BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. W-354, SUB 360

In the Matter of
Application by Carolina Water Service, Inc. of North Carolina
for Authority to Adjust and Increase Rates for
Water and Sewer Utility Service in All of Its Service Areas in
North Carolina, Except Corolla Light and Monteray Shores Service
Area

Pre-filed Rebuttal Testimony

Of

DYLAN D'ASCENDIS, CRRA, CVA

On Behalf Of
CAROLINA WATER SERVICE, INC. OF NORTH CAROLINA

October 12, 2018

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I. INTRODUCTION

Q. **Please state your name and business address.**

A. My name is Dylan W. D'Ascendis. My business address is 3000 Atrium Way, Suite 241, Mount Laurel, NJ 08054.

Q. **By whom are you employed and in what capacity?**

A. I am a Director at ScottMadden, Inc.

Q. **Are you the same Dylan W. D'Ascendis that provided direct testimony in this proceeding?**

A. Yes, I am.

II. PURPOSE OF TESTIMONY

Q. **What is the purpose of your rebuttal testimony in this proceeding?**

A. My rebuttal testimony responds to the direct testimony of John R. Hinton, witness for the Public Staff of the North Carolina Utilities Commission ("Public Staff") concerning the investor required return on common equity ("ROE") of Carolina Water Service, Inc. of North Carolina ("CWSNC" or the "Company").

Q. **Have you prepared an exhibit in support of your rebuttal testimony?**

A. Yes. I have prepared D'Ascendis Rebuttal Exhibit No. 1, which consists of Schedules DWD-1R through DWD-10R.

III. SUMMARY

Q. **What conclusions do you reach?**

A. My updated analysis recommends the North Carolina Utilities Commission ("Commission" or "NCUC") authorize the Company the opportunity to earn

an overall rate of return between 8.29% and 8.49%, based on a ratemaking capital structure as of June 30, 2018. The updated capital structure is based on the actual capital structure of CWSNC's parent, Utilities, Inc., at June 30, 2018. It consists of 49.09% long-term debt at an embedded cost rate of 5.68% and 50.91% common equity at my updated range of common equity cost rates from 10.80% to 11.20%. My updated recommended overall rate of return is summarized on page 1 of Schedule DWD-1R and in Table 1, below:

Table 1: Summary of Overall Rate of Return

Type of Capital	Ratios	Cost Rate	Weighted Cost Rate
Long-Term Debt	49.09%	5.68%	2.79%
Common Equity	50.91%	10.80% - 11.20%	5.50% - 5.70%
Total	100.00%		8.29% - 8.49%

I also respond to Mr. Hinton's estimation of the Company's ROE using the Discounted Cash Flow Model ("DCF") and Risk Premium Model ("RPM") approaches and explain its shortcomings, including its:

- Misapplication of the DCF;
- Misapplication of the RPM;
- Failure to account for size-specific risks;
- Opinion that the Company's Water and Sewer Improvement Charge Mechanisms are unique to the Company;

I will also address Mr. Hinton's opinions regarding current capital markets.

IV. UPDATED ANALYSIS

Q. **Have you updated your analysis in this proceeding to reflect current investor expectations?**

A. Yes, I have. My updated study is as of September 28, 2018 and is contained in Schedule DWD-1R.

Q. **Have you applied the models in the same manner as you applied them in your direct testimony?**

A. No. I will list the changes in my analysis from the direct testimony below:

- In the Predictive Risk Premium Model ("PRPM") applicable to the proxy group companies, instead of averaging the spot and long-term average predicted variances, I selected the minimum value for each company;
- For the beta adjusted equity risk premium ("ERP"), instead of averaging the ERPs by source (*i.e.* Ibbotson, Value Line, and Bloomberg), I gave all six ERP measures equal weight;
- For the Standard & Poor's ("S&P") utility-specific ERP, instead of averaging the ERPs by source, I gave all five ERP measures equal weight; and
- For the market risk premium ("MRP") used in the Capital Asset Pricing Model ("CAPM"), instead of averaging the MRPs by source, I gave all six MRP measures equal weight.

Q. **When did you change your application of your models?**

A. In May of 2018.

Q. **Did you also update the ratemaking capital structure?**

A. Yes. The Company's ratemaking capital structure at June 30, 2018 consists of 49.09% long-term debt at an embedded debt cost rate of 5.68% and 50.91% common equity. This capital structure includes the revolving credit facility and its corresponding debt cost rate as shown on Table 2, below:

Table 2: Calculation of Updated Capital Structure at June 30, 2018[1]

Type of Capital	Balance at 6/30/18	Percentage	Cost Rate	Weighted Cost
Term Notes	$170,234		6.58%	4.61%
Revolving Credit Facility	73,000		3.57%	1.07%
Total Debt	$243,234	49.09%		5.68%
Common Equity	$252,230	50.91%		

V. CURRENT CAPITAL MARKETS

Q. **Please summarize Mr. Hinton's summary of current capital markets.**

A. Mr. Hinton provided the Moody's A-rated public utility bond yield as of January 10, 2014, when Docket No. W-354, Sub 336 was stipulated, which was 4.63%, and the current Moody's A-rated public utility bond as of August 2018, which is 4.26%. Mr. Hinton then presents a chart showing the current flattening yield curve as compared with the yield curves in January 2014, September 2015, and August 2017, the approximate dates of CWSNC's last three rate cases.[2] Despite the graph showing increased short-term interest rates, Mr. Hinton recommends the use of current bond yields in his ROE analysis while reviewing forecasted interest rates. Mr. Hinton claims

[1] Company-provided. Dollar amounts in thousands.
[2] Hinton Direct Testimony, at 14.

that current interest rates are inherently forward-looking, as they reflect investor expectation of current and future returns.[3]

Q. **Do you have any comment on Mr. Hinton's opinions regarding current market conditions?**

A. Yes. Mr. Hinton should have focused on the changes in the capital markets since CWSNC's most recent rate case, Docket No. W-354, Sub 356, not from three rate cases ago (Docket No. W-354, Sub 336). If he did, Mr. Hinton would discover that since September 2017, several risk measures have increased, indicating a rising cost of capital.

In Table 3, below, the Moody's A-rated public utility bond, the 30-year Treasury bond, the Federal Funds Rate, and water utility expected growth rates in earnings per share ("EPS") have increased since the resolution of CWSNC's last rate case. Since one needs both the dividend yield and an expected growth rate to calculate a DCF, I also included the dividend yields, which have declined slightly from CWSNC's last rate case.

[3] *Ibid.,* at 15-16.

Table 3: Risk Measures in September 2017 and September 2018[4]

Risk Measure	September 2017	September 2018
A-Rated Public Utility Bonds	3.87%	4.32%
30-Year Treasury Bonds	2.78%	3.15%
Federal Funds Rate	100-125 bp	200-225 bp
Beta	0.725	0.767
Expected Growth in EPS	7.75%	8.33%
Dividend Yield	2.12%	2.08%
Indicated DCF[5]	9.95%	10.50%

Q. **Is there another recent North Carolina rate case that may also inform the Commission regarding the current investor-required cost of common equity?**

A. Yes. In Docket No. E-7, Sub 1146, Duke Energy Carolinas, LLC ("Duke") was awarded a 9.90% return on common equity relative to a 52% equity ratio as a result of a settlement on June 22, 2018. The most recent monthly data available for that Docket was as of December 2017, which was presented in the rebuttal phase. The comparison between the market data in the Duke case and the market data in this case are presented in Table 4, below:

[4] Interest rates are from Bloomberg Professional Services, all other measures are from Value Line Investment Survey, Standard Edition, July 14, 2017 and July 13, 2018.

[5] The indicated DCF cost rate was derived consistent with my application of the DCF in my direct testimony as described on pages 14-17.

Table 4: Risk Measures in December 2017 and September 2018[6]

Risk Measure	December 2017	September 2018
A-Rated Public Utility Bonds	3.79%	4.32%
30-Year Treasury Bonds	2.77%	3.15%
Federal Funds Rate	100-125 bp	200-225 bp
Beta (Public Staff)	0.627	0.767
Beta (Company)	0.713	0.767
Expected Growth in EPS (Public Staff)	5.05%	8.33%
Expected Growth in EPS (Company)	5.45%	8.33%
Dividend Yield (Public Staff)	3.30%	2.08%
Dividend Yield (Company)	3.30%	2.08%
Indicated DCF (Public Staff)[7]	8.44%	10.50%
Indicated DCF (Company)[8]	8.85%	10.50%

As shown in Table 4, above, every single measure of risk has increased from the Duke case. The increases of these risk measures in conjunction with the smaller size and lower equity ratio of CWSNC compared to Duke justify my updated recommendation of 10.80% to 11.20% in view of the 9.90% authorized return on common equity in the Duke case.

Addressing the flattening yield curve, the Federal Reserve Bank ("Fed") has raised the Federal funds rate ("Fed funds rate") eight times, from 0.00% - 0.25% to 2.00% - 2.25%, after its Quantitative Easing Initiative was completed in October 2014 and it began the process of rate normalization.[9] While the long-term Treasury yields have not yet caught up with the short-

6 Interest rates are from Bloomberg Professional Services, all other measures are from Value Line Investment Survey, Standard Edition, December 15, 2017, November 17, 2017, October 31, 2017, and July 13, 2018.

7 The indicated DCF cost rate was derived consistent with my application of the DCF in my direct testimony as described on pages 14-17.

8 The indicated DCF cost rate was derived consistent with my application of the DCF in my direct testimony as described on pages 14-17.

9 *See* Federal Reserve Press Release (December 16, 2015).

term yields, this has more to do with Fed policy rather than market fundamentals. As the Fed continues to unwind their balance sheet by not reinvesting after their Treasury securities have matured,[10] shorter-term notes will mature faster than long-term notes, which will effectively lower demand for those replacement notes (as the Fed is no longer reinvesting), which will lower prices, and raise yields faster than the long-term notes. As the unwinding of the Fed balance sheet continues, the longer-term notes will mature, and the yields for the long-term Treasury securities will also increase.

Q. **Do you believe that current interest rates are appropriate for the estimation of the cost of common equity in this proceeding?**

A. No. Using current measures, like interest rates, are inappropriate for cost of capital and ratemaking purposes because they are both prospective in nature. The cost of capital, including the cost rate of common equity, is expectational in that it reflects investors' expectations of future capital markets, including an expectation of interest rate levels, as well as future risks. Ratemaking is prospective in that the rates set in this proceeding will be in effect for a period in the future.

Even though Mr. Hinton relies, in part, on projected growth rates in his DCF analyses, he fails to apply the same logic to selecting an appropriate interest rate in his RPM analysis.

[10] The current monthly maturities of Treasury securities are $30 billion per month. Starting in Q4 2018, maturities will be $50 billion per month.

Whether Mr. Hinton believes those forecasts will prove to be accurate is irrelevant to estimating the market-required cost of common equity. Published industry forecasts, such as *Blue Chip Financial Forecasts*' ("*Blue Chip")* consensus interest rate projections, reflect industry expectations. Additionally, investors' expectations are not improper inputs to cost of common equity estimation models simply because prior projections were not proven correct in hindsight. As FERC noted in Opinion No. 531, "the cost of common equity to a regulated enterprise depends upon what the market expects, not upon what ultimately happens."[11] Because our analyses are predicated on market expectations, the expected increase in bond yields is a measurable and relevant data point that should be reflected in Mr. Hinton's analysis.

VI. RESPONSE TO MR. HINTON

Q. **What does Mr. Hinton recommend in his direct testimony?**

A. Mr. Hinton recommends that the Commission establish an overall rate of return of 7.47% based on a capital structure consisting of 49.09% long-term debt at an embedded cost rate of 5.68% and 50.91% common equity at his recommended cost of common equity of 9.20%. [12] His 9.20% recommendation is based on the average of the midpoint of his DCF range (8.70%)[13] and the result of his RPM (9.70%).[14]

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11 Opinion No. 531, 150 FERC ¶ 61,165 at P 88.
12 Hinton supplemental direct testimony.
13 Mr. Hinton's DCF results range from 8.20% to 9.20%.
14 Hinton Direct Testimony, at 30.

Q. **Do you have any general comments on Mr. Hinton's recommended ROE?**

A. Yes. Mr. Hinton only relies on two models, the DCF and the RPM, in his ROE analysis, while in Docket No. W-218, Sub 319, Mr. Hinton used both the Capital Asset Pricing Model ("CAPM") and the Comparable Earnings Model ("CEM") in conjunction with the DCF to arrive at his recommended ROE.[15] As discussed in my direct testimony,[16] the use of multiple models adds reliability to the estimation of the common equity cost rate, and the prudence of using multiple cost of common equity models is supported in both the financial literature and regulatory precedent. Therefore, Mr. Hinton should have included the CAPM and CEM in his analysis.

Q. **Can you please provide some examples from the financial literature which support the use of multiple cost of common equity models in determining the investor-required return?**

A. Yes. In one example, Morin states:

> Each methodology requires the exercise of considerable judgment on the reasonableness of the assumptions underlying the methodology and on the reasonableness of the proxies used to validate a theory. The inability of the DCF model to account for changes in relative market valuation, discussed below, is a vivid example of the potential shortcomings of the DCF model when applied to a given company. Similarly, the inability of the CAPM to account for variables that affect security returns other than beta tarnishes its use.
>
> **No one individual method provides the necessary level of precision for determining a fair return, but each method provides useful evidence to facilitate the exercise of an**

[15] Docket No. W-218, Sub 319, Direct Testimony of John R. Hinton, at 21-22.
[16] D'Ascendis Direct Testimony, at 37.

> **informed judgment.** Reliance on any single method or preset formula is inappropriate when dealing with investor expectations because of possible measurement difficulties and vagaries in individual companies' market data. (emphasis added)

* * *

> The financial literature supports the use of multiple methods. Professor Eugene Brigham, a widely respected scholar and finance academician, asserts (footnote omitted):
>
> Three methods typically are used: (1) the Capital Asset Pricing Model (CAPM), (2) the discounted cash flow (DCF) method, and (3) the bond-yield-plus-risk-premium approach. **These methods are not mutually exclusive – no method dominates the others**, and all are subject to error when used in practice. Therefore, when faced with the task of estimating a company's cost of equity, we generally use all three methods and then choose among them on the basis of our confidence in the data used for each in the specific case at hand. (emphasis added)

Another prominent finance scholar, Professor Stewart Myers, in an early pioneering article on regulatory finance, stated(footnote omitted):

> Use more than one model when you can. Because estimating the opportunity cost of capital is difficult, **only a fool throws away useful information**. That means you should not use any one model or measure mechanically and exclusively. Beta is helpful as one tool in a kit, to be used in parallel with DCF models or other techniques for interpreting capital market data. (emphasis added)
>
> Reliance on multiple tests recognizes that no single methodology produces a precise definitive estimate of the cost of equity. As stated in Bonbright, Danielsen, and Kamerschen (1988), 'no single or group test or technique is conclusive.' Only a fool discards relevant evidence. (italics in original) (emphasis added)

* * *

> While it is certainly appropriate to use the DCF methodology to estimate the cost of equity, there is no proof that the DCF produces a more accurate estimate of the cost of equity than

> other methodologies. Sole reliance on the DCF model ignores the capital market evidence and financial theory formalized in the CAPM and other risk premium methods. **The DCF model is one of many tools to be employed in conjunction with other methods to estimate the cost of equity.** It is not a superior methodology that supplants other financial theory and market evidence. The broad usage of the DCF methodology in regulatory proceedings in contrast to its virtual disappearance in academic textbooks does not make it superior to other methods. The same is true of the Risk Premium and CAPM methodologies. (emphasis added) [17]

Finally, Brigham and Gapenski note:

> In practical work, *it is often best to use all three methods* – CAPM, bond yield plus risk premium, and DCF – and then apply judgment when the methods produce different results. People experienced in estimating equity capital costs recognize that both careful analysis and some very fine judgments are required. It would be nice to pretend that these judgments are unnecessary and to specify an easy, precise way of determining the exact cost of equity capital. Unfortunately, this is not possible. Finance is in large part a matter of judgment, and we simply must face this fact. (italics in original) [18]

In the academic literature cited above, three methods are consistently mentioned: the DCF, CAPM, and the RPM, all of which I used in my analyses.

Q. **Can you also provide specific examples where this Commission has considered multiple cost of common equity models?**

A. Yes. The Commission in Docket E-2, Sub 1142, concerning Duke Energy Progress, LLC, stated:

> "Thus, the Commission finds and concludes that the Stipulation, along with the expert testimony of witnesses

[17] Roger A. Morin, New Regulatory Finance, Public Utilities Reports, Inc., 2006, at 428-431. ("Morin")

[18] Eugene F. Brigham and Louis C. Gapenski, Financial Management – Theory and Practice, 4th Ed. (The Dryden Press, 1985) at 256. ("Brigham and Gapenski")

> Hevert (risk premium analysis), O'Donnell (comparable earnings), and Parcell (comparable earnings), are credible and substantial evidence of the appropriate rate of return on equity and are entitled to substantial weight in the Commission's determination of this issue."

Also, in Docket E-7, Sub 1026, concerning Duke Energy Carolinas, LLC, the commission stated the following:

> "In summary, the Commission finds and concludes, for purposes of this case and after thoroughly and independently reviewing all of the evidence, that Company witness Hevert's DCF analysis, particularly on the basis of mean growth rates, is credible and deserving of substantial weight, and that witness Johnson's comparable earnings analysis provides independent corroboration for the results of that analysis and is also credible and deserving of substantial weight,"

In the Commission Orders cited above, there is clear language that the Commission considers multiple models in its determination of ROE. It is also my interpretation of these Orders that the Commission correctly observes capital market conditions and their effect on the model results in determining a ROE for utility companies. This, in addition to the academic literature cited above, justifies the use of the DCF, CAPM, RPM, and CEM in this proceeding.

Q. **Have you performed a CAPM and CEM analysis for Mr. Hinton's proxy group generally consistent with his DCF spot date of September 21, 2018?**

A. Yes, I have. The CAPM analysis and the selection criteria of the comparable group of non-regulated companies is presented on Schedule DWD-1R, pages 21 through 25, which is as of September 28, 2018. The application of the DCF to the non-regulated group is presented on Schedule

DWD-2R,[19] which is also as of September 28, 2018. The results of the CAPM applied to Mr. Hinton's proxy group average 10.88%, with a median of 10.97%. The results of the DCF, RPM, and CAPM applied to the non-regulated proxy group, similar in total risk to Mr. Hinton's proxy group, is 14.13%, 12.32%, and 11.52%, respectively. The average result is 12.66%, while the median is 12.32%.

Q. **Have you applied the CEM differently to Mr. Hinton's water proxy group than when you applied them to your proxy group in your updated analysis?**

A. Yes. In the application of the DCF model for the non-regulated group, I calculated the prospective dividend yield as Mr. Hinton described in his direct testimony at pages 25 and 26. I then added the prospective dividend yield to the average prospective EPS growth rate from Value Line and Yahoo Finance. I only include expected EPS growth rates for use in the DCF, as will be explained in detail, below.

A. <u>Discounted Cash Flow Model</u>

Q. **Please summarize Mr. Hinton's DCF analysis.**

A. Mr. Hinton calculated his dividend yield by using the Value Line estimate of dividends to be declared over the next 12 months divided by the price of the stock as reported in the Value Line Summary and Index for 13 weeks ended September 21, 2018.[20] He then added the expected dividend yield of 2.1%

[19] Since Mr. Hinton and I have the same non-regulated proxy group, the RPM and CAPM results can be found on Schedule DWD-1R, pages 28 and 31, respectively.

[20] Hinton Direct Testimony, at 25-26.

to a range of growth rates from 6.1% to 7.1%[21] to arrive at his range of results from 8.2% to 9.2%.

Q. **Please comment on Mr. Hinton's growth rate analysis in his application of the DCF Model.**

A. Mr. Hinton states on page 26 of his direct testimony that he employed EPS, dividends per share ("DPS"), and book value of equity per share ("BVPS") growth rates as reported in Value Line, both five- and ten-year historical and forecasted, and five-year EPS growth rate projects as reported by Yahoo Finance. He includes both historical and forecasted growth rates, "because it is reasonable to expect that investors consider both sets of data in deriving their expectations". After reviewing the array of growth rates, Mr. Hinton determined a range of expected growth rates between 6.1% and 7.1%. Notwithstanding this statement, it is unclear exactly how much weight Mr. Hinton gave to each of the projected and historical growth rates in arriving at his high and low growth rate estimates for his proxy group, because his range of growth rates bears no logical relationship to the array of growth rates he evaluated.

Moreover, there is a significant body of empirical evidence supporting the superiority of analysts' EPS growth rates in a DCF analysis, indicating that analysts' forecasts of earnings remain the best predictor of growth to use in the DCF model. Such ample evidence of the proven

[21] Mr. Hinton reviewed 10 and 5-year historical growth rates in EPS, DPS, and BVPS as well as 3-5 year projected growth in EPS, DPS and BVPS from Value Line and 5-year projections of EPS growth from Yahoo Finance.

reliability and superiority of analysts' forecasts of EPS should not be dismissed by Mr. Hinton.

Q. **Please describe some of the empirical evidence supporting the reliability and superiority of analysts' EPS growth rates in a DCF analysis.**

A. As discussed in my direct testimony at page 16, lines 11-12, over the long run, there can be no growth in DPS without growth in EPS. Security analysts' earnings expectations have a more significant, but not the only, influence on market prices than dividend expectations. Thus, the use of projected earnings growth rates in a DCF analysis provides a better match between investors' market price appreciation expectations and the growth rate component of the DCF, because they have a significant influence on market prices and the appreciation or "growth" experienced by investors.[22] This should be evident even to relatively unsophisticated investors just by listening to financial news reports on radio, TV, or by reading the newspapers.

In addition, Myron Gordon, the "father" of the standard regulatory version of the DCF model widely utilized throughout the United States in rate base/rate of return regulation, recognized the significance of analysts'

[22] Morin, at 298-303.

forecasts of growth in EPS in a speech he gave in March 1990 before the Institute for Quantitative Research and Finance[23], stating on page 12:

> We have seen that earnings and growth estimates by security analysts were found by Malkiel and Cragg to be superior to data obtained from financial statements for the explanation of variation in price among common stocks… estimates by security analysts available from sources such as IBES are far superior to the data available to Malkiel and Cragg.
>
> * * *
>
> Eq (7) is not as elegant as Eq (4), but it has a good deal more intuitive appeal. It says that investors buy earnings, but what they will pay for a dollar of earnings increases with the extent to which the earnings are reflected in the dividend or in appreciation through growth.

Professor Gordon recognized that the total return is largely affected by the terminal price, which is mostly affected by earnings (hence price/earnings multiples).

Studies performed by Cragg and Malkiel [24] demonstrate that analysts' forecasts are superior to historical growth rate extrapolations. While some question the accuracy of analysts' forecasts of EPS growth, the level of accuracy of those analysts' forecasts well after the fact does not really matter. What is important is the forecasts reflect widely-held expectations influencing investors at the time they make their pricing decisions, and hence, the market prices they pay.

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[23] Gordon, Myron J., "*The Pricing of Common Stock",* Presented before the Spring 1990 Seminar, March 27, 1990 of the Institute for Quantitative Research in Finance, Palm Beach, FL.

[24] Cragg, John G. and Malkiel, Burton G., Expectations and the Structure of Share Prices (University of Chicago Press, 1982) Chapter 4.

In addition, Jeremy J. Siegel[25] also supports the use of security analysts' EPS growth forecasts when he states:

> For the equity holder, the source of future cash flows is the earnings of firms. (p. 90)
>
> * * *
>
> Some people argue that shareholders most value stocks' cash dividends. But this is not necessarily true. (p. 91)
>
> * * *
>
> Since the price of a stock depends primarily on the present discounted value of all expected future dividends, it appears that dividend policy is crucial to determining the value of the stock. However, this is not generally true. (p. 92)
>
> * * *
>
> Since stock prices are the present value of future dividends, it would seem natural to assume that economic growth would be an important factor influencing future dividends and hence stock prices. However, this is not necessarily so. The determinants of stock prices are earnings and dividends on a *per-share* basis. Although economic growth may influence *aggregate* earnings and dividends favorably, economic growth does not necessarily increase the growth of per-share earnings of dividends. It is earnings per share (EPS) that is important to Wall Street because per-share data, not aggregate earnings or dividends, are the basis of investor returns. (italics in original) (pp. 93-94)

Therefore, given the overwhelming academic and empirical support regarding the superiority of security analysts' EPS growth rate forecasts,

[25] Jeremy J. Siegel, Stocks for the Long Run – The Definitive Guide to Financial Market Returns and Long-Term Investment Strategies, McGraw-Hill 2002, pp. 90-94.

such EPS growth rate projections should have been relied on by Mr. Hinton in his DCF analysis.

Q. **What would Mr. Hinton's DCF result be had he only relied on EPS growth forecasts?**

A. As shown on Schedule DWD-3R, the mean DCF derived cost rate based on EPS growth forecasts is 9.10%. This result should be viewed with caution, however, as the DCF model is currently understating the investor required return.

Q. **Why is it your opinion that the DCF model is currently understating the investor-required return?**

A. Traditional rate base/rate of return regulation, where a market-based common equity cost rate is applied to a book value rate base, presumes that market-to-book ("M/B") ratios are at unity or 1.00. However, that is rarely the case. Morin states:

> The third and perhaps most important reason for caution and skepticism is that application of the DCF model produces estimates of common equity cost that are consistent with investors' expected return only when stock price and book value are reasonably similar, that is, when the M/B is close to unity. As shown below, application of the standard DCF model to utility stocks understates the investor's expected return when the market-to-book (M/B) ratio of a given stock exceeds unity. This was particularly relevant in the capital market environment of the 1990s and 2000s where utility stocks were trading at M/B ratios well above unity and have been for nearly two decades. The converse is also true, that is, the DCF model overstates that investor's return when the stock's M/B ratio is less than unity. The reason for the distortion is that the DCF market return is applied to a book

> value rate base by the regulator, that is, a utility's earnings are limited to earnings on a book value rate base.[26]

As he explains, a "simplified" DCF model, like that used by Mr. Hinton, assumes an M/B ratio of 1.0 and therefore under- or over-states investors' required return when market value exceeds or is less than book value, respectively. It does so because equity investors evaluate and receive their returns on the market value of a utility's common equity, whereas regulators authorize returns on the book value of that common equity. This means that the market-based DCF will produce the total annual dollar return expected by investors only when market and book values of common equity are equal, a very rare and unlikely situation.

Q. **Why do market and book values diverge?**

A. Market values can diverge from book values for a myriad of reasons including, but not limited to, EPS and DPS expectations, merger/acquisition expectations, interest rates, etc. As noted by Phillips:

> Many question the assumption that market price should equal book value, believing that 'the earnings of utilities should be sufficiently high to achieve market-to-book ratios which are consistent with those prevailing for stocks of unregulated companies.[27]

In addition, Bonbright states:

> In the first place, commissions cannot forecast, except within wide limits, the effect their rate orders will have on the market prices of the stocks of the companies they regulate. In the second place, *whatever the initial market prices may be, they are sure to change not only with the changing prospects for earnings, but with the changing outlook of an inherently*

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[26] Morin, at 434.

[27] Charles F. Phillips, The Regulation of Public Utilities, Public Utilities Reports, Inc., 1993, p. 395.

> *volatile stock market*. In short, market prices are beyond the control, though not beyond the influence of rate regulation. Moreover, even if a commission did possess the power of control, any attempt to exercise it ... would result in harmful, uneconomic shifts in public utility rate levels. (italics added)[28]

Q. **Can the under- or over-statement of investors' required return by the DCF model be demonstrated mathematically?**

A. Yes, it can. Schedule DWD-4R demonstrates how a market-based DCF cost rate of 8.70%,[29] when applied to a book value substantially below market value, will understate the investors' required return on market value. As shown, there is no realistic opportunity to earn the expected market-based rate of return on book value. In Column [A], investors expect an 8.70% return on an average market price of $50.04 for Mr. Hinton's proxy group of water utility companies. Column [B] shows that when Mr. Hinton's 8.70% return rate is applied to a book value of $15.56,[30] the total annual return opportunity is $1.354. After subtracting dividends of $1.051, the investor only has the opportunity for $0.303 in market appreciation, or 0.61%. The magnitude of the understatement of investors' required return on market value using Mr. Hinton's 8.70% cost rate is 5.99%, which is calculated by subtracting the market appreciation based on book value of 0.61% from Mr. Hinton's expected growth rate of 6.60%.

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[28] James C. Bonbright, Albert L. Danielsen and David R. Kamerschen, Principles of Public Utility Rates (Public Utilities Reports, Inc., 1988), p. 334.

[29] Mr. Hinton's DCF cost rate as shown in Hinton Exhibit JRH-3.

[30] Representing a market-to-book ratio of 321.56%.

Q. **HOW DO THE M/B RATIOS OF THE WATER PROXY GROUP COMPARE TO THEIR TEN-YEAR AVERAGE?**

A. The M/B ratios of the water proxy group are currently extraordinarily high compared with their ten-year average. As shown in Chart 1, below, since early 2016, the M/B ratios of the water proxy group have increased dramatically over their ten-year average M/B ratio of approximately 2.25 times.

Chart 1: M/B Ratios Compared with Ten-Year Average[31]

The significance of this is that even though the ten-year average M/B ratio has always been greater than 1.0x, the current M/B ratio is even further removed from 1.0x, which further distorts DCF results.

[31] Source: Bloomberg Financial Services.

Q. HOW CAN ONE QUANTIFY THE INACCURACY OF THE DCF MODEL WHEN THE M/B RATIOS ARE DIFFERENT THAN UNITY?

A. One can quantify the inaccuracy of the DCF model when M/B ratios are not at unity by estimating the implied cost of equity using the market-value DCF results (based on a market-value capital structure) to reflect a book-value capital structure.

Q. HOW CAN THE INACCURACY OF THE DCF MODEL BE QUANTIFIED BY SUCH A LEVERAGE ADJUSTMENT?

A. The inaccuracy of the DCF model, when market values diverge from book values, can be measured by first calculating the market value of each proxy company's capital structure, which consists of the market value of the company's common equity (shares outstanding multiplied by price) and the fair value of the company's long-term debt and preferred stock. All of these measures, except for price, are available in each company's SEC Form 10-K.

Second, one must de-leverage the implied cost of common equity based on the DCF. This is accomplished using the Modigliani / Miller equation as illustrated in Schedule DWD-5R and shown below:

$$ku = ke - (((ku - i)(1 - t))\ D/E) - (ku - d)\ P/E \quad \text{[Equation 1]}$$

Where:

ku	=	Unlevered (i.e., 100% equity) cost of common equity;
ke	=	Market determined cost of common equity;
i	=	Cost of debt;
t	=	Income tax rate;

D = Debt ratio;
E = Equity ratio;
d = Cost of preferred stock; and
P = Preferred equity ratio.

Using average proxy group-specific data, the equation becomes:

ku = 8.70% - (((ku – 5.25%)(1 - 21%)) 22.20% / 77.74%) - (ku – 7.26%) 0.06% / 77.74%

Solving for ku results in an unlevered cost of common equity of 8.06%.

Next, one must re-leverage those costs of common equity by relating them to each proxy group's average book capital structure as shown below:

ke = ku + (((ku – i)(1 – t)) D/E) + (ku – d) P/E [Equation 2]

Once again, using average proxy group-specific data, the equation becomes:

ke = 8.06%+(((8.06% - 5.25%)(1 - 21%))45.27%/54.61%)+(8.06%-7.26%)0.12%/54.61%

Solving for ke results in a 9.91% indicated cost of common equity relative to the book capital structure of the proxy group, which is an increase of 121 basis points over Mr. Hinton's average indicated DCF result of 8.70%.

Q. ARE YOU ADVOCATING A SPECIFIC ADJUSTMENT TO THE DCF RESULTS TO CORRECT FOR ITS MIS-SPECIFICATION OF THE INVESTOR-REQUIRED RETURN?

A. No. The goal of this discussion is to demonstrate that, like all cost of common equity models, the DCF has its limitations. The use of multiple cost of common equity models, in conjunction with informed expert judgment, provides a clearer picture of the investor-required ROE.

B. Application of the Risk Premium Model

Q. **Please summarize Mr. Hinton's RPM.**

A. Mr. Hinton's RPM explores the relationship between average allowed equity returns for water utility companies published by Regulatory Research Associates, Inc. ("RRA") and annual average Moody's A-rated utility bond yields. Using data from the years 2006 through 2018, Mr. Hinton conducts a regression analysis, which he then combines with recent monthly yields on Moody's A-rated public utility bonds to develop his risk premium estimate of 5.48% and a corresponding cost of equity of 9.70%.

Q. **Please comment on Mr. Hinton's application of the RPM.**

A. As previously addressed, it is inappropriate to use current bond yields to determine an expected ROE, so I will not repeat that discussion here. In addition, instead of using yearly average authorized returns and Moody's A-rated public utility bond yields, it is preferable to use the authorized returns and Moody's A-rated public utility bond yields on a case by case basis.

Q. **What is the corrected result of the RPM after reflecting a prospective Moody's A-rated public utility bond yield and using individual rate case data in place of annual rate case data?**

A. As shown on page 1 of Schedule DWD-6R, the analysis is based on a regression of 169 rate cases for water utility companies from August 24, 2006 through May 2, 2018. It shows the implicit equity risk premium relative

to the yields on Moody's A-rated public utility bonds immediately prior to the issuance of each regulatory decision.[32]

I determined the appropriate prospective Moody's A-rated public utility yield by relying on a consensus forecast of about 50 economists of the expected yield on Moody's Aaa-rated corporate bonds for the six calendar quarters ending with the fourth calendar quarter of 2019, and *Blue Chip's* long-term projections for 2020 to 2024, and 2025 to 2029.[33] As described on note 1 of Schedule DWD-6R, the average expected yield on Moody's Aaa-rated corporate bonds is 4.71%. I then derived an expected yield on Moody's A2-rated public utility bonds, by making upward adjustment of 0.36%, which represents a recent spread between Moody's Aaa-rated corporate bonds and Moody's A2-rated public utility bonds.[34] Adding the recent 0.36% spread to the expected Moody's Aaa-rated corporate bond yield of 4.71% results in an expected Moody's A2-rated public utility bond yield of 5.07%.

I then used the regression results to estimate the equity risk premium applicable to the projected yield on Moody's A2-rated public utility bonds of 5.07%. Given the expected Moody's A-rated utility bond yield of 5.07%, the indicated equity risk premium is 4.87%, which results in an indicated ROE of 9.94%, as shown on Schedule DWD-6R.

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[32] If the Order was in the first half of the month, the Moody's A rated utility bond from two months prior would be used. If the Order was in the second half of the month, the Moody's A rated public utility bond from the last prior month was used.

[33] *Blue Chip Financial Forecasts*, September 1, 2018, at 2, June 1, 2018, at 14.

[34] As explained in note 1, of Schedule DWD-6R.

Q. **What are the results of Mr. Hinton's ROE models after making the adjustments described above and including the CAPM and CEM.**

As discussed above, my adjustments to Mr. Hinton's DCF and RPM result in ROEs of 9.10% and 9.94%, respectively. After the inclusion of the CAPM (10.93%) and CEM (12.49%) results,[35] Mr. Hinton's average result is 10.62%. The average result of 10.62% still does not reflect the cost of common equity for CWSNC, as it has not been adjusted for the Company's greater risk relative to the proxy group based on its small size.

Q. **Mr. Hinton justifies his recommended ROE of 9.20% by reviewing the interest coverage ratio and confirming that his ROE would allow the Company a single "A" rating.[36] Does one measure of financial risk such as pre-tax interest coverage make a credit rating?**

A. No. While I do not take issue with Mr. Hinton's inputs or calculations in determining CWSNC's pre-tax interest coverage ratio, I note that the ratios of pre-tax coverage needed to qualify for a single "A" rating range from 3.0 to 6.0. As can be seen in my Schedule DWD-7R, ROE's ranging from 7.94% to as high as 20.08% all allow CWSNC to qualify for a single "A" rating based on its pre-tax coverage ratio. Clearly these results indicate that simply relying on one measure, out of a multitude of measures, to determine a company's bond rating is misleading and without significance.

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[35] Average of mean and median results as shown on Schedules DWD-1R, page 21 and DWD-2R, respectively.

[36] Hinton Direct Testimony, at 31.

C. Failure to Reflect CWSNC's Greater Relative Risk Due to its Small Size

Q. **Does Mr. Hinton make a specific adjustment to reflect the smaller size of CWSNC relative to the proxy group?**

A. No. As previously discussed in my direct testimony,[37] relative company size is a significant element of business risk for which investors expect to be compensated through greater returns. Smaller companies are simply less able to cope with significant events which affect sales, revenues and earnings. For example, smaller companies face more exposure to business cycles and economic conditions, both nationally and locally. Additionally, the loss of revenues from a few large customers would have a far greater effect on a small company than on a larger company with a more diverse customer base. Finally, smaller companies are generally less diverse in their operations and have less financial flexibility. Consistent with the financial principle of risk and return in my direct testimony,[38] such increased risk due to small size must be taken into account in the allowed rate of return on common equity.

Q. **Is there another empirical study in addition to the empirical analysis you performed in your direct testimony that evaluates the effect of size on the cost of equity?**

A. Yes. Duff & Phelps' ("D&P") 2018 Valuation Handbook Guide to Cost of Capital – Market Results through 2017 ("D&P 2018") presents a Size Study

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37 D'Ascendis Direct Testimony, at 38-39.
38 *Ibid.,* at 8.

based on the relationship of various measures of size and return. Relative to the relationship between average annual return and the various measures of size, D&P state:

> **The size of a company is one of the most important risk elements to consider when developing cost of equity estimates for use in valuing** a firm. Traditionally, researchers have used market value of equity (*i.e.,* "market capitalization" or "market cap") as a measure of size in conducting historical rate of return research. For example, the Center for Research in Security Prices (CRSP) "deciles" are developed by sorting U.S. companies by market capitalization. Another example is the Fama-French "Small Minus Big" (SMB) series, which is the difference in return of "small" stocks minus "big" (*i.e.*, large) stocks, as defined by market capitalization. (emphasis added) [39]

The Size Study uses the following eight measures of size, all of which have empirically shown that over the long-term, the smaller the company, the higher the risk:

- Market Value of Common Equity (or total capital if no debt / equity);
- Book Value of Common Equity;
- Net Income (five-year average);
- Market Value of Invested Capital;
- Total Assets (Invested Capital);
- Earnings Before Interest, Taxes, Depreciation & Amortization ("EBITDA") (five-year average);
- Sales / Operating Revenues; and
- Number of Employees.

[39] D&P 2018, at p. 10-1.

I used the D&P Size Study to determine the approximate magnitude of any necessary risk premium due to the size of CWSNC relative to the water proxy group. Schedule DWD-8R shows the relative size of CWSNC compared with the water proxy group. Indicated size adjustments based on these relative measures range from 0.94% to 2.18%, averaging 1.48%.[40] From these results, it is clear that CWSNC is riskier than the water proxy group due to its small size, and that my proposed size adjustment of 40 basis points for CWSNC is conservative.

Q. **Mr. Hinton cites a study by Dr. Annie Wong for the proposition that there is no size premium for utilities. Does this study establish that contention?**

A. No. Dr. Wong's study is flawed because she attempts to relate a change in size to beta coefficients, which accounts for only a small percentage of diversifiable company-specific risk. Size is company-specific and therefore diversifiable. For example, the average R-squared, or coefficient of determination for the water proxy group, is 0.0941 as shown on Schedule DWD-9R. An R-squared of 0.0941 means that approximately 9.50% of total risk is explained by beta, leaving 90.50% unexplained by beta.

Q. **Is there also a published response to Dr. Wong's article?**

A. Yes, there is. In response to Professor Wong's article, *The Quarterly Review of Economics and Finance* published an article in 2003, authored by Thomas M. Zepp, which commented on the Annie Wong article cited by

[40] We did not have data for 2013 for CWSNC, so the average net income and EBITDA were averaged over four years instead of five.

Mr. Hinton. Relative to Ms. Wong's results, Dr. Zepp concluded in the Abstract on page 1 of his article: "Her weak results, however, do not rule out the possibility of a small firm effect for utilities."[41] Dr. Zepp also noted on page 582 that: "Two other studies discussed here support a conclusion that smaller water utility stocks are more risky than larger ones. To the extent that water utilities are representative of all utilities, there is support for smaller utilities being more risky than larger ones."[42] Finally, I note that Professor Wong's study, while relying on a large group of gas and electric utilities, used no water utilities.

Q. **Are you aware of any other academic article relating to the applicability of a size premium?**

A. Yes. An article by Michael A. Paschall, ASA, CFA, and George B. Hawkins ASA, CFA, "Do Smaller Companies Warrant a Higher Discount Rate for Risk?" also supports the applicability of a size premium. As the article makes clear, all else equal, size is a risk factor which must be taken into account when setting the cost of capital or capitalization (discount) rate. Paschall and Hawkins state in their conclusion as follows:

> The current challenge to traditional thinking about a small stock premium is a very real and potentially troublesome issue. The challenge comes from bright and articulate people and has already been incorporated into some court cases, providing further ammunition for the IRS. Failing to consider the additional risk associated with most smaller companies, however, is to fail to acknowledge reality. Measured properly, small company stocks have proven to be more risky over a long period of time than have larger company stocks. This

[41] Thomas M. Zepp, Thomas M. "Utility Stocks and the Size Effect --- Revisited", The Quarterly Review of Economics and Finance, 43 (2003) at 578-582.

[42] *Ibid, at 582.*

> makes sense due to the various advantages that larger companies have over smaller companies. Investors looking to purchase a riskier company will require a greater return on investment to compensate for that risk. There are numerous other risks affecting a particular company, yet the use of a size premium is one way to quantify the risk associated with smaller companies.[43]

Hence, Paschall and Hawkins corroborate the need for a small size adjustment, all else equal. Consistent with the financial principle of risk and return discussed previously, and the stand-alone nature of ratemaking, an upward adjustment must be applied to the indicated cost of common equity derived from the cost of equity models of the water proxy group used in this proceeding.

Q. **Mr. Hinton presents several charts of North Carolina utility companies' quarterly revenues and earnings to explain that the water industry is less risky than the electric or gas industries. Please comment.**

A. Using quarterly data in seasonal industries like the gas and electric industries makes Mr. Hinton's graphs misleading. A more informative chart would use annual data instead of quarterly, which would eliminate the seasonality of the specific industries. As shown in Charts 2 and 3 below, annual revenues and earnings for publicly traded electric, gas, and water companies are fairly stable, with the only difference being the amount of sales and earnings.

[43] Michael A. Paschall, ASA, CFA and George B. Hawkins ASA, CFA, "Do Smaller Companies Warrant a Higher Discount Rate for Risk?", CCH Business Valuation Alert, Vol. 1, Issue No. 2, December 1999.

Chart 2: Annual Revenues of Publicly Traded Electric, Gas, and Water Companies[44]

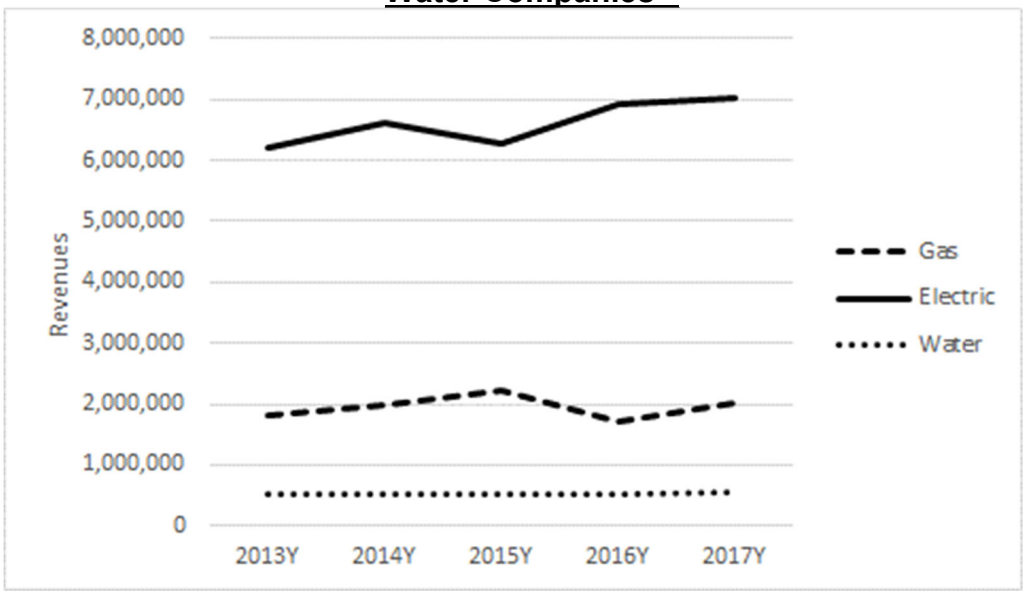
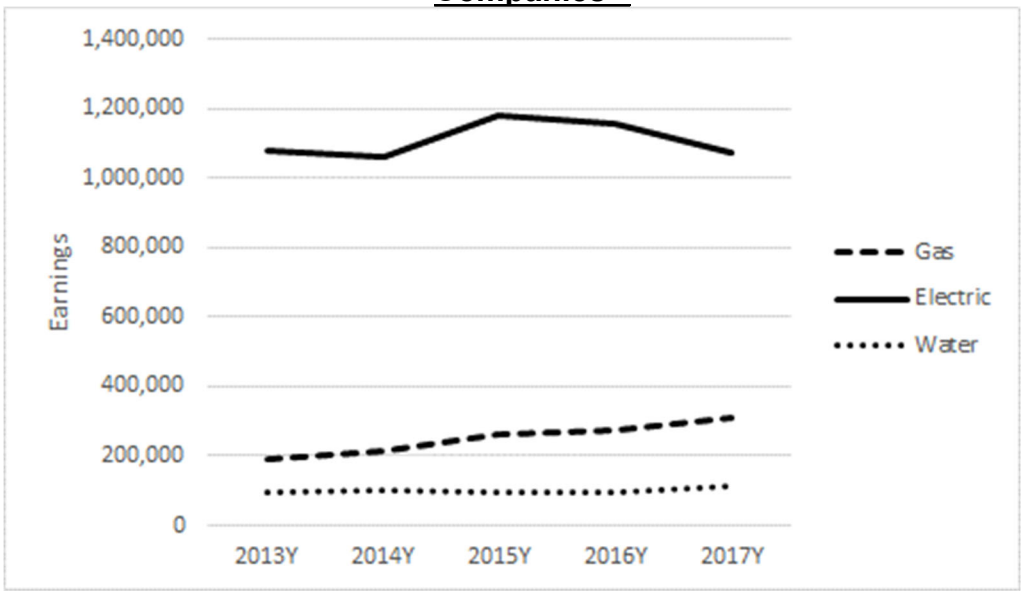


Chart 3: Annual Earnings of Publicly Traded Electric, Gas, and Water Companies[45]



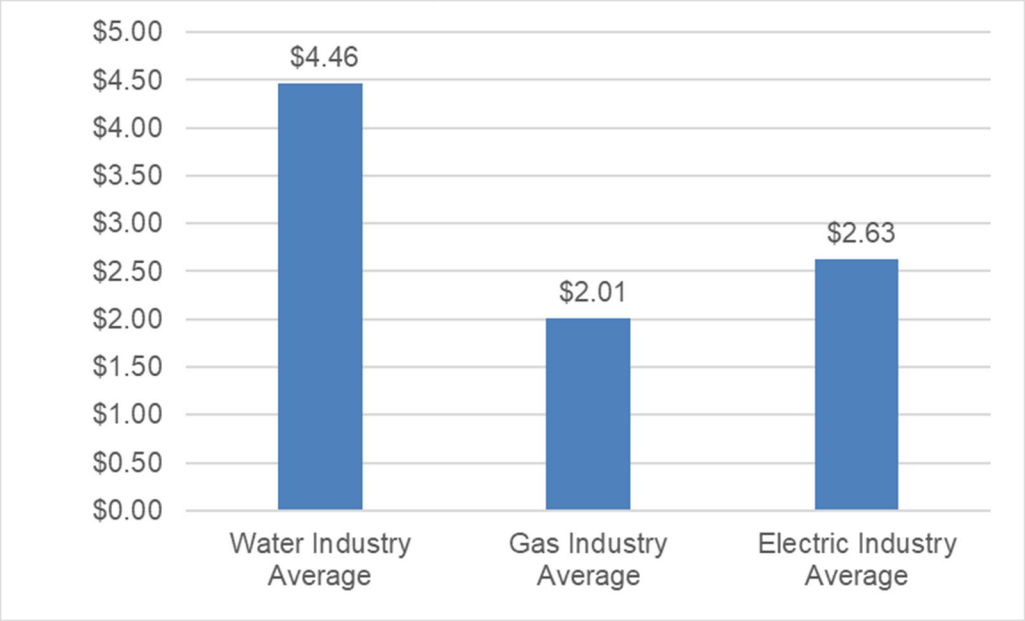
[44] Source: SNL Financial.
[45] *Ibid.*

Q. **Are there other ways to measure relative risk between electric, gas and water industries?**

A. Yes. As stated in my direct testimony,[46] water utility companies have high capital intensity (how many dollars of plant generate one dollar in revenue) and low depreciation rates (a source of internal cash flow). As a capital-intensive industry, water utilities require significantly greater capital investment in infrastructure required to produce a dollar of revenue than electric and natural gas utilities. For example, as shown on Chart 4, below, it took $4.46 of net utility plant on average to produce $1.00 in operating revenues in 2017 for the water utility industry as a whole. In contrast, for the electric and natural gas utility industries, on average it took just $2.63 and $2.01, respectively, to produce $1.00 in operating revenues in 2017. As financing needs have increased and will continue to increase, the competition for capital from traditional sources has increased and continues to increase, making the need to maintain financial integrity and the ability to attract needed new capital increasingly important.

[46] D'Ascendis direct testimony, at 7-8.

Chart 4: Capital Intensity of Publicly Traded Electric, Gas, and Water Companies[47]



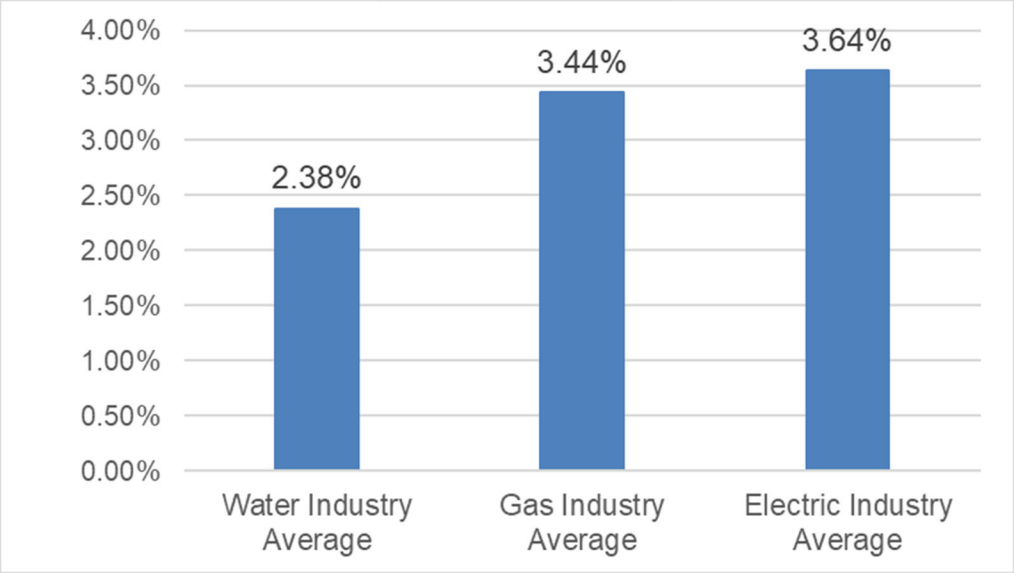
Coupled with its capital-intensive nature, the water utility industry also experiences lower relative depreciation rates compared with other types of utilities. Given that depreciation is one of the principal sources of internally-generated cash flows for all utilities, lower depreciation rates mean that water utilities cannot rely upon depreciation as a source of cash to the same extent that electric and gas utilities do. Because water utility assets have longer lives and, hence, longer capital recovery periods than other types of utilities, water utilities face greater risk due to inflation, which results in a significantly higher replacement cost per dollar of net plant than for other types of utilities.

As shown on Chart 5, below, water utilities experienced an average depreciation rate of 2.38% for 2017. In contrast, in 2017, the electric and

47 Source: SNL Financial, Company 10-K Filings.

natural gas utilities experienced average depreciation rates of 3.64% and 3.44%, respectively. Low depreciation rates signify that the pressure on cash flows remains significantly greater for water utilities than for other types of utilities.

Chart 5: Depreciation Rates of Publicly Traded Electric, Gas, and Water Companies[48]



Q. **What are the average betas for the companies comprising each industry?**

A. The data is provided in Table 5, below. As shown, the water industry's average beta is 0.767, while the electric and gas utility betas are 0.643 and 0.685, respectively. Since beta is a measure of systematic risk, this measure indicates the higher relative risk of the water industry over the electric and gas industries at this time.

48 *Ibid.*

Table 5: Average Betas of the Electric, Gas, and Water Industries[49]

Industry	Average Beta
Electric	0.643
Gas	0.685
Water	0.767

D. Consideration of Mechanisms in Place for CWSNC

Q. **Mr. Hinton discusses the Company's Water and Sewer System Improvement Charges ("WSIC" and "SSIC") mechanisms that he claims impact risk for CWSNC.[50] Is his claim valid?**

A. No. The cost of capital is a comparative exercise, so if the mechanism is common throughout the companies that one bases their analyses on, the comparative risk is zero because any impact of the perceived reduced risk of the mechanism(s) by investors would be reflected in the market data of the proxy group. To that point, as shown on Schedule DWD-10R, every single one of the proxy companies has a Distribution Service Improvement Charge or comparable Water Revenue Adjustment Mechanism in at least one of their jurisdictions.

VII. CONCLUSION

Q. **Does this conclude your rebuttal testimony?**

A. Yes, it does.

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49 Value Line Investment Survey, Standard Edition.

50 Hinton Direct Testimony, at 31.