BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Docket No. R-2024-3046523

Duquesne Light Company
Statement No. 11

Direct Testimony of Paul Moul

Subject: Rate of Return

Date: March 20, 2024

Duquesne Light Company
Direct Testimony of Paul R. Moul
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GLOSSARY OF ACRONYMS AND DEFINED TERMS

ACRONYM	DEFINED TERM
AFUDC	Allowance for Funds Used During Construction
β	Beta
b	Represents the retention rate that consists of the fraction of earnings that are not paid out as dividends
b x r	Represents internal growth
CAPM	Capital Asset Pricing Model
CCR	Corporate Credit Rating
CE	Comparable Earnings
CWIP	Construction Work in Progress
DCF	Discounted Cash Flow
DSIC	Distribution System Improvement Charge
EE&C	Energy Efficiency and Conservation Program
FOMC	Federal Open Market Committee
IGF	Internally Generated Funds
g	Growth rate
lev	Leverage modification
LT	Long Term
M&M	Modigliani & Miller
MPL	Minimum pension liability
OCI	Other Comprehensive Income
POLR	Provider of last resort
PPUC	Pennsylvania Public Utility Commission
r	represents the expected rate of return on common equity
Rf	Risk-free rate of return
Rm	Return on the market
RP	Risk Premium
RTO	Regional Transmission Organizations
s	Represents the new common shares expected to be issued by a firm

GLOSSARY OF ACRONYMS AND DEFINED TERMS	
ACRONYM	**DEFINED TERM**
s x v	Represents external growth
S&P	Standard & Poor's
v	Represents the value that accrues to existing shareholders from selling stock at a price different from book value
ytm	Yield to maturity

DIRECT TESTIMONY OF PAUL R. MOUL

1		**INTRODUCTION AND SUMMARY OF RECOMMENDATION**
2	**Q.**	**Please state your name, occupation and business address.**
3	A.	My name is Paul Ronald Moul. My business address is 251 Hopkins Road,
4		Haddonfield, New Jersey 08033-3062. I am Managing Consultant at the firm P.
5		Moul & Associates, an independent financial and regulatory consulting firm. My
6		educational background, business experience and qualifications are provided in
7		Appendix A, which follows my direct testimony.
8	**Q.**	**What is the purpose of your testimony?**
9	A.	My testimony presents evidence, analysis and a recommendation concerning the
10		appropriate rate of return that the Pennsylvania Public Utility Commission
11		("PPUC" or the "Commission") should recognize in the determination of the
12		revenues that Duquesne Light Company ("Duquesne Light" or the "Company")
13		should realize as a result of this proceeding. My analysis and recommendation are
14		supported by the detailed financial data contained in Exhibit PRM-1, which is a
15		multi-page document divided into fourteen (14) schedules.
16	**Q.**	**Based upon your analysis, what is your conclusion concerning the appropriate**
17		**cost of common equity and rate of return for the Company?**
18	A.	My conclusion is that the Company's appropriate rate of return on common equity
19		is 11.50%. This return falls within the range of results of the cost of equity models.
20		In determining the rate of return on common equity, the Commission should
21		consider the Company's risk related to catastrophic events such as storms and
22		threats to its system security, commitment to safety, and infrastructure investment.
23		The Company's strong performance in these areas are described in the testimony of

1   Mr. C.J. Davis and should be recognized by the Commission in its determination of

2   the Company's rate of return. With this return, I have presented on page 1 of

3   Schedule 1 the weighted average cost of capital, which is 8.34%. The Company's

4   proposed rate of return is shown below:

Type of Capital	Ratios	Cost Rate	Weighted Cost Rate
Long-Term Debt	46.05%	4.64%	2.14%
Common Equity	53.95%	11.50%	6.20%
Total	100.00%		8.34%

5   The resulting overall cost of capital, which is the product of weighting the

6   individual capital costs by the proportion of each respective type of capital, should,

7   if adopted by the Commission, establish a compensatory level of return for the use

8   of capital and provide the Company with the ability to attract capital which is

9   essential to maintaining a safe, reliable and resilient network.

10   **Q.   What background information have you considered in reaching a conclusion**

11   **concerning the Company's cost of capital?**

12   A.   Duquesne Light is wholly-owned subsidiary of Duquesne Light Holdings, Inc.

13   ("DLH" or the "Parent Company"). The Company provides electric delivery

14   service to approximately 606,000 customers in Allegheny and Beaver counties. In

15   2022, electric sales in MWh for Duquesne Light were comprised of approximately

16   33% to residential, 46% to commercial, 21% to industrial customers. The Company

17   is also the default service provider, or provider of last resort ("POLR"), and obtains

18   the energy needs of its customers that use POLR service from third party suppliers.

1   Q.   **How have you determined the cost of common equity in this case?**

2   A.   The cost of common equity is established using capital market and financial data

3   relied upon by investors to assess the relative risk, and hence the cost of equity, for

4   an electric utility, such as Duquesne Light. In this regard, I relied on four well-

5   recognized measures of the cost of equity: The Discounted Cash Flow ("DCF")

6   model, the Risk Premium ("RP") analysis, the Capital Asset Pricing Model

7   ("CAPM"), and the Comparable Earnings ("CE") approach. The results of a variety

8   of approaches indicate that the Company's rate of return on common equity is

9   11.50%.

10   Q.   **In your opinion, what factors should the Commission consider when**

11   **determining the Company's cost of capital in this proceeding?**

12   A.   The Commission's rate of return allowance must be set to cover the Company's

13   interest and dividend payments, provide a reasonable level of earnings retention,

14   produce an adequate level of internally generated funds to meet increasing capital

15   requirements, be commensurate with the risk to which the Company's capital is

16   exposed, assure confidence in the financial integrity of the Company, support

17   reasonable (i.e. investment grade) credit quality, and allow the Company to raise

18   capital on reasonable terms. The return that I propose fulfills these established

19   standards of a fair rate of return set forth by the landmark <u>Bluefield</u> and <u>Hope</u>

20   cases.[1] That is to say, my proposed rate of return is commensurate with returns

21   available on investments having corresponding risks.

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[1]<u>Bluefield Water Works & Improvement Co. v. P.S.C. of West Virginia</u>, 262 U.S. 679 (1923) and <u>F.P.C. v. Hope Natural Gas Co.</u>, 320 U.S. 591 (1944).

1   Q.   **What factors have you considered in measuring the cost of equity in this case?**

2   A.   The models that I used to measure the cost of common equity for the Company

3   were applied with market and financial data developed from my proxy group of ten

4   (10) electric companies. The criteria that I used to assemble the proxy group will

5   be described later in my testimony. The companies in the electric proxy group are

6   identified on page 2 of Schedule 3. I will refer to these companies as the "Electric

7   Group" throughout my testimony.

8   Q.   **How have you performed your cost of equity analysis with the market data for**

9   **the Electric Group?**

10 A.   I have applied the models/methods for estimating the cost of equity using the

11   average data for the Electric Group. I have not measured separately the cost of

12   equity for the individual companies within the Electric Group. By employing group

13   average data, rather than individual Company's analysis, I have helped to minimize

14   the effect of extraneous influences on the market data for an individual company.

15 Q.   **What noteworthy factors have influenced your cost of equity analysis?**

16 A.   My cost of equity analysis reflects the impact of high levels of inflation, which have

17   not been seen for four decades. Indeed, the rate of inflation spiked upward to 9.1%

18   in June 2022, and by January 2024 it had fallen to 3.1%. High levels of inflation,

19   i.e., those above the Federal Open Market Committee ("FOMC") policy goal of 2%,

20   have an impact on the level of economic activity, the cost of capital – particularly

21   the interest cost of debt, and the need for more cautious financial practices, such as

22   a prudent level of borrowing. While short-term interest rates were at historically

23   low levels during much of the Pandemic, longer-term interest rates began to rise in

1	February 2021 and have continued at high levels throughout 2022 and 2023.
2	Following the Pandemic, the accommodative policy by the FOMC has ended, and
3	higher interest rates have occurred. The FOMC uses its open market operations to
4	control the Fed Funds rate as a means of implementing its dual mandate of healthy
5	employment and price stability. This was revealed by the Fed Funds rate, which
6	increased 525 basis points since the beginning of 2022 through 11 increases in 21
7	months. The FOMC paused its rate increases and held rates steady at its meeting on
8	June 14, 2023. Thereafter, another rate increase occurred on July 26, 2023. The
9	FOMC paused again at its meetings on September 20, November 1, and December
10	13, 2023, and January 31, 2024. It appears that we are at the end of the current
11	interest rate tightening cycle. Some discussion suggests that reductions in the Fed
12	Funds rate could occur later in 2024. Modest reductions in the future would not
13	reduce the Fed Funds rate to Pandemic or pre-Pandemic levels, which were very
14	low after the financial crisis of 2007-08.
15	**Q.** **Please summarize your cost of equity analysis.**
16	**A.** My cost of equity determination was derived from the results of the
17	methods/models identified above, and revealed on page 2 of Schedule 1. In
18	general, the use of more than one method provides a superior foundation to arrive at
19	the cost of equity. At any point in time, reliance on a single method can provide an
20	incomplete measure of the cost of equity. The specific application of these
21	methods/models will be described later in my testimony. The following table,
22	derived from the model results presented on page 2 of Schedule 1, provides a
23	summary of the indicated costs of equity using each of these approaches.

	Electric Group
DCF	11.78%
RP	11.50%
CAPM	14.27%
Comparable Earnings	13.25%

1   These returns that provide the range of the cost of equity from 11.50% to 14.27%

2   using the market-based models, i.e., Discounted Cash Flow ("DCF"), Risk

3   Premium, and Capital Asset Pricing Model ("CAPM"). Furthermore, the

4   Comparable Earnings method confirms the reasonableness of the range defined by

5   the market based models. From these measures of the cost of equity, I recommend

6   that the Company's rate of return on common equity be set at 11.50%, which is

7   within the range of results reflected in the above table. I also believe my

8   recommended cost of equity of 11.50% is appropriate in this case because there is

9   always the potential that the Company may not actually achieve its allowed rate of

10   return in the current economic environment. Uncertainty in this regard is related to

11   unanticipated increases in operating and maintenance expenses and the impact on

12   commercial and industrial sales. My recommendation should be viewed as the

13   minimum necessary to satisfy investors' expectations.   It is important that the

14   Company be provided a reasonable opportunity to earn its cost of capital so that it

15   may sustain its ability to attract and retain capital at the level needed to support the

16   increased demand for capital investment.

1   **ELECTRIC UTILITY RISK FACTORS**

2 Q.   **Please identify some of the factors that make the electric utility industry**

3   **generally different today than it was in the past.**

4 A.   Aside from its traditional responsibility to maintain reliability and comply with the

5   mandates of the Commission, a different set of risks now exists for the electric

6   delivery business in Pennsylvania. The potential expansion of distributed

7   generation will have an increasing influence on the business risk of electric-delivery

8   utilities. The obligation to serve represents a key risk factor for the local delivery of

9   electricity. The risks facing the electric utilities are clearly different from those that

10   existed in the past. Investors generally are risk-averse, and with increased

11   uncertainty will require compensation for higher risk.

12 Q. **Have these changes brought about increases in the risks facing electric utilities**

13   **generally?**

14 A.   Electric utilities generally are faced with meaningful changes in the fundamentals

15   that affect their operations, while retaining the obligation to serve under cost of

16   service pricing that continues to dominate its business profile. The risk of

17   distributed generation is a concern, and could have an increasing influence on the

18   business of electric delivery utilities. With technological advances in micro-

19   turbines, potential commercialization of battery systems, development of wind and

20   solar power, and the creation of micro-grids, utilities face the potential for bypass

21   and the resulting declines in transmission and distribution revenues. That is to say,

22   the development of distributed generation and local alternative energy has the

23   potential to displace delivery revenue that can impact the incumbent utility's

1   financial profile. This risk is exacerbated by net metering rules that require offsets

2   against distribution rates even though distribution costs may not be reduced as a

3   result of the installation of distributed generation.

4   The cost to replace aging infrastructure and to enhance reliability and

5   resiliency, and address cyber threats, also adds to the risk of electric delivery

6   utilities, such as Duquesne Light, because these expenditures increase costs without

7   any concomitant increase in revenues, except through regulatory approved rate

8   increases, such as the Distribution System Improvement Charge ("DSIC"). The

9   Company continues to make substantial investments to harden its system and

10   expand its vegetation management practices to reduce the number and duration of

11   storm-related outages experienced by customers. The DSIC contains a variety of

12   limitations that will not eliminate the need for periodic rate cases to cover the

13   significant new investment that is being made by Duquesne Light. Duquesne Light

14   has also been engaged in an energy efficiency and conservation ("EE&C")

15   program, pursuant the programs mandated by Act 129 of 2008, P.L. 1592 ("Act

16   129"). Reductions in revenues resulting from reductions in usage and demand the

17   Company is required to achieve under its Commission-mandated EE&C program,

18   which can have an adverse impact on the Company between rate cases.

19 **Q.   Are there other specific risk issues facing the Company?**

20 A.   Yes. Energy deliveries to commercial and industrial customers, which represent

21   67% of the Company's energy deliveries, are usually thought to be of higher risk

22   than to residential customers. Success in this segment of the Company's market is

23   subject to the business cycle and pressures from alternative providers. Moreover,

1   external factors also can influence deliveries to these customers, which face

2   competitive pressure on their own operations from other facilities outside the

3   utility's service territory.

4   In addition, significant efforts to encourage conservation pursuant to the

5   requirements of Act 129 create a risk that Duquesne Light's distribution revenues

6   will likely decline between base rate cases.

7   Q. **Please indicate how the Company's risk profile is affected by its construction**

8   **program.**

9   A. The Company is faced with the requirement to undertake investment to maintain

10   and upgrade existing facilities in its service territory and to meet growth. Over the

11   next five years (i.e., 2024 through 2028), the Company's total capital expenditures

12   are expected to be approximately $2.525 million. These expenditures will represent

13   approximately 65% ($2.525 million ÷ $3,887.3 million) of the net utility plant at

14   December 31, 2022. A fair rate of return for the Company represents a key to a

15   financial profile that will provide the Company with the ability to raise the capital,

16   in all market conditions to meet its needs, and to satisfy investor requirements. In

17   the situation where additional capital is required, as shown by the construction

18   expenditures indicated above, the regulatory process must establish a return on

19   equity that provides a reasonable opportunity for the Company to actually achieve

20   its cost of capital. This is especially important for Duquesne Light due to its

21   smaller size and the magnitude of its construction program.

22   **FUNDAMENTAL RISK ANALYSIS**

23   Q. **Is it necessary to conduct a fundamental risk analysis to provide a framework**

1   **for a determination of a utility's cost of equity?**

2   A.   Yes. It is necessary to establish a company's relative risk position within its

3   industry through a fundamental analysis of various quantitative and qualitative

4   factors that bear upon investors' assessment of overall risk. The qualitative factors

5   that bear upon the Company's risk have already been discussed. The quantitative

6   risk analysis follows. The items that influence investors' evaluation of risk and

7   their required returns were described above. For this purpose, I compared

8   Duquesne Light to the S&P Public Utilities, an industry-wide proxy consisting of

9   various regulated businesses, and to the Electric Group.

10   **Q.   What are the components of the S&P Public Utilities?**

11   A.   The S&P Public Utilities is a widely recognized index that is comprised of electric

12   power and natural gas companies. These companies are identified on page 3 of

13   Schedule 4.

14   **Q.   What criteria did you employ to assemble the Electric Group?**

15   A.   The Electric Group companies have the following common characteristics: (i) have

16   publicly-traded common stock, (ii) are contained in The Value Line Investment

17   Survey and are classified in the Electric Utility East group, (iii) are not currently the

18   target of an announced merger or acquisition, (iv) are not engaged in the

19   construction of a nuclear generating plant, and (v) have not recently reduced their

20   common dividend in 2023. It would be inappropriate to include a company that is a

21   target of a takeover in a proxy group because the stock price of that company

22   usually does not reflect its underlying fundamentals. This situation is different from

23   the company that initiates the acquisition, which will be the surviving entity. My

1   Electric Group obtained from the <u>Value Line Investment Survey</u> consists of the

2   following companies: AVANGRID, Inc., Consolidated Edison, Dominion Energy,

3   Duke Energy, Eversource Energy, Exelon Corp., FirstEnergy Corp., NextEra

4   Energy, PPL Corp., and Public Service Enterprise Group.

5 **Q. Is knowledge of a utility's bond rating an important factor in assessing its risk**

6   **and cost of capital?**

7 A. Yes. Knowledge of a company's credit quality rating is important because the cost

8   of each type of capital is directly related to the associated risk of the firm. So, while

9   a company's credit quality risk is shown directly by the rating and yield on its

10   bonds, these relative risk assessments also bear upon the cost of equity. This is

11   because a firm's cost of equity is represented by its borrowing cost plus

12   compensation to recognize the higher risk of an equity investment compared to

13   debt.

14 **Q. How do the bond ratings compare for Duquesne Light, the Electric Group, and**

15   **the S&P Public Utilities?**

16 A. For Duquesne Light, its Long Term ("LT") issuer rating is A3 from Moody's

17   Investors Service ("Moody's") and the corporate credit rating ("CCR") is BBB+

18   from Standard & Poor's Corporation ("S&P"). The LT issuer rating by Moody's

19   and the CCR designation by S&P focuses upon the credit quality of the issuer of the

20   debt, rather than upon the debt obligation itself. The testimony of Mr. James

21   Milligan, the Company's Treasurer, provides further detail on the Company's credit

22   ratings. For the Electric Group, the average LT issuer rating is A2 from Moody's

23   and the average CCR is BBB+ from S&P. For the S&P Public Utilities, the average

1   composite rating is A3 by Moody's and A- by S&P. Many of the financial

2   indicators that I will subsequently discuss are considered during the rating process.

3   In this regard, the Company's credit quality is similar to the Electric Group (e.g.

4   Duquesne Light's Moody's rating is one notch weaker than the Electric Group and

5   its S&P rating is also one notch weaker).

6 **Q.** **How do the financial data compare for Duquesne Light, the Electric Group,**

7   **and the S&P Public Utilities?**

8 A. The broad categories of financial data that I will discuss are shown on Schedules 2,

9   3, and 4. The data cover the five-year period 2018-2022. The important categories

10   of relative risk may be summarized as follows:

11   Size. In terms of capitalization, Duquesne Light is much smaller than the

12   average size of the Electric Group and the S&P Public Utilities. All other things

13   being equal, a smaller company is riskier than a larger company because a given

14   change in revenue and expense has a proportionately greater impact on a small firm.

15   In addition, Duquesne Light serves a concentrated geographic area, and in

16   particular, an urban area that is often more costly to service. As I will demonstrate

17   later, the size of a firm can impact its cost of equity. This is the case for Duquesne

18   Light.

19   Market Ratios. Market-based financial ratios provide a partial indication

20   of the investor-required cost of equity. If all other factors are equal, investors will

21   require a higher rate of return on equity for companies that exhibit greater risk, in

22   order to compensate for that risk. That is to say, a firm that investors perceive to

23   have higher risks will experience a lower price per share in relation to expected

1   earnings.[2]

2   There are no market ratios available for Duquesne Light because the

3   Company's stock is not traded. The five-year average price-earnings multiple for

4   the Electric Group was fairly similar to the S&P Public Utilities. The five-year

5   average dividend yield was slightly higher for the Electric Group compared to the

6   S&P Public Utilities. The average market-to-book ratio for the Electric Group was

7   lower than the S&P Public Utilities.

8   <u>Common Equity Ratio.</u> The level of financial risk is measured by the

9   proportion of long-term debt and other senior capital that is contained in a

10   company's capitalization. Financial risk is also analyzed by comparing common

11   equity ratios (the complement of the ratio of debt and other senior capital). That is

12   to say, a firm with a high common equity ratio has lower financial risk, while a firm

13   with a low common equity ratio has higher financial risk. The five-year average

14   common equity ratios, based on permanent capital, were 53.2% for Duquesne Light,

15   45.1% for the Electric Group, and 40.5% for the S&P Public Utilities. The average

16   common equity ratio in 2022 was 43.9% for the Electric Group and reflected a

17   range of common equity ratios from 31.6% to 67.1%. Of note, these common

18   equity ratios are for holding companies, not the operating utilities on whose capital

19   structure are used to set rates. The common equity ratio proposed by Duquesne

20   Light in this case of 53.95%, is within the range of common equity ratios for the

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[2]For example, two otherwise similarly situated firms each reporting $1.00 in earnings per share would have different market prices at varying levels of risk (i.e., the firm with a higher level of risk will have a lower share value, while the firm with a lower risk profile will have a higher share value).

1   Electric Group. Moreover, it is important to emphasize that the Company's actual

2   capital structure is the one that supports its present bond ratings. That is to say, a

3   53% - 54% common equity ratio is required for Duquesne Light to sustain its

4   A3/BBB+ bond rating.

5   Return on Book Equity. Greater variability (i.e., uncertainty) of a firm's

6   earned returns signifies relatively greater levels of risk, as shown by the coefficient

7   of variation (standard deviation ÷ mean) of the rate of return on book common

8   equity. The higher the coefficients of variation, the greater degree of variability.

9   For the five-year period, the coefficients of variation were 0.074 (0.9% ÷ 12.2%)

10   for Duquesne Light, 0.173 (1.4% ÷ 8.1%) for the Electric Group, and 0.040 (0.4% ÷

11   10.0%) for the S&P Public Utilities. The earnings variability for Duquesne Light

12   was lower than the Electric Group, but higher than the S&P Public Utilities. This

13   places the Company between the risk of each.

14   Operating Ratios. I have also compared operating ratios (the percentage

15   of revenues consumed by operating expense, depreciation and taxes other than

16   income taxes).[3] The complement of the operating ratio is the operating margin

17   which provides a measure of profitability. The higher the operating ratio, the lower

18   the operating margin. The five-year average operating ratios were 72.6% for

19   Duquesne Light, 80.8% for the Electric Group, and 81.0% for the S&P Public

20   Utilities. The operating risk for Duquesne Light is below that for to the Electric

21   Group and the S&P Public Utilities, thus indicating lower risk.

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[3]The complement of the operating ratio is the operating margin which provides a measure of profitability. The higher the operating ratio, the lower the operating margin.

1	Coverage. The level of fixed charge coverage (i.e., the multiple by which
2	available earnings cover fixed charges, such as interest expense) provides an
3	indication of the earnings protection for creditors. Higher levels of coverage, and
4	hence earnings protection for fixed charges, are usually associated with superior
5	grades of creditworthiness. The five-year average interest coverage (excluding
6	Allowance for Funds Used During Construction ("AFUDC")) was 4.81 times for
7	Duquesne Light, 3.02 times for the Electric Group, and 2.94 times for the S&P
8	Public Utilities. The higher interest coverage for Duquesne Light can be traced to
9	its lower proportion of debt in its capital structure.
10	Quality of Earnings. Measures of earnings quality usually are revealed by
11	the percentage of AFUDC related to income available for common equity, the
12	effective income tax rate, and other cost deferrals. These measures of earnings
13	quality usually influence a firm's internally generated funds because poor quality of
14	earnings would not generate high levels of cash flow. Quality of earnings has not
15	been a significant concern for Duquesne Light, the Electric Group, and the S&P
16	Public Utilities.
17	Internally Generated Funds. Internally generated funds ("IGF") provide
18	an important source of new investment capital for a utility and represent a key
19	measure of credit strength. Historically, the five-year average percentage of IGF to
20	capital expenditures was 79.4% for Duquesne Light, 65.2% for the Electric Group,
21	and 62.3% for the S&P Public Utilities. The IGF percentages were fairly similar
22	for the Electric Group and the S&P Public Utilities, while the Company's ratio was
23	higher indicating lower risk.

15

1   Betas. The financial data that I have been discussing relate primarily to

2   company-specific risks. Market risk for firms with publicly-traded stock is

3   measured by beta coefficients. Beta coefficients attempt to identify systematic risk,

4   i.e., the risk associated with changes in the overall market for common equities.[4]

5   Value Line publishes such a statistical measure of a stock's relative historical

6   volatility to the rest of the market. A comparison of market risk is shown by the

7   Value Line beta of .88 as the average for the Electric Group (see page 2 of Schedule

8   3), and .90 as the average for the S&P Public Utilities (see page 3 of Schedule 4).

9   The systematic risk was slightly lower for the Electric Group as compared to the

10   S&P Public Utilities.

11 Q. **Please summarize your risk evaluation of the Company and the Electric**

12   **Group.**

13 A. The risk of Duquesne Light parallels that of the Electric Group in certain respects.

14   However, Duquesne Light is much smaller than the average size of the Electric

15   Group. The Company's lower financial risk (i.e., higher common equity ratio)

16   provides a partial offset to this high-risk factor, as well as its credit quality rating of

17   A3/BBB+. Lower risk indicators for the Company are its earnings that are less

18   variable, its operating ratio was lower, its interest coverages are higher, and IGF to

19   construction has been higher compared to the Electric Group. Overall, the results

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[4]Beta is a relative measure of the historical sensitivity of the stock's price to overall fluctuations in the New York Stock Exchange Composite Index. The ''Beta coefficient'' is derived from a regression analysis of the relationship between weekly percentage changes in the price of a stock and weekly percentage changes in the NYSE Index over a period of five years. The betas are adjusted for their long-term tendency to converge toward 1.00. A common stock that has a beta less than 1.0 is considered to have less systematic risk than the market as a whole and would be expected to rise and fall more slowly than the rest of the market. A stock with a beta above 1.0 would have more systematic risk.

1   from the Electric Group provide a reasonable representation of the Company's cost

2   of equity.

3   **CAPITAL STRUCTURE RATIOS**

4   **Q.**   **Please explain the selection of capital structure ratios for Duquesne Light.**

5   A.   In the situation where the operating public utility raises its own long-term debt

6   directly in the capital markets, as is the case for Duquesne Light, it is proper to

7   employ the capital structure ratios and senior capital cost rates of the regulated

8   public utility for rate of return purposes. Furthermore, consistency requires that the

9   embedded cost rate of the Company's senior securities also be employed. This

10   procedure is consistent with the procedures used by the Commission in prior rate

11   cases.

12   **Q.**   **Does Schedule 5 provide the capitalization and capital structure ratios you**

13   **have considered?**

14   A.   Yes. Schedule 5 presents Duquesne Light's capitalization and related capital

15   structure at December 31, 2023, the end of the historic test year ("HTY"). Also

16   shown on Schedule 5 is the Duquesne Light's estimated capital structure at

17   December 31, 2024, which is the end of the future test year ("FTY"), and at

18   December 31, 2025, which is the end of the fully projected future test year

19   ("FPFTY"). During the FTY, the Company's capital structure reflects the projected

20   issuance of $130 million of new debt in two tranches and the Company's projection

21   of retained earnings. For the FPFTY, there is a $200 million of new debt in two

22   tranches and the build-up of retained earnings.

23   Also reflected on Schedule 5 are several adjustments to the capital

1   structure. The first adjustment is related to the call premiums on the early

2   redemption or refunding of high cost long-term debt. The second adjustment relates

3   to the elimination of accumulated Other Comprehensive Income ("OCI").

4   Q.   **Please describe the first adjustment.**

5   A.   I have adjusted the principal amounts of long-term debt to exclude the amounts

6   used to finance premiums on the early redemption of high-cost long-term debt. To

7   do otherwise would deny Duquesne Light the full return on the premiums paid to

8   redeem this high cost capital since additional amounts of capital were issued to pay

9   the call premiums. The amounts issued to finance the call premiums do not

10   increase the Company's rate base. That is to say, no additional rate base was

11   created through additional debt that was necessary to finance these transactions, and

12   therefore an adjustment is required to provide the return necessary to service the

13   additional capital. Hence, Duquesne Light's long-term debt amounts must be

14   adjusted for this disparity in order that the return necessary to service the

15   capitalization is produced from rate base investment times the overall rate of return.

16   This adjustment is equitable since customers receive the cost savings

17   resulting from these refinancing in the form of a lower overall rate of return, and

18   Duquesne Light recovers all costs incurred in providing these benefits to the

19   customers. To accomplish these savings, the Company paid the debt holders a

20   premium for surrendering its securities prior to maturity. These premiums

21   represented an investment made by Duquesne Light to reduce its overall cost of

22   capital. Since the reduced interest costs are reflected in the lower cost of capital to

23   ratepayers, it is appropriate that the Company recover the costs incurred to produce

1   these savings. This includes both a return of and return on the unamortized

2   premiums. Adjusting the principal amounts in the capital structure provides a

3   return on the premium as a part of the embedded cost rates of capital.

4   Q.   **Please explain the second adjustment.**

5   A.   The accumulated OCI must be eliminated from the capital structure for ratesetting

6   purposes. OCI arises from a variety of sources, including: minimum pension

7   liability ("MPL"), foreign currency hedges, unrealized gains and losses on

8   securities available for sale, interest rate swaps, and other cash flow hedges. The

9   accumulated OCI associated with the Company's pension and postretirement plans

10   must be excluded from the common equity because it does not represent funds

11   available to the Company that could be used to finance its rate base.

12   Q.   **What capital structure ratios do you recommend be adopted for rate of return**

13   **purposes in this proceeding?**

14   A.   Since ratemaking is prospective, the rate of return should reflect known changes

15   that will occur during the course of the fully projected future test year, at a

16   minimum, and should consider conditions that will exist during the period of time

17   the proposed rates will be effective. As a result, I will adopt the Company's FPFTY

18   capital structure ratios of 46.05% long-term debt and 53.95% common equity.

19   These capital structure ratios are the best approximation of the mix of capital the

20   Company will employ to finance its rate base during the period new rates are in

21   effect. Short-term debt has been excluded from these ratios because the

22   Commission's approved practice is to assign short-term debt to CWIP in the

23   calculation of AFUDC. Hence, the cost of short-term debt is capitalized through

1   AFUDC and plays no role in setting base rates. Moreover, the short-term debt for

2   the FPFTY shown on Schedule 5 is projected to be $41 million that is less than the

3   CWIP balance of $370 million. Hence, short-term debt must be excluded from the

4   rate of return in this case.

5   **Q.**   **What capital structure ratios do you recommend for determining Duquesne**

6   **Light's overall cost of capital in this proceeding?**

7   A.   Because rate-setting is prospective, the rate of return should, at a minimum, reflect

8   known or reasonably foreseeable changes which will occur during the course of the

9   test year. As a result, I will adopt the Company's FPFTY capital structure ratios of

10   46.05% long-term debt and 53.95% common equity. These ratios are consistent

11   with the Company's current investment grade credit ratings of A3/BBB+.

12   **<u>COST OF SENIOR CAPITAL</u>**

13   **Q.**   **What cost rate have you assigned to the debt portion of Duquesne Light's**

14   **capital structure?**

15   A.   Consistency with the capital structure ratios for the Company requires that the

16   embedded cost rates of Duquesne Light's senior securities must also be employed.

17   This procedure is consistent with the rates -setting procedures used by the

18   Commission in prior Duquesne Light rate cases. The determination of the cost of

19   debt is essentially an arithmetic exercise. This is due to the fact that the Company

20   has contracted for the use of this capital for a specific period of time at a specified

21   cost rate. As shown on page 1 of Schedule 6, the actual embedded cost rate of long-

22   term debt was 4.36% at December 31, 2023. By December 31, 2025, the embedded

23   debt cost rate is estimated to be 4.64%, as shown on page 3 of Schedule 6. For the

1   new issues of debt in the FTY, the Company expects these issues to have a 5.67%

2   for the 30-year term and 5.77% for the 40-year term. In the FPFTY, the rate is

3   expected to be 6.28% coupon rate for both issues. The details leading to the

4   development of the individual effective cost rates for each series of long-term debt,

5   using the cost rate to maturity technique, are shown on page 4 of Schedule 6. The

6   cost rate, or yield to maturity ("ytm"), used on page 4 of Schedule 6 is the rate of

7   discount that equates the present value of all future interest and principal payments

8   with the net proceeds of the bond.

9   I will adopt the 4.64% embedded cost of long-term debt at December 31,

10   2025, as shown on page 3 of Schedule 6. This rate is related to the amount of long-

11   term debt shown on Schedule 5 which provides the basis for the 46.05% long-term

12   debt ratio. In my calculation of the embedded cost of long-term debt, I have

13   recognized the costs associated with the Company's early redemption of high-cost

14   debt. As previously explained, it is necessary to compensate Duquesne Light for

15   the costs incurred to lower the embedded debt cost rate which reduces the cost of

16   capital charged to ratepayers.

17   **COST OF EQUITY – GENERAL APPROACH**

18   **Q.**   **Please describe how you determined the cost of equity for the Company.**

19   A.   Although my fundamental financial analysis provides the required framework to

20   establish the risk relationships among Duquesne Light, the Electric Group, and the

21   S&P Public Utilities, the cost of equity must be measured by standard financial

22   models that I identified above. Differences in risk traits, such as size, business

23   diversification, geographical diversity, regulatory policy, financial leverage, and

1   bond ratings also must be considered when analyzing the cost of equity.

2   It is also important to reiterate that no one method or model of the cost of

3   equity can be applied in an isolated manner. Rather, informed judgment must be

4   used to take into consideration the relative risk traits of the firm. It is for this reason

5   that I have used more than one method to measure the Company's cost of equity.

6   As I describe below, each of the methods used to measure the cost of equity

7   contains certain incomplete and/or overly restrictive assumptions and constraints

8   that are not optimal. Therefore, I favor considering the results from a variety of

9   methods. In this regard, I applied each of the methods with data taken from the

10   Electric Group and arrived at a cost of equity of 11.50% for Duquesne Light.

DISCOUNTED CASH FLOW

12   **Q.   Please describe the DCF model.**

13   A.   The DCF model seeks to explain the value of an asset as the present value of future

14   expected cash flows discounted at the appropriate risk-adjusted rate of return. In its

15   simplest form, the DCF-determined return on common stock consists of a current

16   cash (dividend) yield and future price appreciation (growth) of the investment. The

17   dividend discount equation is the familiar DCF valuation model, which assumes that

18   future dividends are systematically related to one another by a constant growth rate.

19   The DCF formula is derived from the standard valuation model: $P = D/(k-g)$, where

20   P = price, D = dividend, k = the cost of equity, and g = growth in cash flows. By

21   rearranging the terms, we obtain the familiar DCF equation: $k = D/P + g$. All of the

22   terms in the DCF equation represent investors' assessment of expected future cash

23   flows that they will receive in relation to the value that they set for a share of stock

1   (P). The DCF equation is sometimes referred to as the "Gordon" model.[5] My DCF

2   results are provided on Schedule 1, page 2, for the Electric Group. The DCF return

3   is 11.78% with the leverage adjustment and 10.40% without the leverage adjustment

4   for the Electric Group. The leverage adjustment is discussed more fully below.

5   Among the limitations of the model, there is a certain element of circularity

6   in the DCF method when applied in rate cases. This is because investors'

7   expectations for the future depend upon regulatory decisions. In turn, when

8   regulators depend upon the DCF model to set the cost of equity, they rely upon

9   investor expectations that include an assessment of how regulators will decide rate

10   cases. Due to this circularity, the DCF model may not fully reflect the true risk of a

11   utility. Other limitations of the DCF include the constant P-E multiple assertion that

12   does not conform with actual stock market performance. And, indeed, the FERC has

13   moved to using multiple methods for measuring the cost of equity due to the

14   limitations of the DCF. Further, the DCF method is slow to reflect changes in interest

15   rates. Hence, the DCF should always be used along with other methods that are more

16   responsive to changes in interest rates.

17   **Q.   What is the dividend yield component of a DCF analysis?**

18   A.   The dividend yield reveals the portion of investors' cash flow that is generated by the

19   return provided by the dividends an investor receives. It is measured by the dividends

20   per share relative to the price per share. The DCF methodology requires the use of

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[5] Although the popular application of the DCF model is often attributed to the work of Myron J. Gordon in the mid-1950s, J.B. Williams exposited the DCF model in its present form nearly two decades earlier.

1   an expected dividend yield to establish the investor-required cost of equity. For the

2   twelve months ended December 2023, the monthly dividend yields are shown on

3   Schedule 7. The month-end prices were adjusted to reflect the buildup of the

4   dividend in the price that has occurred since the last ex-dividend date (i.e., the date

5   by which a shareholder must own the shares to be entitled to the dividend payment –

6   usually about two to three weeks prior to the actual payment).

7   For the twelve months ended December 2023, the average dividend yield

8   was 4.03% for the Electric Group based upon a calculation using annualized dividend

9   payments and adjusted month-end stock prices. The dividend yields for the more

10   recent six-month and three-month periods were 4.26% and 4.36%, respectively. For

11   applying the DCF model, I have used the six-month average dividend yield of 4.26%

12   for the Electric Group. The use of this dividend yield will reflect current capital costs

13   while avoiding spot yields. For the purpose of a DCF calculation, the average

14   dividend yield must be adjusted to reflect the prospective nature of the dividend

15   payments, i.e., the higher expected dividends for the future. Recall that the DCF is

16   an expectational model that must reflect investors' anticipated cash flows. I have

17   adjusted the six-month average dividend yield in three different but generally

18   accepted manners and used the average of the three adjusted values as calculated in

19   the lower panel of data presented on Schedule 7.[6] This adjustment adds fourteen

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[6] These adjustments are the 1/2 growth approach, the discrete approach, and the quarterly approach. Under the 1/2 approach, the procedure to adjust the average dividend yield for the expectation of a dividend increase during the initial investment period will be at a rate of one-half the growth component, which assumes that half of the dividend payments will be at the expected higher rate during the initial investment period. Under the discrete approach, the "*g*" in the DCF model reflects the discrete growth in the quarterly dividend, which is required for the periodic form of the DCF to properly recognize that dividends are expected to grow on a discrete basis. The quarterly approach takes into account that

1   basis points to the six-month average historical yield, thus producing the 4.40%

2   adjusted dividend yield for the Electric Group.

3 **Q.   What factors influence investors' growth expectations?**

4 A.   As noted previously, investors are interested principally in the dividend yield and

5   future growth of their investment (i.e., the price per share of the stock). Future growth

6   in earnings per share is the DCF model's primary focus because, under the model's

7   assumption that the P-E multiple remains constant, the price per share of stock will

8   grow at the same rate as earnings per share. A growth rate analysis considers a variety

9   of variables to reach a consensus of prospective growth, including historical data and

10   widely available analysts' forecasts of earnings, dividends, book value, and cash flow

11   (all stated on a per-share basis). A fundamental growth rate analysis is frequently

12   based upon internal growth, or b x r, where "r" is the expected rate of return on

13   common equity and "b" is the retention rate (a fraction representing the proportion of

14   earnings not paid out as dividends). To be complete, the internal growth rate should

15   be modified to account for sales of new common stock (external growth), which is

16   represented by the formula s x v, where "s" is the number of new common shares that

17   the firm expects to issue and "v" is the value that accrues to existing shareholders

18   from selling stock at a price above book value. Fundamental growth, which combines

19   internal and external growth, encompasses the factors that cause book value per share

20   to grow over time.

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investors have the opportunity to reinvest quarterly dividend receipts. Recognizing the compounding of the periodic quarterly dividend payments *(D₀)* results in this third DCF formulation. This DCF equation provides no further recognition of growth in the quarterly dividend. A compounding of the quarterly dividend yield recognizes the necessity for an adjusted dividend yield.

1   Growth also can be expressed in multiple stages. This expression of growth

2   consists of an initial "growth" stage during which a firm enjoys rapidly expanding

3   markets, high profit margins, and abnormally high growth in earnings per share.

4   Thereafter, a firm enters a "transition" stage during which fewer technological

5   advances and increased product saturation begin to reduce the growth rate and profit

6   margins come under pressure. During the "transition" stage, investment

7   opportunities begin to mature, capital requirements decline, and a firm begins to pay

8   out a larger percentage of earnings to shareholders. Finally, the mature or "steady-

9   state" stage is reached when a firm's earnings growth, payout ratio, and return on

10   equity stabilize at levels where they remain for the life of a firm. The three stages of

11   growth assume a step-down of high initial growth to lower sustainable growth. Even

12   if these three stages of growth can be envisioned for a firm, the third "steady-state"

13   growth stage, which is assumed to remain fixed in perpetuity, represents an

14   unrealistic expectation because the three stages of growth can be repeated. That is to

15   say, the stages can be repeated where growth for a firm ramps up and ramps down in

16   cycles over time. For these reasons, there is no need to analyze growth rates

17   individually for each cycle, but rather to rely upon analysts' growth forecasts that are

18   used by investors when pricing common stocks.

19   **Q.   What factor should be considered in the determination of an appropriate growth**

20   **rate?**

21   A.   The growth rate used in a DCF calculation should measure investor expectations.

22   Investors consider both company-specific variables and overall market sentiment

23   (i.e., level of inflation rates, interest rates, economic conditions, etc.) when balancing

1   their capital gains expectations with their dividend yield requirements. Investors are

2   not influenced solely by a single set of company-specific variables weighted in a

3   formulaic manner. Therefore, all relevant growth rate indicators should be evaluated

4   using a variety of techniques when formulating a judgment of investor-expected

5   growth.

6   **Q.   What data for the Electric Group have you considered in your growth rate**

7   **analysis?**

8   A.   I considered the growth in the financial variables shown on Schedules 8 and 9, which

9   reflect historical (Schedule 8) and projected (Schedule 9) rates of growth in earnings

10   per share, dividends per share, book value per share, and cash flow per share for the

11   Electric Group. While analysts will review all measures of growth, as I have done,

12   earnings per share growth directly influences the expectations of investors for the

13   future performance of utility stocks. Forecasts of earnings growth are required

14   because the DCF model is forward-looking, and, with the constant P-E multiple and

15   constant payout ratio that the DCF model assumes, all other measures of growth will

16   mirror earnings growth. The historical growth rates, which were also reviewed to

17   gain a perspective on the industry, were obtained from the <u>Value Line</u> publication

18   that provides this data. While historical data cannot be ignored, they are much less

19   significant when applying the DCF model than projections of future growth.

20   Investors cannot purchase the past earnings of a utility. To the contrary, they are only

21   entitled to future earnings, which are the focus of growth projections. Furthermore,

22   if significant weight is assigned to historical performance, the historical data are

23   double-counted because they are already factored into analysts' forecasts of earnings

1   growth.

2   Q. **Is a five-year investment horizon associated with the analysts' forecasts**

3   **consistent with the traditional DCF model?**

4   A. Yes, it is. Although the constant form of the DCF model assumes an infinite stream

5   of cash flows, investors do not expect to hold an investment indefinitely. Rather than

6   viewing the DCF in the context of an endless stream of growing dividends (e.g., a

7   century of cash flows), the growth in the share value (i.e., capital appreciation, or

8   capital gains yield) is most relevant to investors' total return expectations. Hence,

9   the sale price of a stock can be viewed as a liquidating dividend that can be discounted

10   along with the annual dividend receipts during the investment-holding period to

11   arrive at the investors' expected return. The growth in the price per share will equal

12   the growth in earnings per share if, as the DCF model assumes, there is no change in

13   the price-earnings ("P-E") multiple. As such, my company-specific growth analysis,

14   which focuses principally upon five-year forecasts of earnings per share growth,

15   conforms with the type of analysis that influences investors' expectations of their

16   actual total return. Moreover, academic research also focuses on five-year growth

17   rates specifically because market outcomes occurring over that investment horizon

18   are what influence stock prices. Indeed, if investors required forecasts beyond five

19   years in order to properly value common stocks, then it would be reasonable to expect

20   that some investment advisory service would begin publishing that information for

21   individual stocks in order to meet the demands of the marketplace. The absence of

22   such a publication suggests that there is no market for this information because

23   investors do not require forecasts for an infinite series of future data points in order

1   to make informed decisions to purchase and sell stocks.

2   **Q.** **What are the analysts' forecasts of future growth that you considered?**

3   A.   Schedule 9 provides projected earnings per share growth rates taken from analysts'

4   five-year forecasts compiled by IBES/First Call, Zacks, and <u>Value Line</u>. These are

5   all reliable authorities of projected growth that investors use to make buy, sell, and

6   hold decisions. The IBES/First Call and Zacks estimates are obtained from the

7   Internet and are widely available to investors. The growth rates reported by

8   IBES/First Call and Zacks are consensus forecasts taken from a survey of analysts

9   that make growth projections for these companies. Notably, First Call's earnings

10   forecasts are frequently quoted in the financial press. The <u>Value Line</u> forecasts also

11   are widely available to investors and can be obtained by subscription or free of charge

12   at most public and collegiate libraries. The IBES/First Call and Zacks forecasts are

13   limited to earnings per share growth, while <u>Value Line</u> makes projections of other

14   financial variables. The <u>Value Line</u> forecasts of dividends per share, book value per

15   share, and cash flow per share for the Electric Group are also included on Schedule

16   9.

17 **Q.** **What are the projected growth rates published by the sources you discussed?**

18 A.   Schedule 9 shows the prospective five-year earnings per share growth rates projected

19   for the Electric Group by IBES/First Call (7.18%), Zacks (5.28%), and <u>Value Line</u>

20   (5.33%).

21 **Q.** **Are certain growth rate forecasts entitled to greater weight in developing a**

22   **growth rate for use in the DCF model?**

23 A.   Yes. While a variety of factors should be examined to reach a reasonable conclusion

1   on the DCF growth rate, growth in earnings per share should receive the greatest

2   emphasis. Growth in earnings per share is the primary determinant of investors'

3   expectations of the total returns they will obtain from stocks because the capital gains

4   yield (i.e., price appreciation) will track earnings growth if the P-E multiple remains

5   constant, as the DCF model assumes. Moreover, earnings per share (derived from

6   net income) are the source of dividend payments and are the primary driver of

7   retention growth and its surrogate, i.e., book value per share growth. As such, under

8   these circumstances, greater emphasis must be placed upon projected earnings per

9   share growth. In fact, Professor Gordon, the foremost proponent of the use of the

10   DCF model in setting utility rates, concluded that the best measure of growth for use

11   in the DCF model is a forecast of earnings per-share growth.[7] Consistent with

12   Professor Gordon's findings, projections of earnings per share growth, such as those

13   published by IBES/First Call, Zacks, and <u>Value Line</u>, provide the best indication of

14   investor expectations.

15   **Q.**   **What growth rate do you use in your DCF model?**

16   A.   The forecasts shown on Schedule 9 for the Electric Group exhibit a range of average

17   earnings per share growth rates from 5.28% to 7.18%. DCF growth rates should not

18   be established by mathematical formulation, and I have not done so. In my opinion,

19   a growth rate of 6.00% is a reasonable estimate of investor-expected growth for the

20   Electric Group. This value is within the array of analysts' forecasts of five-year

21   earnings per share growth rates. The reasonableness of this growth rate is also

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[7] Gordon, Gordon & Gould, "Choice Among Methods of Estimating Share Yield," <u>The Journal of Portfolio Management</u> (Spring 1989).

1   supported by the expected continuation of electric utility infrastructure spending.

2   Q. **What is the raw, unadjusted result of the DCF prior to further considerations**

3   **in public utility rate cases?**

4   A. Without further adjustment, the DCF result is 10.40% as shown on Schedule 7.

5   However, financial risk considerations must be recognized when applying these

6   results to a book value capital structure. This is explained below.

7   Q. **Are the dividend yield and growth components of the DCF adequate to**

8   **accurately depict the rate of return on common equity when it is used to**

9   **calculate a utility's weighted average overall cost of capital?**

10 A. The components of the DCF model are adequate for that purpose only if the capital

11   structure ratios are measured by the market value of debt and equity. In the case of

12   the Electric Group, average capital structure ratios are 37.91% long-term debt, 0.36%

13   preferred stock, and 61.74% common equity, as shown on Schedule 10. If book

14   values are used to compute the capital structure ratios, then a leverage adjustment is

15   required.

16 Q. **What is a leverage adjustment?**

17 A. If a firm's capitalization, as measured by its stock price, diverges from its

18   capitalization, measured at book value, the potential exists for a financial risk

19   difference. Such a risk difference arises because a market-valued capitalization

20   contains more equity and less debt than a book-value capitalization and, therefore,

21   has less risk than the book-value capitalization. A leverage adjustment properly

22   accounts for the risk differential between market-value and book-value capital

23   structures.

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1   Q.   **Why is a leverage adjustment necessary?**

2   A.   In order to make the DCF results relevant to the capitalization measured at book value

3   (as is done for rate setting purposes), the market-derived cost rate must be adjusted

4   to account for this difference in financial risk. The only perspective that is important

5   to investors is the return that they can realize on the market value of their investment.

6   As I have measured the DCF, the simple yield (D/P) plus growth (g) provides a return

7   applicable strictly to the price (P) that an investor is willing to pay for a share of

8   stock. The need for the leverage adjustment arises when the results of the DCF model

9   (k) are to be applied to a capital structure that is different from the capital structure

10   indicated by the market price (P). From the market perspective, the financial risk of

11   the Electric Group is accurately measured by the capital structure ratios calculated

12   from the market-valued capitalization of a firm. If the ratemaking process utilized

13   the market capitalization ratios, then no additional analysis or adjustment would be

14   required, and the simple yield (D/P) plus growth (g) components of the DCF would

15   satisfy the financial risk associated with the market value of the equity capitalization.

16   Because the ratemaking process uses ratios calculated from a firm's book value

17   capitalization, further analysis is required to synchronize the financial risk of the book

18   capitalization with the required return on the book value of the firm's equity. This

19   adjustment is developed through precise mathematical calculations, using well-

20   recognized analytical procedures that are widely accepted in the financial literature.

21   To arrive at that return, the rate of return on common equity is the unleveraged cost

22   of capital (or equity return at 100% equity) plus one or more terms reflecting the

23   increase in financial risk resulting from the use of leverage in the capital structure.

1   The calculations presented in the lower panel of data shown on Schedule 10, under

2   the heading "M&M,"[8] provide a return of 9.07% when applicable to a capital

3   structure with 100% common equity.

4   **Q.   Are there specific factors that influence market-to-book ratios that determine**

5   **whether the leverage adjustment should be made?**

6   A.   No. The leverage adjustment is not intended, nor was it designed, to address the

7   reasons that stock prices vary from book value. Hence, any observations concerning

8   market prices relative to book value are not on point. The leverage adjustment deals

9   with the issue of financial risk and does not transform the DCF result to a book value

10   return through a market-to-book adjustment. Again, the leverage adjustment that I

11   propose is based on the fundamental financial precept that the cost of equity is equal

12   to the rate of return for an unleveraged firm (i.e., where the overall rate of return

13   equates to the cost of equity with a capital structure that contains 100% equity) plus

14   the additional return required for introducing debt and/or preferred stock leverage

15   into the capital structure.

16   Further, as noted previously, the relatively high market prices of utility

17   stocks cannot be attributed solely to the notion that these companies are expected to

18   earn a return on the book value of equity that differs from their cost of equity

19   determined from stock market prices. Stock prices above book value are common

20   for utility stocks, and indeed the stock prices of non-regulated companies exceed

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[8] Franco Modigliani and Merton H. Miller, "The Cost of Capital, Corporation Finance, and the Theory of Investments," American Economic Review, June 1958, at 261-97. Franco Modigliani and Merton H. Miller, "Taxes and the Cost of Capital: A Correction," American Economic Review, June 1963, at 433-43.

1 book values by even greater margins. It is difficult to accept that the vast majority of

2 all firms operating in our economy are generating returns far in excess of their cost

3 of capital. Certainly, in our free-market economy, competition should contain such

4 "excesses" if they actually exist.

5   Finally, the leverage adjustment adds stability to the final DCF cost rate.

6 That is to say, as the market capitalization increases relative to its book value, the

7 leverage adjustment increases while the simple yield (D/P) plus growth (g) result

8 declines. The reverse is also true: when the market capitalization declines, the

9 leverage adjustment also declines as the simple yield (D/P) plus growth (g) result

10 increases.

11 **Q.** **Is the leverage adjustment that you propose designed to transform the market**

12   **return into one that is designed to produce a particular market-to-book ratio?**

13 A. No, it is not. What I label a "leverage adjustment" is merely a convenient way of

14   showing the amount that must be added to (or subtracted from) the result of the simple

15   DCF model (i.e., D/P + g) when the DCF return applies to a capital structure used for

16   ratemaking that is computed with book-value weighting rather than market-value

17   weighting. Although I specify a separate factor, which I call the leverage adjustment,

18   there is no need to do so other than to identify this factor. If I were to express my

19   return solely in the context of the book value weighting that we use to calculate the

20   weighted average cost of capital and ignore the familiar D/P + g expression entirely,

21   then a separate element in the DCF cost of equity determination would not be needed

22   to reflect the differential in financial leverage between a market-value and book-value

23   capitalization. As shown in the bottom panel of data on Schedule 10, the equity return

1   applicable to the book value common equity ratio is equal to 9.07%, which is the

2   return for the Electric Group appropriate for a capital structure with no debt (i.e., a

3   100% equity ratio) plus 2.67% to compensate investors for the risk of a 55.23% debt

4   ratio and 0.04% for a 0.46% preferred stock ratio. These are the book-value ratios

5   that differ markedly from the market-value based ratios I discussed previously.

6   Under this approach, the parts add up to 11.78% (9.07% + 2.67% + 0.04%), and there

7   is no need to even address the cost of equity in terms of D/P + g. To express this

8   same return in the context of the familiar DCF model, I added the 4.40% dividend

9   yield, the 6.00% growth rate, and 1.38% for the leverage adjustment in order to arrive

10   at the same 11.78% (4.40% + 6.00% + 1.38%) return. I know of no means to

11   mathematically solve for the 1.38% leverage adjustment by expressing it in the terms

12   of any particular relationship of market price to book value. The 1.38% adjustment

13   is merely a convenient way to compare the 11.78% return computed using the

14   Modigliani & Miller formulas to the 10.40% return generated by the DCF model (i.e.,

15   D_1/P_0 + g, or the traditional form of the DCF shown on Schedule 1, page 2) based on

16   a market-value capital structure. A 10.40% return assigned to anything other than

17   the market value of equity cannot equate to a reasonable return on book value that

18   has higher financial risk. My point is that when we use a market-determined cost of

19   equity developed from the DCF model, it reflects a level of financial risk that is

20   different (in this case, lower) from the capital structure stated at book value. This

21   process has nothing to do with targeting any particular market-to-book ratio.

22 **Q.** **Please provide the DCF return based upon your preceding discussion of**

23   **dividend yield, growth, and leverage.**

1   A.   As explained previously, I have utilized a six-month average dividend yield (D_1/P_0)

2   adjusted in a forward-looking manner for my DCF calculation. This dividend yield

3   is used in conjunction with the growth rate (g) previously developed. The DCF also

4   includes the leverage modification (Lev.) required when the book value equity ratio

5   is used in determining the weighted average cost of capital in the ratemaking process

6   rather than the market value equity ratio related to the price of stock. The resulting

7   DCF cost rate is 11.78%, computed as follows:

$$\boldsymbol{D_1/P_0} \; + \quad \boldsymbol{g} \quad + \quad \boldsymbol{lev.} \quad = \quad \boldsymbol{K}$$

Electric Group   4.40% + 6.00% + 1.38% = 11.78%

8   The DCF result shown above represents the simplified (i.e., Gordon) form

9   of the model that contains a constant-growth assumption. I should reiterate, however,

10   that the DCF-indicated cost rate provides an explanation of the rate of return on

11   common stock market prices without regard to the prospect of a change in the P-E

12   multiple. An assumption that there will be no change in the P-E multiple is not

13   supported by the realities of the equity market because P-E multiples do not remain

14   constant. This is one of the constraints of this model that makes it important to

15   consider the results of other models when determining a company's cost of equity.

16   **RISK PREMIUM ANALYSIS**

17   Q.   **Please describe your use of the Risk Premium approach to determine the cost of**

18   **equity.**

19   A.   With the Risk Premium approach, the cost of equity capital is determined by

20   corporate bond yields plus a premium to account for the fact that common equity is

1   exposed to greater investment risk than debt capital. The result of my Risk Premium

2   study is shown on Schedule 1, page 2. That result is 11.50%.

3 **Q. What long-term public utility debt cost rate did you use in your Risk Premium**

4   **analysis?**

5 A. In my opinion, and as I will explain in more detail further in my testimony, a 5.00%

6   yield represents a reasonable estimate of the prospective yield on long-term, public

7   utility bonds. The 5.00% public utility bond yield I used in the Risk Premium method

8   is very conservative given current interest rates.

9 **Q. What historical data are shown by the Moody's data?**

10 A. I have analyzed the historical yields on the Moody's index of long-term public utility

11   debt as shown on Schedule 11, page 1. For the 12 months ended December 2023 the

12   average monthly yield on Moody's index public utility bonds was 5.54%. For the

13   six- and three-month periods ended December 2023, the yields were 5.78% and

14   5.91%, respectively. During the 12 months ended December 2023, the range of the

15   yields on public utility bonds were 5.13% to 6.34%. Page 2 of Schedule 11 shows

16   the long-run spread in yields between A-rated public utility bonds and long-term

17   Treasury bonds. As shown on page 3 of Schedule 11, the yields on A-rated public

18   utility bonds have exceeded those on Treasury bonds by 1.45% on a twelve-month

19   average basis, 1.37% on a six-month average basis, and 1.32% on a three-month

20   average basis. With these data, 1.25% represents a reasonable, albeit conservative,

21   spread for the yield on A-rated public utility bonds over Treasury bonds.

22 **Q. What forecasts of interest rates have you considered in your analysis?**

23 A. I have determined the prospective yield on A-rated public utility debt by using the

1   Blue Chip Financial Forecasts ("Blue Chip") along with the spread in the yields that

2   I describe above. Blue Chip is a reliable authority and contains consensus forecasts

3   of various interest rates compiled from a panel of banking, brokerage and investment

4   advisory services. In early 1999, Blue Chip stopped publishing forecasts of yields on

5   A-rated public utility bonds because the Federal Reserve deleted these yields from its

6   Statistical Release H.15. To independently project a forecast of the yields on A-rated

7   public utility bonds, I have combined the forecast yields on long-term Treasury bonds

8   published on December 28, 2023, and a yield spread of 1.25%, derived from recent

9   historical data.

10   **Q.   How have you used these data to project the yield on A-rated public utility bonds**

11   **for the purpose of your Risk Premium analyses?**

12   A.   Shown below is my calculation of the prospective yield on A-rated public utility

13   bonds using the building blocks discussed above, i.e., the Blue Chip forecast of

14   Treasury bond yields and the public utility bond yield spread. For comparative

15   purposes, I have also shown the Blue Chip forecasts of Aaa-rated and Baa-rated

16   corporate bonds. These forecasts are:

| | | Blue Chip Financial Forecasts | | | | |
| | | Corporate | | 30-Year | A-rated Public Utility | |
Year	Quarter	Aaa-rated	Baa-rated	Treasury	Spread	Yield
2024	First	5.1%	6.1%	4.3%	1.25%	5.55%
2024	Second	5.0%	6.0%	4.3%	1.25%	5.55%
2024	Third	4.9%	6.0%	4.2%	1.25%	5.45%
2024	Fourth	4.8%	5.9%	4.1%	1.25%	5.35%
2025	First	4.8%	5.8%	4.0%	1.25%	5.25%
2025	Second	4.7%	5.8%	4.0%	1.25%	5.25%

17   **Q.   Are there additional forecasts of interest rates that extend beyond those shown**

1   **above?**

2 A. Yes. Twice yearly, <u>Blue Chip</u> provides long-term forecasts of interest rates. In its

3   December 1, 2023 publication, <u>Blue Chip</u> published longer-term forecasts of interest

4   rates, which were reported to be:

	Blue Chip Financial Forecasts		
	Corporate		30-Year
Averages	Aaa-rated	Baa-rated	Treasury
2025-2029	4.9%	6.0%	4.1%
2030-2034	5.0%	6.0%	4.2%

5   The longer-term forecasts by <u>Blue Chip</u> suggest that interest rates will

6   continue to be above pre-Pandemic levels. A 5.00% yield on A-rated public utility

7   bonds represents a reasonably conservative benchmark for measuring the cost of

8   equity in this case. All the data I used to formulate my conclusion as to a prospective

9   yield on A-rated public utility debt are based on forecasts available to investors, who

10   regularly rely upon such data to make investment decisions. In this case, I have taken

11   a conservative approach in selecting a 5.00% yield on A-rated public utility bonds,

12   because current ratios and forecasts would support a higher rate. My rate will

13   accommodate reductions that may occur later in 2024.

14 Q. **What equity risk premium have you determined for public utilities?**

15 A.   To develop an appropriate equity risk premium, I analyzed the results from

16   2022 SBBI Yearbook, Stocks, Bonds, Bills and Inflation. My investigation reveals

17   that the equity risk premium varies according to the level of interest rates. That is to

18   say, the equity risk premium increases as interest rates decline, and it declines as

19   interest rates increase. This inverse relationship is revealed by the summary data

1   presented below and shown on Schedule 12, page 1.

<div align="center">

Common Equity Risk Premiums

</div>

Low Interest Rates	7.13%
Average Across All Interest Rates	5.96%
High Interest Rates	4.76%

2

3   Based on my analysis of the historical data, the equity risk premium was

4   7.13% when the marginal cost of long-term government bonds was low (i.e., 2.83%,

5   which was the average yield during periods of low rates). Conversely, when the yield

6   on long-term government bonds was high (i.e., 7.03% on average during periods of

7   high interest rates), the spread narrowed to 4.76%. Over the entire spectrum of

8   interest rates, the equity risk premium was 5.96% when the average government bond

9   yield was 4.91%. From these data, I have utilized a 6.50% equity risk premium. The

10   equity risk premium of 6.50% is between the premiums associated with low interest

11   rates (i.e., 7.13%) and average for the entire historical period interest rates (i.e.,

12   5.96%).

13   Q.   **What common equity cost rate did you determine based on your Risk Premium**

14   **analysis?**

15   A.   The cost of equity (i.e., "k") is represented by the sum of the prospective yield for

16   long-term public utility debt (i.e., "i"), the equity risk premium (i.e., "RP"), and the

17   adjustment for flotation costs (i.e., flot.). The Risk Premium approach provides a

18   cost of equity of:

$$i \quad + \quad RP \quad = \quad k$$

Electric Group   5.00% + 6.50% = 11.50%

1

CAPITAL ASSET PRICING MODEL

3   **Q.**   **How is the CAPM used to measure the cost of equity?**

4   A.   The CAPM uses the yield on a risk-free interest-bearing obligation plus a rate of

5   return premium that is proportional to the systematic risk of an investment.   As

6   shown on page 2 of Schedule 1, the result of the CAPM is 14.27% for the Electric

7   Group with the leverage adjustment. Without the leverage adjustment, the CAPM

8   result is 12.04% (14.27% - (0.27 x 8.26%)) through use of the Value Line beta

9   excluding the leverage adjustment (i.e., 1.15 - 0.88 = 0.27). The results of the CAPM

10   further removing the size adjustment would be 11.02% (12.04% - 1.02%). To

11   compute the cost of equity with the CAPM, three components are necessary: a risk-

12   free rate of return ("Rf"), the beta measure of systematic risk ("β"), and the market

13   risk premium ("Rm-Rf") derived from the total return on the market of equities

14   reduced by the risk-free rate of return. The CAPM specifically accounts for

15   differences in systematic risk (i.e., market risk as measured by the beta) between an

16   individual firm or group of firms and the entire market of equities.

17   **Q.**   **What betas have you considered in the CAPM?**

18   A.   For my CAPM analysis, I initially considered the Value Line betas. As shown on

19   page 2 of Schedule 3, the average beta is 0.88 for the Electric Group.

20   **Q.**   **Did you use the Value Line betas in the CAPM determined cost of equity?**

21   A.   I used the Value Line betas as a foundation for the leverage adjusted betas that I used

41

1   in the CAPM. The <u>Value Line</u> betas are measured over a five-year period. The betas

2   must be reflective of the financial risk associated with the ratemaking capital structure

3   that is measured at book value. Therefore, <u>Value Line</u> betas cannot be used directly

4   in the CAPM, unless the cost rate developed using those betas is applied to a capital

5   structure measured with market values. Since we used book values in this case, the

6   <u>Value Line</u> betas must be adjusted for the higher financial risk associated with the

7   book value capital structure. To develop a CAPM cost rate applicable to a book-

8   value capital structure, the <u>Value Line</u> (market value) betas have been unleveraged

9   and re-leveraged for the book value common equity ratios using the Hamada

10   formula,[9] as follows:

$$\beta l = \beta u \ [1 + (1 - t) \ D/E + P/E]$$

12   ill = the leveraged beta, ßu = the unleveraged beta, t = income tax rate, D =

13   debt ratio, P = preferred stock ratio, and E = common equity ratio. The betas

14   published by <u>Value Line</u> have been calculated with the market price of stock and are

15   related to the market value capitalization. By using the formula shown above and the

16   capital structure ratios measured at market value, the beta would become 0.63 for the

17   Electric Group if it employed no leverage and was 100% equity financed. Those

18   calculations are shown on Schedule 10 under the section labeled "Hamada," who is

19   credited with developing those formulas. With the unleveraged beta as a base, I

20   calculated the leveraged beta of 1.15 for the book value capital structure of the

---

[9] Robert S. Hamada, "The Effects of the Firm's Capital Structure on the Systematic Risk of Common Stocks;" <u>The Journal of Finance</u>, Vol. 27, No. 2; Papers and Proceedings of the Thirtieth Annual Meeting of the American Finance Association, New Orleans, Louisiana, Dec. 27-29, 1971. (May 1972), pp. 435-52.

1   Electric Group.

2 **Q.   What risk-free rate have you used in the CAPM?**

3 A.   As shown on page 1 of Schedule 13, I provided the historical yields on Treasury notes

4   and bonds. For the twelve months ended December 2023, the average yield on 30-

5   year Treasury bonds was 4.09%. For the six- and three-months ended December

6   2023, the yields on 30-year Treasury bonds were 4.41% and 4.58%, respectively.

7   During the twelve months ended December 2023, the range of the yields on 30-year

8   Treasury bonds was 3.66% to 4.95%. The low yields that existed during 2020 can be

9   traced to extraordinary events associated with the Pandemic that jolted the capital

10   markets. I described these events earlier in my pre-filed direct testimony. Due to

11   high inflation rates above the policy goal of the FOMC, the accommodative policy

12   was ended by the FOMC in the first quarter of 2022. A tighter monetary policy exists

13   today and has caused higher interest rates that have already occurred. After the

14   FOMC ended its bond-buying program (i.e., quantitative easing) in March 2022, it is

15   in the process of running off its $9 trillion asset portfolio, which will keep interest

16   rates at elevated levels.

17   High interest rates clearly point to high capital costs, as indicated by recent

18   bond yields. The yield on 10-year Treasury bonds moved above the 3% level on May

19   2, 2022, for the first time since late 2018. By December 2023, the yield on 30-year

20   Treasury bonds moved to 4.14%, or an increase of 2.47% (or 148%) since December

21   2020.

22   As shown on page 2 of Schedule 13, forecasts published by Blue Chip on

23   December 28, 2023, indicate that the yields on long-term Treasury bonds are

1   expected to be in the range of 4.0% to 4.3% during the next six quarters. This means

2   that elevated interest rates will continue near current levels into 2024. The longer-

3   term forecasts show that the yields on 30-year Treasury bonds will average 4.1%

4   from 2025 through 2029 and 4.2% from 2030 to 2034. For the reasons explained

5   previously, forecasts of interest rates should be emphasized at this time in selecting

6   the risk-free rate of return in CAPM. Hence, I have used a conservative 3.75% risk-

7   free rate of return for CAPM purposes, which considers the possibility of some

8   moderation of rates prospectively.

9 **Q.** **What market premium have you used in the CAPM?**

10 A.   As shown in the lower panel of data presented on page 2 of Schedule 13, the market

11   premium is derived from historical data and the forecast returns. For the historically

12   based market premium, I have used the arithmetic mean obtained from the data

13   presented on page 1 of Schedule 12. On that schedule, the market return was 12.21%

14   (12.40% + 12.02% = 24.42% ÷ 2) as the midpoint of the "low" and "average" interest

15   rate environments. During those periods, the yield on long-term government bonds

16   was 3.87% (2.83% + 4.91% = 7.74% ÷ 2). The resulting market premium is 8.34%

17   (12.21% - 3.87%) based on historical data, as shown on page 2 of Schedule 13. As

18   also shown on page 2 of Schedule 13, I calculated the forecast returns, which show a

19   11.93% total market return based on the <u>Value Line</u> forecasts. With these data, I

20   calculated a market premium of 8.18% (11.93% - 3.75%) using the forecast data by

21   Value Line. The resulting market premium applicable to the CAPM derived from

22   these sources equals 8.26% (8.18% + 8.34% = 16.52% ÷ 2).

1   **Q.**   **Are there adjustments to the CAPM that are necessary to fully reflect the rate**

2   **of return on common equity?**

3   **A.**   Yes. The technical literature supports an adjustment relating to the size of the

4   company or portfolio for which the calculation is performed. As the size of a firm

5   decreases, its risk and required return increases. Moreover, in his discussion of the

6   cost of capital, Professor Eugene F. Brigham has indicated that smaller firms have

7   higher capital costs than otherwise similar larger firms. Also, the Fama/French study

8   (see "The Cross-Section of Expected Stock Returns"; The Journal of Finance, June

9   1992) established that the size of a firm helps explain stock returns. In an October

10   15, 1995 article in Public Utility Fortnightly, entitled "Equity and the Small-Stock

11   Effect," it was demonstrated that the CAPM could significantly understate the cost

12   of equity according to a company's size. Indeed, it was demonstrated in the SBBI

13   Yearbook that the returns for stocks in lower deciles (i.e., smaller stocks) had returns

14   in excess of those shown by the simple CAPM. To recognize this fact, I used the

15   mid-cap adjustment of 1.02%, as revealed on page 3 of Schedule 13, for the CAPM

16   calculation. The adjustment here is related to the size of the Gas Group.

17   **Q.**   **What does your CAPM analysis show?**

18   **A.**   Using the 3.75% risk-free rate of return, the leverage adjusted beta of 1.15 for the

19   Gas Group, the 8.26% market premium, and the 1.02% size adjustment, the following

20   result is indicated.

21

$$Rf \quad + \quad \beta \quad x \ (\quad Rm\text{-}Rf \ ) + \quad size \quad = \quad k$$

22   Electric Group   3.75% + 1.15 x (8.26%) + 1.02% = 14.27%

1   The CAPM results shown here should receive more weight in an

2   environment of rising interest rates, because the DCF will provide an understated

3   result. Indeed, the Commission has used the results of the CAPM when the DCF is

4   producing atypical results.

5   **COMPARABLE EARNINGS APPROACH**

6   **Q.   What is the Comparable Earnings approach?**

7   A.   The Comparable Earnings approach estimates a fair return on equity by comparing

8   returns realized by non-regulated companies to returns that a public utility with

9   similar risk characteristics would need to realize in order to compete for capital.

10   Because regulation is a substitute for competitively determined prices, the returns

11   realized by non-regulated firms with comparable risks to a public utility provide

12   useful insight into investor expectations for public utility returns. The firms selected

13   for the Comparable Earnings approach should be companies whose prices are not

14   subject to cost-based price ceilings (i.e., non-regulated firms) so that circularity is

15   avoided.

16   There are two avenues available to implement the Comparable Earnings

17   approach. One method involves the selection of another industry (or industries) with

18   comparable risks to the public utility in question, and the results for all companies

19   within that industry serve as a benchmark. The second approach requires the

20   selection of parameters that represent similar risk traits for the public utility and the

21   comparable risk companies. Using this approach, the business lines of the

22   comparable companies become unimportant. The latter approach is preferable with

1   the further qualification that the comparable risk companies exclude regulated firms

2   in order to avoid the circular reasoning implicit in the use of the achieved

3   earnings/book ratios of other regulated firms. The United States Supreme Court has

4   held that:

5   A public utility is entitled to such rates as will permit it to
6   earn a return on the value of the property which it employs
7   for the convenience of the public equal to that generally being
8   made at the same time and in the same general part of the
9   country on investments in other business undertakings which
10   are attended by corresponding risks and uncertainties. The
11   return should be reasonably sufficient to assure confidence in
12   the financial soundness of the utility and should be adequate,
13   under efficient and economical management, to maintain and
14   support its credit and enable it to raise the money necessary
15   for the proper discharge of its public duties. Bluefield Water
16   Works v. Public Service Commission, 262 U.S. 668 (1923).
17
18   It is important to identify the returns earned by firms that compete for

19   capital with a public utility. This can be accomplished by analyzing the returns of

20   non-regulated firms that are subject to the competitive forces of the marketplace.

21 Q. **Did you compare the results of your DCF and CAPM analyses to the results**

22   **indicated by a Comparable Earnings approach?**

23 A. Yes. I selected companies from The Value Line Investment Survey for Windows

24   that have six categories of comparability designed to reflect the risk of the Electric

25   Group. These screening criteria were based upon the range as defined by the rankings

26   of the companies in the Electric Group. The items considered were Timeliness Rank,

27   Safety Rank, Financial Strength, Price Stability, Value Line betas, and Technical

28   Rank. The definition for these parameters is provided on Schedule 14, page 3. The

29   identities of the companies comprising the Comparable Earnings group and their

1   associated rankings within the ranges are identified on Schedule 14, page 1.

2   I relied upon Value Line data because it provides a comprehensive basis for

3   evaluating the risks of the comparable firms. As to the returns calculated by Value

4   Line for these companies, there is some downward bias in the figures shown on

5   Schedule 14, page 2, because Value Line computes the returns on year-end rather

6   than average book value. If average book values had been employed, the rates of

7   return would have been slightly higher. Nevertheless, these are the returns considered

8   by investors when taking positions in these stocks. Because many of the

9   comparability factors, as well as the published returns, are used by investors in

10   selecting stocks, and the fact that investors rely on the Value Line service to gauge

11   returns, it is an appropriate database for measuring comparable return opportunities.

12 **Q.** **What data did you consider in your Comparable Earnings analysis?**

13 A.   I used both historical realized returns and forecasted returns for non-utility

14   companies. As noted previously, I have not used returns for utility companies in

15   order to avoid the circularity that arises from using regulatory-influenced returns to

16   determine a regulated return. It is appropriate to consider a relatively long

17   measurement period in the Comparable Earnings approach in order to cover

18   conditions over an entire business cycle. A ten-year period (five historical years and

19   five projected years) is sufficient to cover an average business cycle. Unlike the DCF

20   and CAPM, the results of the Comparable Earnings method can be applied directly

21   to the book value capitalization. In other words, the Comparable Earnings approach

22   does not contain the potential misspecification contained in market models when the

23   market capitalization and book value capitalization diverge significantly. A point of

1   demarcation was chosen to eliminate the results of highly profitable enterprises,

2   which the Bluefield case stated were not the type of returns that a utility was entitled

3   to earn. For this purpose, I used 20% as the point where those returns could be viewed

4   as highly profitable and should be excluded from the Comparable Earnings approach.

5   The average historical rate of return on book common equity was 13.1% using only

6   the returns that were less than 20%, as shown on Schedule 14, page 2. The average

7   forecasted rate of return as published by Value Line is 13.4% also using values less

8   than 20%, as provided on Schedule 14, page 2. Using the average of these data, my

9   Comparable Earnings result is 13.25%, as shown on Schedule 1, page 2.

10   <div align="center">**CONCLUSION ON COST OF EQUITY**</div>

11   **Q.   What is your conclusion regarding the Company's cost of common equity?**

12   A.   Based upon the application of a variety of methods and models described previously,

13   it is my opinion that a reasonable rate of return on common equity is 11.50% for

14   Duquesne Light. My cost of equity recommendation is obtained from a range of the

15   market based models (i.e., 11.50% to 14.27%) and should be considered in the

16   context of the Company's risk characteristics, as well as the general condition of the

17   capital markets, and the strong performance of the Company's management. It is

18   essential that the Commission employ a variety of techniques to measure the

19   Company's cost of equity because of the limitations/infirmities that are inherent in

20   each method.

21   **Q.   Does this complete your direct testimony?**

22   A.   Yes. However, I reserve the right to supplement my testimony, if necessary, and to

23   respond to witnesses presented by other parties.

APPENDIX A TO DIRECT TESTIMONY OF PAUL R. MOUL

EDUCATIONAL BACKGROUND, BUSINESS EXPERIENCE
AND QUALIFICATIONS

1   I was awarded a degree of Bachelor of Science in Business Administration by

2   Drexel University in 1971. While at Drexel, I participated in the Cooperative Education

3   Program which included employment, for one year, with American Water Works Service

4   Company, Inc., as an internal auditor, where I was involved in the audits of several

5   operating water companies of the American Water Works System and participated in the

6   preparation of annual reports to regulatory agencies and assisted in other general

7   accounting matters.

8   Upon graduation from Drexel University, I was employed by American Water

9   Works Service Company, Inc., in the Eastern Regional Treasury Department where my

10   duties included preparation of rate case exhibits for submission to regulatory agencies, as

11   well as responsibility for various treasury functions of the thirteen New England

12   operating subsidiaries.

13   In 1973, I joined the Municipal Financial Services Department of Betz

14   Environmental Engineers, a consulting engineering firm, where I specialized in financial

15   studies for municipal water and wastewater systems.

16   In 1974, I joined Associated Utility Services, Inc., now known as AUS

17   Consultants. I held various positions with the Utility Services Group of AUS

18   Consultants, concluding my employment there as a Senior Vice President.

19   In 1994, I formed P. Moul & Associates, an independent financial and regulatory

20   consulting firm. In my capacity as Managing Consultant and for the past twenty-nine

21   years, I have continuously studied the rate of return requirements for cost of service-

1   regulated firms. In this regard, I have supervised the preparation of rate of return studies,

2   which were employed, in connection with my testimony and in the past for other

3   individuals. I have presented direct testimony on the subject of fair rate of return,

4   evaluated rate of return testimony of other witnesses, and presented rebuttal testimony.

5   My studies and prepared direct testimony have been presented before thirty-seven

6   (37) federal, state and municipal regulatory commissions, consisting of: the Federal

7   Energy Regulatory Commission; state public utility commissions in Alabama, Alaska,

8   California, Colorado, Connecticut, Delaware, Florida, Georgia, Hawaii, Illinois, Indiana,

9   Iowa, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota,

10   Missouri, New Hampshire, New Jersey, New York, North Carolina, Ohio, Oklahoma,

11   Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Virginia, West Virginia,

12   Wisconsin, and the Philadelphia Gas Commission, and the Texas Commission on

13   Environmental Quality. My testimony has been offered in over 200 rate cases involving

14   electric power, natural gas distribution and transmission, resource recovery, solid waste

15   collection and disposal, telephone, wastewater, and water service utility companies.

16   While my testimony has involved principally fair rate of return and financial matters, I

17   have also testified on capital allocations, capital recovery, cash working capital, income

18   taxes, factoring of accounts receivable, and take-or-pay expense recovery. My testimony

19   has been offered on behalf of municipal and investor-owned public utilities and for the

20   staff of a regulatory commission. I have also testified at an Executive Session of the

21   State of New Jersey Commission of Investigation concerning the BPU regulation of solid

22   waste collection and disposal.

23   I was a co-author of a verified statement submitted to the Interstate Commerce

1   Commission concerning the 1983 Railroad Cost of Capital (Ex Parte No. 452). I was

2   also co-author of comments submitted to the Federal Energy Regulatory Commission

3   regarding the Generic Determination of Rate of Return on Common Equity for Public

4   Utilities in 1985, 1986 and 1987 (Docket Nos. RM85-19-000, RM86-12-000, RM87-35-

5   000 and RM88-25-000). Further, I have been the consultant to the New York Chapter of

6   the National Association of Water Companies, which represented the water utility group

7   in the Proceeding on Motion of the Commission to Consider Financial Regulatory

8   Policies for New York Utilities (Case 91-M-0509). I have also submitted comments to

9   the Federal Energy Regulatory Commission in its Notice of Proposed Rulemaking

10   (Docket No. RM99-2-000) concerning Regional Transmission Organizations and on

11   behalf of the Edison Electric Institute in its intervention in the case of Southern California

12   Edison Company (Docket No. ER97-2355-000). Also, I was a member of the panel of

13   participants at the Technical Conference in Docket No. PL07-2 on the Composition of

14   Proxy Groups for Determining Gas and Oil Pipeline Return on Equity.

15   In late 1978, I arranged for the private placement of bonds on behalf of an

16   investor-owned public utility. I have assisted in the preparation of a report to the

17   Delaware Public Service Commission relative to the operations of the Lincoln and

18   Ellendale Electric Company. I was also engaged by the Delaware P.S.C. to review and

19   report on the proposed financing and disposition of certain assets of Sussex Shores Water

20   Company (P.S.C. Docket Nos. 24-79 and 47-79). I was a co-author of a Report on

21   Proposed Mandatory Solid Waste Collection Ordinance prepared for the Board of County

22   Commissioners of Collier County, Florida.

23   I have been a consultant to the Bucks County Water and Sewer Authority

APPENDIX A TO DIRECT TESTIMONY OF PAUL R. MOUL

1   concerning rates and charges for wholesale contract service with the City of Philadelphia.

2   My municipal consulting experience also included an assignment for Baltimore County,

3   Maryland, regarding the City/County Water Agreement for Metropolitan District

4   customers (Circuit Court for Baltimore County in Case 34/153/87-CSP-2636).

DUQUESNE LIGHT COMPANY

EXHIBIT

TO ACCOMPANY

THE DIRECT TESTIMONY

OF

PAUL R. MOUL

CONCERNING
RATE OF RETURN

Duquesne Light Company
Index of Schedules

Duquesne Light Company
Proposed Rate of Return
Estimated at December 31, 2025

Type of Capital	Ratios	Cost Rate	Weighted Cost Rate
Long-Term Debt	46.05%	4.64%	2.14%
Common Equity	53.95%	11.50%	6.20%
Total	100.00%		8.34%

Indicated levels of fixed charge coverage assuming that
the Company could actually achieve its proposed rate of return:

Pre-tax coverage of interest expense based upon a
28.8921% composite federal and state income tax rate
(10.86% ÷ 2.14%)   5.07 x

Post-tax coverage of interest expense
(8.34% ÷ 2.14%)   3.9 x

Duquesne Light Company
Cost of Equity
With Market Data through
December 31, 2023

Discounted Cash Flow (DCF)	D_1/P_0 [1]	+	g [2]	+	lev. [3]	=	k
Electric Group	4.40%	+	6.00%	+	1.38%	=	11.78%

Risk Premium (RP)			I [4]	+	RP [5]	=	k
Electric Group			5.00%	+	6.50%	=	11.50%

Capital Asset Pricing Model (CAPM)	Rf [6]	+	ß [7]	x (Rm-Rf [8]) +	size [9]	=	k
Electric Group	3.75%	+	1.15	x (8.26%) +	1.02%	=	14.27%

Comparable Earnings (CE) [10]	*Historical*	*Forecast*	*Average*
Comparable Earnings Group	13.1%	13.4%	13.25%

References:
[1] Schedule 07
[2] Schedule 09
[3] Schedule 10
[4] A-rated public utility bond yield comprised of a 2.10% risk-free rate of return (Schedule 13 page 2) and a yield spread of 1.25% (Schedule 11 page 3)
[5] Schedule 12 page 1
[6] Schedule 13 page 2
[7] Schedule 10
[8] Schedule 13 page 2
[9] Schedule 13 page 3
[10] Schedule 14 page 2

<u>Duquesne Light Company</u>
Capitalization and Financial Statistics
<u>2018-2022, Inclusive</u>

	2022	2021	2020	2019	2018	
			(Millions of Dollars)			
Amount of Capital Employed						
Permanent Capital	$ 3,214.3	$ 2,989.5	$ 2,880.7	$ 2,589.0	$ 2,498.1	
Short-Term Debt	$ -	$ -	$ -	$ -	$ -	
Total Capital	$ 3,214.3	$ 2,989.5	$ 2,880.7	$ 2,589.0	$ 2,498.1	
						Average
Capital Structure Ratios						
Based on Permanent Capital:						
Long-Term Debt	46.8%	45.9%	47.6%	45.1%	48.5%	46.8%
Common Equity	53.2%	54.1%	52.4%	54.9%	51.5%	53.2%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Based on Total Capital:						
Total Debt, incl. Short Term	46.8%	45.9%	47.6%	45.1%	48.5%	46.8%
Common Equity	53.2%	54.1%	52.4%	54.9%	51.5%	53.2%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Rate of Return on Book Common Equity	12.3%	11.2%	11.6%	13.6%	12.2%	12.2%
Operating Ratio (1)	73.2%	73.0%	72.9%	70.5%	73.6%	72.6%
Coverage incl. AFUDC (2)						
Pre-tax: All Interest Charges	5.17 x	4.70 x	4.56 x	5.26 x	4.38 x	4.81 x
Post-tax: All Interest Charges	4.29 x	3.94 x	3.93 x	4.38 x	3.73 x	4.05 x
Coverage excl. AFUDC (3)						
Pre-tax: All Interest Charges	5.17 x	4.70 x	4.56 x	5.26 x	4.38 x	4.81 x
Post-tax: All Interest Charges	4.29 x	3.94 x	3.93 x	4.38 x	3.73 x	4.05 x
Quality of Earnings & Cash Flow						
AFC/Income Avail. for Common Equity	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Effective Income Tax Rate	21.1%	20.4%	17.7%	20.7%	19.4%	19.9%
Internal Cash Generation/Construction (4)	75.3%	84.3%	73.5%	92.6%	71.4%	79.4%
Gross Cash Flow/ Avg. Total Debt(5)	27.4%	26.9%	28.0%	29.4%	27.6%	27.9%
Gross Cash Flow Interest Coverage(6)	7.32 x	7.22 x	7.12 x	7.42 x	6.75 x	7.17 x
Common Dividend Coverage (7)	3.53 x	5.43 x	4.44 x	6.97 x	4.15 x	4.90 x

See Page 2 for Notes.

Duquesne Light Company
Capitalization and Financial Statistics
2018-2022, Inclusive

Notes:

(1)   Total operating expenses, maintenance, depreciation and taxes other than income as a percentage of operating revenues.

(2)   Coverage calculations represent the number of times available earnings including AFUDC (allowance for funds used during construction), as reported in its entirety, cover fixed charges.

(3)   Coverage calculations represent the number of times available earnings excluding AFUDC (allowance for funds used during construction), as reported in its entirety, cover fixed charges.

(4)   Internal cash generation/gross construction is the percentage of gross construction expenditures provided by internally generated funds from operations after payment of all cash dividends.

(5)   Gross Cash Flow (sum of net income, depreciation, amortization, net deferred income taxes and investment tax credits, less AFUDC) as a percentage of average total debt.

(6)   Gross Cash Flow plus interest charges divided by interest charges.

(7)   Common dividend coverage is the relationship of internally generated funds from operations after payment of preferred stock dividends to common dividends paid.

Source of Information: Company provided data

Electric Group
Capitalization and Financial Statistics [1]
2018-2022, Inclusive

	2022	2021	2020	2019	2018	
			(Millions of Dollars)			
Amount of Capital Employed						
Permanent Capital	$ 56,763.6	$ 55,240.3	$ 54,211.8	$ 52,064.3	$ 46,943.9	
Short-Term Debt	$ 2,137.3	$ 1,777.2	$ 1,638.4	$ 1,473.9	$ 1,960.6	
Total Capital	$ 58,900.9	$ 57,017.5	$ 55,850.2	$ 53,538.2	$ 48,904.5	
						Average
Market-Based Financial Ratios						
Price-Earnings Multiple	25 x	24 x	26 x	20 x	19 x	23 x
Market/Book Ratio	200.9%	197.3%	186.0%	197.4%	187.8%	193.9%
Dividend Yield	3.4%	3.8%	4.0%	3.7%	3.9%	3.8%
Dividend Payout Ratio	78.8%	79.7%	96.3%	69.7%	70.5%	79.0%
Capital Structure Ratios						
Based on Permanent Captial:						
Long-Term Debt	54.1%	52.3%	54.1%	52.0%	52.2%	52.9%
Preferred Stock	2.0%	2.1%	2.3%	2.1%	1.5%	2.0%
Common Equity [2]	43.9%	45.5%	43.6%	45.9%	46.4%	45.1%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Based on Total Capital:						
Total Debt incl. Short Term	55.8%	53.8%	55.5%	53.4%	54.0%	54.5%
Preferred Stock	2.0%	2.1%	2.2%	2.0%	1.4%	1.9%
Common Equity [2]	42.3%	44.1%	42.3%	44.6%	44.6%	43.6%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Rate of Return on Book Common Equity [2]	6.7%	7.5%	7.4%	8.7%	10.2%	8.1%
Operating Ratio [3]	84.3%	84.9%	79.3%	78.7%	76.7%	80.8%
Coverage incl. AFUDC [4]						
Pre-tax: All Interest Charges	3.48 x	2.89 x	2.70 x	3.00 x	3.48 x	3.11 x
Post-tax: All Interest Charges	3.09 x	2.60 x	2.47 x	2.66 x	2.97 x	2.76 x
Overall Coverage: All Int. & Pfd. Div.	3.08 x	2.58 x	2.46 x	2.65 x	2.91 x	2.74 x
Coverage excl. AFUDC [4]						
Pre-tax: All Interest Charges	3.38 x	2.81 x	2.61 x	2.91 x	3.39 x	3.02 x
Post-tax: All Interest Charges	2.99 x	2.52 x	2.38 x	2.57 x	2.89 x	2.67 x
Overall Coverage: All Int. & Pfd. Div.	2.98 x	2.51 x	2.37 x	2.57 x	2.83 x	2.65 x
Quality of Earnings & Cash Flow						
AFC/Income Avail. for Common Equity	6.6%	8.2%	6.5%	4.8%	5.5%	6.3%
Effective Income Tax Rate	18.0%	15.9%	9.2%	17.3%	20.0%	16.1%
Internal Cash Generation/Construction [5]	59.6%	61.2%	60.3%	67.1%	78.0%	65.2%
Gross Cash Flow/ Avg. Total Debt [6]	14.9%	14.7%	15.4%	17.4%	19.3%	16.3%
Gross Cash Flow Interest Coverage [7]	6.62 x	5.17 x	4.84 x	4.84 x	5.45 x	5.38 x
Common Dividend Coverage [8]	3.10 x	3.08 x	3.09 x	3.38 x	3.75 x	3.28 x

See Page 2 for Notes.

Electric Group
Capitalization and Financial Statistics
2018-2022, Inclusive

Notes:
(1) All capitalization and financial statistics for the group are the arithmetic average of the achieved results for each individual company in the group.
(2) Excluding Accumulated Other Comprehensive Income ("OCI") from the equity account.
(3) Total operating expenses, maintenance, depreciation and taxes other than income taxes as a percent of operating revenues.
(4) Coverage calculations represent the number of times available earnings, both including and excluding AFUDC (allowance for funds used during construction) as reported in its entirety, cover fixed charges.
(5) Internal cash generation/gross construction is the percentage of gross construction expenditures provided by internally-generated funds from operations after payment of all cash dividends divided by gross construction expenditures.
(6) Gross Cash Flow (sum of net income, depreciation, amortization, net deferred income taxes and investment tax credits, less total AFUDC) plus interest charges, divided by interest charges.
(7) Gross Cash Flow plus interest charges divided by interest charges.
(8) Common dividend coverage is the relationship of internally-generated funds from operations after payment of preferred stock dividends to common dividends paid.

Basis of Selection:
The Electric Group includes companies that: (i) have publicly-traded common stock, (ii) are contained in The Value Line Investment Survey and are classified in the Electric Utility East group, (iii) are not currently the target of an announced merger or acquisition, (iv) are not engaged in the construction of a nuclear generating plant or have not recently cancelled the construction of a nuclear generating plant, and (v) have not recently reduced its common dividend.

| | | Corporate Credit Ratings | | Stock | Value Line |
Ticker	Company	Moody's	S&P	Traded	Beta
AGR	AVANGRID, Inc (AGR)	A3	A-	NYSE	0.85
ED	Consolidated Edison Inc (ED)	Baa1	A-	NYSE	0.75
D	Dominion Energy, Inc. (D)	A2	BBB+	NYSE	0.85
DUK	Duke Energy Corporation (DUK)	A2	BBB+	NYSE	0.85
ES	Eversource Energy (ES)	A2	A	NYSE	0.90
EXC	Exelon Corp (EXC)	A2	BBB+	NDQ	NMF
FE	FirstEnergy Corp (FE)	A3	BBB	NYSE	0.85
NEE	NextEra Energy Inc (NEE)	A1	A	NYSE	0.95
PPL	PPL Corp (PPL)	A3	A	NYSE	1.05
PEG	Public Service Enterprise Group	A3	A-	NYSE	0.90
	Average	A3	A-		0.88

Note: Ratings are those of utility subsidiaries

Source of Information: Standard & Poor's Utility COMPUSTAT
Moody's Investors Service
Standard & Poor's Corporation

<u>Standard & Poor's Public Utilities</u>
Capitalization and Financial Statistics [1]
<u>2018-2022, Inclusive</u>

	2022	2021	2020	2019	2018	
			(Millions of Dollars)			
Amount of Capital Employed						
Permanent Capital	$ 42,136.6	$ 40,154.3	$ 38,732.9	$ 36,461.6	$ 32,871.6	
Short-Term Debt	$ 1,713.7	$ 1,397.4	$ 1,154.1	$ 1,221.9	$ 1,420.3	
Total Capital	$ 43,850.3	$ 41,551.7	$ 39,887.0	$ 37,683.5	$ 34,291.9	
						Average
Market-Based Financial Ratios						
Price-Earnings Multiple	23 x	22 x	23 x	20 x	21 x	22 x
Market/Book Ratio	219.2%	220.7%	218.2%	220.9%	204.4%	216.7%
Dividend Yield	3.3%	3.5%	3.6%	3.2%	3.5%	3.4%
Dividend Payout Ratio	72.5%	72.9%	78.0%	62.7%	68.7%	71.0%
Capital Structure Ratios						
Based on Permanent Captial:						
Long-Term Debt	58.3%	57.4%	58.1%	56.7%	55.0%	57.1%
Preferred Stock	2.2%	2.3%	2.6%	2.4%	2.5%	2.4%
Common Equity [2]	39.6%	40.4%	39.4%	41.0%	42.5%	40.5%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Based on Total Capital:						
Total Debt incl. Short Term	60.0%	58.9%	59.4%	58.1%	57.0%	58.7%
Preferred Stock	2.1%	2.2%	2.5%	2.3%	2.4%	2.3%
Common Equity [2]	37.9%	38.9%	38.1%	39.6%	40.7%	39.1%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Rate of Return on Book Common Equity [2]	9.9%	9.4%	10.2%	10.3%	10.3%	10.0%
Operating Ratio [3]	83.1%	83.1%	79.8%	79.3%	79.8%	81.0%
Coverage incl. AFUDC [4]						
Pre-tax: All Interest Charges	3.28 x	3.16 x	2.80 x	3.05 x	2.94 x	3.05 x
Post-tax: All Interest Charges	2.94 x	2.87 x	2.60 x	3.10 x	2.59 x	2.82 x
Overall Coverage: All Int. & Pfd. Div.	2.89 x	2.81 x	2.55 x	3.04 x	2.55 x	2.77 x
Coverage excl. AFUDC [4]						
Pre-tax: All Interest Charges	3.17 x	3.06 x	2.70 x	2.95 x	2.84 x	2.94 x
Post-tax: All Interest Charges	2.84 x	2.78 x	2.50 x	3.00 x	2.48 x	2.72 x
Overall Coverage: All Int. & Pfd. Div.	2.79 x	2.72 x	2.46 x	2.94 x	2.44 x	2.67 x
Quality of Earnings & Cash Flow						
AFC/Income Avail. for Common Equity	7.1%	7.4%	6.8%	6.0%	7.3%	6.9%
Effective Income Tax Rate	12.9%	10.6%	9.9%	12.2%	42.0%	17.5%
Internal Cash Generation/Construction [5]	60.2%	60.5%	58.6%	65.9%	66.2%	62.3%
Gross Cash Flow/ Avg. Total Debt [6]	15.1%	15.0%	15.9%	17.5%	17.4%	16.2%
Gross Cash Flow Interest Coverage [7]	5.70 x	5.17 x	4.90 x	4.97 x	4.98 x	5.14 x
Common Dividend Coverage [8]	3.49 x	3.47 x	3.52 x	5.56 x	4.80 x	4.17 x

See Page 2 for Notes.

<u>Standard & Poor's Public Utilities</u>
Capitalization and Financial Statistics
<u>2018-2022, Inclusive</u>

Notes:

(1)   All capitalization and financial statistics for the group are the arithmetic average of the achieved results for each individual company in the group.
(2)   Excluding Accumulated Other Comprehensive Income ("OCI") from the equity account
(3)   Total operating expenses, maintenance, depreciation and taxes other than income taxes as a percent of operating revenues.
(4)   Coverage calculations represent the number of times available earnings, both including and excluding AFUDC (allowance for funds used during construction) as reported in its entirety, cover fixed charges.
(5)   Internal cash generation/gross construction is the percentage of gross construction expenditures provided by internally-generated funds from operations after payment of all cash dividends divided by gross construction expenditures.
(6)   Gross Cash Flow (sum of net income, depreciation, amortization, net deferred income taxes and investment tax credits, less total AFUDC) as a percentage of average total debt.
(7)   Gross Cash Flow (sum of net income, depreciation, amortization, net deferred income taxes and investment tax credits, less total AFUDC) plus interest charges, divided by interest charges.
(8)   Common dividend coverage is the relationship of internally-generated funds from operations after payment of preferred stock dividends to common dividends paid.

Source of Information: Annual Reports to Shareholders
                                        Utility COMPUSTAT

Standard & Poor's Public Utilities
Company Identities

	Ticker	Credit Rating [1]		Common Stock Traded	Value Line Beta
		Moody's	S&P		
Alliant Energy Corporation	LNT	Baa1	A-	NYSE	0.85
Ameren Corporation	AEE	Baa1	BBB+	NYSE	0.85
American Electric Power	AEP	Baa1	A-	NYSE	0.75
American Water Works	AWK	Baa1	A	NYSE	0.90
CenterPoint Energy	CNP	Baa1	BBB+	NYSE	1.10
CMS Energy	CMS	Baa1	A-	NYSE	0.80
Consolidated Edison	ED	Baa1	A-	NYSE	0.75
Dominion Energy	D	A2	BBB+	NYSE	0.85
DTE Energy Co.	DTE	A2	A-	NYSE	0.95
Duke Energy	DUK	A2	BBB+	NYSE	0.85
Edison Int'l	EIX	Baa1	BBB	NYSE	0.95
Entergy Corp.	ETR	Baa1	BBB+	NYSE	0.95
Evergy, Inc.	EVRG	Baa1	A-	NYSE	0.90
Eversource	ES	A3	A	NYSE	0.90
Exelon Corp.	EXC	A2	BBB+	NDQ	NMF
FirstEnergy Corp.	FE	A3	BBB	NYSE	0.85
NextEra Energy Inc.	NEE	A1	A	NYSE	0.95
NiSource Inc.	NI	Baa2	BBB+	NYSE	0.85
NRG Energy Inc.	NRG	Ba1	BB	NYSE	1.10
Pinnacle West Capital	PNW	A3	BBB+	NYSE	0.90
PPL Corp.	PPL	A3	A	NYSE	1.05
Public Serv. Enterprise Inc.	PEG	A3	A-	NYSE	0.90
Sempra Energy	SRE	A3	BBB+	NYSE	0.95
Southern Co.	SO	Baa1	BBB+	NYSE	0.90
WEC Energy Corp.	WEC	A2	A-	NYSE	0.80
Xcel Energy Inc	XEL	A2	A-	NYSE	0.80
Average for S&P Utilities		A3	BBB+		0.90

Note: [1] Ratings are those of utility subsidiaries

Source of Information: Moody's Investors Service, Inc.
S&P Global Inc.
The Value Line Investment Survey

Duquesne Light Company
Capitalization and Related Capital Structure Ratios
Actual at December 31, 2023 and Estimated at December 31, 2024 and December 31, 2025

	Actual at December 31, 2023			Estimated at December 31, 2024			Estimated at December 31, 2025		
	Amount Outstanding	Ratios Excl. S-T Debt	Incl. S-T Debt	Amount Outstanding	Ratios Excl. S-T Debt	Incl. S-T Debt	Amount Outstanding	Ratios Excl. S-T Debt	Incl. S-T Debt
Long-Term Debt	$ 1,513,478,460	45.67%	42.70%	$ 1,644,913,726 [2]	45.33%	43.47%	$ 1,846,037,542 [2]	46.05%	45.59%
Common Equity									
Common Stock	-			-			-		
Capital Surplus	988,426,521			988,426,521			988,426,521		
Retained earnings[1]	812,302,514			995,509,514 [3]			1,173,872,514 [3]		
Total Common Equity	1,800,729,035	54.33%	50.81%	1,983,936,035	54.67%	52.43%	2,162,299,035	53.95%	53.40%
Total Permanent Capital	3,314,207,495	100.00%	93.51%	3,628,849,761	100.00%	95.90%	4,008,336,577	100.00%	98.99%
Short-term Debt	230,000,000		6.48%	155,000,000		4.10%	41,000,000		1.02%
Total Capital Employed	$ 3,544,207,495		99.99%	$ 3,783,849,761		100.00%	$ 4,049,336,577		100.01%

Notes:

[1] Excluding Accumulated Other Comprehensive Income ("OCI") of:

	$ 1,092,073	$ 1,092,073	$ 1,092,073

[2] Reflects changes in the principal amount of long-term debt of:

New issues		$ 130,000,000	$ 200,000,000
Net change in Loss on Reacquired Debt		1,435,266	1,123,816

[3] Projection of retained earnings consisting of:

Net Income		$ 183,207,000	$ 221,363,000
Distributions		0	(43,000,000)

Source of Information: Company provided data

Duquesne Light Company
Calculation of the Embedded Cost of Long-Term Debt
Actual at December 31, 2023

Series	Principal Amount Outstanding (1)	Percent to Total	Effective Cost Rate	Weighted Cost Rate (2)
1st Mortgage Bond 4.76% due 2/3/42	$ 200,000,000	13.12%	4.81%	0.63%
1st Mortgage Bond 4.97% due 11/14/43	160,000,000	10.49%	5.01%	0.53%
1st Mortgage Bond 5.02% due 2/4/44	45,000,000	2.95%	5.06%	0.15%
1st Mortgage Bond 5.12% due 2/4/54	85,000,000	5.57%	5.16%	0.29%
1st Mortgage Bond 3.78% due 3/2/45	100,000,000	6.56%	3.81%	0.25%
1st Mortgage Bond 3.93% due 3/2/55	200,000,000	13.12%	3.95%	0.52%
1st Mortgage Bond 3.93% due 7/15/45	160,000,000	10.49%	3.96%	0.42%
1st Mortgage Bond 3.82% due 10/3/47	60,000,000	3.93%	3.86%	0.15%
1st Mortgage Bond 3.89% due 2/1/48	60,000,000	3.93%	3.93%	0.15%
1st Mortgage Bond 4.04% due 2/1/58	125,000,000	8.20%	4.07%	0.33%
1st Mortgage Bond 3.11% due 5/5/50	200,000,000	13.12%	3.14%	0.41%
1st Mortgage Bond 4.59% due 10/03/52	130,000,000	8.53%	4.63%	0.39%
Total Long -Term Debt	1,525,000,000	100.00%		4.22%
Unamortized Call Premium	(11,521,540)			
Long Term- Debt	$ 1,513,478,460			
Annualized Cost	$ 64,406,272			
Amortization of Loss on Reacquired Debt	1,603,597			
Total Cost	$ 66,009,869			4.36%

Notes: (1) Includes current portion of long-term debt.
(2) As calculated on page 4 of this schedule.

Source of Information: Company provided data

Duquesne Light Company
Calculation of the Embedded Cost of Long-Term Debt
Estimated at December 31, 2024

Series	Principal Amount Outstanding (1)	Percent to Total	Effective Cost Rate	Weighted Cost Rate (2)
1st Mortgage Bond 4.76% due 2/3/42	$ 200,000,000	12.09%	4.81%	0.58%
1st Mortgage Bond 4.97% due 11/14/43	160,000,000	9.67%	5.01%	0.48%
1st Mortgage Bond 5.02% due 2/4/44	45,000,000	2.72%	5.06%	0.14%
1st Mortgage Bond 5.12% due 2/4/54	85,000,000	5.14%	5.16%	0.27%
1st Mortgage Bond 3.78% due 3/2/45	100,000,000	6.04%	3.81%	0.23%
1st Mortgage Bond 3.93% due 3/2/55	200,000,000	12.09%	3.95%	0.48%
1st Mortgage Bond 3.93% due 7/15/45	160,000,000	9.67%	3.96%	0.38%
1st Mortgage Bond 3.82% due 10/3/47	60,000,000	3.63%	3.86%	0.14%
1st Mortgage Bond 3.89% due 2/1/48	60,000,000	3.63%	3.93%	0.14%
1st Mortgage Bond 4.04% due 2/1/58	125,000,000	7.55%	4.07%	0.31%
1st Mortgage Bond 3.11% due 5/5/50	200,000,000	12.09%	3.14%	0.38%
1st Mortgage Bond 4.59% due 10/03/52	130,000,000	7.86%	4.63%	0.36%
1st Mortgage Bond 5.67% due 3/12/54	80,000,000	4.83%	5.71%	0.28%
1st Mortgage Bond 5.77% due 3/12/64	50,000,000	3.02%	5.86%	0.18%
Total Long -Term Debt	1,655,000,000	100.00%		4.34%
Unamortized Call Premium	(10,086,274)			
Long Term- Debt	$ 1,644,913,726			
Annualized Cost	$ 71,904,237			
Amortization of Loss on Reacquired Debt	1,316,259			
Total Cost	$ 73,220,496			4.45%

Notes: (1) Includes current portion of long-term debt.
(2) As calculated on page 4 of this schedule.

Source of Information: Company provided data

Duquesne Light Company
Calculation of the Embedded Cost of Long-Term Debt
Estimated at December 31, 2025

Series	Principal Amount Outstanding (1)	Percent to Total	Effective Cost Rate	Weighted Cost Rate (2)
1st Mortgage Bond 4.76% due 2/3/42	$ 200,000,000	10.78%	4.81%	0.52%
1st Mortgage Bond 4.97% due 11/14/43	160,000,000	8.63%	5.01%	0.43%
1st Mortgage Bond 5.02% due 2/4/44	45,000,000	2.43%	5.06%	0.12%
1st Mortgage Bond 5.12% due 2/4/54	85,000,000	4.58%	5.16%	0.24%
1st Mortgage Bond 3.78% due 3/2/45	100,000,000	5.39%	3.81%	0.21%
1st Mortgage Bond 3.93% due 3/2/55	200,000,000	10.78%	3.95%	0.43%
1st Mortgage Bond 3.93% due 7/15/45	160,000,000	8.63%	3.96%	0.34%
1st Mortgage Bond 3.82% due 10/3/47	60,000,000	3.24%	3.86%	0.12%
1st Mortgage Bond 3.89% due 2/1/48	60,000,000	3.24%	3.93%	0.13%
1st Mortgage Bond 4.04% due 2/1/58	125,000,000	6.74%	4.07%	0.27%
1st Mortgage Bond 3.11% due 5/5/50	200,000,000	10.78%	3.14%	0.34%
1st Mortgage Bond 4.59% due 10/03/52	130,000,000	7.01%	4.63%	0.32%
1st Mortgage Bond 5.67% due 3/12/54	80,000,000	4.31%	5.71%	0.25%
1st Mortgage Bond 5.77% due 3/12/64	50,000,000	2.70%	5.86%	0.16%
1st Mortgage Bond 6.28% due 4/1/55	100,000,000	5.39%	6.31%	0.34%
1st Mortgage Bond 6.28% due 12/1/55	100,000,000	5.39%	6.33%	0.34%
Total Long -Term Debt	1,855,000,000	100.00%		4.56%
Unamortized Call Premium	(8,962,458)			
Long Term- Debt	$ 1,846,037,542			
Annualized Cost	$ 84,544,970			
Amortization of Loss on Reacquired Debt	1,087,303			
Total Cost	$ 85,632,273			4.64%

Notes: (1) Includes current portion of long-term debt.
(2) As calculated on page 4 of this schedule.

Source of Information: Company provided data

Duquesne Light Company
Calculation of the Effective Cost of Long-Term Debt by Series

Series	Coupon Rate	Date of Issue	Date of Maturity	Term in Years	Principal Amount Outstanding	Premium/ Discount & Expense	Net Proceeds	Net Proceeds Ratio	Effective Cost Rate [1]
1st Mortgage Bond 4.76% due 2/3/42	4.76%	02/03/12	02/03/42	30.0	$ 200,000,000	$ 1,685,878	$ 198,314,122	99.16%	4.81%
1st Mortgage Bond 4.97% due 11/14/43	4.97%	11/14/13	11/14/43	30.0	160,000,000	962,455	159,037,545	99.40%	5.01%
1st Mortgage Bond 5.02% due 2/4/44	5.02%	02/04/14	02/04/44	30.0	45,000,000	273,501	44,726,499	99.39%	5.06%
1st Mortgage Bond 5.12% due 2/4/54	5.12%	02/04/14	02/04/54	40.0	85,000,000	543,463	84,456,537	99.36%	5.16%
1st Mortgage Bond 3.78% due 3/2/45	3.78%	03/02/15	03/02/45	30.0	100,000,000	446,281	99,553,719	99.55%	3.81%
1st Mortgage Bond 3.93% due 3/2/55	3.93%	03/02/15	03/02/55	40.0	200,000,000	891,394	199,108,606	99.55%	3.95%
1st Mortgage Bond 3.93% due 7/15/45	3.93%	07/15/15	07/15/45	30.0	160,000,000	781,258	159,218,742	99.51%	3.96%
1st Mortgage Bond 3.82% due 10/3/47	3.82%	10/03/17	10/03/47	30.0	60,000,000	437,811	59,562,189	99.27%	3.86%
1st Mortgage Bond 3.89% due 2/1/48	3.89%	02/01/18	02/01/48	30.0	60,000,000	377,534	59,622,466	99.37%	3.93%
1st Mortgage Bond 4.04% due 2/1/58	4.04%	02/01/18	02/01/58	40.0	125,000,000	786,529	124,213,471	99.37%	4.07%
1st Mortgage Bond 3.11% due 5/5/50	3.11%	05/01/20	05/05/50	30.0	200,000,000	1,114,869	198,885,131	99.44%	3.14%
1st Mortgage Bond 4.59% due 10/03/52	4.59%	10/03/22	10/03/52	30.0	130,000,000	773,009	129,226,991	99.41%	4.63%
1st Mortgage Bond 5.67% due 3/12/54	5.67%	03/12/24	03/12/54	30.0	80,000,000	500,320	79,499,680	99.37%	5.71%
1st Mortgage Bond 5.77% due 3/12/64	5.77%	03/12/24	03/12/64	40.0	50,000,000	667,123	49,332,877	98.67%	5.86%
1st Mortgage Bond 6.28% due 4/1/55	6.28%	04/01/25	04/01/55	30.0	100,000,000	348,048	99,651,952	99.65%	6.31%
1st Mortgage Bond 6.28% due 12/1/55	6.28%	12/01/25	12/01/55	30.0	100,000,000	652,591	99,347,409	99.35%	6.33%

Notes: [1] The effective cost for each issue is the yield to maturity using as inputs the average term of issue, coupon rate, and net proceeds ratio.

Source of Information: Company provided data

Monthly Dividend Yields for
Electric Group
for the Twelve Months Ending December 2023

Company	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	12-Month Average	6-Month Average	3-Month Average
AVANGRID, Inc (AGR)	4.20%	4.51%	4.43%	4.40%	4.69%	4.69%	4.78%	5.10%	5.86%	5.95%	5.70%	5.46%			
Consolidated Edison Inc (ED)	3.42%	3.63%	3.40%	3.31%	3.48%	3.60%	3.44%	3.65%	3.81%	3.72%	3.60%	3.58%			
Dominion Energy, Inc. (D)	4.23%	4.86%	4.79%	4.71%	5.38%	5.18%	5.03%	5.50%	6.01%	6.70%	5.89%	5.71%			
Duke Energy Corporation (DUK)	3.96%	4.27%	4.19%	4.10%	4.51%	4.51%	4.42%	4.63%	4.67%	4.66%	4.45%	4.25%			
Eversource Energy (ES)	3.29%	3.61%	3.46%	3.50%	3.91%	3.82%	3.76%	4.28%	4.65%	5.05%	4.58%	4.38%			
Exelon Corp (EXC)	3.44%	3.57%	3.45%	3.41%	3.64%	3.55%	3.47%	3.60%	3.83%	3.73%	3.75%	4.03%			
FirstEnergy Corp (FE)	3.84%	3.95%	3.92%	3.95%	4.19%	4.04%	4.00%	4.34%	4.60%	4.66%	4.45%	4.50%			
NextEra Energy Inc (NEE)	2.52%	2.63%	2.43%	2.45%	2.55%	2.53%	2.56%	2.80%	3.27%	3.23%	3.20%	3.09%			
PPL Corp (PPL)	3.26%	3.57%	3.46%	3.36%	3.70%	3.64%	3.50%	3.89%	4.09%	3.93%	3.71%	3.55%			
Public Service Enterprise Group Inc (PEG)	3.70%	3.81%	3.66%	3.63%	3.85%	3.65%	3.63%	3.77%	4.02%	3.72%	3.68%	3.74%			
Average	**3.59%**	**3.84%**	**3.72%**	**3.68%**	**3.99%**	**3.92%**	**3.86%**	**4.16%**	**4.48%**	**4.54%**	**4.30%**	**4.23%**	**4.03%**	**4.26%**	**4.36%**

Note: Monthly dividend yields are calculated by dividing the annualized quarterly dividend by the month-end closing stock price adjusted by the fraction of the ex-dividend.

Source of Information: https://finance.yahoo.com
https://www.nasdaq.com

Forward-looking Dividend Yield

		D_0/P_0		D_1/P_0	
1/2 Growth		4.26%	(.5g) 1.030000	4.39%	$K = \dfrac{D_0(1+g)^0 + D_0(1+g)^0 + D_0(1+g)^1 + D_0(1+g)^1}{P_0} + g$
Discrete		4.26%	Adj. 1.037227	4.42%	$K = \dfrac{D_0(1+g)^{.25} + D_0(1+g)^{.50} + D_0(1+g)^{.75} + D_0(1+g)^{1.00}}{P_0} + g$
Quarterly		1.0650%	Adj. 1.014674	4.39%	$K = \left[\left(1 + \dfrac{D_0(1+g)^{.25}}{P_0}\right)^4 - 1\right] + g$
Average				4.40%	

Growth rate   6.00%

K   10.40%

Historical Growth Rates
Earnings Per Share, Dividends Per Share,
Book Value Per Share, and Cash Flow Per Share

Electric Group	Earnings per Share Value Line		Dividends per Share Value Line		Book Value per Share Value Line		Cash Flow per Share Value Line	
	5 Year	10 Year	5 Year	10 Year	5 Year	10 Year	5 Year	10 Year
AVANGRID, Inc.	7.00%	-	9.00%	-	0.50%	-	3.50%	-
Consol. Edison	1.50%	2.00%	3.00%	2.50%	4.00%	4.00%	4.50%	4.00%
Dominion Energy, Inc.	2.50%	3.00%	0.50%	4.00%	5.50%	4.50%	3.00%	4.00%
Duke Energy	4.50%	3.00%	3.50%	3.00%	1.00%	2.00%	5.00%	4.00%
Eversource Energy	5.50%	6.50%	6.00%	7.50%	4.50%	5.50%	7.50%	5.00%
Exelon Corp.	2.50%	-0.50%	4.00%	-3.00%	3.50%	4.50%	5.50%	3.00%
FirstEnergy Corp.	-1.50%	-	1.50%	-3.50%	-2.50%	-6.50%	-6.50%	-3.00%
NextEra Energy	11.00%	8.00%	12.00%	11.00%	7.50%	8.00%	9.00%	7.50%
PPL Corp.	-11.50%	-6.00%	-2.00%	-	4.00%	-	-5.00%	-3.50%
Public Serv. Enterprise	4.50%	2.00%	4.50%	4.00%	2.00%	4.00%	3.00%	2.00%
Average	2.60%	2.25%	4.20%	3.19%	3.00%	3.25%	2.95%	2.56%

Source of Information: Value Line Investment Survey, November 10, 2023

Analysts' Five-Year Projected Growth Rates
Earnings Per Share, Dividends Per Share,
Book Value Per Share, and Cash Flow Per Share

| Electric Group | I/B/E/S First Call | Zacks | Value Line | | | | Percent Retained to Common Equity |
			Earnings Per Share	Dividends Per Share	Book Value Per Share	Cash Flow Per Share	
AVANGRID, Inc.	neg.	4.10%	4.50%	1.00%	1.50%	4.00%	1.50%
Consol. Edison	5.66%	2.00%	6.00%	3.50%	3.00%	5.50%	3.50%
Dominion Energy, Inc.	neg.	4.00%	0.50%	1.50%	4.00%	1.00%	3.00%
Duke Energy	6.70%	6.30%	5.00%	2.00%	2.50%	5.00%	3.00%
Eversource Energy	4.00%	5.00%	6.00%	6.00%	4.00%	5.50%	4.00%
Exelon Corp.	4.20%	5.60%	NMF	NMF	NMF	NMF	4.00%
FirstEnergy Corp.	6.30%	NA	4.50%	4.50%	7.50%	3.00%	5.00%
NextEra Energy	8.15%	8.20%	9.50%	9.50%	8.00%	7.50%	5.50%
PPL Corp.	17.21%	7.40%	8.00%	-1.50%	3.50%	3.50%	3.50%
Public Serv. Enterprise	5.20%	4.90%	4.00%	5.50%	2.50%	3.50%	4.50%
Average	7.18%	5.28%	5.33%	3.56%	4.06%	4.28%	3.75%

Source of Information :   Yahoo Finance, January 10, 2024
Zacks, January 10, 2024
Value Line Investment Survey, November 10, 2023 and December 8, 2023

Electric Group
Financial Risk Adjustment

	AVANGRID Inc (AGR)	Consolidated Edison Inc (ED)	Dominion Energy, Inc. (D)	Duke Energy Corporation (DUK)	Eversource Energy (ES)	Exelon Corp(EXC)	FirstEnergy Corp (FE)	NextEra Energy Inc (NEE)	PPL Corp (PPL)	Public Service Enterprise Group Inc (PEG)	Average
Fiscal Year	12/31/22	12/31/22	12/31/22	12/31/22	12/31/22	12/31/22	12/31/22	12/31/22	12/31/22	12/31/22	
Capitalization at Fair Values											
Debt(D)	7,991,000	18,234,000	38,216,000	63,454,000	18,891,300	32,613,000	19,784,000	57,892,000	12,239,000	16,164,000	28,547,830
Preferred(P)	0	0	1,783,000	1,962,000	136,700	0	0	0	0	0	388,170
Equity(E)	16,617,297	31,642,920	51,202,200	79,302,300	29,213,533	42,963,271	23,995,171	166,113,200	21,520,150	30,451,190	49,302,123
Total	24,608,297	49,876,920	91,201,200	144,718,300	48,241,533	75,576,271	43,779,171	224,005,200	33,759,150	46,615,190	78,238,123
Capital Structure Ratios											
Debt(D)	32.47%	36.56%	41.90%	43.85%	39.16%	43.15%	45.19%	25.84%	36.25%	34.68%	37.91%
Preferred(P)	0.00%	0.00%	1.96%	1.36%	0.28%	0.00%	0.00%	0.00%	0.00%	0.00%	0.36%
Equity(E)	67.53%	63.44%	56.14%	54.80%	60.56%	56.85%	54.81%	74.16%	63.75%	65.32%	61.74%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.01%
Common Stock											
Issued		355,000.000				995,830.000				534,000.000	
Treasury		23,000.000				2,000.000				37,000.000	
Outstanding	386,628.586	332,000.000	835,000.000	770,000.000	348,443.855	993,830.000	572,130.932	1,987,000.000	736,487.000	497,000.000	
Market Price	$42.98	$95.31	$61.32	$102.99	$83.84	$43.23	$41.94	$83.60	$29.22	$61.27	
Capitalization at Carrying Amounts											
Debt(D)	8,627,000	20,796,000	41,517,000	71,215,000	21,044,100	37,464,000	21,641,000	61,889,000	13,243,000	18,070,000	31,550,610
Preferred(P)	0	0	1,783,000	1,962,000	155,600	0	0	0	0	0	390,060
Equity(E)	19,380,000	20,687,000	26,098,000	47,360,000	15,473,158	24,744,000	10,166,000	39,229,000	13,915,000	13,729,000	23,078,116
Total	28,007,000	41,483,000	69,398,000	120,537,000	36,672,858	62,208,000	31,807,000	101,118,000	27,158,000	31,799,000	55,018,786
Capital Structure Ratios											
Debt(D)	30.80%	50.13%	59.82%	59.08%	57.38%	60.22%	68.04%	61.20%	48.76%	56.83%	55.23%
Preferred(P)	0.00%	0.00%	2.57%	1.63%	0.42%	0.00%	0.00%	0.00%	0.00%	0.00%	0.46%
Equity(E)	69.20%	49.87%	37.61%	39.29%	42.19%	39.78%	31.96%	38.80%	51.24%	43.17%	44.31%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Betas Value Line	0.85	0.75	0.85	0.85	0.90	NMF	0.85	0.95	1.05	0.90	0.88

Hamada

Bl	=	Bu	[1+	(1 - t)	D/E	+	P/E	]
0.88	=	Bu	[1+	(1-0.35)	0.6140	+	0.0058	]
0.88	=	Bu	[1+	0.65	0.6140	+	0.0058	]
0.88	=	Bu	1.4049					
0.63	=	Bu						

Hamada

Bl	=	0.63	[1+	(1 - t)	D/E	+	P/E	]
Bl	=	0.63	[1+	0.65	1.2464	+	0.0104	]
Bl	=	0.63	1.8206					
Bl	=	1.15						

M&M

ku	=	ke	-	(((	ku	-	i	)		1-t	)		D	/	E	)-(	ku	-	d	)	P	/	E
9.07%	=	10.40%	-	(((	9.07%	-	5.78%	)		0.65	)		37.91%	/	61.74%	)-(	9.07%	- 5.68%	)	0.36%	/	61.74%
9.07%	=	10.40%	-	(((	3.29%			)		0.65	)		0.6140			)-(	3.39%		)	0.0058		
9.07%	=	10.40%	-	((	2.14%					0.6140	)					)-(	3.39%		)	0.0058		
9.07%	=	10.40%	-		1.31%											-	0.02%					

M&M

ke	=	ku	+	(((	ku	-	i	)		1-t	)		D	/	E	)+(	ku	-	d	)	P	/	E
11.78%	=	9.07%	+	(((	9.07%	-	5.78%	)		0.65	)		55.23%	/	44.31%	)+(	9.07%	- 5.68%	)	0.46%	/	44.31%
11.78%	=	9.07%	+	(((	3.29%			)		0.65	)		1.2464			)+(	3.39%		)	0.0104		
11.78%	=	9.07%	+	((	2.14%					1.2464	)					)+(	3.39%		)	0.0104		
11.78%	=	9.07%	+		2.67%											+	0.04%					

Interest Rates for Investment Grade Public Utility Bonds
Yearly for 2017-2022
and the Twelve Months Ended December 2023

Years	Aa Rated	A Rated	Baa Rated	Average
2018	4.09%	4.25%	4.67%	4.34%
2019	3.61%	3.77%	4.19%	3.86%
2020	2.79%	3.02%	3.39%	3.07%
2021	2.97%	3.11%	3.36%	3.15%
2022	4.53%	4.72%	5.03%	4.77%
Five-Year Average	3.60%	3.77%	4.13%	3.84%
Months				
Jan-23	4.98%	5.20%	5.49%	5.23%
Feb-23	5.12%	5.29%	5.54%	5.32%
Mar-23	5.24%	5.39%	5.68%	5.44%
Apr-23	5.00%	5.13%	5.47%	5.20%
May-23	5.24%	5.36%	5.71%	5.44%
Jun-23	5.26%	5.38%	5.73%	5.46%
Jul-23	5.30%	5.41%	5.73%	5.48%
Aug-23	5.58%	5.71%	6.08%	5.77%
Sep-23	5.72%	5.86%	6.15%	5.91%
Oct-23	6.19%	6.34%	6.61%	6.38%
Nov-23	5.82%	5.96%	6.20%	5.99%
Dec-23	5.27%	5.42%	5.68%	5.46%
Twelve-Month Average	5.39%	5.54%	5.84%	5.59%
Six-Month Average	5.65%	5.78%	6.08%	5.83%
Three-Month Average	5.76%	5.91%	6.16%	5.94%

Source: Mergent Bond Record

Yields on
A-rated Public Utility Bonds and
Spreads over 30-Year Treasuries
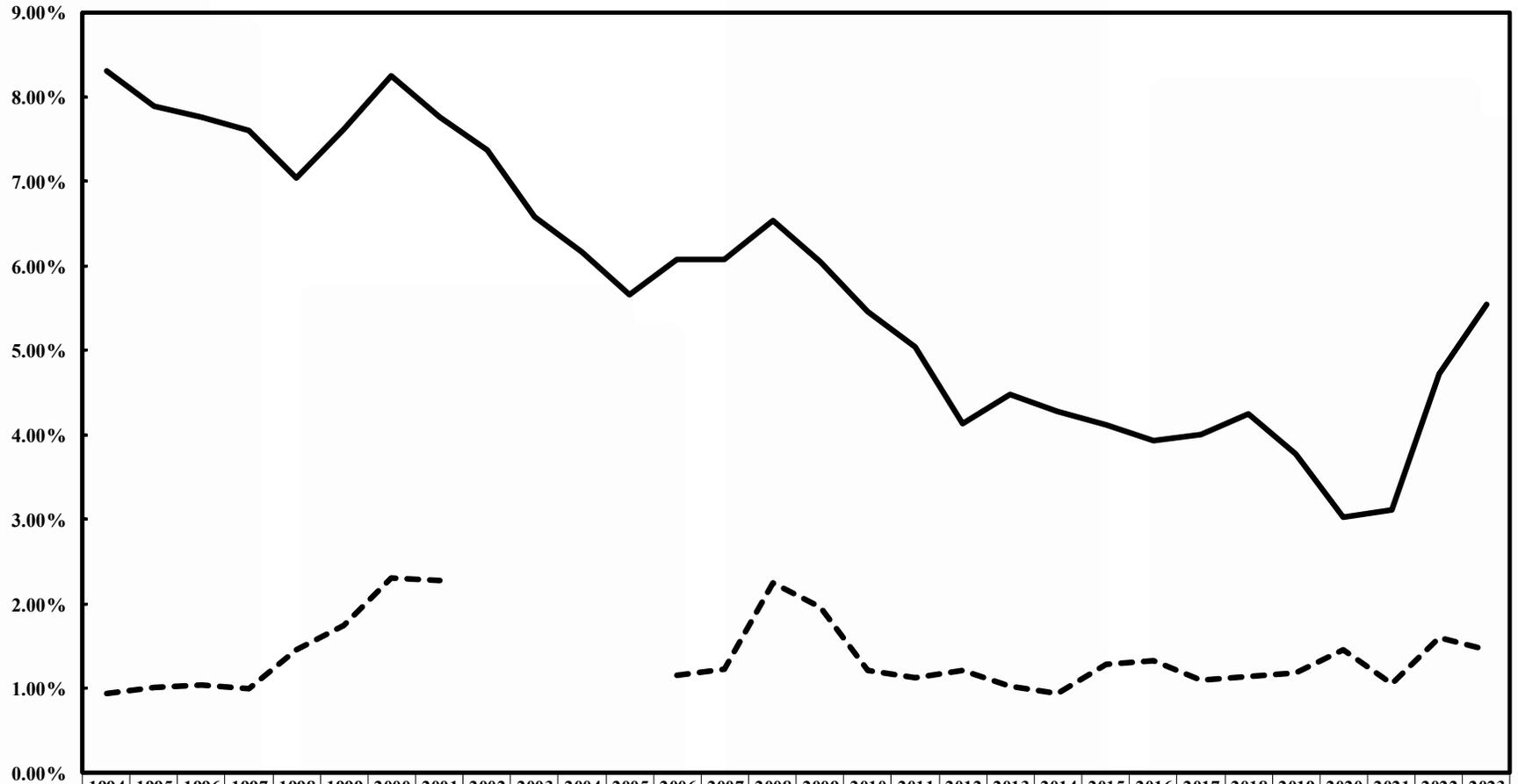
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
A-rated Public Utility	8.31	7.89	7.75	7.60	7.04	7.62	8.24	7.76	7.37	6.58	6.16	5.65	6.07	6.07	6.53	6.04	5.46	5.04	4.13	4.48	4.28	4.12	3.93	4.00	4.25	3.77	3.02	3.11	4.72	5.54
Spread vs. 30-year	0.94	1.01	1.04	0.99	1.46	1.75	2.30	2.27					1.16	1.23	2.25	1.96	1.21	1.13	1.21	1.03	0.94	1.28	1.33	1.10	1.14	1.19	1.46	1.06	1.60	1.45

A rated Public Utility Bonds over 30-Year Treasuries

Year	A-rated Public Utility	30-Year Treasuries Yield	30-Year Treasuries Spread
Jan-99	6.97%	5.16%	1.81%
Feb-99	7.09%	5.37%	1.72%
Mar-99	7.26%	5.58%	1.68%
Apr-99	7.22%	5.55%	1.67%
May-99	7.47%	5.81%	1.66%
Jun-99	7.74%	6.04%	1.70%
Jul-99	7.71%	5.98%	1.73%
Aug-99	7.91%	6.07%	1.84%
Sep-99	7.93%	6.07%	1.86%
Oct-99	8.06%	6.26%	1.80%
Nov-99	7.94%	6.15%	1.79%
Dec-99	8.14%	6.35%	1.79%
Jan-00	8.35%	6.63%	1.72%
Feb-00	8.25%	6.23%	2.02%
Mar-00	8.28%	6.05%	2.23%
Apr-00	8.29%	5.85%	2.44%
May-00	8.70%	6.15%	2.55%
Jun-00	8.36%	5.93%	2.43%
Jul-00	8.25%	5.85%	2.40%
Aug-00	8.13%	5.72%	2.41%
Sep-00	8.23%	5.83%	2.40%
Oct-00	8.14%	5.80%	2.34%
Nov-00	8.11%	5.78%	2.33%
Dec-00	7.84%	5.49%	2.35%
Jan-01	7.80%	5.54%	2.26%
Feb-01	7.74%	5.45%	2.29%
Mar-01	7.68%	5.34%	2.34%
Apr-01	7.94%	5.65%	2.29%
May-01	7.99%	5.78%	2.21%
Jun-01	7.85%	5.67%	2.18%
Jul-01	7.78%	5.61%	2.17%
Aug-01	7.59%	5.48%	2.11%
Sep-01	7.75%	5.48%	2.27%
Oct-01	7.63%	5.32%	2.31%
Nov-01	7.57%	5.12%	2.45%
Dec-01	7.83%	5.48%	2.35%
Jan-02	7.66%	5.45%	2.21%
Feb-02	7.54%	5.40%	2.14%
Mar-02	7.76%		
Apr-02	7.57%		
May-02	7.52%		
Jun-02	7.42%		
Jul-02	7.31%		
Aug-02	7.17%		
Sep-02	7.08%		
Oct-02	7.23%		
Nov-02	7.14%		
Dec-02	7.07%		
Jan-03	7.07%		
Feb-03	6.93%		
Mar-03	6.79%		
Apr-03	6.64%		
May-03	6.36%		
Jun-03	6.21%		
Jul-03	6.57%		
Aug-03	6.78%		
Sep-03	6.56%		
Oct-03	6.43%		
Nov-03	6.37%		
Dec-03	6.27%		
Jan-04	6.15%		
Feb-04	6.15%		
Mar-04	5.97%		
Apr-04	6.35%		
May-04	6.62%		
Jun-04	6.46%		
Jul-04	6.27%		
Aug-04	6.14%		
Sep-04	5.98%		
Oct-04	5.94%		
Nov-04	5.97%		
Dec-04	5.92%		
Jan-05	5.78%		

Year	A-rated Public Utility	30-Year Treasuries Yield	30-Year Treasuries Spread
Jan-06	5.75%		
Feb-06	5.82%	4.54%	1.28%
Mar-06	5.98%	4.73%	1.25%
Apr-06	6.29%	5.06%	1.23%
May-06	6.42%	5.20%	1.22%
Jun-06	6.40%	5.15%	1.25%
Jul-06	6.37%	5.13%	1.24%
Aug-06	6.20%	5.00%	1.20%
Sep-06	6.00%	4.85%	1.15%
Oct-06	5.98%	4.85%	1.13%
Nov-06	5.80%	4.69%	1.11%
Dec-06	5.81%	4.68%	1.13%
Jan-07	5.96%	4.85%	1.11%
Feb-07	5.90%	4.82%	1.08%
Mar-07	5.85%	4.72%	1.13%
Apr-07	5.97%	4.87%	1.10%
May-07	5.99%	4.90%	1.09%
Jun-07	6.30%	5.20%	1.10%
Jul-07	6.25%	5.11%	1.14%
Aug-07	6.24%	4.93%	1.31%
Sep-07	6.18%	4.79%	1.39%
Oct-07	6.11%	4.77%	1.34%
Nov-07	5.97%	4.52%	1.45%
Dec-07	6.16%	4.53%	1.63%
Jan-08	6.02%	4.33%	1.69%
Feb-08	6.21%	4.52%	1.69%
Mar-08	6.21%	4.39%	1.82%
Apr-08	6.29%	4.44%	1.85%
May-08	6.28%	4.60%	1.68%
Jun-08	6.38%	4.69%	1.69%
Jul-08	6.40%	4.57%	1.83%
Aug-08	6.37%	4.50%	1.87%
Sep-08	6.49%	4.27%	2.22%
Oct-08	7.56%	4.17%	3.39%
Nov-08	7.60%	4.00%	3.60%
Dec-08	6.52%	2.87%	3.65%
Jan-09	6.39%	3.13%	3.26%
Feb-09	6.30%	3.59%	2.71%
Mar-09	6.42%	3.64%	2.78%
Apr-09	6.48%	3.76%	2.72%
May-09	6.49%	4.23%	2.26%
Jun-09	6.20%	4.52%	1.68%
Jul-09	5.97%	4.41%	1.56%
Aug-09	5.71%	4.37%	1.34%
Sep-09	5.53%	4.19%	1.34%
Oct-09	5.55%	4.19%	1.36%
Nov-09	5.64%	4.31%	1.33%
Dec-09	5.79%	4.49%	1.30%
Jan-10	5.77%	4.60%	1.17%
Feb-10	5.87%	4.62%	1.25%
Mar-10	5.84%	4.64%	1.20%
Apr-10	5.81%	4.69%	1.12%
May-10	5.50%	4.29%	1.21%
Jun-10	5.46%	4.13%	1.33%
Jul-10	5.26%	3.99%	1.27%
Aug-10	5.01%	3.80%	1.21%
Sep-10	5.01%	3.77%	1.24%
Oct-10	5.10%	3.87%	1.23%
Nov-10	5.37%	4.19%	1.18%
Dec-10	5.56%	4.42%	1.14%
Jan-11	5.57%	4.52%	1.05%
Feb-11	5.68%	4.65%	1.03%
Mar-11	5.56%	4.51%	1.05%
Apr-11	5.55%	4.50%	1.05%
May-11	5.32%	4.29%	1.03%
Jun-11	5.26%	4.23%	1.03%
Jul-11	5.27%	4.27%	1.00%
Aug-11	4.69%	3.65%	1.04%
Sep-11	4.48%	3.18%	1.30%
Oct-11	4.52%	3.13%	1.39%
Nov-11	4.25%	3.02%	1.23%
Dec-11	4.33%	2.98%	1.35%
Jan-12	4.34%	3.03%	1.31%

Year	A-rated Public Utility	30-Year Treasuries Yield	30-Year Treasuries Spread
Jan-13	4.15%	3.08%	1.07%
Feb-13	4.18%	3.17%	1.01%
Mar-13	4.20%	3.16%	1.04%
Apr-13	4.00%	2.93%	1.07%
May-13	4.17%	3.11%	1.06%
Jun-13	4.53%	3.40%	1.13%
Jul-13	4.68%	3.61%	1.07%
Aug-13	4.73%	3.76%	0.97%
Sep-13	4.80%	3.79%	1.01%
Oct-13	4.70%	3.68%	1.02%
Nov-13	4.77%	3.80%	0.97%
Dec-13	4.81%	3.89%	0.92%
Jan-14	4.63%	3.77%	0.86%
Feb-14	4.53%	3.66%	0.87%
Mar-14	4.51%	3.62%	0.89%
Apr-14	4.41%	3.52%	0.89%
May-14	4.26%	3.39%	0.87%
Jun-14	4.29%	3.42%	0.87%
Jul-14	4.23%	3.33%	0.90%
Aug-14	4.13%	3.20%	0.93%
Sep-14	4.24%	3.26%	0.98%
Oct-14	4.06%	3.04%	1.02%
Nov-14	4.09%	3.04%	1.05%
Dec-14	3.95%	2.83%	1.12%
Jan-15	3.58%	2.46%	1.12%
Feb-15	3.67%	2.57%	1.10%
Mar-15	3.74%	2.63%	1.11%
Apr-15	3.75%	2.59%	1.16%
May-15	4.17%	2.96%	1.21%
Jun-15	4.39%	3.11%	1.28%
Jul-15	4.40%	3.07%	1.33%
Aug-15	4.25%	2.86%	1.39%
Sep-15	4.39%	2.95%	1.44%
Oct-15	4.29%	2.89%	1.40%
Nov-15	4.40%	3.03%	1.37%
Dec-15	4.35%	2.97%	1.38%
Jan-16	4.27%	2.86%	1.41%
Feb-16	4.11%	2.62%	1.49%
Mar-16	4.16%	2.68%	1.48%
Apr-16	4.00%	2.62%	1.38%
May-16	3.93%	2.63%	1.30%
Jun-16	3.78%	2.45%	1.33%
Jul-16	3.57%	2.23%	1.34%
Aug-16	3.59%	2.26%	1.33%
Sep-16	3.66%	2.35%	1.31%
Oct-16	3.77%	2.50%	1.27%
Nov-16	4.08%	2.86%	1.22%
Dec-16	4.27%	3.11%	1.16%
Jan-16	4.27%	2.86%	1.41%
Feb-16	4.11%	2.62%	1.49%
Mar-16	4.16%	2.68%	1.48%
Apr-16	4.00%	2.62%	1.38%
May-16	3.93%	2.63%	1.30%
Jun-16	3.78%	2.45%	1.33%
Jul-16	3.57%	2.23%	1.34%
Aug-16	3.59%	2.26%	1.33%
Sep-16	3.66%	2.35%	1.31%
Oct-16	3.77%	2.50%	1.27%
Nov-16	4.08%	2.86%	1.22%
Dec-16	4.27%	3.11%	1.16%
Jan-17	4.14%	3.02%	1.12%
Feb-17	4.18%	3.03%	1.15%
Mar-17	4.23%	3.08%	1.15%
Apr-17	4.12%	2.94%	1.18%
May-17	4.12%	2.96%	1.16%
Jun-17	3.94%	2.80%	1.14%
Jul-17	3.99%	2.88%	1.11%
Aug-17	3.86%	2.80%	1.06%
Sep-17	3.87%	2.78%	1.09%
Oct-17	3.91%	2.88%	1.03%
Nov-17	3.83%	2.80%	1.03%
Dec-17	3.79%	2.77%	1.02%
Jan-18	3.86%	2.88%	0.98%

Year	A-rated Public Utility	30-Year Treasuries Yield	30-Year Treasuries Spread
Jan-19	4.35%	3.04%	1.31%
Feb-19	4.25%	3.02%	1.23%
Mar-19	4.16%	2.98%	1.18%
Apr-19	4.08%	2.94%	1.14%
May-19	3.98%	2.82%	1.16%
Jun-19	3.82%	2.57%	1.25%
Jul-19	3.69%	2.57%	1.12%
Aug-19	3.29%	2.12%	1.17%
Sep-19	3.37%	2.16%	1.21%
Oct-19	3.39%	2.19%	1.20%
Nov-19	3.43%	2.28%	1.15%
Dec-19	3.40%	2.30%	1.10%
Jan-20	3.29%	2.22%	1.07%
Feb-20	3.11%	1.97%	1.14%
Mar-20	3.50%	1.46%	2.04%
Apr-20	3.19%	1.27%	1.92%
May-20	3.14%	1.38%	1.76%
Jun-20	3.07%	1.49%	1.58%
Jul-20	2.74%	1.31%	1.43%
Aug-20	2.73%	1.36%	1.37%
Sep-20	2.84%	1.42%	1.42%
Oct-20	2.95%	1.57%	1.38%
Nov-20	2.85%	1.62%	1.23%
Dec-20	2.77%	1.67%	1.10%
Jan-21	2.91%	1.82%	1.09%
Feb-21	3.09%	2.04%	1.05%
Mar-21	3.44%	2.34%	1.10%
Apr-21	3.30%	2.30%	1.00%
May-21	3.33%	2.32%	1.01%
Jun-21	3.16%	2.16%	1.00%
Jul-21	2.95%	1.94%	1.01%
Aug-21	2.95%	1.92%	1.03%
Sep-21	2.96%	1.94%	1.02%
Oct-21	3.09%	2.06%	1.03%
Nov-21	3.02%	1.94%	1.08%
Dec-21	3.13%	1.85%	1.28%
Jan-22	3.33%	2.10%	1.23%
Feb-22	3.68%	2.25%	1.43%
Mar-22	3.98%	2.41%	1.57%
Apr-22	4.32%	2.81%	1.51%
May-22	4.75%	3.07%	1.68%
Jun-22	4.86%	3.25%	1.61%
Jul-22	4.78%	3.10%	1.68%
Aug-22	4.76%	3.13%	1.63%
Sep-22	5.28%	3.56%	1.72%
Oct-22	5.88%	4.04%	1.84%
Nov-22	5.75%	4.00%	1.75%
Dec-22	5.28%	3.66%	1.62%
Jan-23	5.20%	3.66%	1.54%
Feb-23	5.29%	3.80%	1.49%
Mar-23	5.39%	3.77%	1.62%
Apr-23	5.13%	3.68%	1.45%
May-23	5.36%	3.86%	1.50%
Jun-23	5.38%	3.87%	1.51%
Jul-23	5.41%	3.96%	1.45%
Aug-23	5.71%	4.28%	1.43%
Sep-23	5.86%	4.47%	1.39%
Oct-23	6.34%	4.95%	1.39%
Nov-23	5.96%	4.66%	1.30%
Dec-23	5.42%	4.14%	1.28%

Recent Average:	12-months	1.45%
	6-months	1.37%
	3-months	1.32%

Common Equity Risk Premiums
Years 1926-2022

	Large Common Stocks	Long-Term Corp. Bonds	Equity Risk Premium	Long-Term Govt. Bonds Yields
Low Interest Rates	12.40%	5.27%	7.13%	2.83%
Average Across All Interest Rates	12.02%	6.06%	5.96%	4.91%
High Interest Rates	11.63%	6.87%	4.76%	7.03%

Source of Information: 2023 SBBI Yearbook Stocks, Bonds, Bills, and Inflation

Basic Series
Annual Total Returns (except yields)

Year	Large Common Stocks	Long-Term Corp. Bonds	Long-Term Govt. Bonds Yields
2020	18.40%	15.40%	1.37%
2021	28.71%	-2.66%	1.88%
1940	-9.78%	3.39%	1.94%
1945	36.44%	4.08%	1.99%
1941	-11.59%	2.73%	2.04%
1949	18.79%	3.31%	2.09%
1946	-8.07%	1.72%	2.12%
1950	31.71%	2.12%	2.24%
2019	31.49%	19.95%	2.25%
1939	-0.41%	3.97%	2.26%
1948	5.50%	4.14%	2.37%
1947	5.71%	-2.34%	2.43%
1942	20.34%	2.60%	2.46%
1944	19.75%	4.73%	2.46%
2012	16.00%	10.68%	2.46%
2014	13.69%	17.28%	2.46%
1943	25.90%	2.83%	2.48%
1938	31.12%	6.13%	2.52%
2017	21.83%	12.25%	2.54%
1936	33.92%	6.74%	2.55%
2011	2.11%	17.95%	2.55%
2015	1.38%	-1.02%	2.68%
1951	24.02%	-2.69%	2.69%
1954	52.62%	5.39%	2.72%
2016	11.96%	6.70%	2.72%
1937	-35.03%	2.75%	2.73%
1953	-0.99%	3.41%	2.74%
1935	47.67%	9.61%	2.76%
1952	18.37%	3.52%	2.79%
2018	-4.38%	-4.73%	2.84%
1934	-1.44%	13.84%	2.93%
1955	31.56%	0.48%	2.95%
2008	-37.00%	8.78%	3.03%
1932	-8.19%	10.82%	3.15%
1927	37.49%	7.44%	3.17%
1957	-10.78%	8.71%	3.23%
1930	-24.90%	7.98%	3.30%
1933	53.99%	10.38%	3.36%
1928	43.61%	2.84%	3.40%
1929	-8.42%	3.27%	3.40%
1956	6.56%	-6.81%	3.45%
1926	11.62%	7.37%	3.54%
2013	32.39%	-7.07%	3.78%
1960	0.47%	9.07%	3.80%
1958	43.36%	-2.22%	3.82%
1962	-8.73%	7.95%	3.95%
1931	-43.34%	-1.85%	4.07%
2010	15.06%	12.44%	4.14%
1961	26.89%	4.82%	4.15%
1963	22.80%	2.19%	4.17%
1964	16.48%	4.77%	4.23%
2022	-18.11%	-26.18%	4.24%
1959	11.96%	-0.97%	4.47%
1965	12.45%	-0.46%	4.50%
2007	5.49%	2.60%	4.50%
1966	-10.06%	0.20%	4.55%
2009	26.46%	3.02%	4.58%
2005	4.91%	5.87%	4.61%
2002	-22.10%	16.33%	4.84%
2004	10.88%	8.72%	4.84%
2006	15.79%	3.24%	4.91%
2003	28.68%	5.27%	5.11%
1998	28.58%	10.76%	5.42%
1967	23.98%	-4.95%	5.56%
2000	-9.10%	12.87%	5.58%
2001	-11.89%	10.65%	5.75%
1971	14.30%	11.01%	5.97%
1968	11.06%	2.57%	5.98%
1972	18.99%	7.26%	5.99%
1997	33.36%	12.95%	6.02%
1995	37.58%	27.20%	6.03%
1970	3.86%	18.37%	6.48%
1993	10.08%	13.19%	6.54%
1996	22.96%	1.40%	6.73%
1999	21.04%	-7.45%	6.82%
1969	-8.50%	-8.09%	6.87%
1976	23.93%	18.65%	7.21%
1973	-14.69%	1.14%	7.26%
1992	7.62%	9.39%	7.26%
1991	30.47%	19.89%	7.30%
1974	-26.47%	-3.06%	7.60%
1986	18.67%	19.85%	7.89%
1994	1.32%	-5.76%	7.99%
1977	-7.16%	1.71%	8.03%
1975	37.23%	14.64%	8.05%
1989	31.69%	16.23%	8.16%
1990	-3.10%	6.78%	8.44%
1978	6.57%	-0.07%	8.98%
1988	16.61%	10.70%	9.19%
1987	5.25%	-0.27%	9.20%
1985	31.73%	30.09%	9.56%
1979	18.61%	-4.18%	10.12%
1982	21.55%	42.56%	10.95%
1984	6.27%	16.86%	11.70%
1983	22.56%	6.26%	11.97%
1980	32.50%	-2.76%	11.99%
1981	-4.92%	-1.24%	13.34%

Yields for Treasury Constant Maturities
Yearly for 2018-2022
and the Twelve Months Ended December 2023

Years	1-Year	2-Year	3-Year	5-Year	7-Year	10-Year	20-Year	30-Year
2018	2.33%	2.53%	2.63%	2.75%	2.85%	2.91%	3.02%	3.11%
2019	2.05%	1.97%	1.94%	1.96%	2.05%	2.14%	2.40%	2.58%
2020	0.38%	0.40%	0.43%	0.54%	0.73%	0.89%	1.35%	1.56%
2021	0.10%	0.27%	0.46%	0.86%	1.19%	1.44%	1.98%	2.05%
2022	2.79%	2.98%	3.05%	3.00%	3.01%	2.95%	3.30%	3.12%
Five-Year Average	1.53%	1.63%	1.70%	1.82%	1.97%	2.07%	2.41%	2.48%

Months	1-Year	2-Year	3-Year	5-Year	7-Year	10-Year	20-Year	30-Year
Jan-23	4.69%	4.21%	3.91%	3.64%	3.59%	3.53%	3.81%	3.66%
Feb-23	4.93%	4.53%	4.23%	3.94%	3.86%	3.75%	3.95%	3.80%
Mar-23	4.68%	4.30%	4.09%	3.82%	3.77%	3.66%	3.94%	3.77%
Apr-23	4.68%	4.02%	3.76%	3.54%	3.50%	3.46%	3.80%	3.68%
May-23	4.91%	4.13%	3.82%	3.59%	3.58%	3.57%	3.96%	3.86%
Jun-23	5.24%	4.64%	4.27%	3.95%	3.85%	3.75%	4.04%	3.87%
Jul-23	5.37%	4.83%	4.47%	4.14%	4.03%	3.90%	4.15%	3.96%
Aug-23	5.37%	4.90%	4.59%	4.31%	4.26%	4.17%	4.46%	4.28%
Sep-23	5.44%	5.02%	4.74%	4.49%	4.46%	4.38%	4.65%	4.47%
Oct-23	5.42%	5.07%	4.89%	4.77%	4.82%	4.80%	5.13%	4.95%
Nov-23	5.28%	4.88%	4.64%	4.49%	4.53%	4.50%	4.84%	4.66%
Dec-23	4.96%	4.46%	4.19%	4.00%	4.04%	4.02%	4.32%	4.14%
Twelve-Month Average	5.08%	4.58%	4.30%	4.06%	4.02%	3.96%	4.25%	4.09%
Six-Month Average	5.31%	4.86%	4.59%	4.37%	4.36%	4.30%	4.59%	4.41%
Three-Month Average	5.22%	4.80%	4.57%	4.42%	4.46%	4.44%	4.76%	4.58%

Source: Federal Reserve statistical release H.15

Measures of the Risk-Free Rate & Corporate Bond Yields
The forecast of Treasury and Corporate yields
per the consensus of nearly 50 economists
reported in the Blue Chip Financial Forecasts dated December 1, 2023 and December 28, 2023

		Treasury					Corporate	
Year	Quarter	1-Year Bill	2-Year Note	5-Year Note	10-Year Note	30-Year Bond	Aaa Bond	Baa Bond
2024	First	5.0%	4.5%	4.2%	4.2%	4.3%	5.1%	6.1%
2024	Second	4.7%	4.2%	4.0%	4.1%	4.3%	5.0%	6.0%
2024	Third	4.4%	4.0%	3.9%	3.9%	4.2%	4.9%	6.0%
2024	Fourth	4.2%	3.8%	3.8%	3.9%	4.1%	4.8%	5.9%
2025	First	3.9%	3.7%	3.6%	3.8%	4.0%	4.8%	5.8%
2025	Second	3.7%	3.6%	3.6%	3.7%	4.0%	4.7%	5.8%
Long-range CONSENSUS								
2025		3.7%	3.7%	3.7%	3.9%	4.1%	5.0%	6.0%
2026		3.4%	3.5%	3.7%	3.9%	4.1%	4.9%	6.0%
2027		3.3%	3.4%	3.7%	3.9%	4.1%	4.9%	6.0%
2028		3.3%	3.4%	3.7%	3.9%	4.2%	5.0%	6.0%
2029		3.2%	3.4%	3.7%	3.9%	4.2%	5.0%	6.0%
Averages:								
	2025-2029	3.4%	3.5%	3.7%	3.9%	4.1%	4.9%	6.0%
	2030-2034	3.2%	3.4%	3.7%	3.9%	4.2%	5.0%	6.0%

Measures of the Market Premium

Historical Market Premium

Avg. to Low Interest Rates	(Rm)	(Rf)	
1926-2022 Arith. mean	12.21%	3.87%	8.34%

Forecast Market Premium

Value Line	Dividend Yield		Median Appreciation Potential		Median Total Return
As of: 29-Dec-23	2.2%	+	9.73%	=	11.93%
Risk-free Rate of Return (Rf)					3.75%
					8.18%
Average - Historical/Forecast					8.26%

Exhibit 7.8: Size-Decile Portfolios of the NYSE/NYSE MKT/NASDAQ Long-Term Returns in Excess of CAPM
1926–2016

Size Grouping	OLS Beta	Arithmetic Mean	Return in Excess of Risk-free Rate (actual)	Return in Excess of Risk-free Rate (as predicted by CAPM)	Size Premium
Mid-Cap (3–5)	1.12	13.82%	8.80%	7.79%	1.02%
Low-Cap (6–8)	1.22	15.26%	10.24%	8.49%	1.75%
Micro-Cap (9–10)	1.35	18.04%	13.02%	9.35%	3.67%
Breakdown of Deciles 1–10					
1-Largest	0.92	11.05%	6.04%	6.38%	-0.35%
2	1.04	12.82%	7.81%	7.19%	0.61%
3	1.11	13.57%	8.55%	7.66%	0.89%
4	1.13	13.80%	8.78%	7.80%	0.98%
5	1.17	14.62%	9.60%	8.09%	1.51%
6	1.17	14.81%	9.79%	8.14%	1.66%
7	1.25	15.41%	10.39%	8.67%	1.72%
8	1.30	16.14%	11.12%	9.04%	2.08%
9	1.34	16.97%	11.96%	9.28%	2.68%
10-Smallest	1.39	20.27%	15.25%	9.66%	5.59%

Betas are estimated from monthly returns in excess of the 30-day U.S. Treasury bill total return, January 1926–December 2016. Historical riskless rate measured by the 91-year arithmetic mean income return component of 20-year government bonds (5.02%). Calculated in the context of the CAPM by multiplying the equity risk premium by beta. The equity risk premium is estimated by the arithmetic mean total return of the S&P 500 (11.95%) minus the arithmetic mean income return component of 20-year government bonds (5.02%) from 1926–2016. Source: Morningstar *Direct* and CRSP. Calculated based on data from CRSP US Stock Database and CRSP US Indices Database ©2017 Center for Research. Used with permission. All calculations performed by Duff & Phelps, LLC.

Comparable Earnings Approach
Using Non-Utility Companies with
Timeliness of 2, 3 & 4; Safety Rank of 1, 2 & 3; Financial Strength of B+, B++, A & A+;
Price Stability of 75 to 95; Betas of .75 to 1.05; and Technical Rank of 3 & 4

Company	Industry	Timeliness Rank	Safety Rank	Financial Strength	Price Stability	Beta	Technical Rank
AAON Inc	Machinery	3	3	B+	80	0.85	3
Abbott Laboratories	Med Supp Non-Invasive	3	1	A+	95	0.90	5
AbbVie Inc	Drug	3	2	A	95	0.85	4
Acushnet Holdings	Recreation	2	3	B++	75	0.95	3
Agilent Technologies	Precision Instrument	3	2	A	90	0.95	3
Allstate Corporation	Insurance (Prop/Cas.)	2	2	A	90	1.00	5
Altria Group Inc	Tobacco	3	3	B++	95	0.85	3
Amphenol Corp	Electronics	3	1	A	95	1.05	3
Analog Devices Inc	Semiconductor	3	1	A+	85	1.00	3
Arthur J Gallagher and Company	Financial Svcs. (Div.)	4	1	A	95	0.95	4
Booz Allen Hamilton Holding Corporation	Industrial Services	3	2	B++	90	0.85	3
Boston Scientific Corp	Med Supp Invasive	4	3	B++	85	1.05	4
Brady Corp	Diversified Co.	3	2	B++	90	0.95	4
Broadridge Fin'l	Information Services	3	2	B++	95	0.90	3
Brown and Brown Inc	Financial Svcs. (Div.)	3	1	A	95	0.95	3
BWX Technologies	Power	4	2	B++	90	0.80	3
CACI International Inc	IT Services	2	3	B+	90	0.90	4
Caseys General Stores Inc	Retail/Wholesale Food	2	2	B++	90	0.90	3
Cboe Global Markets	Brokers & Exchanges	3	2	A	95	0.80	3
CME Group Inc	Brokers & Exchanges	2	2	A	90	0.95	3
Cognizant Technology Solutions Corp	IT Services	3	2	A+	85	1.00	3
Commerce Bancshares Inc	Bank (Midwest)	3	3	B++	90	0.90	4
Cooper Companies Inc	Med Supp Non-Invasive	3	2	A	80	1.05	3
Copart Inc	Retail Automotive	4	2	B++	85	1.05	3
Corteva Inc.	Chemical (Basic)	4	3	B++	80	0.95	3
CSG Systems International Inc	IT Services	3	2	B+	95	0.75	3
CSW Industrials	Petroleum (Producing)	3	2	B++	85	0.90	3
CSX Corporation	Railroad	3	2	B++	90	1.00	3
Donaldson Co	Machinery	2	2	A	90	1.05	3
EBay Inc	Internet	2	3	B+	75	1.05	3
Expeditors International of Washington I	Industrial Services	3	1	A+	95	0.95	3
Exponent Inc.	Information Services	4	3	B+	80	0.95	4
F5 Inc.	Telecom. Equipment	2	2	A	75	0.95	3
Fastenal Co	Retail Building Supply	2	1	A+	95	0.90	3
FirstCash Holdings	Financial Svcs. (Div.)	2	3	B++	80	0.90	4
Fiserv Inc	IT Services	2	2	B++	85	1.05	4
Franklin Electric Co Inc	Electrical Equipment	3	2	A	90	0.90	3
GATX Corp	Railroad	3	3	B+	90	0.95	3
Gen Digital Inc.	Cyber Security	2	3	B+	75	0.80	3
Graco Inc	Machinery	2	2	A	90	1.05	3
Graphic Packaging	Packaging & Container	3	3	B+	85	1.05	3
Hanover Insurance Group Inc	Insurance (Prop/Cas.)	4	2	A	95	0.95	5
Harris Corp.	Aerospace/Defense	3	2	A+	85	0.90	3
Henry Schein Inc	Med Supp Non-Invasive	2	3	B+	80	1.00	4
Hologic Inc	Med Supp Non-Invasive	3	3	B+	75	0.95	5
Houlihan Lokey	Investment Banking	4	3	A	90	0.75	3
Huntington Ingalls Industries Inc	Aerospace/Defense	2	3	A	80	0.95	3
Ingredion Incorporated	Food Processing	2	2	B++	95	0.90	3
Intercontinental Exch.	Brokers & Exchanges	4	1	A	95	0.95	3
International Business Machines Corp	Computers/Peripherals	3	3	B++	95	0.90	3
International Paper Co	Paper/Forest Products	3	3	B++	75	1.05	3
J and J Snack Foods Corp	Food Processing	3	2	A	85	0.90	3
Jack Henry and Associates Inc	IT Services	3	1	A+	90	0.85	5
Keysight Technologies	Precision Instrument	3	2	A	75	0.90	3
Knight-Swift Trans.	Trucking	4	3	B++	85	0.85	3
Kraft Heinz Co.	Food Processing	3	3	A	75	0.75	4
Landstar System	Trucking	4	1	A	95	0.80	3
Leidos Holdings Inc	Industrial Services	2	3	B++	75	1.05	4
Lincoln Electric Holdings Inc	Machinery	3	2	A	90	1.00	3
Lindsay Corporation	Machinery	4	3	B++	75	0.90	4
McCormick and Co	Food Processing	4	1	A+	95	0.80	3
Mercury General Corp	Insurance (Prop/Cas.)	2	3	B+	75	0.90	3
Mettler Toledo International Inc	Precision Instrument	3	3	B++	80	1.05	4
Motorola Solutions Inc	Telecom. Equipment	3	2	B++	95	0.95	3
MSCI Inc	Information Services	3	3	B+	75	1.05	3
Murphy USA Inc	Retail (Hardlines)	2	3	B++	75	0.75	3
Nasdaq Inc.	Brokers & Exchanges	3	1	A+	85	1.05	4
NetScout Systems	Cyber Security	3	3	B++	75	0.90	3
Norfolk Southern Corp	Railroad	4	2	A+	85	1.05	3
O Reilly Automotive Inc	Retail Automotive	2	2	B++	90	0.90	3
Omnicom Group Inc	Advertising	3	3	B+	85	1.05	3
Packaging Corp	Packaging & Container	3	2	A	90	0.95	3
Parsons Corp.	Aerospace/Defense	3	3	B++	80	0.95	3
Pfizer Inc	Drug	3	2	A	90	0.80	5
Philip Morris International Inc	Tobacco	4	3	B++	90	0.95	3
Prestige Consumer	Household Products	4	3	B++	90	0.85	3
Quest Diagnostics Inc	Medical Services	3	2	B++	90	0.75	3
RLI Corp	Insurance (Prop/Cas.)	3	2	A	95	0.80	5
RTX Corp.	Aerospace/Defense	2	1	A+	90	1.05	5
S&P Global	Information Services	3	2	A	90	1.05	3
Schneider National	Trucking	4	3	B++	85	0.80	4
Selective Insurance Group Inc	Insurance (Prop/Cas.)	2	3	B++	95	0.85	5
Sensient Technologies Corp	Food Processing	4	3	B++	95	0.90	3
Service Corp International Inc	Industrial Services	3	3	B+	85	0.90	4
Sherwin Williams	Retail Building Supply	2	1	A+	90	0.95	3
Snap on Inc	Machinery	3	2	A+	85	1.05	3
Sonoco Products	Packaging & Container	2	2	A	95	1.00	5
Standard Motor Products Inc	Auto Parts	3	3	B+	75	0.85	3
Stepan Company	Chemical (Specialty)	4	2	B++	85	0.80	3
The Travelers Companies Inc	Insurance (Prop/Cas.)	2	1	A+	95	0.95	4
Thermo Fisher Scientific Inc	Precision Instrument	3	1	A	95	0.85	4
Toro Co	Machinery	2	2	B++	80	1.00	4
Tractor Supply Co	Retail Building Supply	3	2	A+	85	0.75	5
Transmission Holdings Inc	Auto Parts	2	3	B+	80	1.05	3
Trimas Corporation	Diversified Co.	3	3	B+	80	0.90	4
Tyler Technologies	IT Services	4	2	A+	85	0.85	3
UniFirst Corp	Industrial Services	3	2	A	90	0.90	3
United Parcel Service	Air Transport	4	2	A+	85	0.80	4
Vail Resorts	Hotel/Gaming	4	3	B+	75	1.05	4
Valmont Industries	Diversified Co.	4	2	A	75	1.05	4
Verisk Analytics Inc	Information Services	2	2	B++	95	0.90	3
Walt Disney Co	Entertainment	4	2	A	80	1.05	5
Waters Corp	Precision Instrument	2	2	A	85	0.95	3
Werner Enterprises Inc	Trucking	4	2	B++	95	0.75	4
Western Union Company	Financial Svcs. (Div.)	2	3	B+	85	0.85	4
WR Berkley Corp	Insurance (Prop/Cas.)	2	2	B++	85	1.05	4
WW Grainger Inc	Electrical Equipment	3	1	A+	90	1.00	3
Average		3	2	B++	87	0.93	3
Electric Group	Average	3	2	A	87	0.88	4

Source of Information: Value Line Investment Survey for Windows, January 2024

Comparable Earnings Approach
Five-Year Average Historical Earned Returns
for Years 2018-2022 and
Projected 3-5 Year Returns

Company	2018	2019	2020	2021	2022	Average	Projected 2026-28
AAON Inc	17.2%	18.5%	21.3%	12.6%	17.9%	17.5%	18.0%
Abbott Laboratories	16.8%	18.7%	20.0%	26.2%	25.8%	21.5%	24.0%
AbbVie Inc	-	-	NMF	NMF	NMF	-	NMF
Acushnet Holdings	11.2%	13.2%	9.8%	17.2%	21.2%	14.5%	22.0%
Agilent Technologies	19.9%	20.8%	21.0%	24.7%	29.5%	23.2%	33.0%
Allstate Corporation	13.9%	12.8%	15.9%	16.5%	NMF	14.8%	13.0%
Altria Group Inc	51.0%	NMF	NMF	NMF	NMF	51.0%	NMF
Amphenol Corp	30.0%	25.5%	22.3%	24.9%	27.1%	26.0%	23.0%
Analog Devices Inc	20.4%	16.3%	15.2%	6.8%	13.6%	14.5%	15.5%
Arthur J Gallagher and Company	13.9%	12.8%	13.2%	10.7%	8.9%	11.9%	18.0%
Booz Allen Hamilton Holding Corporation	58.8%	56.4%	50.8%	54.5%	61.3%	56.4%	33.5%
Boston Scientific Corp	23.6%	16.1%	9.2%	14.4%	14.3%	15.5%	17.0%
Brady Corp	14.9%	15.4%	13.0%	13.5%	16.5%	14.7%	18.0%
Broadridge Fin'l	46.1%	49.1%	43.7%	36.8%	39.9%	43.1%	35.0%
Brown and Brown Inc	11.5%	11.9%	12.8%	14.0%	14.6%	13.0%	16.5%
BWX Technologies	96.3%	60.4%	45.1%	48.0%	31.8%	56.3%	32.5%
CACI International Inc	9.4%	11.2%	12.1%	17.2%	12.0%	12.4%	9.5%
Caseys General Stores Inc	14.5%	16.1%	16.2%	15.2%	16.8%	15.8%	15.5%
Cboe Global Markets	13.1%	11.1%	13.9%	14.6%	6.8%	11.9%	12.5%
CME Group Inc	7.6%	8.1%	8.0%	9.6%	10.0%	8.7%	9.5%
Cognizant Technology Solutions Corp	23.4%	20.3%	17.0%	18.1%	18.6%	19.5%	18.5%
Commerce Bancshares Inc	14.8%	13.4%	10.4%	15.4%	19.8%	14.8%	14.5%
Cooper Companies Inc	10.3%	12.9%	6.2%	9.5%	8.6%	9.5%	9.0%
Copart Inc	26.3%	30.1%	24.5%	25.2%	23.3%	25.9%	20.5%
Corteva Inc.	-	4.4%	4.5%	6.3%	7.6%	5.7%	10.0%
CSG Systems International Inc	18.3%	20.9%	13.9%	16.6%	12.4%	16.4%	22.5%
CSW Industrials	17.5%	16.6%	9.8%	14.2%	18.3%	15.3%	17.0%
CSX Corporation	26.3%	28.1%	21.1%	26.1%	32.4%	26.8%	19.5%
Donaldson Co	31.0%	29.9%	26.0%	25.2%	29.4%	28.3%	19.5%
EBay Inc	40.2%	62.4%	71.4%	17.4%	32.1%	44.7%	33.5%
Expeditors International of Washington Inc	31.1%	26.9%	26.2%	40.5%	43.6%	33.7%	27.5%
Exponent Inc.	23.0%	23.5%	22.8%	24.3%	31.9%	25.1%	28.0%
F5 Inc.	35.3%	24.3%	13.8%	14.0%	13.0%	20.1%	16.0%
Fastenal Co	32.7%	29.7%	31.4%	30.4%	34.4%	31.7%	37.5%
FirstCash Holdings	11.6%	12.2%	8.3%	6.9%	13.5%	10.5%	11.5%
Fiserv Inc	55.9%	8.4%	9.3%	12.1%	13.6%	19.9%	12.5%
Franklin Electric Co Inc	14.6%	12.3%	12.1%	16.3%	17.5%	14.6%	20.0%
GATX Corp	11.2%	10.9%	6.5%	9.0%	10.7%	9.7%	9.5%
Gen Digital Inc.	18.3%	NMF	-	NMF	51.0%	34.7%	27.5%
Graco Inc	43.6%	31.7%	25.7%	25.7%	24.8%	30.3%	19.5%
Graphic Packaging	11.9%	13.2%	11.7%	10.8%	24.3%	14.4%	21.0%
Hanover Insurance Group Inc	9.9%	11.4%	11.1%	11.2%	8.5%	10.4%	28.0%
Harris Corp.	-	3.6%	5.4%	9.6%	5.7%	6.1%	17.0%
Henry Schein Inc	18.1%	23.4%	12.0%	18.4%	15.6%	17.5%	17.0%
Hologic Inc	25.3%	22.8%	29.7%	44.4%	26.7%	29.8%	13.5%
Houlihan Lokey	17.9%	18.7%	22.6%	30.3%	16.0%	21.1%	24.0%
Huntington Ingalls Industries Inc	55.1%	36.5%	36.6%	19.4%	16.6%	32.8%	17.0%
Ingredion Incorporated	20.8%	16.4%	13.6%	14.4%	15.6%	16.2%	20.5%
Intercontinental Exch.	12.1%	12.7%	12.8%	12.8%	13.1%	12.7%	11.5%
International Business Machines Corp	75.4%	54.9%	37.7%	47.7%	37.9%	50.7%	35.0%
International Paper Co	22.3%	15.9%	10.8%	12.4%	17.7%	15.8%	12.5%
J and J Snack Foods Corp	11.1%	11.4%	2.3%	6.6%	5.5%	7.4%	12.0%
Jack Henry and Associates Inc	22.3%	19.0%	19.1%	23.6%	26.3%	22.1%	23.5%
Keysight Technologies	25.4%	30.0%	27.8%	30.8%	33.4%	29.5%	23.5%
Knight-Swift Trans.	8.4%	6.6%	8.0%	12.1%	11.8%	9.4%	7.5%
Kraft Heinz Co.	8.3%	6.8%	7.1%	7.3%	7.1%	7.3%	8.5%
Landstar System	37.2%	31.6%	27.8%	44.3%	48.6%	37.9%	20.5%
Leidos Holdings Inc	20.3%	22.0%	21.8%	22.0%	21.2%	21.5%	20.5%
Lincoln Electric Holdings Inc	35.7%	35.8%	31.6%	43.2%	46.9%	38.6%	22.0%
Lindsay Corporation	11.4%	5.8%	12.9%	12.6%	16.6%	11.9%	13.0%
McCormick and Co	20.9%	20.8%	19.4%	18.7%	14.6%	18.9%	16.0%
Mercury General Corp	6.2%	8.0%	15.1%	7.5%	-	9.2%	26.5%
Mettler Toledo International Inc	83.6%	NMF	NMF	NMF	NMF	83.6%	NMF
Motorola Solutions Inc	-	-	-	-	-	-	NMF
MSCI Inc	-	-	-	-	-	-	NMF
Murphy USA Inc	22.1%	19.3%	49.2%	49.2%	105.0%	49.0%	42.5%
Nasdaq Inc.	14.9%	14.8%	16.0%	19.9%	21.5%	17.4%	15.5%
NetScout Systems	NMF	NMF	1.0%	1.7%	2.9%	1.9%	4.0%
Norfolk Southern Corp	17.4%	17.9%	16.0%	22.0%	25.7	18.3%	23.5%
O Reilly Automotive Inc	NMF	NMF	NMF	NMF	NMF	-	NMF
Omnicom Group Inc	52.1%	46.9%	30.7%	43.0%	40.5%	42.6%	28.0%
Packaging Corp	27.6%	22.7%	16.9%	24.8%	28.4%	24.1%	25.0%
Parsons Corp.	24.5%	7.4%	5.4%	3.4%	4.7%	9.1%	13.5%
Pfizer Inc	17.6%	25.8%	11.0%	29.0%	32.8%	23.2%	22.5%
Philip Morris International Inc	-	-	-	-	-	-	NMF
Prestige Consumer	13.3%	12.2%	12.1%	13.0%	14.5%	13.0%	10.0%
Quest Diagnostics Inc	16.8%	15.9%	22.6%	28.4%	20.0%	20.7%	17.5%
RLI Corp	11.4%	11.8%	10.4%	14.5%	19.1%	13.4%	14.0%
RTX Corp.	16.0%	17.1%	4.6%	8.8%	9.8%	11.3%	13.0%
S&P Global	NMF	NMF	NMF	NMF	10.3%	10.3%	13.5%
Schneider National	12.6%	6.6%	10.3%	16.7%	16.1%	12.5%	12.0%
Selective Insurance Group Inc	12.2%	12.0%	9.1%	13.5%	13.0%	12.0%	21.0%
Sensient Technologies Corp	18.3%	14.2%	11.7%	14.1%	13.9%	14.4%	12.5%
Service Corp International Inc	20.4%	19.4%	29.8%	40.7%	36.3%	29.3%	29.0%
Sherwin Williams	47.1%	47.9%	62.6%	89.3%	74.1%	64.2%	NMF
Snap on Inc	21.9%	20.3%	16.4%	19.6%	20.3%	19.7%	23.5%
Sonoco Products	19.4%	19.8%	18.2%	19.4%	22.6%	19.9%	17.0%
Standard Motor Products Inc	12.2%	13.7%	14.6%	16.2%	12.0%	13.7%	12.0%
Stepan Company	14.4%	11.6%	12.9%	12.8%	12.6%	12.9%	8.5%
The Travelers Companies Inc	10.7%	9.8%	9.2%	12.2%	13.9%	11.2%	11.5%
Thermo Fisher Scientific Inc	10.7%	11.5%	18.5%	18.9%	15.8%	15.1%	15.5%
Toro Co	40.7%	31.9%	29.6%	35.6%	32.8%	34.1%	41.0%
Tractor Supply Co	34.1%	36.0%	41.9%	49.8%	53.3%	43.0%	53.5%
Transmission Holdings Inc	97.0%	77.3%	39.6%	69.7%	60.8%	68.9%	26.0%
Trimas Corporation	13.1%	9.5%	11.8%	9.1%	10.2%	10.7%	11.5%
Tyler Technologies	14.6%	13.1%	11.5%	12.8%	12.1%	12.8%	15.5%
UniFirst Corp	10.2%	10.0%	7.8%	8.1%	5.4%	8.3%	8.5%
United Parcel Service	NMF	NMF	NMF	NMF	57.0%	57.0%	43.0%
Vail Resorts	23.9%	20.1%	7.5%	8.0%	21.6%	16.2%	27.0%
Valmont Industries	16.1%	13.8%	14.8%	16.9%	18.2%	16.0%	16.5%
Verisk Analytics Inc	28.9%	19.9%	26.4%	23.7%	45.5%	28.9%	NMF
Walt Disney Co	25.8%	11.7%	NMF	2.3%	3.4%	10.8%	9.5%
Waters Corp	39.9%	-	NMF	NMF	NMF	39.9%	47.0%
Werner Enterprises Inc	13.6%	15.0%	15.1%	17.6%	16.5%	15.6%	10.5%
Western Union Company	-	-	NMF	NMF	NMF	-	NMF
WR Berkley Corp	9.5%	9.6%	7.1%	14.3%	18.1%	11.7%	4.0%
WW Grainger Inc	49.6%	51.6%	47.9%	55.7%	63.4%	53.6%	47.5%
Average						22.9%	20.0%
Median						16.4%	17.5%
Average (excluding companies with values >20%)						13.1%	13.4%

Comparable Earnings Approach
Screening Parameters

Timeliness Rank

The rank for a stock's probable relative market performance in the year ahead. Stocks ranked 1 (Highest) or 2 (Above Average) are likely to outpace the year-ahead market. Those ranked 4 (Below Average) or 5 (Lowest) are not expected to outperform most stocks over the next 12 months. Stocks ranked 3 (Average) will probably advance or decline with the market in the year ahead. Investors should try to limit purchases to stocks ranked 1 (Highest) or 2 (Above Average) for Timeliness.

Safety Rank

A measure of potential risk associated with individual common stocks rather than large diversified portfolios (for which Beta is good risk measure). Safety is based on the stability of price, which includes sensitivity to the market (see Beta) as well as the stock's inherent volatility, adjusted for trend and other factors including company size, the penetration of its markets, product market volatility, the degree of financial leverage, the earnings quality, and the overall condition of the balance sheet. Safety Ranks range from 1 (Highest) to 5 (Lowest). Conservative investors should try to limit purchases to equities ranked 1 (Highest) or 2 (Above Average) for Safety.

Financial Strength

The financial strength of each of the more than 1,600 companies in the VS II data base is rated relative to all the others. The ratings range from A++ to C in nine steps. (For screening purposes, think of an A rating as "greater than" a B). Companies that have the best relative financial strength are given an A++ rating, indicating ability to weather hard times better than the vast majority of other companies. Those who don't quite merit the top rating are given an A+ grade, and so on. A rating as low as C++ is considered satisfactory. A rating of C+ is well below average, and C is reserved for companies with very serious financial problems. The ratings are based upon a computer analysis of a number of key variables that determine (a) financial leverage, (b) business risk, and (c) company size, plus the judgment of Value Line's analysts and senior editors regarding factors that cannot be quantified across-the-board for companies. The primary variables that are indexed and studied include equity coverage of debt, equity coverage of intangibles, "quick ratio", accounting methods, variability of return, fixed charge coverage, stock price stability, and company size.

Price Stability Index

An index based upon a ranking of the weekly percent changes in the price of the stock over the last five years. The lower the standard deviation of the changes, the more stable the stock. Stocks ranking in the top 5% (lowest standard deviations) carry a Price Stability Index of 100; the next 5%, 95; and so on down to 5. One standard deviation is the range around the average weekly percent change in the price that encompasses about two thirds of all the weekly percent change figures over the last five years. When the range is wide, the standard deviation is high and the stock's Price Stability Index is low.

Beta

A measure of the sensitivity of the stock's price to overall fluctuations in the New York Stock Exchange Composite Average. A Beta of 1.50 indicates that a stock tends to rise (or fall) 50% more than the New York Stock Exchange Composite Average. Use Beta to measure the stock market risk inherent in any diversified portfolio of, say, 15 or more companies. Otherwise, use the Safety Rank, which measures total risk inherent in an equity, including that portion attributable to market fluctuations. Beta is derived from a least squares regression analysis between weekly percent changes in the price of a stock and weekly percent changes in the NYSE Average over a period of five years. In the case of shorter price histories, a smaller time period is used, but two years is the minimum. The Betas are periodically adjusted for their long-term tendency to regress toward 1.00.

Technical Rank

A prediction of relative price movement, primarily over the next three to six months. It is a function of price action relative to all stocks followed by Value Line. Stocks ranked 1 (Highest) or 2 (Above Average) are likely to outpace the market. Those ranked 4 (Below Average) or 5 (Lowest) are not expected to outperform most stocks over the next six months. Stocks ranked 3 (Average) will probably advance or decline with the market. Investors should use the Technical and Timeliness Ranks as complements to one another.