors Services is greater than the average long-term issuer ratings for his gas utility proxy group of A2/A3.[135] It is common sense in financial service industry that a higher bond rate brings a lower risk premium. Therefore, Mr. D'Ascendis size adjustment is an unnecessary adjustment because rating agency already consider overall financial and business risks when rating was estimated. If size adjustment is accepted than it will introduce an upward bias in COE estimate.

Q. What is Staff's concern with Mr. D'Ascendis' flotation costs adjustments?

A. Concerning his flotation cost adjustment, Staff expresses concern that Mr. D'Ascendis' is attributing Spire Inc.'s flotation costs to Spire Missouri.[136] Mr. D'Ascendis insisted that because there is no other mechanism in the ratemaking paradigm through which

[132] On page 44, D'Ascendis' Direct Testimony.
[133] S&P Global Market Intelligence.
[134] On page 43, D'Ascendis' Direct Testimony.
[135] S&P Global Market Intelligence.
[136] Staff's Data Request No. 0289.

such costs can be recognized and recovered, and equity issuance costs are real, necessary, and legitimate, recovery of these costs should be permitted.[137] However, Staff is of the opinion that equity floatation costs of Spire Inc. should be borne by Spire, Inc., not Spire Missouri's ratepayers. Spire Missouri is financially independent of Spire, Inc.; that is the reason why the Commission ordered Spire Missouri's own capital structure be used for ratemaking. Spire Missouri does not pay Spire Inc.'s debt costs; it only makes sense that it should not pay Spire, Inc.'s equity cost as well.

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

A. Staff's recalculated COE estimate with proper inputs and models are summarized in Table 6:[138]

Table 6. D'Ascendis' COE estimation and Staff's Recalculation

	Cost of Equity	
COE Estimation Methods	D'Ascendis' Estimate	Staff Recalculation
Discounted Cash Flow Model (DCF)	9.74%	8.43%
Risk Premium Model (RPM)	10.04%	8.43%
Capital Asset Pricing Model (CAPM)	11.58%	7.06%

As evident in Table 6, Mr. D'Ascendis' COE estimates are too high compared to Staff's recalculated COE. Staff recommends that Mr. D'Ascendis' COE estimates should not be utilized for calculating a just and reasonable authorized ROE.

8. The Capital Structure of Spire Missouri for ROR

Q. What capital structure and ROR did Mr. Selinger recommend for Spire Missouri's ratemaking in this proceeding?

[137] On page 46, D'Ascendis' Direct Testimony.
[138] Recalculated COE, Staff's Rebuttal Workpaper.

A. Mr. Selinger recommended a pro forma capital structure, as of May 31, 2021, with 54.25% common equity and 45.75% long-term debt, for Spire Missouri. According to Spire Missouri's response to Staff's data request, Mr. Selinger's recommended capital structure includes an adjustment to Spire Missouri's actual capital structure, to account for the Company's long-term debt issuance on May 20, 2021.[139] Spire Missouri's actual capital structure as of September 30, 2020 consisted of 56.79 percent common equity and 43.21 percent long-term debt.[140] Spire Missouri requested an update of all elements of the capital structure at the proposed May 31, 2021 true-up date. Mr. Selinger recommended an authorized ROR of 7.23%, calculated using Mr. D'Ascendis' recommended ROE of 9.95%, and embedded cost of debt of 4.00%, applied to a capital structure consisting of 45.75 percent long-term debt and 54.25 percent common equity.[141]

Q. Does Staff have concerns with the capital structure recommended by Spire Missouri's witness?

A. Staff does not have major concerns with Spire Missouri's proposed capital structure. The only minor concern is that Spire Missouri is yet to provide detailed information about the closing result of its long-term debt issue, and the update of all elements of the capital structure at the proposed May 31, 2021 true-up date. Staff will keep monitoring whether Spire Missouri would change the recommended capital structure. Staff will address Staff's final recommended capital structure in its surrebuttal and true-up testimony after examining Spire Missouri's true-up capital structure information.

[139] Staff's Data Request No. 0109.1.
[140] At page 8, Selinger's Direct Testimony.
[141] WES-1, Schedule F, Selinger's Direct Testimony.

III RESPONSE TO TESTIMONY OF OPC WITNESS MURRAY

Q. What is Mr. Murray's recommended ROE for use in this proceeding?

A. Mr. Murray recommended that the Commission set Spire Missouri's authorized ROE at 9.25%, in the range of 8.50% to 9.50%, based on his COE estimates range of 6.5% to 7.5%. Mr. Murray estimated his COE using a multi-stage DCF approach and a CAPM analysis.

Q. Do you have any concerns with Mr. Murray's recommended ROE?

A. Staff does not have major concerns with Mr. Murray's ROE recommendation. Mr. Murray's recommended ROE of 9.25% is 12 basis points lower than Staff's 9.37%, and within Staff's reasonable range of 9.12% to 9.62%. Mr. Murray's recommended ROE is the same as the Commission's authorized ROE of 9.25% in Empire District's electric rate case (Case No. ER-2019-0374). Although Staff does not agree with Mr. Murray's estimation procedures for his recommended ROE, Staff found no substantial deficiency in Mr. Murray's ROE recommendation.

Q. What is Mr. Murray's recommended capital structure for use in this proceeding?

A. Mr. Murray recommended Spire Inc.'s capital structure consisting of approximately 47.36 percent common equity, 45.35 percent long-term debt, and 7.28 percent short-term debt for use in setting Spire Missouri's ROR.[142] Mr. Murray's recommended common equity ratio is slightly higher than the approximate 44.5 percent common equity ratio Spire Inc. has maintained the last three years when including short-term debt but consistent with Spire Inc.'s consolidated capital structure ratios, net of short-term debt adjusted for CWIP balances.[143] Additionally, Mr. Murray assigned Spire Inc.'s preferred stock issued in 2019, at coupon of 5.9%,

[142] On page 3, Murray's Direct Testimony.
[143] On page 39, Ibid.

to the capital structure at 50% weight for equity and 50% weight for debt, instead of incorporating it directly into his capital structure recommendation.[144]

Q. What is Staff's concern with Mr. Murray's capital structure recommendation?

A. Staff has multiple concerns with Mr. Murray's capital structure recommendation. However, Staff will address only one major concern in this rebuttal testimony. Staff will address the remaining concerns in subsequent testimonies after receiving all the responses to Staff's data requests. Mr. Murray's recommended capital structure was developed based on Spire Inc.'s consolidated capital structure, instead of Spire Missouri's. Mr. Murray argued that because Spire Inc., the parent company of Spire Missouri, manages Spire Missouri for purposes of taking advantage of debt capacity afforded by Spire Inc.'s low-risk regulated utility subsidiaries, the appropriate capital structure for Spire Missouri ratemaking should be Spire Inc.'s. Staff disagrees that Spire Inc. is managing Spire Missouri for the purpose of taking advantage of debt capacity.

Q. Please explain why Staff disagrees with Mr. Murray's recommendation to use Spire Inc.'s capital structure instead of Spire Missouri's own capital structure, for ratemaking.

A. It is Staff's position that Spire Missouri's stand-alone capital structure represents the actual capital structure used to finance Spire Missouri's respective jurisdictional rate base. In addition, Spire Missouri's own capital is consistent with the capital structure ratios maintained by, or authorized for, other natural gas utilities. Mr. Murray's recommended common equity ratio of 47.36 percent is much lower than the average of his natural gas proxy group's common equity ratio of approximately 51 percent.[145]

[144] On page 43, Ibid.
[145] Staff's Rebuttal Workpaper.

Furthermore, Mr. Murray's recommendation is not compatible with typical regulatory practices on when to use a parent company's capital structure instead of a subsidiary's own capital structure for the subsidiary's ratemaking. The Society of Utility and Regulatory Financial Analysts ("SURFA") lists the following four guidelines for determining when to use a parent company's capital structure, in its guidebook, The Cost of Capital – A Practitioner's Guide ("CRRA Guide"):

> 1. Whether the subsidiary utility obtains all of its capital from its parent, or issues its own debt and preferred stock;
>
> 2. Whether the parent guarantees any of the securities issued by the subsidiary;
>
> 3. Whether the subsidiary's capital structure is independent of its parent (i.e., existence of double leverage, absence of proper relationship between risk and leverage of utility and non-utility subsidiaries); and,
>
> 4. Whether the parent (or consolidated enterprise) is diversified into non-utility operations.[146]

There is nothing in these guidelines that suggests that it is appropriate to use Spire Inc. (the parent company of Spire Missouri)'s capital structure to set Spire Missouri's ROR. For the first guideline, except common stocks, Spire Missouri has not received any other long-term financing, debt or preferred stock, from Spire Inc.[147] Spire Missouri's stand-alone capital structure supports its own bond rating.[148] Actually, Spire Missouri's bond rating of A1 is higher than Spire Inc.'s Baa2.[149] For the second guideline, Spire Inc. or Spire Inc.'s other subsidiaries do not guarantee the securities issued by Spire Missouri.[150] For the third guideline, Staff has not found the existence of double leverage, or absence of proper relationship between risk and leverage of utility and non-utility

[146] David C. Parcell in The Cost of Capital – A Practitioner's Guide prepared for SURFA.
[147] Staff's Data Request No. 0122.1.
[148] S&P Global Market Intelligence.
[149] Credit Opinion (April 1, 2021), Moody's Investors Service.
[150] Staff's Data Request No. 0122.1.

subsidiaries.[151] For the fourth guideline, according to Spire Inc.'s consolidated balance sheet in 2020, Spire Inc.'s non-utility asset is less than 5 percent of Spire Inc.'s total assets.[152] Furthermore, OPC's position is not consistent with the Commission's decision in previous Spire Inc.'s rate cases.[153]

Q. What was the Commission's decision on the ratemaking capital structure for Spire Missouri's previous rate cases?

A. The Commission ruled in the last Spire Missouri's rate cases that the appropriate capital structure to use to set Spire Missouri's ROR is Spire Missouri's own standalone capital structure.[154] According to the Amended Report and Order of the last Spire Missouri's rate cases, the Commission determined that the capital structure of Spire Missouri, without short-term debt, is the reasonable capital structure for ratemaking purpose.[155] The Commission determined that the appropriate capital structure is Spire Missouri's actual true-up capital structure, 54.2 percent common equity and 45.8 percent long-term debt.[156] The Commission's decision to use the utility-specific capital structure and not Spire Inc.'s consolidated capital structure is supported by the facts in this proceeding including that Spire Missouri has an independently determined capital structure with its own long-term debt issuances secured by its own assets.[157] Staff found no reason to change the Commission's decision on capital structure in this proceeding.[158]

[151] Staff's Data Request No. 0122.
[152] SEC 10-K Form.
[153] On page 43, Amended Report and Order issued March 7, 2018, in Case Nos. GR-2017-0215 and GR-2017-0216.
[154] On page 44, Ibid.
[155] On page 43, Ibid.
[156] On page 45, Ibid.
[157] On page 43, Ibid.
[158] Staff's Data Request No. 0122.1.

IV SUMMARY AND CONCLUSIONS

Q. Please summarize the conclusions of your rebuttal testimony.

A. Mr. D'Ascendis' recommended ROE of 9.95% for Spire Missouri is not just and reasonable considering his inappropriate reliance on certain ROE calculation methodologies and use of certain inappropriate inputs into those methodologies. Staff recommends that the reasonable authorized ROE to use in this proceeding is 9.37%, in a reasonable range of 9.12% to 9.62%. Staff does not have major concern with OPC's witness' Mr. Murray, recommended authorized ROE of 9.25% because it is within Staff's zone of reasonableness.

Given that Spire Missouri's capital structure includes first mortgage bonds issued on May 20, 2021, Staff recommends that the appropriate capital structure to use to set Spire Missouri's allowed ROR of 6.92% in this proceeding is Spire Missouri's capital structure consisting of 45.75 percent long-term debt and 54.25 percent common equity, and 4.00% cost of debt, as of May 31, 2021. Staff will keep monitoring Spire Missouri's updated capital structure and cost of debt until the true-up period and will make its final recommendation at that time.

Q. Does this conclude your rebuttal testimony?

A. Yes.

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of Spire Missouri Inc.'s d/b/a Spire Request for Authority to Implement a General Rate Increase for Natural Gas Service Provided in the Company's Missouri Service Areas	)))))	Case No. GR-2021-0108

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 17th day of June 2021.

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

Notary Public