



**NORTH CAROLINA  
PUBLIC STAFF  
UTILITIES COMMISSION**

November 5, 2021

Ms. A. Shonta Dunston, Chief Clerk  
North Carolina Utilities Commission  
4325 Mail Service Center  
Raleigh, North Carolina 27699-4300

Re: Docket No. W-354, Sub 384 – Application by Carolina Water Service, Inc. of North Carolina, 4944 Parkway Plaza Boulevard, Suite 375, Charlotte North Carolina 28217 for Authority to Adjust and Increase Rates for Water and Sewer Utility Service in All of Its Service Areas in North Carolina

Dear Ms. Dunston:

Attached for filing on behalf of the Public Staff in the above-referenced docket are the testimony and exhibits of John R. Hinton, Director, Public Staff Economic Research Division.

By copy of this letter, I am forwarding a copy to all parties of record by electronic delivery.

Sincerely,

Electronically submitted  
s/John D. Little  
Staff Attorney  
[john.little@psncuc.nc.gov](mailto:john.little@psncuc.nc.gov)

**Attachments**

Executive Director  
(919) 733-2435

Accounting  
(919) 733-4279

Consumer Services  
(919) 733-9277

Economic Research  
(919) 733-2267

Energy  
(919) 733-2267

Legal  
(919) 733-6110

Transportation  
(919) 733-7766

Water/Telephone  
(919) 733-5610

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. W-354, SUB 384

In the Matter of )  
Application by Carolina Water Service, )  
Inc. of North Carolina, 4944 Parkway )  
Plaza Boulevard, Suite 375, Charlotte, )  
North Carolina 28217 for Authority to )  
Adjust and Increase Rates for Water )  
and Sewer Utility Service in All of Its )  
Service Areas in North Carolina )

TESTIMONY OF  
JOHN R. HINTON  
PUBLIC STAFF – NORTH  
CAROLINA UTILITIES  
COMMISSION

**CAROLINA WATER SERVICE, INC. OF NORTH CAROLINA  
DOCKET NO. W-354, SUB 384**

**TESTIMONY OF JOHN R. HINTON  
ON BEHALF OF THE PUBLIC STAFF  
NORTH CAROLINA UTILITIES COMMISSION**

**NOVEMBER 5, 2021**

1 **Q. PLEASE STATE YOUR NAME, POSITION, AND BUSINESS**  
2 **ADDRESS FOR THE RECORD.**

3 A. My name is John R. Hinton and my business address is 430 North  
4 Salisbury Street, Raleigh, North Carolina. I am the Director of the  
5 Economic Research Division of the Public Staff. My qualifications  
6 and experience are provided in Appendix A.

7 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS**  
8 **PROCEEDING?**

9 A. The purpose of my testimony is to present to the North Carolina  
10 Utilities Commission (Commission) the results of my analysis and  
11 my recommendations as to the fair rate of return to be used in  
12 establishing rates for water and sewer utility service provided by  
13 Carolina Water Service, Inc. of North Carolina (CWSNC or  
14 Company).

15

1 **Q. WHAT IS THE CURRENTLY APPROVED COST OF CAPITAL**  
2 **FOR CWSNC?**

3 A. In the last CWSNC general rate case, Docket No. W-354, Sub 364,  
4 the Commission approved a capital structure of 50.90% long-term  
5 debt, 49.10% common equity, a cost rate of long-term debt of  
6 5.36%, and a cost rate of common equity of 9.50% for an overall  
7 weighted cost of capital of 7.39%.

8 **Q. WHAT IS THE COST OF CAPITAL REQUESTED BY CWSNC IN**  
9 **THIS PROCEEDING?**

10 A. Company witness Drennan's Supplemental Testimony filed on  
11 October 8, 2021 proposes an overall weighted cost of capital of  
12 7.60%. This applied for rate of return is based on a updated capital  
13 structure as of March 31, 2021, that is comprised of 50.57% long-  
14 term debt, 49.43% common equity. The Company has requested a  
15 cost rate of long-term debt of 4.76%, and a cost rate for common  
16 equity of 10.50% as testified to by witness D'Ascendis.

17 **Q. HOW DOES CWSNC WITNESS D'ASCENDIS DEVELOP HIS**  
18 **RECOMMENDATION?**

19 A. CWSNC witness Dylan D'Ascendis utilizes three cost of equity  
20 methods: (1) Discounted Cash Flow (DCF); (2) the Risk Premium  
21 Model which relies on the Predictive Risk Premium method (PRPM)

1 and the Total Market Approach RPM; and (3) Capital Asset Pricing  
2 Model (CAPM). He applies these methodologies to a proxy group of  
3 six publically traded water companies. D'Ascendis' first method relies  
4 on the DCF model which produces an 8.63% estimated cost of equity.  
5 For his other cost of equity models, he produced two cost of equity  
6 estimates that rely on either current interest rates and projected  
7 interest rates.

8 Mr. D'Ascendis' second method employs the Risk Premium model,  
9 which produces an 11.03% estimated cost of equity using projected  
10 interest rates and 10.53% using current interest rates.

11 Mr. D'Ascendis' third method employs the mean and medium results  
12 of his traditional and empirical capital asset pricing model (CAPM),  
13 which produces a 10.68% estimated cost of equity using projected  
14 interest rates and 10.24% using current interest rates.

15 His fourth method applies the above three models to a group of non-  
16 price regulated companies that he selected with the use of Value  
17 Line's beta coefficients along with the residual standard errors. This  
18 method resulted in cost of equity estimates that range from 10.13% to  
19 10.42% using projected interest rates and 9.81% to 10.05% using  
20 current interest rates.

1           Given that the witness believes that CWSNC's small size relative to  
2           his proxy groups is riskier, he increases the baseline cost of equity by  
3           0.40% using projected interest rates and using current interest rates.  
4           As such, his overall recommended cost of common equity of 10.50%  
5           is based on cost rates that range from 10.53% to 10.82% using  
6           projected interest rates 10.21% to 10.45% using current interest rates.

7   **Q.   WHAT IS THE OVERALL RATE OF RETURN RECOMMENDED**  
8   **BY THE PUBLIC STAFF?**

9   A.   The Public Staff recommends an overall rate of return of 6.90%,  
10       based on the updated capital structure as of September 30, 2021  
11       that consists of 49.80% long-term debt and 50.20% common  
12       equity. The recommended overall cost of capital incorporates the  
13       updated September 30, 2021 capital structure for Corix Regulated  
14       Utilities, Inc. (Corix) a recommended debt cost rate of 4.85%, and  
15       an 8.93% return on common equity (ROE). Relative to the  
16       Company's last rate case, Sub 364, the reduction in the Public  
17       Staff's recommended ROE represents a 17 basis point reduction  
18       from the 9.10% cost rate for common equity. Based on the Public  
19       Staff's recommended rate base, capital structure, and  
20       recommended cost of debt, the proposed 10.50% ROE as  
21       compared to the Public Staff's recommended 8.93% ROE leads to  
22       an approximate \$1.5 million increase in CWSNC's revenue

1 requirements.

2 **Q. HOW IS THE REMAINDER OF YOUR TESTIMONY**  
3 **STRUCTURED?**

4 A. The remainder of my testimony is presented in the following six  
5 sections:

6 I. Legal and Economic Guidelines for Fair Rate of Return.

7 II. Present Financial Market Conditions.

8 III. Appropriate Capital Structure and Cost of Long-Term Debt.

9 IV. The Cost of Common Equity Capital.

10 V. Concerns with Company Witness D'Ascendis' Testimony.

11 VI. Summary and Recommendations.

12 **I. LEGAL AND ECONOMIC GUIDELINES FOR**  
13 **FAIR RATE OF RETURN**

14 **Q. PLEASE BRIEFLY DESCRIBE THE ECONOMIC AND LEGAL**  
15 **FRAMEWORK OF YOUR ANALYSIS.**

16 A. Public utilities possess certain characteristics of natural  
17 monopolies. For instance, it is more efficient for a single firm to  
18 provide a service such as water production and distribution or  
19 wastewater collection and treatment than for two or more firms  
20 offering the same service in the same area to do so. Therefore,  
21 regulatory bodies have assigned franchised territories to public

1 utilities to provide services more efficiently and at a lower cost to  
2 consumers.

3 **Q. WHAT IS THE ECONOMIC RELATIONSHIP BETWEEN RISK**  
4 **AND THE COST OF CAPITAL?**

5 A. The cost of equity capital to a firm is equal to the rate of return  
6 investors expect to earn on the firm's securities given the securities'  
7 level of risk. Investors will require a higher expected return from an  
8 investment with a greater risk. In Federal Power Comm'n v. Hope  
9 Natural Gas Co., 320 U.S. 591, 603 (1944) (Hope), the United  
10 States Supreme Court stated:

11 [T]he return to the equity owner should be  
12 commensurate with returns on investments in other  
13 enterprises having corresponding risks. That return,  
14 moreover, should be sufficient to assure confidence in  
15 the financial integrity of the enterprise, so as to  
16 maintain its credit and to attract capital.

17 In Bluefield Waterworks & Impr. Co. v. Public Service Comm'n, 262  
18 U.S. 679, 692-93 (1923) (Bluefield) the United States Supreme  
19 Court stated:

20 A public utility is entitled to such rates as will permit it  
21 to earn a return on the value of the property which it  
22 employs for the convenience of the public equal to  
23 that generally being made at the same time and in the  
24 same general part of the country on investments in  
25 other business undertakings which are attended by  
26 corresponding risks and uncertainties, but it has no  
27 constitutional right to profits such as are realized or  
28 anticipated in highly profitable enterprises or



1 speculative ventures. The return should be  
2 reasonably sufficient to assure confidence in the  
3 financial soundness of the utility and should be  
4 adequate, under efficient and economical  
5 management, to maintain and support its credit and  
6 enable it to raise the money necessary for the proper  
7 discharge of its public duties. A rate of return may be  
8 reasonable at one time and become too high or too  
9 low by changes affecting opportunities for investment,  
10 the money market, and business conditions.

11 These two decisions recognize that utilities are competing for the  
12 capital of investors and provide legal guidelines as to how the  
13 allowed rate of return should be set. The decisions specifically  
14 speak to the standards or criteria of capital attraction, financial  
15 integrity, and comparable earnings. The Hope decision, in  
16 particular, recognizes that the cost of common equity is  
17 commensurate with the risk relative to investments in other  
18 enterprises. In competitive capital markets, the required return on  
19 common equity will be the expected return foregone by not  
20 investing in alternative stocks of comparable risk. Thus, in order for  
21 the utility to attract capital, possess financial integrity, and exhibit  
22 comparable earnings, the return allowed on a utility's common  
23 equity should be that return required by investors for stocks with  
24 comparable risk. As such, the return requirements of debt and  
25 equity investors, which is shaped by expected risk and return, is  
26 paramount in attracting capital.

1 It is widely recognized that a public utility should be allowed a rate  
2 of return on capital, which will allow the utility, under prudent  
3 management, to attract capital under the criteria or standards  
4 referenced by the Hope and Bluefield decisions. If the allowed rate  
5 of return is set too high, consumers are burdened with excessive  
6 costs, current investors receive a windfall, and the utility has an  
7 incentive to overinvest. Likewise, customers will be charged prices  
8 that are greater than the true economic costs of providing these  
9 services. Consumers will consume too few of these services from a  
10 point of view of efficient resource allocation. If the return is set too  
11 low, then the utility stockholders would suffer because a declining  
12 value of the underlying property will be reflected in a declining value  
13 of the utility's equity shares. This could happen because the utility  
14 would not be earning enough to maintain and expand its facilities to  
15 meet customer demand for service, cover its operating costs, and  
16 attract capital on reasonable terms. Lenders will shy away from the  
17 company because of the increased risk that the utility will default on  
18 its debt obligations. Because a public utility is capital intensive, the  
19 cost of capital is a very large part of its overall revenue requirement  
20 and is a crucial issue for a company and its ratepayers.

21 The Hope and Bluefield standards are embodied in N.C. Gen. Stat.  
22 § 62-133(b)(4), which requires that the allowed rate of return be

1 sufficient to enable a utility by sound management:

2 “...to produce a fair return for its shareholders,  
3 considering changing economic conditions and other  
4 factors, . . . to maintain its facilities and services in  
5 accordance with the reasonable requirements of its  
6 customers in the territory covered by its franchise, and  
7 to compete in the market for capital funds on terms  
8 that are reasonable and are fair to its customers and  
9 to its existing investors.”

10 N.C. Gen. Stat. § 62-133(b)(4) (2017).

11 On April 12, 2013, the North Carolina Supreme Court decided State  
12 ex rel. Utils. Comm’n v. Cooper, 366 N.C. 484, 739 S.E. 2d 541  
13 (2013) (Cooper). In that decision, the Supreme Court reversed and  
14 remanded the Commission’s January 27, 2012, Order in Docket  
15 No. E-7, Sub 989, approving a stipulated return on equity of  
16 10.50% for Duke Energy Carolinas, LLC. In its decision, the  
17 Supreme Court held (1) that the 10.50% return on equity was not  
18 supported by the Commission’s own independent findings and  
19 analysis as required by State ex rel. Utils. Comm’n v. Carolina Util.  
20 Customers Ass’n, 348 N.C. 452, 500 S.E.2d 693 (1998) (CUCA I),  
21 in cases involving nonunanimous stipulations, and (2) that the  
22 Commission must make findings of fact regarding the impact of  
23 changing economic conditions on consumers when determining the  
24 proper return on equity for a public utility. In Cooper, the Court’s  
25 holding introduced a new factor to be considered by the

1 Commission regardless of whether there is a stipulation.

2 In considering this new element, the Commission is guided by  
3 ratemaking principles laid down by statute and interpreted by a  
4 body of North Carolina case law developed over many years.  
5 According to these principles, the test of a fair rate of return is a  
6 return on equity that will provide a utility, by sound management,  
7 the opportunity to (1) produce a fair profit for its shareholders in  
8 view of current economic conditions, (2) maintain its facilities and  
9 service, and (3) compete in the marketplace for capital. State ex rel.  
10 Utils. Comm'n v. General Tel. Co., 281 N.C. 318, 370, 189 S.E.2d  
11 705, 738 (1972). Rates should be set as low as reasonably  
12 possible consistent with constitutional constraints. State ex rel.  
13 Utils. Comm'n v. Pub. Staff-N. Carolina Utils. Comm'n, 323 N.C.  
14 481, 490, 374 S.E.2d 361, 366 (1988). The exercise of subjective  
15 judgment is a necessary part of setting an appropriate return on  
16 equity. Id. Thus, in a particular case, the Commission must strike a  
17 balance that (1) avoids setting a return so low that it impairs the  
18 utility's ability to attract capital, (2) avoids setting a return any

1 higher than needed to raise capital on reasonable terms, and (3)  
2 considers the impact of changing economic conditions on  
3 consumers.

4 **Q. WHAT IS A FAIR RATE OF RETURN?**

5 A. The fair rate of return is simply a percentage, which, when  
6 multiplied by a utility's rate base investment will yield the dollars of  
7 net operating income, a utility should reasonably have the  
8 opportunity to earn. This dollar amount of net operating income is  
9 available to pay the interest cost on a utility's debt capital and a  
10 return to the common equity investor. The fair rate of return  
11 multiplied by the utility's rate base yields the dollars a utility needs  
12 to recover in order to earn the investors' required return on capital.

13 **Q. HOW DID YOU DETERMINE THE FAIR RATE OF RETURN THAT**  
14 **YOU RECOMMEND IN THIS PROCEEDING?**

15 A. To determine the fair rate of return, I performed a cost of capital  
16 study consisting of three steps. First, I determined the appropriate  
17 capital structure for ratemaking purposes, i.e., the proper  
18 proportions of each form of capital. Utilities normally finance assets  
19 with debt and common equity. Because each of these forms of  
20 capital have different costs, especially after income tax  
21 considerations, the relative amounts of each form employed to

1 finance the assets can have a significant influence on the overall  
2 cost of capital, revenue requirements, and rates. Thus, the  
3 determination of the appropriate capital structure for ratemaking  
4 purposes is important to the utility and to ratepayers. Second, I  
5 determined the cost rate of each form of capital. The individual debt  
6 issues have contractual agreements explicitly stating the cost of  
7 each issue. The embedded annual cost rate of debt is generally  
8 calculated with the annual interest cost divided by the debt  
9 outstanding. The cost of common equity is more difficult to  
10 determine because it is based on the investor's opportunity cost of  
11 capital. Third, by combining the appropriate capital structure ratios  
12 for ratemaking purposes with the associated cost rates, I calculate  
13 an overall weighted cost of capital or fair rate of return.

14 **II. PRESENT FINANCIAL MARKET CONDITIONS**

15 **Q. CAN YOU BRIEFLY DESCRIBE CURRENT FINANCIAL MARKET**  
16 **CONDITIONS?**

17 A. Yes. The cost of financing is much lower today than in the more  
18 inflationary period of the 1990s. While current CPIU-base inflation  
19 rates have been over 5% since May 2021, the average for the first 6  
20 months was 3.4%. Relatively low rates of inflation and expectations  
21 of future low inflation rates have contributed to even lower interest

1 rates. According to Moody's Bond Survey, yields on long-term  
2 monthly "A" rated public utility bond yields have fallen 54 basis points  
3 from 3.50% for March 31, 2020 Order in Docket No. W-354, Sub 364  
4 to 2.96% for September, 2021. By the close of this proceeding, the  
5 Company will have received six rate increases over the last eight  
6 eight years (Docket Nos. W-354, Sub 360, Sub 356, Sub 344, Sub  
7 336 and Sub 364). Relative to the filing of the 9.75% cost of equity  
8 settlement in the January 2014 rate case in Docket No. W-354, Sub  
9 336, yields on Moody's A-rated utility bonds are 167 basis points  
10 lower than the average 4.63% yield observed during January 2014,  
11 as illustrated in my Exhibit 1.

12 **Q. HOW DO INTEREST RATES AFFECT THE FINANCING COSTS**  
13 **OF A COMPANY?**

14 A. The lower interest rates, especially for longer-term securities,  
15 indicate that borrowers are paying less for the time value of money.  
16 This is significant since utility stocks and utility capital costs are  
17 highly interest rate-sensitive relative to most industries within the  
18 securities markets. Furthermore, given that investors often view  
19 purchases of the common stocks of utilities as substitutes for fixed  
20 income investments, the reductions in interest rates observed over  
21 the past ten or more years has generally followed the decreases in  
22 investor required rates of return on common equity.

1 Q. WITH THE DECREASES IN INTEREST RATES, DO YOU RELY  
2 ON INTEREST RATE PREDICTIONS IN YOUR INVESTIGATION?

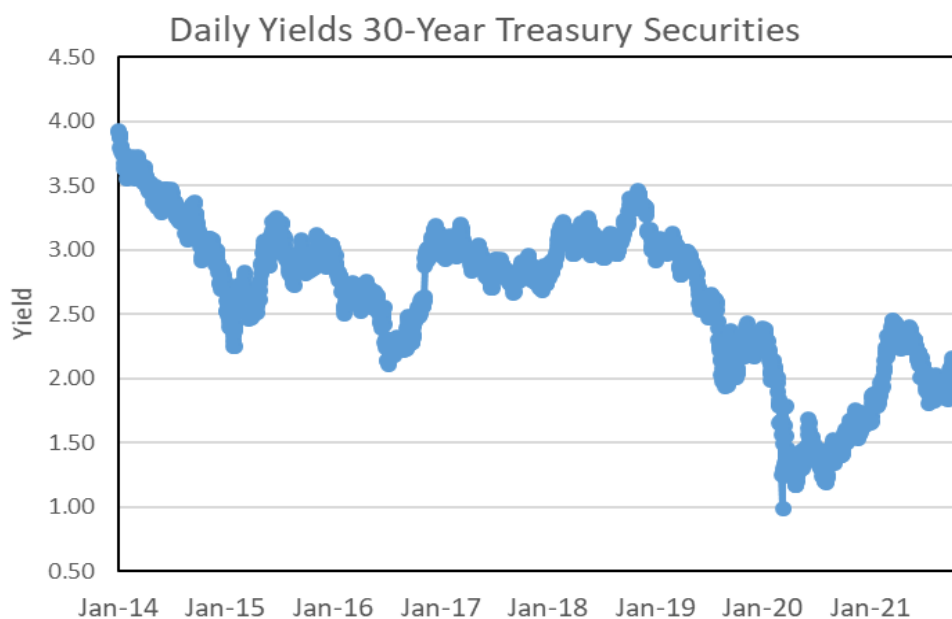
3 A. No. I do not rely on interest rate forecasts to determine the cost of  
4 equity. Rather, I believe that relying on current interest rates,  
5 especially in relation to yields on long-term bonds, is more  
6 appropriate for ratemaking. In that, it is reasonable to expect that as  
7 investors are pricing bonds in the marketplace, their pricing is based  
8 on expectations on the domestic and international demand and  
9 supply of capital, future interest rates, future inflation rates, and other  
10 relevant factors. While I have a healthy respect for forecasting, I am  
11 aware of the risk of relying on predictions of rising interest rates to  
12 determine utility rates. A case can be observed in the testimony of  
13 witness Ahern in the 2013 Aqua rate case, Docket W-218, Sub 363.  
14 In that proceeding, she identified several interest rate forecasts by  
15 Blue Chip Financial Forecasts of 30-year Treasury Bonds yields that  
16 were predicted to rise to 4.3% in 2015, 4.7% in 2016, 5.2% in 2017,  
17 and 5.5% for 2020 – 2024<sup>1</sup>. As illustrated in the graph below, these  
18 forecasts significantly over-estimated actual interest rates for 30-year  
19 Treasury Bonds. Similar over-estimated forecasts can be identified in  
20 witness D'Ascendis' Exhibit DWD-4 in the Company's 2018 rate  
21 case, where the Blue Chip Consensus Forecasts predicted the 30-

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<sup>1</sup> Docket W-218 Sub 363, T. Vol. 2, page 171, lines 8-9.



1 year Treasury Bonds would rise to 3.8% by the third quarter of 2019.  
2 According to the Federal Reserve, the highest observed yield on 30-  
3 year Treasury Bonds for the third quarter of 2019 is 2.65%, and the  
4 average for the quarter was 2.29%, a forecasting error between 115  
5 to 151 basis points. In my opinion, these types of errors make these  
6 forecasts inappropriate for ratemaking.



7  
8 In addition, the tendency of economists to make poor interest rate  
9 predictions in the last ten years was addressed in a December 14,  
10 2019 Wall Street Journal article entitled, "Economists Got the  
11 Decade All Wrong. They're Trying to Figure Out Why," and attached  
12 as Hinton Exhibit 2. The foregoing examples illustrate why I tend to  
13 place more weight in current market interest rates that are inherently  
14 forward looking as they reflect investor expectations of both current

1 and future returns on bonds, and to an extent, future rates of  
2 inflation.

3 **III. APPROPRIATE CAPITAL STRUCTURE AND**  
4 **COST OF LONG-TERM DEBT**

5 **Q. WHY IS THE APPROPRIATE CAPITAL STRUCTURE**  
6 **IMPORTANT FOR RATEMAKING PURPOSES?**

7 A. For companies that do not have monopoly power, the price that an  
8 individual company charges for its products or services is set in a  
9 competitive market, and that price is generally not influenced by the  
10 company's capital structure. However, the capital structure that is  
11 determined to be appropriate for a regulated public utility has a  
12 direct bearing on the fair rate of return, revenue requirement, and,  
13 therefore, the prices charged to captive ratepayers.

14 **Q. PLEASE EXPLAIN THE TERM CAPITAL STRUCTURE AND**  
15 **HOW THE CAPITAL STRUCTURE APPROVED FOR**  
16 **RATEMAKING PURPOSES AFFECTS RATES.**

17 A. The capital structure is simply a representation of how a utility's  
18 assets are financed. It is the relative proportions or ratios of debt  
19 and common equity to the total of these forms of capital, which  
20 have different costs. Common equity is far more expensive than  
21 debt for ratemaking purposes for two reasons. First, as mentioned

1 earlier, there are income tax considerations. Interest on debt is  
2 deductible for purposes of calculating income taxes. The cost of  
3 common equity, on the other hand, must be “grossed up” to allow  
4 the utility sufficient revenue to pay income taxes and to earn its cost  
5 of common equity on a net or after-tax basis. Therefore, the amount  
6 of revenue the utility must collect from ratepayers to meet income  
7 tax obligations is directly related to both the common equity ratio in  
8 the capital structure and the cost of common equity. A second  
9 reason for this cost difference is that the cost of common equity  
10 must be set at a marginal or current cost rate. Conversely, the cost  
11 of debt is set at an embedded rate because the utility is incurring  
12 costs that are previously established in contracts with security  
13 holders.

14 Because the Commission has the duty to promote economic utility  
15 service, it must decide whether or not a utility’s requested capital  
16 structure is appropriate for ratemaking purposes. An example of the  
17 cost difference can be seen in the Company’s filing. Based upon  
18 the Company’s requested capital cost rates, each dollar of its  
19 common equity, and long-term debt that supports the retail rate  
20 base has the following approximate annual costs (including income  
21 tax, regulatory fee, and gross receipts tax expense) to ratepayers:

1 (1) Each \$1 of common equity costs a ratepayer  
2 approximately 12 cents per year.

3  
4 (2) Each \$1 of long-term debt costs a ratepayer  
5 approximately 5 cents per year.

6 **Q. DO YOU SUPPORT THE CAPITAL STRUCTURE PROPOSED BY**  
7 **THE COMPANY IN THIS CASE?**

8 A. While the Corix's proposed capital structure is reasonable, I  
9 recommend that the Company update its proposed capital structure  
10 as of September 30, 2021. As compared to the proposed capital  
11 structure as of March 31, 2021, my recommended capital structure  
12 contains slightly more common equity. This increase is largely due to  
13 the parent company's infusion of common equity in August 2021, a  
14 significant increase in paid in capital, the additional growth of  
15 retained earnings, which contributed to the increase in the balance  
16 of common equity, and a debt repayment in September 2021. I  
17 believe that the updated capital structure with 49.80% long-term  
18 debt and 50.20% common equity is both representative and  
19 reasonable for ratemaking. The support for the recommended  
20 balances of long-term debt and common equity in the capital  
21 structure that underlie the proposed ratios is shown in my Exhibit 3.

22 **Q. WHAT IS YOUR RECOMMENDED COST OF LONG-TERM**

1           **DEBT?**

2    A.    I recommend the use of the embedded cost of debt as of  
3           September 30, 2021, of 4.85%. The reduction in the embedded  
4           cost rate from the 2019 rate case in Docket No. W-354, Sub 364  
5           reflects the addition of \$200,000,000 of other long-term issuances  
6           at significantly lower interest rates relative to the 6.58% cost of  
7           debt. This series of debt is associated with a Master Note Purchase  
8           Agreement of Collateral Trust Notes totaling \$180,000,000 with  
9           \$9,000,000 annual payments that began in 2017 and  
10          continuethrough 2035. The Company maintains that the make  
11          whole provisions contained in these Notes make it uneconomical  
12          for refinancing. The Public Staff continues to urge the Company to  
13          investigate sources of capital that minimize the embedded cost rate  
14          for long-term debt. My recommended capital structure and cost of  
15          debt are as follows:

16                   **CORIX REGULATED UTILITIES AND SUBSIDIARY COMPANIES**

17   **as of September 30, 2021**

	<u>Item</u>	<u>Ratio</u>	<u>Cost Rate</u>
18			
19	Long-Term Debt	\$ 341,467,855	49.80%    4.85%
20	<u>Common Equity</u>	<u>\$ 344,152,953</u>	<u>50.20%</u>
21	Total	\$ 658,620,808	100.00%

#### **IV. THE COST OF COMMON EQUITY CAPITAL**

1 **Q. HOW DID YOU DEFINE THE COST OF COMMON EQUITY?**

2 A. The cost of equity capital for a firm is the expected rate of return on  
3 common equity that investors require in order to induce them to  
4 purchase shares of the firm's common stock. The return is  
5 expected given that when the investor buys a share of the firm's  
6 common stock, he does not know with certainty what his returns will  
7 be in the future.

8 **A: DCF METHOD**

9 **Q. HOW DID YOU DETERMINE THE COST OF COMMON EQUITY**  
10 **CAPITAL FOR THE COMPANY?**

11 A. I used the discounted cash flow (DCF) model and the Risk  
12 Premium model to determine the cost of equity for the Company.

13 **Q. PLEASE DESCRIBE YOUR DCF ANALYSIS.**

14 A. The discounted cash flow model is a method of evaluating the  
15 expected cash flows from an investment by giving appropriate  
16 consideration to the time value of money. The DCF model is based  
17 on the theory that the price of the investment will equal the  
18 discounted cash flows of returns. The return to an equity investor  
19 comes in the form of expected future dividends and price  
20 appreciation. However, as the new price will again be the sum of

1 the discounted cash flows, price appreciation is ignored, and  
2 attention focused on the expected stream of dividends.  
3 Mathematically, this relationship may be expressed as follows:

4 Let  $D_1$  = expected dividends per share over the next twelve months;

5  $g$  = expected growth rate of dividends;

6  $k$  = cost of equity capital; and

7  $P$  = price of stock or present value of the future income  
8 stream.

9 Then,

$$10 \quad P = \frac{D_1}{1+k} + \frac{D_1(1+g)}{(1+k)^2} + \frac{D_1(1+g)^2}{(1+k)^3} + \dots + \frac{D_1(1+g)^{t-1}}{(1+k)^t}$$

13 This equation represents the amount an investor would be willing to  
14 pay for a share of common stock with a dividend stream over the  
15 future periods. Using the formula for a sum of an infinite geometric  
16 series, this equation may be reduced to:

$$17 \quad P = \frac{D_1}{k-g}$$

20 Solving for  $k$  yields the DCF equation:

$$21 \quad k = \frac{D_1 + g}{P}$$

24

1           Therefore, the rate of return on equity capital required by investors  
2           is the sum of the dividend yield ( $D_1/P$ ) plus the expected long-term  
3           growth rate in dividends ( $g$ ).

4   **Q.    DID YOU APPLY THE DCF METHOD DIRECTLY TO CWSNC?**

5   A.    No, the the common stock of the ultimate owner of CWSNC is the  
6        British Columbia Investment Management Corporation (BCIMC)  
7        whose common equity shares are not publicly traded; rather, it is a  
8        private equity fund. Thus to estimate the investor required rate of  
9        return, I applied the DCF method to a risk-comparable investment  
10       comprised of seven water utilities followed by Value Line  
11       Investment Survey (Value Line). The standard edition of Value Line  
12       covers eight water companies. I excluded Consolidated Water Co.  
13       from my group because of its significant overseas operations.

14   **Q.    WHAT MEASURES OF RISK DID YOU REVIEW TO**  
15        **DETERMINE THE COMPARABILITY OF INVESTING IN**  
16        **WATER UTILITIES?**

17   A.    I reviewed standard risk measures that are widely available to  
18        investors and are considered by most investors when making  
19        investment decisions. The beta coefficient is a measure of the  
20        sensitivity of a stock's price to overall fluctuations in the market.  
21        The Value Line Investment Survey beta coefficient describes



1 the relationship between a company's stock price and the New  
2 York Stock Exchange Composite. A beta value of less than 1.0  
3 means that the stock's price is less volatile than the movement  
4 in the market; conversely, a beta value greater than 1.0  
5 indicates that the stock price is more volatile than the market.

6 I reviewed the Value Line Safety Rank, which is defined as a  
7 measure of the total risk of a stock. The Safety Rank is  
8 calculated by averaging two variables: (1) the stock's index of  
9 price stability and (2) the Financial Strength rating of the  
10 company. In addition, I reviewed the S&P Common Stock  
11 Rating. The stock rating system takes into consideration two  
12 important factors in the determination of a stock's rating: the  
13 stability and growth of earnings and dividends. However, the  
14 stock rating does not consider a company's balance sheet or  
15 other factors. The stock rating system has seven grades, with  
16 A+ being the highest rating possible.

17 I also reviewed Moody's and S&P's Bond Rating, which are  
18 assessments of a company's creditworthiness. Credit rating  
19 agencies focus on the creditworthiness of the particular bond  
20 issuer, which includes a detailed and thorough review of the  
21 potential areas of business risk and financial risk of the

1 company. These and other risk measures for the comparable  
2 groups are shown in my Exhibit 4 and are further explained in  
3 Appendix B.

4 **Q. HOW DID YOU DETERMINE THE DIVIDEND YIELD**  
5 **COMPONENT OF THE DCF?**

6 A. I calculated the dividend yield by using the Value Line estimate of  
7 dividends to be declared over the next 12 months divided by the  
8 price of the stock as reported in the Value Line Summary and Index  
9 sections for each week of the 13-week period of July 30, 2021,  
10 through October 22, 2021. A 13-week averaging period tends to  
11 smooth out short-term variations in the stock prices. This process  
12 resulted in an average dividend yield of 1.6% for the comparable  
13 group of water utilities.

14 **Q. HOW DID YOU DETERMINE THE EXPECTED GROWTH RATE**  
15 **COMPONENT OF THE DCF?**

16 A. I employed the growth rates of the comparable group in earnings  
17 per share (EPS), dividend per share (DPS), and book value per  
18 share (BPS) as reported in Value Line over the past ten and five  
19 years. I also employed the forecasts of the growth rates of the  
20 comparable groups in EPS, DPS, and BPS, as reported in Value  
21 Line. The historical and forecasted growth rates are prepared by

1 analysts of an independent advisory service that is widely available  
2 to investors and should also provide an estimate of investor  
3 expectations. I include both known, historical growth rates and  
4 forecasted growth rates because it is reasonable to expect that  
5 investors consider both sets of data in deriving their expectations.

6 Finally, I incorporated the consensus of various analysts' forecasts  
7 of five-year EPS growth rate projections, as reported in Yahoo  
8 Finance. The dividend yields and growth rates for each of the  
9 companies and for the average for the comparable group are  
10 shown in my Exhibit 5.

11 **Q. WHAT IS YOUR CONCLUSION REGARDING THE COST OF**  
12 **COMMON EQUITY TO THE COMPANY BASED ON THE DCF**  
13 **METHOD?**

14 A. Based upon the DCF analysis for the comparable group of water  
15 utilities, I determined that a reasonable expected dividend yield is  
16 1.6%. Based on the average historical growth rate of the group, I  
17 believe a 6.98% expected growth rate is reasonable for investors.  
18 Assuming that investors give weight to forecasted growth rates, I  
19 believe that a 6.68% expected growth rate is also reasonable.  
20 Lastly, based on the average historical and forecasted growth rates,  
21 it is reasonable to expect investors to consider the 6.86% growth

1 rate. The combination of expected dividend yield and the expected  
2 growth rate yields a range of of 8.3% to 8.6% cost of equity.

3 **B: REGRESSION ANALYSIS METHOD**

4 **Q. PLEASE DESCRIBE YOUR RISK PREMIUM ANALYSIS.**

5 A. The equity risk premium method can be defined as the difference  
6 between the expected return on a common stock and the expected  
7 return on a debt security. The differential between the two rates of  
8 return is indicative of the return investors require in order to  
9 compensate them for the additional risk involved with an investment  
10 in the Company's common stock over an investment in the  
11 Company's bonds, which involves less risk.

12 In order to quantify the risk premium, I need estimates of the cost of  
13 equity and the cost of debt at contemporaneous points in time. This  
14 method relies on approved returns on common equity for water  
15 utility companies from various public utility commissions that are  
16 published by the Regulatory Research Associates, Inc. (RRA),  
17 within SNL Global Market Intelligence. In order to estimate the  
18 relationship with a representative cost of debt capital, I have  
19 regressed the average annual allowed equity returns with the  
20 average Moody's A-rated yields for Public Utility bonds from 2006  
21 through 2021. The regression analysis quantifies the historical

1 relationship of approved ROEs and A-rated public utility bond yields,  
2 which is combined with recent monthly yields to provide an estimate  
3 of the current cost of common equity.

4 **Q. WHAT ARE THE STRENGTHS OF USING ALLOWED RETURNS?**

5 A. The use of allowed returns as the basis for the expected equity  
6 return has strengths over other approaches that involve models that  
7 subtract a cost rate of debt from the estimated equity return. One  
8 strength of my approach is that authorized returns on equity are  
9 generally arrived at through lengthy investigations by various parties  
10 with opposing views on the rate of return required by investors. Thus,  
11 it is reasonable to conclude that the approved allowed returns are  
12 good estimates for the cost of equity.

13 **Q. WHAT WERE THE RESULTS OF YOUR RISK PREMIUM**  
14 **ANALYSIS?**

15 A. The summary data of risk premiums shown on my Exhibit 6, page 1  
16 of 2 indicates that the average risk premium is 5.17%, which, when  
17 combined with the average of the last six months of A-rated bond  
18 yields of 3.11%, produces yields with an average cost of equity of  
19 8.28%. However, I believe a better estimate of the current cost of  
20 equity is determined through a regression equation shown in my  
21 Exhibit 6, page 2 of 2. The equation indicates a significant statistical

1 relationship exists with the allowed equity returns and bond costs,  
2 such that a one percent decrease in the bond cost corresponds to an  
3 increase of approximately 27 basis points in the equity risk  
4 premium.<sup>2</sup> While various studies on the cost of equity capital have  
5 differed on the level of the negative relationship of interest rates and  
6 risk premiums, there has been agreement that as interest rates fall,  
7 there is an increase in the premium.<sup>3</sup> Applying this relationship to  
8 the current utility bond cost of 3.11%<sup>4</sup> resulted in a current estimate  
9 of the cost of equity of 9.41%.

10 **Q. GIVEN YOUR STUDY ON THE COST OF EQUITY, WHAT IS YOUR**  
11 **RECOMMENDED COST OF EQUITY?**

12 A. All of the results of my DCF model indicate a cost of equity estimate  
13 of 8.28%, 8.46%, and 8.56%, with a central estimate of 8.44%. The  
14 Risk Premium Method indicates a cost of equity of 9.41%. Relying  
15 on the average of those two methods, I determined that the investor  
16 required rate of return for CWSNC is 8.93%, as shown in my Exhibit  
17 7.

18 **Q. TO WHAT EXTENT DOES YOUR RECOMMENDED RATE OF**

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<sup>2</sup> The regression indicated a significant statistical relationship of  $ROE = 0.08599 + 0.261495$ , with an adjusted  $R^2 = 0.8322$ .

<sup>3</sup> 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, pp. 33-45.

<sup>4</sup> The 3.11% current bond yield was determined using the most recent six-month average yield-to-maturity rate of Moody's A-rated Utility Bond Yields.

1           **RETURN ON COMMON EQUITY TAKE INTO CONSIDERATION**  
2           **THE IMPACT OF A WATER/SEWER SYSTEM IMPROVEMENT**  
3           **MECHANISM PURSUANT TO N.C. GEN. STAT. § 62-133.12 ON**  
4           **THE COMPANY'S FINANCIAL RISK?**

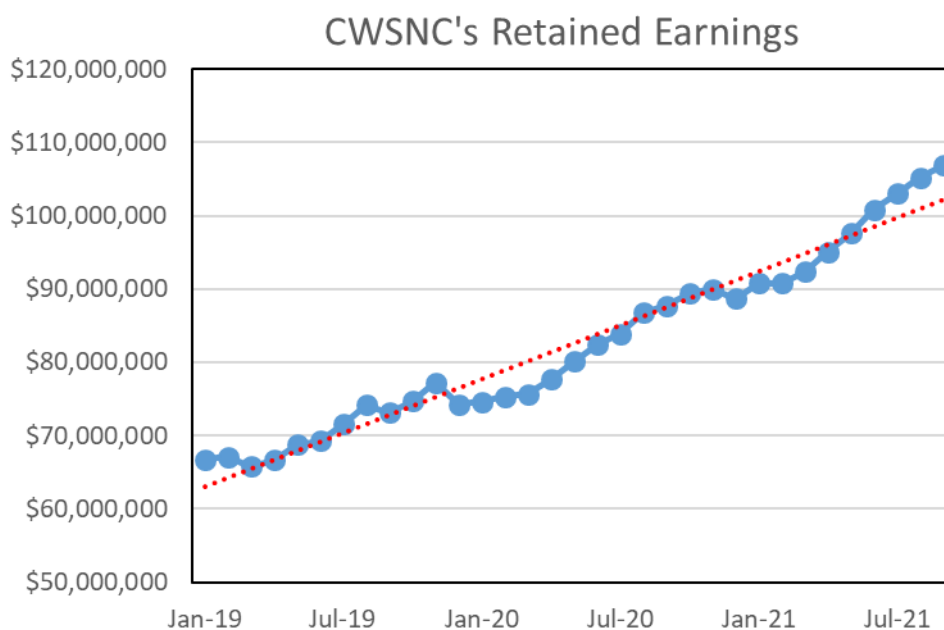
5    A.    In my opinion, the water and sewer improvement charge  
6           mechanism (WSIC and SSIC) offers enhanced cost recovery of  
7           eligible capital improvements, thereby reducing regulatory lag  
8           through incremental and timely rate increases. I believe this  
9           mechanism is seen by debt and equity investors as supportive  
10          regulation that mitigates business and regulatory risk. As such, I  
11          believe that this mechanism is noteworthy and is supportive of my  
12          recommendation. However, I do not believe that its enhancement to  
13          Company's revenues are at a level that warrant an explicit  
14          reduction in the cost of equity.

15   **Q.    WHAT OTHER EVIDENCE DID YOU CONSIDER IN YOUR**  
16           **ASSESSMENT OF THE REASONABLENESS OF YOUR**  
17           **RECOMMENDED RETURN?**

18   A.    In regard to my reasonableness assessment with financial risk, I  
19          considered the pre-tax interest coverage ratio produced by my cost  
20          of capital recommendation. Based on the recommended capital  
21          structure, cost of debt, and return on equity, the pre-tax interest  
22          coverage ratio is approximately 3.4 times. This level of pre-tax

1 interest coverage and funds flow coverage should allow CWSNC to  
2 qualify for a single "A" bond rating.

3 Another supportive reason is the strong and relatively stable growth  
4 of the Company's retained earnings over the last three years. The  
5 graph of its retained earnings reveals an annual growth rate that is  
6 in excess of 10%. Furthermore, over this time period, the Company  
7 paid \$10,000,000 in dividends. Lastly, the red dotted trend line  
8 shows the stability of its retained earnings which indicate the  
9 relative lower investment risks associated with water utilities.



10

11



1 Q. TO WHAT EXTENT DOES YOUR RECOMMENDED RATE OF  
2 RETURN ON EQUITY TAKE INTO CONSIDERATION THE  
3 IMPACT OF CHANGING ECONOMIC CONDITIONS ON  
4 CWSNC'S CUSTOMERS?

5 A. I am aware of no clear numerical basis for quantifying the impact of  
6 changing economic conditions on customers in determining an  
7 appropriate return on equity in setting rates for a public utility.  
8 Rather, the impact of changing economic conditions nationwide is  
9 inherent in the methods and data used in my study to determine the  
10 cost of equity for utilities that are comparable to CWSNC. I have  
11 reviewed certain information on the economic conditions from the  
12 Bureau of Economic Analysis (BEA) for the counties served by  
13 CWSNC, specifically the 2017 and 2018 data on total personal  
14 income and per capita income for North Carolina up through the  
15 second quarter of 2021. In addition, I reviewed the 2019  
16 Development Tier Designations published by the North Carolina  
17 Department of Commerce for the counties. The BEA data indicates  
18 that total personal income weighted by the number of water  
19 customers by county grew at a 2019 compound annual growth rate  
20 (CAGR) of approximately 3.5%. At this time, county-wide BEA data  
21 only extends through 2019; however, the BEA has published  
22 updated reports on income per capita for North Carolina that show

1 an annual growth rate between 4.4% and 5.2% from 2016 through  
2 the second quarter of 2020. In addition, North Carolina per capita  
3 income from the second quarter of 2020 through the second  
4 quarter of 2021 has shown 0.3% annual growth, which is notable  
5 given the COVID-19 pandemic.

6 The North Carolina Department of Commerce annually ranks the  
7 state's 100 counties based on economic well-being and assigns  
8 each a Tier designation. The most distressed counties are rated a  
9 "1," and the most prosperous counties are rated a "3." The  
10 rankings examine several economic measures such as household  
11 income, poverty rates, unemployment rates, population growth, and  
12 per capita property tax base. For 2019, the average Tier ranking  
13 that has been weighted by the number of water customers by  
14 county is 2.2. Both of these economic measures indicate that there  
15 have been improvements in the economic conditions for CWSNC's  
16 service area relative to the four previous rate increases in Docket  
17 Nos. W-354, Subs 364, 360, 356, and 344 that were approved in  
18 2020, 2018, 2017, and 2015, respectively.

19 As discussed above, it is the Commission's duty to set rates as low  
20 as reasonably possible consistent within constitutional constraints.  
21 This duty exists regardless of the customers' ability to pay.

1           Moreover, the rate of return on common equity is only one  
2           component of the rate established by the Commission. N.C. Gen.  
3           Stat. § 62-133 sets out an intricate formula for the Commission to  
4           follow in determining a utility's overall revenue requirement. It is the  
5           combination of rate base, expenses, capital structure, cost rates for  
6           debt and equity capital, and capital structure that determines how  
7           much customers pay for utility service and how much investors  
8           receive in return for their investment. The Commission must  
9           exercise its best judgment in balancing the interests of both groups.  
10          My analysis indicates that my recommended rate of return on  
11          equity will allow the Company to properly maintain its facilities,  
12          provide adequate service to its customers, attract capital on terms  
13          that are fair and reasonable to its customers and investors, and will  
14          result in rates that are just and reasonable.

15                           **V. CONCERNS WITH COMPANY WITNESS**  
16   **D'ASCENDIS' TESTIMONY**

17   **Q.   DO YOU HAVE CONCERNS ABOUT COMPANY WITNESS**  
18           **D'ASCENDIS' TESTIMONY?**

19    A.    Yes. I have identified several areas of concern with his testimony.

1                                    **Interest Rate Forecasts for Ratemaking**

2                    As noted, I have concerns with the use of interest rate forecasts to  
3                    determine the cost of equity. In this proceeding, Mr. D'Ascendis  
4                    relies on the Blue Chip Consensus Forecasts of 30-year treasury  
5                    yields of 2.73% in his CAPM analysis, as shown in his Exhibit 1,  
6                    Schedule DWD-5. However, it is worth noting that the witness relied  
7                    on similar forecasts for 30-year yields in his predictive CAPM  
8                    analysis in the Company's last rate case, Sub 364. A comparison of  
9                    the Blue Chip predictions of forecasts through the third quarter of  
10                    2020 and the maximum observed daily yields on 30-year Treasury  
11                    Securities revealed an average overestimation of approximately  
12                    127 basis points. As observed in prior rate cases, interest rate  
13                    forecasts have a tendency to over-estimate the future level of  
14                    interest rates by a significant degree, which I maintain are  
15                    inappropriate for ratemaking.

16                                   **Risk Adjustment for Small Size**

17                    Another concern with his testimony is his 40 basis point adjustment  
18                    for the size of CWSNC. I do not believe that it is appropriate to add  
19                    a risk premium to the cost of equity due to the size of a regulated  
20                    utility. CWSNC is owned by the Corix, which is owned by BCIMC.  
21                    As such, Corix and BCIMC have a significant influence over the

1 balances of common equity and long-term debt of CWSNC. BCIMC  
2 determines the amount of dividend payments paid by Corix and the  
3 frequency of those payments. My reasons are as follows: first, from  
4 a regulatory policy perspective, ratepayers should not be required  
5 to pay higher rates because they are located in the franchise area  
6 of a utility of a size which is arbitrarily considered to be small.  
7 Further, if such adjustments were routinely allowed, an incentive  
8 would exist for large existing utilities to form subsidiaries when  
9 merging or even to form smaller subsidiaries to obtain higher  
10 allowed returns. Lastly, CWSNC operates in a franchise  
11 environment that insulates the Company from competition, and it  
12 operates with procedures in place that allow for rate adjustments  
13 for eligible capital improvements and other unusual circumstances  
14 that impact its earnings.

15 Furthermore, CWSNC operates in the water and sewer industry,  
16 where expensive bottled water provides the only alternative to utility  
17 service. It is factually correct that rating agencies and investors add  
18 a risk factor for small companies with relatively limited capital  
19 resources; however, the inherent protection from competition and  
20 the ability to recover its capital costs and operating costs removes  
21 this risk, which would otherwise be a concern to investors.

1 I testified to these same concerns in the last CWSNC rate case,  
2 Docket No. W-354, Sub 360, where the Commission found that a  
3 size adjustment was not warranted. Similar arguments have been  
4 made in a 1997 CWS System, Inc., rate case, Docket No. W-778,  
5 Sub 31, where witness Hanley of AUS Consultants relied on similar  
6 cost of capital methods as witness D'Ascendis, as noted on pages  
7 824-825 in the Commission's Eighty-Seventh Report of Orders and  
8 Decisions. In a 1994 CWSNC rate case, the Commission was not  
9 persuaded to accept an adjustment for small size and elevated risk,  
10 as noted in on page 520 in its Eighty-Fourth Report of Orders and  
11 Decisions. The explicit consideration of the small size of a regulated  
12 utility has been argued before this Commission in a rate case  
13 involving North Carolina Natural Gas, Inc. (NCNG), Docket No. G-  
14 21, Sub 293. In an Order dated December 6, 1991, the  
15 Commission disagreed with the Company witness who testified that  
16 the Company's small size warranted the selection of other small  
17 sized companies in his proxy group. The Commission stated on  
18 page 563 in its Eighty-First Report of Orders and Decisions:

19 "Dr. Andrews selected a group of 16 companies,  
20 including NCNG, in his DCF model (and his CAPM)  
21 because they are all publicly traded, they are all small in  
22 size, and they are all principally in the local gas  
23 distribution business. He testified that these companies  
24 were the "best available" in terms of being comparable to  
25 NCNG. In contrasting his comparable group to those of

1 witness Hinton, Dr. Andrews stated that it was better to  
2 have some similarity in size among the companies even  
3 if this meant some dissimilarity in financial attributes. The  
4 Commission disagrees. If a group of companies is to be  
5 screened for comparability in terms of investor  
6 expectations, financial attributes are far more relevant  
7 than size.”

8 While there are published studies that address how the small size  
9 of a company relates to higher risks, I am aware of only one study  
10 by Dr. Annie Wong<sup>5</sup> that focuses on the size of regulated utilities  
11 and risk. Whereas, published journal articles generally rely on  
12 company size and return data for a multitude of privately held  
13 companies covered by the Center for Research in Security Prices<sup>6</sup>  
14 (CRSP), any correlation with the smaller size of a company and  
15 higher stock returns is dominated by industrial firms as Dr. Wong  
16 notes in her published article. Dr. Wong has tested the data for a  
17 size premium in utilities and concluded the following:

18 [U]nlike industrial stocks, utility stocks do not exhibit  
19 a significant size premium. As explained, there are  
20 several reasons why such a size premium would not  
21 be attributable to utilities because they are regulated  
22 closely by state and federal agencies and  
23 commissions, and hence, their financial performance  
24 is monitored on an ongoing basis by both the state  
25 and federal governments.  
26

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<sup>5</sup> Annie Wong, “Utility Stocks and the Size Effect: An Empirical Analysis,” Journal of the Midwest Finance Association, pp. 95-101, (1993).

<sup>6</sup> Center for Research in Security Prices, University of Chicago, Booth School of Business, Chicago, IL.

1                                    **CAPITAL STRUCTURE OF A PARENT CORPORATION AS**  
2                                    **COMPARED TO THAT OF A REGULATED UTILITY**

3                    I have concerns with Mr. D'Ascendis's comparison of the  
4                    ratemaking capital structure of Corix and that of his water utility  
5                    proxy group. Page 2 of his Schedule DWD-2 displays the 49.39%  
6                    average equity ratio for his eight corporate parent or holding  
7                    companies. While the 49.39% equity ratio for his comparable group  
8                    of water utilities is reasonable, I have similar concerns with his  
9                    group as noted in the prior rate case, Sub 364, where the equity  
10                  ratio for a similar group of publically traded companies was 55.57%.  
11                  The key difference for the lower equity ratio in this rate case is the  
12                  addition of Global Water Resources, Inc., which has a 16.48% five-  
13                  year average equity ratio. However, I still believe that this  
14                  comparison is deficient, in that, it is better to contrast recently  
15                  Commission approved common equity ratios for regulated water  
16                  and wastewater utilities than it is to make comparisons with equity  
17                  ratios of a corporate parent or a holding company. Often, parent  
18                  corporations are invested in other non-regulated businesses that  
19                  involve higher risks and higher rates of returns as compared to the  
20                  regulated operations of a water and wastewater utility. Secondly,  
21                  the acquisition policies of large corporate utilities may result in  
22                  equity ratios that may not be comparable to CWSNC or Corix. As



1 such, I believe a better comparison of financial risk in connection  
2 with an equity ratio is demonstrated in my Exhibit 8, which has the  
3 average annual approved common equity ratios for water and  
4 wastewater utilities of 50.90% and 51.10% for 2014 through 2021,  
5 as compiled by the Regulatory Research Associates of S&P Global  
6 Market Intelligence.

7 **Q. DO YOU AGREE WITH CONCERNS TO ADD BASIS POINTS TO**  
8 **THE DCF BASED COST OF EQUITY TO ACCOUNT FOR**  
9 **MARKET TO BOOK RATIOS SIGNIFICANTLY GREATER THAN**  
10 **1.0?**

11 A. No. Witness D'Ascendis's Rebuttal Testimony filed in Docket No.  
12 W-354, Sub 360, argued that the market to book ratios of the water  
13 utility proxy group was approximately 2.25 times and that the high  
14 ratio was causing inaccuracies in the DCF model. Furthermore, one  
15 needed to de-leverage the implied cost of equity with the use of the  
16 Modigliani/Miller equation, which would increase his 8.70% cost of  
17 equity to 9.91% cost of equity<sup>7</sup>. This argument presumes that the  
18 value of assets prescribed by regulated accounting methods and  
19 market valuation are in lock-step with each other, which I do not  
20 accept. Secondly, FERC and the FCC have ruled in prior cost of  
21 capital investigations on claims that market-to-book valuations  
22 greater than 1.0 leads to the DCF model understating the cost of

1 equity<sup>7</sup>. FERC found that during periods of falling interest rates, the  
2 cost of equity falls; however, the result is a tendency for utilities to  
3 earn more than their shareholders require, with market values  
4 exceeding book values. FERC went on to say there is a similar  
5 tendency with rising interest rates and rising costs of equity. In that,  
6 utilities will file frequent rate cases in order to protect their  
7 shareholders, and the result will be that utilities will maintain their  
8 market-to-book ratios during periods of rising equity costs.  
9 Furthermore, in 1988, the FERC noted that this argument “is an old  
10 one, and the problem of circularity inherent in that approach has  
11 been long and widely recognized.”

12 **VI. SUMMARY AND RECOMMENDATIONS**

13 **Q. WOULD YOU PLEASE SUMMARIZE YOUR RECOMMEND-**  
14 **ATIONS CONCERNING THE COST OF CAPITAL?**

15 A. Based upon the results of this study, it is my recommendation that  
16 the appropriate capital structure to employ for ratemaking purposes  
17 in this proceeding consists of 49.80% long-term debt and 50.20%  
18 common equity. The appropriate embedded cost of long-term debt  
19 associated with this capital structure is 4.85%, and the  
20 recommended cost of common equity of 8.93%. My recommended,

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<sup>7</sup> Federal Communications Commission Record 91-389, p. 7196 and Federal Register, Vol 53, No. 24, pages 3,347 and 3,348.

1 overall weighted cost of capital produced is 6.90%, as shown in my  
2 Exhibit 9.

3 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

4 **A. Yes.**

## QUALIFICATIONS AND EXPERIENCE

JOHN ROBERT HINTON

I received a Bachelor of Science degree in Economics from the University of North Carolina at Wilmington in 1980 and a Master of Economics degree from North Carolina State University in 1983. I joined the Public Staff in May of 1985. I filed testimony on the long-range electrical forecast in Docket No. E-100, Sub 50. In 1986, 1989, and 1992, I developed the long-range forecasts of peak demand for electricity in North Carolina. I filed testimony on electricity weather normalization in Docket Nos. E-7, Sub 620, E-2, Sub 833, and E-7, Sub 989. I filed testimony on customer growth and the level of funding for nuclear decommissioning costs in Docket No. E-2, Sub 1023. I filed testimony on the level of funding for nuclear decommissioning costs in Docket Nos. E-7, Sub 1026 and E-7, Sub 1146. I have filed testimony on the Integrated Resource Plans (IRPs) filed in Docket No. E-100, Subs 114 and 125, and I have reviewed numerous peak demand and energy sales forecasts and the resource expansion plans filed in electric utilities' annual IRPs and IRP updates.

I have been the lead analyst for the Public Staff in numerous avoided cost proceedings, filing testimony in Docket No. E-100, Subs 106, 136, 140, 148, and Sub 158. I have filed a Statement of Position in the arbitration

case involving EPCOR and Progress Energy Carolinas in Docket No. E-2, Sub 966. I have filed testimony in avoided cost related to the cost recovery of energy efficiency programs and demand side management programs in Dockets Nos. E-7, Sub 1032, E-7, Sub 1130, E-2, Sub 1145, and E-2, Sub 1174.

I have filed testimony on the issuance of certificates of public convenience and necessity (CPCN) in Docket Nos. E-2, Sub 669, SP-132, Sub 0, E-7, Sub 790, E-7, Sub 791, and E-7, Sub 1134.

I filed testimony on the merger of Dominion Energy, Inc. and SCANA Corp. in Docket Nos. E-22, Sub 551, and G-5, Sub 585.

I have filed testimony on the issue of fair rate of return in Docket Nos. E-22, Subs 333 412, and 532; P-26, Sub 93; P-12, Sub 89; G-21, Sub 293; P-31, Sub 125; P-100, Sub 133b; P-100, Sub 133d (1997 and 2002); G-21, Sub 442; G-5, Subs 327, 386; and 632; G-9, Subs 351, 382, and 722, ,W-778, Sub 31; W-218, Subs 319, 497, 526; W-354, Sub 360; 364, and in several smaller water utility rate cases. I have filed testimony on credit metrics and the risk of a downgrade in Docket No. E-7, Sub 1146.

I have filed testimony on the hedging of natural gas prices in Docket No. E-2, Subs 1001 and 1018. I have filed testimony on the expansion of natural gas in Docket No. G-5, Subs 337 and 372. I performed the financial analysis in the two audit reports on Mid-South Water Systems, Inc., Docket No. W-100, Sub 21. I testified in the application to transfer the CPCN from North Topsail Water and Sewer, Inc. to Utilities, Inc., in Docket No. W-1000, Sub 5. I have filed testimony on rainfall normalization with respect of water sales in Docket No. W-274, Sub 160.

With regard to the 1996 Safe Drinking Water Act, I was a member of the Small Systems Working Group that reported to the National Drinking Water Advisory Council of the U.S. Environmental Protection Agency. I have published an article in the National Regulatory Research Institute's Quarterly Bulletin entitled Evaluating Water Utility Financial Capacity.

## RISK MEASURES

### VALUE LINE SAFETY RANK

The Safety Rank is a measure of the total risk of a stock. It includes factors unique to the company's business such as its financial condition, management competence, etc. The Safety Rank is derived by averaging two variables: the stock's Price Stability Index, and the Financial Strength Rating of the company. The Safety Rank ranges from 1 (Highest) to 5 (Lowest).

### VALUE LINE BETA ( $\beta$ )

The Beta is derived from a regression analysis between weekly percent changes in the price of a stock and weekly percent price changes in the New York Stock Exchange Composite Index over a period of five years.

There has been a tendency over the years for high Beta stocks to become lower and for low Beta stocks to become higher. This tendency can be measured by studying Betas of stocks in five consecutive intervals. The Betas published in the Value Line Investment Survey are adjusted for this tendency and hence are likely to be better predictors of future Betas than those based exclusively on the experience of the past five years.

The New York Stock Exchange Composite Index is used as the basis for calculating the Beta because this index is a good proxy for the complete equity portfolio. Since Beta's significance derives primarily from its usefulness in portfolios rather than individual stocks, it is best constructed by relating to an overall market portfolio. The Value Line Index, because it weights all stocks equally, would not serve as well.

The security's return is regressed against the return on the New York Stock Exchange Composite Index over the past five years so that 259 observations of weekly price changes are used. Value Line adjusts its estimate of Beta ( $\beta_i$ ) for regression described by Blume (1971). The estimated Beta is adjusted as follows:

$$\text{Adjusted } \beta_i = 0.35 + 0.67\beta$$

### VALUE LINE FINANCIAL STRENGTH RATING

The Financial Strength Ratings are primarily a measure of the relative financial strength of a company. The rating considers key variables such as coverage of debt, variability of return, stock price stability, and company size. The Financial Strength Ratings range from the highest at A++ to the lowest at C.

### VALUE LINE PRICE STABILITY INDEX

The Price Stability Index is based upon a ranking of the standard deviation of weekly percent changes in the price of a stock over the last five years. The top 5% carry a Price Stability Index of 100; the next 5%, 95; and so on down to an Index of 5.

### VALUE LINE EARNINGS PREDICTABILITY INDEX

The Earnings Predictability Index is a measure of the reliability of an earnings forecast. The most reliable forecasts tend to be those with the highest rating (100), the least reliable (5).

### S&P BETA ( $\beta$ )

The Beta is derived from a regression analysis between 60 months of price changes in a company's stock price (plus corresponding dividend yield) and the monthly price changes in the S&P 500 Index (plus corresponding dividend yield). Prices and dividends are adjusted for all subsequent stock splits and stock dividends.



### S&P BOND RATING

The S&P Bond Ratings is an appraisal of the credit quality based on relevant risk factors. S&P reviews both the company's financial and business profiles. Shown below are the rankings:

- AAA An extremely strong capacity to pay interest and repay principal.
- AA+ A very strong capacity to pay interest and repay principal.
- AA There is only a small degree of difference between "AAA" or "AA."
- AA- debt issues.
  
- A+ A strong capacity to pay interest and repay principal. These
- A these ratings indicate the obligor is more susceptible to
- A- changes in economic conditions than AAA" or "AA" debt issues.
- BBB+ An adequate capacity to pay interest and repay principal.
- BBB economic conditions or changing circumstances are more likely to
- BBB- lead to a weakened capacity to pay interest and repay principal.
  
- BB+ "BB" indicates less near-term vulnerability to default than other
- BB speculative issues. However, these bonds face major ongoing
- BB- uncertainties or exposure to adverse conditions that could lead to
- inadequate capacity to meet timely interest and principal payments.

### S&P STOCK RANKING

The S&P Stock Rankings is an appraisal of the growth and stability of the company's earnings and dividends over the past 10 years. The final score for each stock is measured against a scoring matrix determined by an analysis of the scores of a large and representative sample of stocks. Shown below are the rankings:

- A+ Highest
- A High
- A- Above average
- B+ Average
- B Below Average
- B- Lower
- C Lowest
- D In Reorganization
- NR Not rated

### MOODY'S BOND RATING

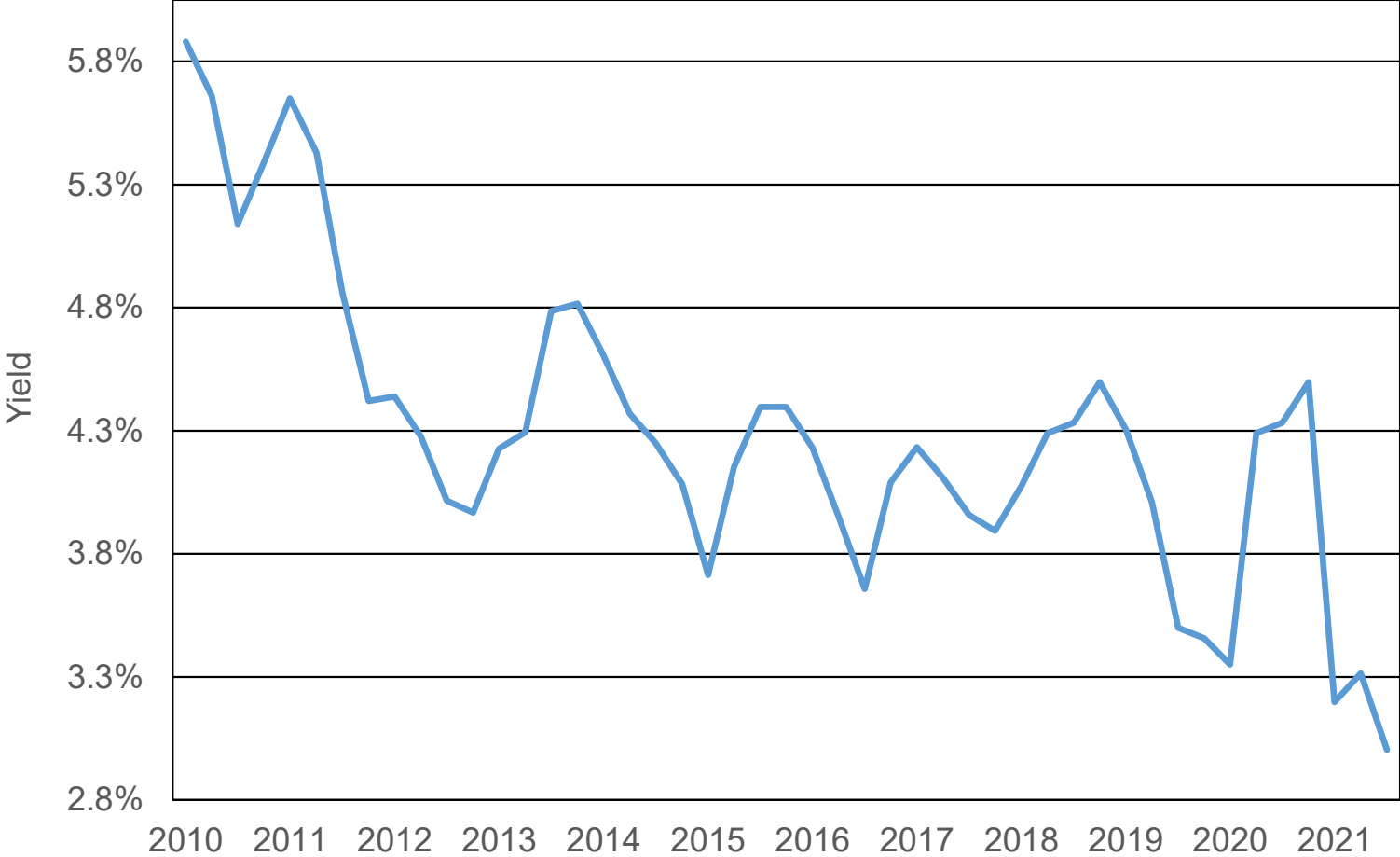
Moody's Bond Ratings assign a rating on the creditworthiness of an obligor. Such ratings reflect both the likelihood of default and any financial loss suffered in the event of a default. Shown below are the rankings:

- Aaa Obligations rated Aaa are judged to be of the highest quality with minimal risk.
- Aa Obligations rated Aa are judged to be of the high quality and are subject to low credit risk.
- A Obligations rated A are considered upper-medium-grade and are subject to low credit risk.
- Baa Obligations rated Baa are subject to moderate credit-risk. They are considered medium-grade and are subject to substantial credit risk.
- Ba Obligations rated Ba are subject to have speculative and are subject to substantial credit risk.
- B Obligations rated B are considered speculative and are subject to high credit risk.
- Caa Obligations rated Caa are judged to be of poor standing and are subject to very high credit risk.
- Ca Obligations rated Ca are highly speculative and are likely in, or very near default with some prospect of recovery in principle and interest.
- C Obligations rated C are the lowest-grade class of bonds and are typically in default, with little prospect of recovery in principle and interest.

Sources:

- <sup>1</sup> Value Line Investment Analyzer, Version 3.0.15a, New York, NY.
- <sup>2</sup> Standard & Poor's, Utility Compustat II, September 15, 1993, New York, NY.

# Moody's A-Rated Utility Bond Yields (averaged over a quarter)



Hinton Exhibit I  
Public Staff

# THE WALL STREET JOURNAL.

## Economists Got the Decade All Wrong. They're Trying to Figure Out Why.

The U.S. has enjoyed its longest economic expansion on record without triggering inflation as interest rates remain historically low

by Greg Ip

Dec. 14, 2019 1:00 pm ET



In the fall of 2009, the global financial crisis had only just ended, and interest rates were a mere 0.1%. Peering ahead, economists assumed the recovery would resemble previous recoveries, though a tad slower, and thus rates would start rising the next year and plateau at 4.2% by 2015.

But by the fall of 2010, rates hadn't budged. Like Charlie Brown taking another run at the football, economists gamely made the same forecast that year, and the year after that and the year after that. Rates remained stuck near zero until 2015, a stretch of free money unseen since the 1940s.

When rates started to rise, they didn't come close to levels once considered normal, ending the decade between 1.5% and 1.75%. Private-sector economists now expect them to average 2.4% over the long term, according to Blue Chip Economic Indicators. Judging by the bond market, they might have guessed high again: Ten-year Treasury note yields are just 1.8%—roughly zero, adjusted for inflation.

How could economists have gotten something so basic so spectacularly wrong? What was it about this past decade that made all their predictions go awry?



Fed Chairman Jerome Powell and former chairmen Janet Yellen and Ben Bernanke. The financial crisis was followed by a stretch of free money

Economists have been casting around for the answer, a theory to explain their inability to peer accurately into the months ahead, let alone the years. Such a theory must do more than say “The Federal Reserve did it.” It must explain why growth was the most subdued of any expansion since the 1940s and inflation consistently ran below the Fed’s 2% target, the reasons the Fed kept rates so low.

And, no less difficult, it would have to explain why, in spite of that subdued growth, the U.S. has enjoyed its longest economic expansion on record, one marked by a record-breaking bull market in stocks and unemployment falling to a 50-year low.

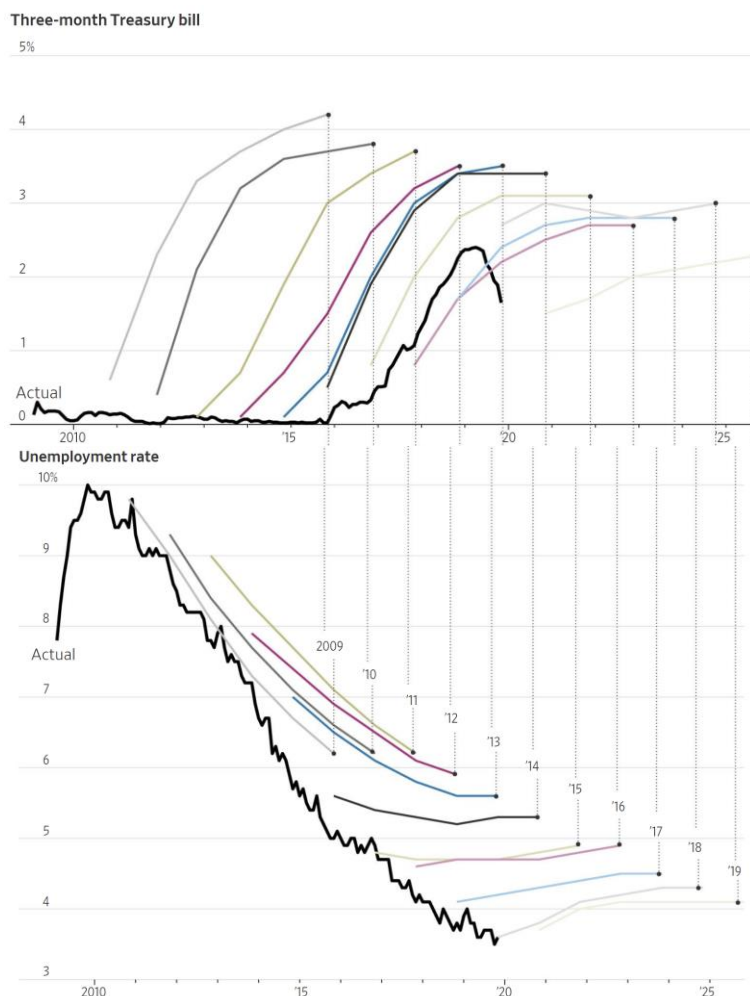
One explanation is the “debt hangover” theory popularized by Carmen Reinhart and Kenneth Rogoff, whose history of financial crises, “This Time Is Different: Eight Centuries of Financial Folly,” was a sleeper hit in 2009. They found that in the wake of financial crises, households, banks, businesses and sometimes governments are fixated on paying down debts and wary that another crisis is around the corner, so they avoid borrowing and investing. This holds down growth, inflation and interest rates.

The U.S. initially tracked this model. It had barely exited its own crisis when another erupted in the eurozone, pushing Greece into default and others to the brink of it.

But as those crises faded from view, low growth, inflation and rates persisted.

### **A Confounding Decade**

Since 2009 economists’ projections of interest rates and unemployment (shown with year made) have consistently proved too high.



Sources: Blue Chip Economic Indicators (forecasts); Federal Reserve Bank of St. Louis (actual T-bill, unemployment rates)

So in 2013 Larry Summers, a former top adviser to Presidents Bill Clinton and Barack Obama and now an economist at Harvard University, advanced an alternative explanation: [“secular stagnation.”](#) He borrowed the phrase from an earlier Harvard economist, Alvin Hansen who used it in 1938 to describe the Great Depression’s persistently weak growth and high unemployment. Mr. Hansen tied it to weak investment due to slow population growth: Businesses had less need to invest when there were fewer new workers and customers and when aging households bought fewer big-ticket products like houses.

Slow population growth is once again weighing on growth and interest rates, Mr. Summers noted, and he added several other factors: the fastest-growing businesses, such as social-media platforms, invest little of their rich profits. Higher inequality meant more income flows to the high-saving, low-spending rich.

Though initially skeptical of Mr. Summers’s thesis, many economists have since warmed to it, at least for other parts of the world, if not the U.S. In some countries like Germany a persistent

excess of savings manifests itself as a trade surplus which flows into other countries' bonds, holding down interest rates around the world.

Secular stagnation has several profound implications. First, with interest rates closer to zero, central banks are less able to combat future recessions. Second, a structural shortage of private borrowing means governments can run big deficits without pushing up interest rates. Indeed, given central banks' lack of ammunition, governments should run deficits, or the economy will stagnate. Reducing entitlements such as future Social Security benefits in the name of fiscal prudence may worsen the problem by encouraging households to save more.

Secular stagnation also increases the risk of protectionism. Any country with too little domestic demand to achieve full employment and 2% inflation will be tempted to foist the problem on its neighbors by cheapening its currency or erecting tariffs so as to export more and import less.

Yet in key respects the past decade doesn't conform to the gloomy prognosis of secular stagnation: The stock market has romped to one record after another, and job growth has remained consistently strong.

As with interest rates, economists have been surprised by unemployment, which peaked at almost 10% in 2010. Year after year, they expected it to bottom out around 5%. It's now down to 3.5%, a 50-year low, and likely headed lower.

The expansion is now the longest since records begin in the mid-1800s. It bears little resemblance to the 1930s, which Mr. Hansen described as "sick recoveries which die in their infancy and...leave a hard and seemingly immovable core of unemployment."



Job seekers and recruiters at a fair in Los Angeles. Economists have been surprised by the continued decline of unemployment.

This points to a third possible theory. The so-called natural rate of unemployment, the lowest the U.S. can sustain without running out of workers or pushing up inflation (called  $u^*$  or "u-star" in economists' equations) is much lower than previously thought. So the recovery has had more ground to cover than many realized, and as a result the economy has spent much of the past decade operating well below capacity.

Jan Hatzius, chief economist at Goldman Sachs, says there isn't a lot of mystery about the behavior of inflation and interest rates: "We fell into a deep hole so we had a lot of spare capacity, and it took a long time to climb out."

The U.S. may have finally climbed out, but until Europe has as well, interest rates may remain low, he says. “How secular is it? How cyclical? Until you’ve seen economies really normalize from a cyclical perspective it’s going to be hard to fully distinguish between those two things.”

In other words, it might take the next decade to answer what really happened in the last.

Mr. Ip is The Wall Street Journal’s chief economics commentator, in Washington. He can be reached at [greg.ip@wsj.com](mailto:greg.ip@wsj.com).



CORIX REGULATED UTILITIES (US) INC. AND SUBSIDIARY COMPANIES  
CONSOLIDATED STATEMENTS OF CAPITALIZATION  
FOR THE NINE MONTHS ENDED SEPTEMBER 30, 2021 AND 2020

	Unaudited September 30, 2021	December 31, 2020
<b><u>Common Shareholders' Equity</u></b>		
Common shares, \$.10 par value; authorized and issued 1,100 shares	\$110	\$110
Paid-in capital	237,265,034	223,265,034
Retained earnings	106,887,809	88,719,030
Total Common Equity	<u>\$344,152,953</u>	<u>\$311,984,174</u>
<b><u>Long-Term Debt</u></b>		
Collateral trust notes- 6.58%, \$9,000,000 due in annual installments beginning in 2017 through 2035	134,372,198	143,340,372
Collateral trust notes- 4.37%, Series 2018, due 10/4/2033	99,582,255	99,556,146
Collateral trust notes- 3.15%, Series 2020, due 5/26/30	49,762,783	49,781,241
Collateral trust notes- 3.35%, Series 2020, due 5/26/35	49,750,618	49,776,724
Revolving Loan Balance	8,000,000	9,000,000
Total Debt	341,467,855	351,454,483
Total Capitalization	<u>\$685,620,808.09</u>	<u>\$663,438,657.39</u>

Source: Company Data Request No. 44, Item 8.

## Investment Risk Measures

### Group of Water Utility Companies

Company	Value Line <sup>1</sup>				S&P <sup>2</sup> Beta	S&P <sup>2</sup> Quality Ranking	S&P <sup>3</sup> Bond Rating	Moody's <sup>3</sup> Bond Rating	
	Safety Rank	Beta	Price Stability	Earnings Predict.					Financial Strength
1 American States Water	2	0.65	100	90	A	0.08	A	A+	A2
2 American Water Works	3	0.90	80	90	B++	0.22	A-	A	Baa1
3 Essential Util.	3	0.70	85	60	B+	0.54	A	A	Baa2
4 California Water	3	1.00	95	60	B++	0.17	A-	A+	NA
5 Middlesex Water	2	0.70	85	85	B++	0.35	A	A	NA
6 SJW Group	3	0.80	80	50	B+	0.42	B+	A-	NA
7 York Water	3	0.85	80	100	B+	0.32	A	A-	NA
Average	2.7	0.80	86	76		0.30			

Sources:

<sup>1</sup> Value Line Investment Survey, Standard Edition, October 8, 2021

<sup>2</sup> CRFA Stock Report, October 29 - November 1, 2021.

<sup>3</sup> S&P Global Market Intelligence, downloaded on October 12, 2021.

## DCF ANALYSIS

### Group of Water Utility Companies

Company Name	Yield <sup>1</sup>	Value Line <sup>2</sup> Historical						Value Line <sup>2</sup> Forecast			Yahoo
		EPS	DPS	BPS	EPS	DPS	BPS	EPS	DPS	BPS	Forecast <sup>3</sup>
		10-Yr	10-Yr	10-Yr	5-Yr	5-Yr	5-Yr	5-Yr	5-Yr	5-Yr	5-Yr
1 Amer. States Water	1.7	9.0	8.5	5.5	5.5	7.5	5.0	6.5	9.5	5.5	7.4
2 Amer. Water Works	1.4	10.5	11.0	3.5	8.0	11.5	4.5	8.5	8.5	5.0	8.6
3 Essential Util.	2.2	5.5	7.5	9.5	-1.5	7.5	11.5	10.0	7.5	6.5	6.4
4 California Water	1.5	5.0	3.0	5.0	8.0	4.0	5.0	7.0	6.5	3.5	11.7
5 Middlesex Water	1.1	9.0	3.0	5.5	12.5	5.0	8.0	5.0	5.5	2.5	2.7
6 SJW Group	2.0	7.0	6.0	8.5	-0.5	10.0	12.5	13.0	6.0	4.5	7.0
7 York Water Co.	1.6	6.0	3.5	4.5	5.5	4.0	4.5	6.5	6.0	4.0	4.9
Average	1.6	7.4	6.1	6.0	7.9	7.1	7.3	8.1	7.1	4.5	7.0
Estimated Cost of Equity		9.1	7.7	7.6	9.5	8.7	8.9	9.7	8.7	6.1	8.6

#### Sources:

1. Value Line Investment Survey, Summary and Index from July 16, 2021 to October 08, 2021.
2. Value Line Investment Survey, Standard Edition, October 08, 2021.
3. Yahoo Earnings Forecast as of October 28, 2021.
4. 5-yr Negative EPS for Essential Util and SJW Group are excluded from analysis

REGRESSION ANALYSIS OF ALLOWED RETURNS ON EQUITY

Year	[A] Water Utilities Approved Returns on Equity <sup>1</sup>	[B] Moody's A-Rated Bond Yields <sup>2</sup>	[C]=[A]-[B] Water Utility Risk Premium
2006	10.23%	6.07%	4.16%
2007	10.07%	6.05%	4.02%
2008	10.24%	6.51%	3.73%
2009	10.18%	6.04%	4.15%
2010	10.18%	5.47%	4.71%
2011	10.04%	5.04%	5.00%
2012	9.90%	4.13%	5.77%
2013	9.73%	4.48%	5.25%
2014	9.59%	4.28%	5.31%
2015	9.76%	4.12%	5.65%
2016	9.71%	3.93%	5.78%
2017	9.56%	4.00%	5.56%
2018	9.43%	4.25%	5.18%
2019	9.63%	3.77%	5.86%
2020	9.36% <sup>4</sup>	3.02%	6.35%
2021	9.40% <sup>5</sup>	3.12% <sup>3</sup>	6.28%
		Average	5.17%
		Maximum	6.35%
		Minimum	3.73%

Sources:

<sup>1</sup> Regulatory Research Associates, Water Advisory, February 8, 2021 and November 1, 2021

<sup>2</sup> Moody's Creditrends with yield data as of October 11, 2021.

REGRESSION ANALYSIS OF APPROVED RETURNS ON EQUITY

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.918385627
R Square	0.843432159
Adjusted R Square	0.832248742
Standard Error	0.001269348
Observations	16

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	0.000121517	0.000121517	75.418107	5.20119E-07
Residual	14	2.25574E-05	1.61124E-06		
Total	15	0.000144074			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	0.085997269	0.001432806	60.02017775	2.734E-18
X Variable 1	0.261495306	0.030111063	8.684359926	5.201E-07

A-Rated Public Utility Bond Yield	
Apr-21	3.30%
May-21	3.33%
Jun-21	3.16%
Jul-21	2.95%
Aug-21	2.95%
Sep-21	2.96%
Average	3.11%

Predicted Cost of Equity **9.41%**

Note:

Predicted Cost of Equity of 9.41% = 0.085997 + 0.261495 x 3.11%.

## Cost of Equity Summary

<hr/>	
<u>DCF Method</u>	
Based on Average Historical	8.58%
Based on Historical & Forecasted Growth Rates	8.46%
Based on Predicted Growth Rates	8.28%
<hr/>	
	Average 8.44%
Risk Premium Method	9.41%
<hr/>	
Average of DCF and Risk Premium	8.93%

COMMISSION APPROVED COMMON EQUITY RATIOS

	State	Utility	Order date	Equity Ratio
1	IA	Iowa American Water Co.	2/28/14	52.57%
2	NC	Carolina Water Service of NC	3/10/14	50.27%
3	NC	Aqua North Carolina	5/2/14	50.00%
4	HI	Waikoloa Utilities	5/23/14	50.00%
5	NJ	Middlesex Water Co.	6/18/14	50.71%
6	NY	SUEZ Water New York Inc.	6/24/14	44.00%
7	NY	SUEZ Water Westchester	6/24/14	47.00%
8	DE	Tidewater Utilities, Inc.	8/19/14	50.96%
9	NJ	Aqua New Jersey	8/20/14	52.47%
10	OH	Aqua Ohio Water Co.	9/10/14	51.60%
11	NY	SUEZ Water New Rochelle, Inc.	11/14/14	47.00%
		<b>Average</b>		<b>49.69%</b>
12	HI	Waikoloa Water	2/19/15	50.00%
13	ME	Maine Water	3/11/15	48.50%
14	IL	Aqua Illinois	3/25/15	53.26%
15	HI	Kona Water Service	6/29/15	53.00%
16	NJ	SUEZ Toms River	8/19/15	53.00%
17	NJ	Middlesex Water Co.	8/19/15	51.36%
18	NJ	New Jersey American Water Co.	9/11/15	52.00%
19	NC	Carolina Water Service of NC	12/7/15	51.00%
		<b>Average</b>		<b>51.52%</b>
20	VA	Aqua Virginia, Inc.	1/7/16	49.20%
21	DE	Artesian Water	1/19/16	50.54%
22	NV	Utilities, Inc. of Central Nevada	1/25/16	49.45%
23	WV	West Virginia American Water Co.	2/24/16	45.84%
24	NC	CWS Systems, Inc.	2/24/16	51.00%
25	NJ	SUEZ New Jersey Inc.	4/27/16	53.00%
26	NJ	Aqua New Jersey	8/9/16	52.86%
27	HI	Hawaii Water Service	9/12/16	53.00%
28	IL	Illinois American Water Co.	12/13/16	49.80%
		<b>Average</b>		<b>50.52%</b>
29	NY	SUEZ Water New York	1/27/17	46.00%
30	IA	Iowa American Water	2/27/17	52.04%
31	NY	New York American Water Co.	5/18/17	46.00%
32	VA	Virginia-American Water	5/24/17	46.09%
33	NC	Carolina Water Service, Inc. of NC	11/8/17	52.00%
		<b>Average</b>		<b>48.43%</b>
34	IL	Aqua Illinois	3/7/18	53.22%
35	CA	California American Water Co.	3/22/18	55.39%
36	CA	California Water Service Co.	3/22/18	53.40%
37	CA	Golden State Water Co.	3/22/18	57.00%
38	CA	San Jose Water Co.	3/22/18	53.28%
39	NJ	Middlesex Water Co.	3/24/18	52.75%
40	SC	Carolina Water Service, Inc.	5/2/18	51.89%
41	NY	SUEZ Water Owego-Nicols Inc.	7/13/18	46.00%
42	IL	Utility Services of IL, Inc. Water	9/24/18	52.15%
43	IL	Utility Services of IL, Inc. Water/Water	9/24/18	52.15%
44	RI	Suez Water Rhode Island	10/5/18	53.91%
45	NJ	New Jersey American Water	10/29/18	54.00%
46	MD	Aquarion Water Co. of Mass.	10/31/18	47.04%
47	NJ	SUEZ Water New Jersey	11/19/18	54.00%
48	NC	Aqua North Carolina	12/18/18	50.00%
49	CA	Suburban Water Systems	12/20/18	60.00%
50	VA	Massanutten Public Service Corp.	12/21/18	52.19%
		<b>Average</b>		<b>52.85%</b>
51	HI	Hawaii Water Service	1/7/19	53.40%
52	MD	Maryland American Water	2/5/19	48.66%
53	WV	West Virginia American Water Co.	2/8/19	49.79%
54	NC	Carolina Water Service of NC	2/21/19	50.91%
55	NJ	Aqua New Jersey	5/28/19	53.00%
56	KY	Kentucky American Water Co.	6/27/19	48.76%
		<b>Average</b>		<b>50.75%</b>
57	NC	Carolina Water Service of NC	3/31/20	49.10%
58	NY	SUEZ Water of New York <sup>1</sup>	7/16/2020	48.00%
59	NC	Aqua North Carolina	10/26/20	50.00%
60	NJ	New Jersey American Water Co.	10/28/20	54.56%
		<b>Average</b>		<b>50.42%</b>
61	NJ	SUEZ Water of New Jersey	5/19/21	54.00%
62	IA	Iowa American Water	6/28/21	52.28%
63	CT	Connecticut Water Co.	7/28/21	52.73%
		<b>Average</b>		<b>53.00%</b>
		<b>Average of Annual Averages (8 observations)</b>		<b>50.90%</b>
		<b>Average Across Years (63 observations)</b>		<b>51.10%</b>

Source: Regulatory Research Assoc., Global Market Intelligence, downloaded on November 2, 2021.

Carolina Water Service, Inc. of North Carolina  
Cost of Capital as of September 30, 2021

Item	Balance	Ratios	Cost Rate	Weighted Cost Rate	Pre-Tax Cost of Capital <sup>1</sup>
Long-Term Debt	341,467,855	49.80%	4.85%	2.42%	2.42%
Common Equity	344,152,953	50.20%	8.93%	4.48%	5.82%
Total	\$685,620,808	100.00%		6.90%	8.25%
				Pre-Tax Interest Coverage <sup>2</sup>	3.4
				Funds Flow to Debt <sup>3</sup>	22.62

<sup>1</sup> The pre-tax cost of debt and equity is grossed up by tax retention factors.

<sup>2</sup> Pre-Tax Interest Coverage: 3.4 = 8.23 / 2.42.

<sup>3</sup> Funds Flow to Debt = (Recommended rate base\*weighted debt cost rate) / (Net Income for Return + Depreciation + Amortization).

22.62 = ((143739820\*0.0242)/(9839761+7102774-1566582))\*100