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Issues: Return on Equity, Capital Structure
Witness: Robert B. Hevert
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Sponsoring Party: The Empire District Electric Company
Case No.:ER-2019-0374
Date Testimony Prepared: March 2020

Before the Public Service Commission of the State of Missouri

Surrebuttal Testimony

of

Robert B. Hevert

on behalf of

The Empire District Electric Company a Liberty Utilities Company

****Denotes Confidential****

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March 2020

PUBLIC VERSION

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ROBERT B HEVERT
THE EMPIRE DISTRICT ELECTRIC COMPANY
BEFORE THE
MISSOURI PUBLIC SERVICE COMMISSION
CASE NO. ER-2019-0374

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GLOSSARY OF FREQUENTLY USED TERMS

TERM	DESCRIPTION
Beta Coefficient	A component of the CAPM that measures the risk of a given stock relative to the risk of the overall market.
Bond Yield Plus Risk Premium Approach	A risk premium model used to estimate the Cost of Equity. The Bond Yield Plus Risk Premium approach assumes that investors required a risk premium over the cost of debt as compensation for assuming the greater risk of common equity investment. The model is expressed as a bond yield plus equity risk premium.
Capital Asset Pricing Model ("CAPM")	A risk premium-based model used to estimate the Cost of Equity, assuming the stock is added to a well-diversified portfolio. The CAPM assumes that investors are compensated for the time value of money (represented by the Risk-Free Rate), and risk (represented by the combination of the Beta Coefficient and the Market Risk Premium).
Constant Growth DCF Model	A form of the DCF model that assumes cash flows will grow at a constant rate, in perpetuity. The model simplifies to a form that expresses the Cost of Equity as the sum of the expected dividend yield and the expected growth rate.
Cost of Equity	The return required by investors to invest in equity securities. The terms "Return on Equity" and "Cost of Equity" are used interchangeably.
Discounted Cash Flow ("DCF") Model	A model used to estimate the Cost of Equity based on expected cash flows. The Cost of Equity equals the discount rate that sets the current market price equal to the present value of expected cash flows.
Dividend Yield	For a given stock, the current annualized dividend divided by its current market price.
Gross Domestic Product ("GDP")	The value of all finished goods and services produced within a country during a given period of time (usually measured annually). GDP includes public and private consumption, government expenditures, investments, and net exports (that is, exports minus imports).
Market Return	The expected return on the equity market, taken as a portfolio.
Market Risk Premium	The additional compensation required by investing in the equity market as a portfolio over the Risk-Free rate. The Market Risk Premium is a component of the CAPM.

TERM	DESCRIPTION
Proxy Group	A group of publicly traded companies used as the "proxy" for the subject company (in this case, Liberty-Empire). Proxy companies are sometimes referred to as "Comparable Companies."
Return on Equity ("ROE")	The return required by investors to invest in equity securities. The terms "Return on Equity" and "Cost of Equity" are used interchangeably. Please note that the ROE in this context is distinct from the accounting measure sometimes referred to as the "Return on Average Common Equity".
Risk-Free Rate	The rate of return on an asset with no risk of default.
Risk Premium	The additional compensation required by investors for taking on additional increments of risk. Risk Premium-based approaches are used in addition to the DCF and CAPM to estimate the Cost of Equity.
Treasury Yield	The return on Treasury securities; the yield on long-term Treasury bonds is considered to be a measure of the Risk-Free Rate.

SURREBUTTAL TESTIMONY
OF
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THE EMPIRE DISTRICT ELECTRIC COMPANY
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I. INTRODUCTION, CAPITAL MARKET UPDATE, AND SUMMARY OF RECOMMENDATIONS

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Robert B. Hevert and my business address is ScottMadden, Inc., 1900 West Park Drive, Suite 250, Westborough, MA 01581.

Q. ON WHOSE BEHALF ARE YOU SUBMITTING THIS TESTIMONY?

A. I am submitting this surrebuttal testimony ("Surrebuttal Testimony") before the Missouri Public Service Commission ("Commission") on behalf of The Empire District Electric Company, a Liberty Utilities company ("Liberty-Empire" or the "Company").

Q. ARE YOU THE SAME ROBERT B. HEVERT WHO FILED DIRECT AND REBUTTAL TESTIMONY IN THIS MATTER ON BEHALF OF LIBERTY-EMPIRE?

A. Yes, I am.

Q. WHAT IS THE PURPOSE OF YOUR SURREBUTTAL TESTIMONY?

A. My Surrebuttal Testimony responds to the rebuttal testimonies of Peter Chari on behalf of the Commission's Utility Services Division ("Staff"), and David Murray on behalf of the Office of the Public Counsel ("OPC") (together, the "Opposing Witnesses"), as they relate to the Company's Return on Equity ("ROE" or "Cost of Equity") and capital

structure. My analyses and conclusions are supported by the data presented in Schedules RBH-S1 through RBH-S6, which have been prepared by me or under my direction.

Q. HAVE YOU UPDATED YOUR ROE ANALYSES FROM THOSE PRESENTED IN YOUR REBUTTAL TESTIMONY?

A. No, I have not. I continue to rely on the analyses provided in my Rebuttal Testimony, which were updated based on market data through January 31, 2020.

Q. PLEASE PROVIDE A SUMMARY OVERVIEW OF YOUR SURREBUTTAL TESTIMONY.

A. In my Rebuttal Testimony, I found the Company's Cost of Equity to be 9.95 percent, within a range of 9.80 percent to 10.60 percent. For the reasons discussed throughout my Surrebuttal Testimony, none of the arguments raised in Messrs. Chari or Murray's rebuttal testimonies have caused me to revise my recommendation. That said, the capital markets continue to be extraordinarily volatile. As discussed below, from mid-February through March 20, the utility sector lost about 31.00 percent of its value. During that time, utility dividend yields increased over 100 basis points, and the correlation between utility stocks and the overall market approached 100.00 percent. In short, utilities have not escaped the severe market volatility, and investors have increased the returns they require because of that risk.

In my Direct and Rebuttal Testimonies, I recommended an ROE range of 9.80 percent to 10.60 percent. Because the capital markets deteriorated so quickly, the models used to estimate the Cost of Equity have not fully reflected those changes. For example, Beta coefficients in the Capital Asset Pricing Model ("CAPM") measure systematic risk over five years; the most recent month or two will not materially affect them. Further,

although the significant fall in Treasury yields is a matter of heightened risk, the CAPM would not make a specific adjustment to reflect that effect.

Even though financial models may not fully capture the now-elevated risk to utility stocks, there can be no question the risk is higher than it was even two months ago. Giving any weight to that heightened risk indicates an ROE toward the very upper end of my recommended range. That said, I have maintained my 9.95 percent ROE recommendation which, under current conditions, is a conservative estimate of the Company's Cost of Equity.

Messrs. Chari's and Murray's ROE recommendations, both 9.25 percent, are unduly low under more "normal" market conditions; they are even more so now. With the ongoing uncertainty in capital markets, now is not the time to add the financial risk created by lower cash flows, and regulatory risk associated with a return that is far removed from those available to investors in other electric utilities. Putting aside the continuing flaws in their approaches, Messrs. Chari's and Murray's recommendations would have the counterproductive effect of increasing risks to investors, and increasing the returns required by them, as well as potentially restricting access to capital.

As to the Company's proposed capital structure, nothing in Mr. Murray's rebuttal testimony changes my position that the proper frame of reference is Liberty-Empire's capital structure relative to industry practice. Nor does Mr. Murray's rebuttal testimony change my view that conditions 4 and 5 established in Case No. EM-2016-0213 (referred to herein as "Merger Conditions") are properly assessed by reference to industry practice. As I explain in Section IV, the analyses Mr. Murray "expected" to see in my rebuttal

testimony have no bearing on whether Liberty-Empire is properly, or "economically" capitalized.

What is relevant is that Mr. Murray's recommendation would force the Company to take on unnecessary levels of debt just as the capital markets require stronger, not weaker balance sheets. It would compound extraordinarily high levels of market risk with inefficient levels of financing risk. Regardless of its derivation, Mr. Murray's proposed 46.00 percent equity ratio cannot be seen as the "most economical".

Q. PLEASE DISCUSS THE CURRENT CAPITAL MARKET CONDITIONS, AND THEIR IMPLICATIONS FOR ESTIMATING THE COMPANY'S COST OF EQUITY.

A. The recent, dramatic shifts in the capital markets brought about by the COVID-19 virus cannot be overstated. From February 12 to March 20, the S&P 500 lost about 32.00 percent of its value, and the utility sector lost about 31.00 percent.[1] During that time the VIX, which measures expected market volatility, increased as high as six-fold.[2] On March 9, the 30-year Treasury yield fell below 1.00 percent for the first time.

Central banks have implemented multiple policies to address the financial market instability. On March 3, 2020 the Federal Reserve reduced the overnight lending rate by 50 basis points, to a target range of 1.00 percent to 1.25 percent. It did so in light of the "evolving risks to economic activity" posed by the coronavirus, and despite its view that "[t]he fundamentals of the U.S. economy remain strong."[3] On March 12, 2020, the Federal Reserve Bank of New York ("FRBNY") released a statement regarding "Treasury Reserve Management Purchases and Repurchase Operations". In that

1 Source: S&P Capital IQ. Utility sector measured by the XLU, and Dow Jones Utility Average.
2 Source: YahooFinance.
3 Federal Reserve Press Release, March 3, 2020.

statement, the FRBNY announced that from March 13 to April 13, 2020 it would repurchase $60 billion of Treasury securities "across a range of maturities". The FRBNY also stated it had updated its monthly schedule of repurchase agreement operations to "address temporary disruptions in Treasury financing markets." Together, the FRBNY's changes were meant to "address highly unusual disruptions in Treasury financing markets associated with the coronavirus outbreak."

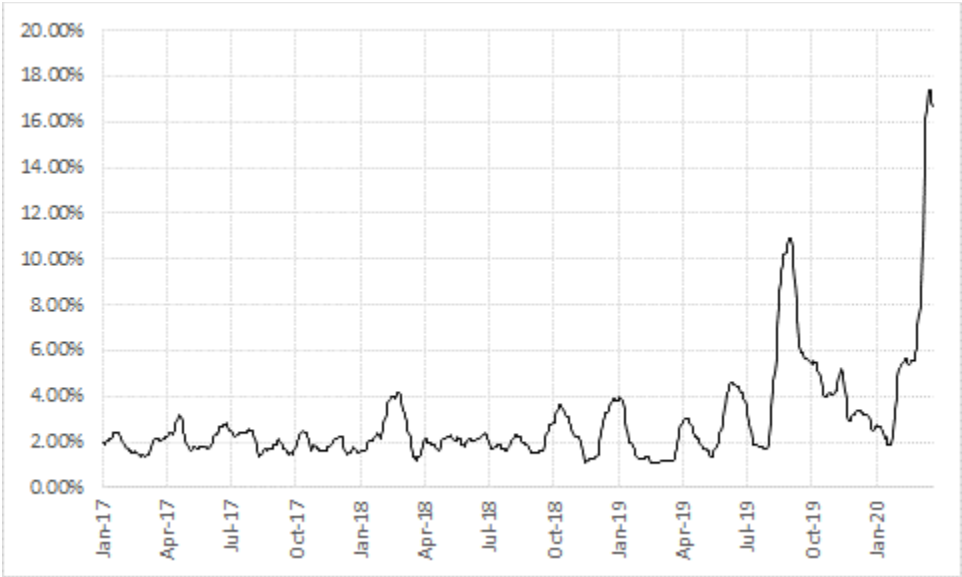
Three days later, on March 15, 2020 the Bank of Canada, the Bank of England, the Bank of Japan, the European Central Bank, the Federal Reserve, and the Swiss National Bank announced "a coordinated action to enhance the provision of liquidity via the standing U.S. dollar liquidity swap line arrangements."[4] The same day, the Federal Reserve lowered the Federal Funds rate by an additional 100 basis points, to a target range of 0.00 percent to 0.25 percent, and announced its plan to increase holdings of Treasury securities and agency mortgage-backed securities by a total of $700 million.[5]

Despite those central bank actions, the 30-Year Treasury bond yield has remained highly volatile (see Chart 1 below).

[4] Federal Reserve Board Press Release, *Coordinated Central Bank Action to Enhance the Provision of Global U.S. Dollar Liquidity*, March 15, 2020.

[5] Federal Reserve Press Release, March 15, 2020.

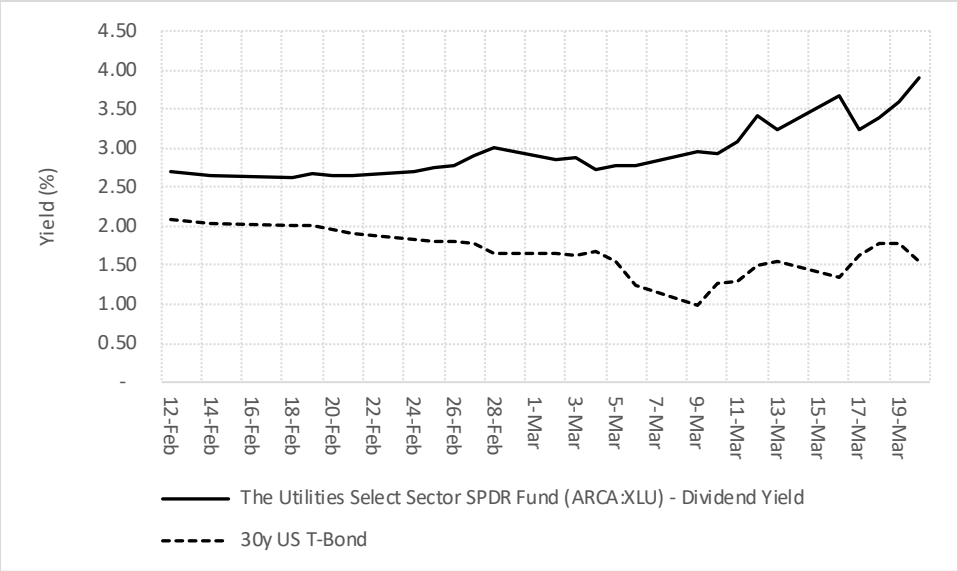
Chart 1: Coefficient of Variation in 30-Year Treasury Yields[6]



That volatility also is reflected in the "yield spread", or the difference between dividend yields and long-term Government bond yields. Looking to the XLU, an exchange-traded fund of utility companies, the dividend yield increased over 120 basis points from February 12 to March 20, 2020 as the 30-year Treasury yield fell by 54 basis points (see Chart 2, below).

[6] Source: S&P Global Market Intelligence.

Chart 2: Utility Dividend Yields vs. 30-Year Treasury Yields[7]



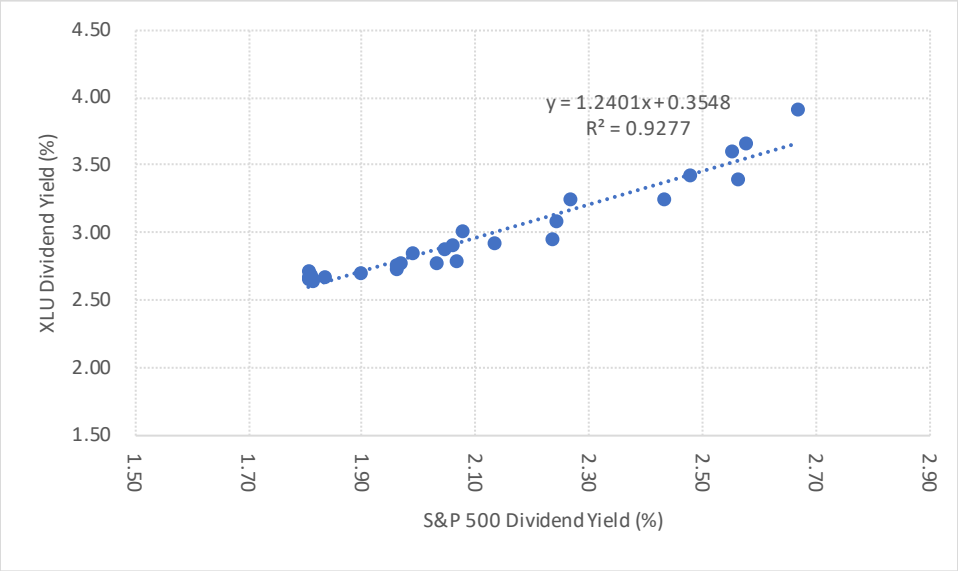
From a slightly different perspective, from January 1 to February 11, 2020, the correlation between the S&P 500 dividend yield and the utility sector dividend yield was about 18.00 percent. From February 12 to March 20, 2020 it increased to 96.00 percent (see Chart 3, below). That strong correlation is not surprising - as Morningstar recently explained, during volatile markets there often is little distinction in returns across assets or portfolios. That is, "correlations go to 1."[8] When that happens, utility stocks lose their "defensive" quality.

[7] Source: S&P Global Capital IQ.

[8] Morningstar, *Correlations Going to 1: Amid Market Collapse, U.S. Stock Fund Factors Show Little Differentiation*, March 6, 2020.

Chart 3: Utility Sector Dividend Yield vs. S&P 500 Dividend Yield

(2/12/2020 – 3/20/2020)[9]



The sudden increase in equity market volatility and dividend yields, together with the decrease in Government bond yields reflects the commonly understood safety-seeking behavior on the part of investors (*i.e.*, "flight to safety"). The increase in correlations across asset classes, including utilities, makes clear that utility investors are not exempt from the extraordinary uncertainty pervading the capital markets.

Q. WHAT CONCLUSIONS DO YOU DRAW FROM THOSE ANALYSES?

A. When markets become this uncertain, and this disrupted, we know investors increase their return requirements. As explained in my Direct Testimony, however, "[n]o individual model is more reliable than all others under all market conditions."[10] In his rebuttal testimony, Mr. Chari explains that Staff relies on only two methods, the

[9] Utility sector represented by the XLU. Please note, R^2 of 0.9277 indicates a correlation coefficient (R) of 0.9632.

[10] Direct Testimony of Robert B. Hevert, at 15.

Discounted Cash Flow ("DCF") model and CAPM approach.[11] As markets become increasingly (historically) volatile, however, it is important to look well beyond two methods to understand how investors view the risks now facing them, and the returns they now require. That is the technical issue.

The practical issue is plain: when utility investors are faced with such extraordinary market uncertainty, regulatory consistency and supportiveness become critically important. If the Commission were to adopt the Opposing Witnesses' recommendations, it would convey the opposite; it would suggest a lack of support and an increase in regulatory risk just as that support is most critical. The inevitable result will be diminished access to higher-cost capital, ultimately to the detriment of customers. In my view, the Opposing Witnesses' recommendations are inadequate under "normal" market conditions. They are even more so now.

I appreciate that the Commission has the difficult task of balancing the interests of customers and investors. I also appreciate doing so becomes increasingly difficult under stressed economic and financial conditions. We should not lose sight of the common interest customers and investors have in a financially strong utility. On balance, it remains my opinion that the Company's Cost of Equity falls in the range of 9.80 percent to 10.60 percent. Current conditions indicate, however, that the investor-required ROE now falls toward the top of that range.

[11] Rebuttal Testimony of Peter Chari, at 4.

Q. HOW IS THE BALANCE OF YOUR SURREBUTTAL TESTIMONY STRUCTURED?

A. Sections II and III respond to the rebuttal testimonies of Messrs. Chari and Murray, respectively, as they relate to the Company's Cost of Equity. Section IV responds to their rebuttal testimonies regarding the Company's capital structure. Lastly, Section V summarizes and concludes my Surrebuttal Testimony.

II. RESPONSE TO TESTIMONY OF STAFF WITNESS CHARI

Q. PLEASE BRIEFLY SUMMARIZE MR. CHARI'S CRITICISMS OF YOUR COST OF EQUITY ANALYSES.

A. Mr. Chari believes: (1) there is a difference between the Cost of Equity and the authorized return; (2) the growth rates in my Constant Growth DCF model are too high; (3) the Market Risk Premia used in my CAPM analyses are not calculated correctly; (4) my Empirical CAPM ("ECAPM") analysis is not appropriate; (5) the Bond Yield Plus Risk Premium approach should not be relied on; and (6) the small size premium is not appropriate, because Liberty-Empire is not a stand-alone company.

A. Cost of Equity and Authorized Returns on Equity

Q. PLEASE SUMMARIZE MR. CHARI'S CONCERNS RELATED TO THE RELATIONSHIP BETWEEN THE COST OF EQUITY AND AUTHORIZED ROE.

A. Mr. Chari states the authorized return is "a Commission-determined return awarded to utility companies affording them the opportunity to earn fair and reasonable compensation for equity capital employed in the provision of utility services."[12] He

[12] *Ibid*., at 5.

further argues that because certain companies do not earn their authorized return, the Cost of Equity and authorized ROE are not equivalent.[13]

Q. WHAT IS YOUR RESPONSE TO MR. CHARI?

A. Mr. Chari's view that the Cost of Equity is disassociated from authorized ROEs is unfounded in theory and practice. In Missouri, the Commission has explained that, "[t]o determine a return on equity, the Commission must consider the expectations and requirements of investors when they choose to invest their money in Ameren Missouri rather than in some other investment opportunity."[14] The Commission further cited the Missouri Court of Appeals:

> While rate of return is the result of a straight forward mathematic calculation, the inputs, particularly regarding the cost of common equity, are not a matter of 'precise science,' because inferences must be made about the cost of equity, which involves an estimation of investor expectations. In other words, some amount of speculation is inherent in any ratemaking decision to the extent that it is based on capital structure, because such decisions are forward-looking and rely, in part, on the accuracy of financial and market forecasts.[15]

Clearly, the Commission has discussed the Return on Equity it would authorize as the "cost of equity" – the return required by investors. That is, the Commission has explained that its role is to determine the appropriate ROE, which is based on investor expectations and requirements. The fact that the authorized ROE is not guaranteed does not mean investor-required returns are irrelevant to it. Rather, authorized ROEs are based on the same types of models, data, and information at issue in this proceeding. One cannot be dissociated from the other.

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13 *Ibid*., at 5-6.

14 Public Service Commission of the State of Missouri, *In the Matter of Union Electric Company, d/b/a Ameren Missouri's Tariff to Increase Its Revenues for Electric Service*, ER-2014-0258, April 29, 2015, at 61.

15 *Ibid*., at 68, citing *State ex rel. Missouri Gas Energy v. Public Service Commission*, 186 S.W.3d 376, 383 (Mo App. W.D. 2005). .

If Mr. Chari's concern is that the authorized ROE, or Cost of Equity, may not be the same as the eventual earned Return on Average Common Equity, I addressed that point in my Direct Testimony; the *Glossary of Frequently Used Terms* describes the Return on Equity ("ROE") as:

> The return required by investors to invest in equity securities. The terms "Return on Equity" and "Cost of Equity" are used interchangeably. Please note that the ROE in this context is distinct from the accounting measure sometimes referred to as the "Return on Average Common Equity".

It seems, then, that Mr. Chari's concern is that authorized ROEs do not reflect the Cost of Equity. As explained above, the Commission has stated otherwise.

Q. IS MR. CHARI'S ASSERTION THAT THE COST OF EQUITY DOES NOT EQUAL THE AUTHORIZED ROE CONSISTENT WITH THE APPROACH TAKEN BY OTHER REGULATORY COMMISSIONS?

A. No, it is not. Mr. Chari's position that the Cost of Equity and the authorized return on equity are two separate and incompatible concepts is inconsistent with industry practice. For example, in a recent rate case order in Docket No. D.P.U. 17-05, the Massachusetts Department of Public Utilities noted, "[t]he terms ROE and cost of equity are used interchangeably herein."[16] Similarly, the Public Service Commission of the District of Columbia uses the terms "return on equity" and "Cost of Equity" interchangeably, as does the Illinois Commerce Commission, the Public Service Commission of South Carolina, and the Virginia State Corporation Commission.[17]

[16] Massachusetts Department of Public Utilities, *Petition of NSTAR Electric Company and Western Massachusetts Electric Company, each doing business as Eversource Energy, Pursuant to G.L. c. 164, § 94 and 220 CMR 5.00 et seq., for Approval of General Increases in Base Distribution Rates for Electric Service and a Performance Based Ratemaking Mechanism,* D.P.U. 17-05, November 30, 2017, at 642.

[17] See, for example, Public Service Commission of the District of Columbia, *In the Matter of the Application of Washington Gas Light Company for Authority to Increase Existing Rates and Charges for Gas Service,* Formal Case No. 1137, Order No. 18712, at 28; Illinois Commerce Commission, *Liberty Utilities*

Further, in my experience regulatory commissions generally consider model results (as well as other analyses and qualitative information) presented by witnesses to determine the appropriate ROE for the subject company. That is, the model results are used as a direct measure to inform the authorized ROE. Under Mr. Chari's construct, over many years and across many jurisdictions, substantially all regulatory commissions in the U.S., including this Commission, have been inappropriately considering those models, and improperly estimating the authorized ROE.

Q. DO YOU HAVE ANY OBSERVATIONS REGARDING THE EARNED RETURNS PRESENTED ON PAGE 5 OF MR. CHARI'S REBUTTAL TESTIMONY?

A. Yes, I do. I agree with Mr. Chari that the companies he reports with relatively low earned returns had seen increases in their stock price. However, as shown in Chart 4, below, companies that earned comparatively high returns saw greater increases in their stock prices. Because Mr. Chari focuses on the companies that have relatively low earned returns, I averaged the change in stock price for the companies presented on page 5 of Mr. Chari's rebuttal testimony since the beginning of 2013, consistent with Mr. Chari's analytical period.[18] I then calculated the average stock price change since the beginning of 2013 for the companies with the highest earned returns.[19]

(Midstates Natural Gas) Corp. d/b/a Liberty Utilities Proposed General Increase in Natural Gas Rates, Docket No. 14-0371, February 11, 2015, at 65-67; Public Service Commission of South Carolina, *Application of Duke Energy Progress, LLC for Adjustments in Electric Rate Schedules and Tariffs,* Docket No. 2018-318-E, Order No. 2019-341, May 21, 2019, at 24; and Virginia State Corporation Commission, *Application of Appalachian Power Company For a 2014 Biennial Review of the Rates, Terms and Conditions for the Provision of Generation, Distribution and Transmission Services Pursuant to § 56-585.1 A of the Code of Virginia*, Case No. PUE-2014-00026, at 26-29.

[18] I did not include Avangrid, Inc. ("Avangrid") in my analysis, because it was not publicly traded for the entirety of the analytical period.

[19] I included the six companies with the highest earned returns, consistent with the six lowest in Mr. Chari's table on page 5 of his rebuttal testimony (excluding Avangrid).

As shown in Chart 4, companies with the lowest earned returns experienced an average stock price increase of approximately 46.00 percent since January 1, 2013, whereas the companies with the highest earned returns have experienced a stock price increase of approximately 115.00 percent.[20] Mr. Chari's conclusion that because companies with relatively low earned returns experienced increases in stock prices proves that the Cost of Equity and authorized ROE are not equivalent,[21] is a partial analysis that does not support his conclusion.

Chart 4: Average Stock Price Change by

Companies with Highest and Lowest Earned Returns[22]

Lastly, Chart 4 also shows that utility companies saw significant declines in their stock prices regardless of their past earnings growth. That finding goes back to a point made earlier: in volatile markets, stocks tend to trade together (i.e.,, correlations go to 1).

[20] On February 18, 2020 the companies with this highest and lowest earned returns reached their highest average stock price increases of approximately 173.00 percent and 112.00 percent, respectively.
[21] Rebuttal Testimony of Peter Chari, at 6.
[22] Source: S&P Global Market Intelligence, as of March 16, 2020.

That is, in highly volatile markets, such as the current environment, stocks across all sectors exhibit return patterns.

Q. WHAT ARE MR. CHARI'S OBSERVATIONS RELATED TO RECENTLY AUTHORIZED RETURNS?

A. Mr. Chari argues there were only six fully litigated authorized returns for vertically integrated authorized returns in 2019, with an average of 9.36 percent.[23] He suggests one of those six, DTE Electric Co. ("DTE Electric"), is an outlier because its authorized equity ratio was "far lower" than those authorized in the remaining five rate cases. Mr. Chari concludes my recommended ROE therefore is "implausible".[24]

Q. WHAT IS YOUR RESPONSE TO MR. CHARI?

A. Although Mr. Chari states there were only six fully litigated returns for vertically integrated electric utilities in 2019, there were ten. The four returns Mr. Chari excludes were authorized in December 2019, and ranged from 10.20 percent to 10.50 percent. Including all fully litigated authorized returns for vertically integrated electric utilities in 2019 results in an average return of 9.74 percent.[25]

Mr. Chari's concern appears to be that my recommended ROE is removed from the national average authorized ROE. When all fully litigated cases for vertically integrated electric utilities in 2019 are considered, however, my recommended return is fewer than 20 basis points removed from the national average; the low end of my range is

[23] Rebuttal Testimony of Peter Chari, at page 6-7.
[24] *Ibid*., at page 7.
[25] Schedule RBH-S1.

only six basis points from the average. Mr. Chari's recommendation, on the other hand, is approximately 50 basis points below.[26]

As to Mr. Chari's suggestion that the DTE Electric authorized return of 10.00 percent in Michigan is an outlier due to its relatively low equity ratio of 37.94 percent, I disagree. The Michigan Public Service Commission ("MPSC") includes additional items in the ratemaking capital structure beyond common equity and long-term debt. As shown in the final order in Case No. U-20162 (reproduced in Table 1, below), the reported capital structure includes additional components, such as preferred stock, short-term debt, investment tax credits, and deferred income taxes.

Table 1: DTE Electric Authorized Capital Structure[27]

Capital Structure Component	Ratio
Long-Term Debt	37.94%
Preferred Stock	0.00%
Common Shareholders' Equity	37.94%
Short-Term Debt	0.66%
Investment Tax Credit (ITC) – Debt	0.06%
Investment Tax Credit (ITC) – Equity	0.06%
Deferred Income Taxes (Net)	23.33%
Total	100.00%

The MPSC noted in its order in the DTE Electric rate case that it "adopts a 50/50 debt to equity capital structure."[28] That is, considering only long-term debt and common equity results in a capital structure of 50.00 percent for each component. A 50.00 percent equity ratio is within the range of authorized equity ratios reported by Mr. Chari on page 7 of his rebuttal testimony. As such, I disagree that DTE Electric's 10.00 percent ROE should be viewed as an outlier.

[26] As discussed in my Rebuttal Testimony at pages 28 through 31, I do not agree with Mr. Chari that a simple review of a small number of authorized returns in fully litigated cases is an appropriate benchmark.

[27] Michigan Public Service Commission, *In the matter of the application of DTE Electric Company for authority to increase its rates, amend its rate schedules and rules governing the distribution and supply of electric energy, and for miscellaneous accounting authority*, Case No. U-20162, at 70.

[28] *Ibid*.

Q. DO YOU HAVE ANY OTHER OBSERVATIONS RELATED TO RECENTLY AUTHORIZED RETURNS?

A. As discussed in my Rebuttal Testimony, when individual authorized returns are considered, there has been no obvious trend in authorized returns since 2015.[29] However, looking at 2018 and 2019, authorized returns for vertically integrated electric utilities were 9.68 percent and 9.73 percent, respectively.[30] Since the beginning of 2019 (through February 28, 2020) the average authorized return for vertically integrated electric utilities was 9.74 percent, only six basis points below my recommended range.[31]

B. Constant Growth DCF Model

Q. PLEASE SUMMARIZE MR. CHARI'S CONCERNS WITH YOUR APPLICATION OF THE CONSTANT GROWTH DCF MODEL.

A. Mr. Chari believes the growth rates in my Constant Growth DCF model are too high relative to expected GDP growth.[32]

Q. WHAT IS YOUR RESPONSE TO MR. CHARI ON THOSE POINTS?

A. Although Mr. Chari does not specifically note in his rebuttal testimony his source for expected GDP growth rate, he appears to believe any growth rate above 4.10 percent is improper.[33] In Staff's Cost of Service Report, however, Mr. Chari assumed a growth rate range of 4.20 percent to 5.00 percent in his Constant Growth DCF analysis.[34] Consequently, the highest growth rate Mr. Chari finds reasonable is below the low end of the growth rate range in his Constant Growth DCF analysis. It appears Mr. Chari's own

[29] Rebuttal Testimony of Robert B. Hevert, at 30-31.
[30] S&P Global Market Intelligence, *RRA Regulatory Focus Major Rate Case Decisions – January-December 2019*, January 31, 2020, at 1.
[31] Source: S&P Global Market Intelligence.
[32] Rebuttal Testimony of Peter Chari, at 7-8.
[33] *Ibid*., at 7. Mr. Chari states that he believes the long-term GDP growth rate is "about 4.1%" in footnote 7 of his rebuttal testimony.
[34] Staff Cost of Service Report, at 16.

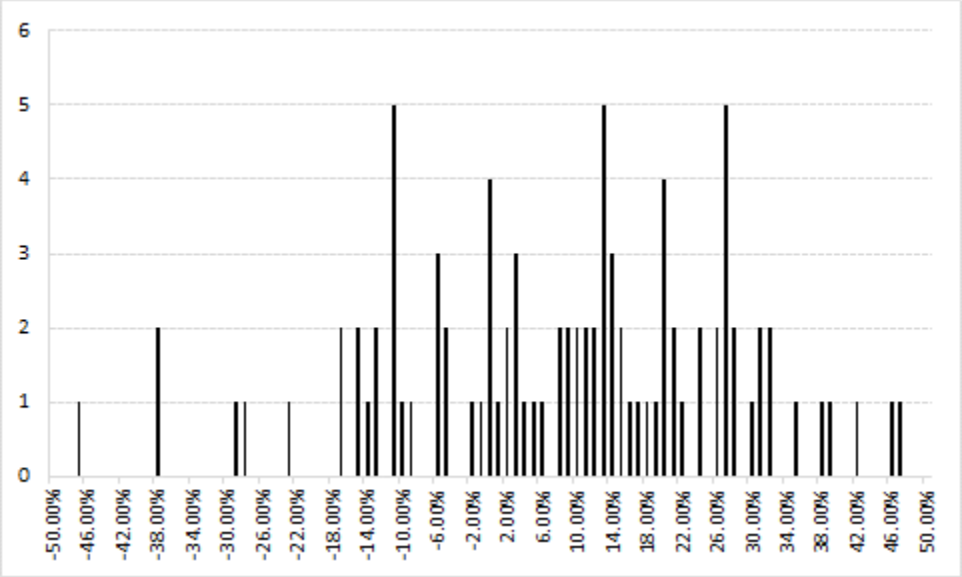
analysis contradicts his argument that 4.10 percent is a reasonable limit on growth rates in the Constant Growth DCF model.

Q. ARE THE GROWTH RATES USED IN YOUR CONSTANT GROWTH DCF ANALYSIS TOO HIGH?

A. No, they are not. Mr. Chari's construct assumes all firms would converge to the rate of GDP growth over time. Under the Constant Growth DCF model's fundamental assumptions, the expected earnings growth rate equals the expected rate of capital appreciation (because it also assumes a constant Price/Earnings ("P/E") ratio). Mr. Chari's method, therefore, assumes capital appreciation will not exceed GDP growth. Market-wide capital appreciation rates of 5.80 percent (the average growth rate in the Constant Growth DCF analysis in my Direct Testimony) and higher have occurred quite often (*see* Chart 5 below, which provides the frequency with which historical observations have fallen in certain ranges).[35] By historical standards, the growth rates Mr. Chari considers too high represent approximately the 42nd percentile of the actual capital appreciation rates observed from 1926 to 2018. That is, over the 1926 to 2018 period, more than half (*i.e.*, 58.00 percent) of the annual capital appreciation returns were greater than 5.80 percent.

[35] Under the Constant Growth DCF model's assumptions, the growth rate equals the rate of capital appreciation.

Chart 5: Frequency Distribution of Capital Appreciation Returns, 1926-2018[36]



Q. DOES MR. CHARI CONSIDER WHETHER OR HOW HIS DCF MODEL RESULTS REFLECT COMMONLY CONSIDERED MEASURES OF RISK?

A. No, he does not. In addressing that issue, it is helpful to recall the Constant Growth DCF model's fundamental structure. As explained in my Direct Testimony[37], the DCF model noted by the equation $k = \frac{D(1+g)}{P_0} + g$ is derived from the longer-form present value formula:

$$P_0 = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \cdots + \frac{D_\infty}{(1+k)^\infty} \quad [1]$$

The model fundamentally assumes investors use the present value structure alone to find the intrinsic value of common stock, and intrinsic value always equals market value. But it has long been understood the two are not necessarily the same. The DCF model

[36] Duff & Phelps, 2019 SBBI Yearbook, at A-3.
[37] Direct Testimony of Robert B. Hevert, at 47.

therefore will not produce accurate estimates of the market-required ROE if the market price diverges from the present value-based estimate of intrinsic value.

In discussing the "Relationship between Intrinsic Value and Market Price", Graham and Dodd stated:

> …the influence of what we call analytical factors over the market price is both *partial* and *indirect* – partial, because it frequently competes with purely speculative factors which influence the price in the opposite direction; and indirect, because it acts through the intermediary of people's sentiments and decisions. In other words, the market is not a weighing machine, on which the value of each issue is recorded by an exact and impersonal mechanism, in accordance with its specific qualities. Rather should we say that the market is a voting machine, whereon countless individuals register choices which are the product partly of reason and partly of emotion.[38]

As Graham and Dodd explained, differences between market prices and intrinsic value may arise for many reasons. In recent markets, those reasons may include taking short-term trading positions to hedge risk (*e.g.*, a "flight to safety"), to speculating (*e.g.*, momentum trades), or taking positions to increase current income (*i.e.*, a "reach for yield).[39]

As my Direct Testimony explained, the "reach for yield" has a limit; investors will not accept the incremental risk of capital losses when valuation multiples continually expand. Charts 9 and 10 to my Direct Testimony, which provided the variation in P/E ratios over time suggested much the same. That is, valuations do not strictly follow interest rates. The incremental risk of capital losses as valuations expand may be seen in the DCF model, and its derivative measure of "equity duration".

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[38] Benjamin Graham and David L. Dodd, Security Analysis, McGraw Hill Book Company, Inc., 1934, facsimile edition, copyright 2005, at 28.

[39] Some investors may select relatively high dividend yield companies as a "reach for yield" in response to the shortage of investment alternatives that provide adequate yield in today's capital market, rather than investing in stocks based on their long-term return potential.

Q. PLEASE EXPLAIN THE CONCEPT OF "EQUITY DURATION", AND HOW IT MAY BE APPLIED IN THIS CIRCUMSTANCE.

A. In general, "duration" measures the security's price sensitivity to changes in the underlying discount rate. For bonds, duration measures the percent change in price relative to the percent change in the yield to maturity.[40] The same concept may be applied to equity investments, where equity duration measures the sensitivity of equity prices to changes in the Cost of Equity. In each case (that is, for both stocks and bonds), duration represents the weighted average time (in years) over which cash flows are received. Because it measures the sensitivity of prices to changes in yields, duration is an important measure of risk to investors.

Q. PLEASE GENERALLY DESCRIBE HOW DURATION IS CALCULATED.

A. Consistent with the Constant Growth DCF model, equity duration recognizes that equity cash flows (dividends) continue in perpetuity. Based on the Constant Growth DCF model's structure, duration may be defined as $d = \frac{1}{k - g}$ [2], where d is the duration, k is the Cost of Equity, and g is the assumed growth rate.[41] Because the DCF model assumes the Cost of Equity is the sum of the dividend yield and the growth rate, the denominator equals the assumed dividend yield. Modified duration (d_m), sometimes considered a more precise measure, adjusts Equation [2] by the discount rate:

$$d_m = \frac{d}{1 + k} \quad [3]$$

The percent change in stock prices ("P") brought about by a change in the Cost of Equity is calculated as:

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40 https://www.investopedia.com/terms/d/duration.asp

41 James L. Farrell, Jr., *The Dividend Discount Model: A Primer*, Financial Analysts Journal, November/December 1985, at 23.

$$\frac{\Delta P}{P} = -d_m \times \Delta k \quad [4]$$

Two points bear particular attention. First, duration will increase as the difference between *k* and *g* decreases. Assuming that difference equals the expected dividend yield, lower-yielding stocks will tend to have higher durations and, therefore, are more sensitive to changes in the Cost of Equity. The second, and related point, is that as *k* decreases, duration increases (assuming no change in expected growth). An increase in duration therefore indicates an increase in the market risks to which equity investors are exposed.

Here, Mr. Chari presents the DCF analysis Staff applied to its natural gas proxy group, in this proceeding, and in the Spire Missouri case.[42] In the Spire Missouri case, Staff presented an average dividend yield of 2.71 percent, and a midpoint "Indicated Cost of Common Equity" of 7.31 percent. The implied modified duration based on those inputs is 34.39.[43] Mr. Chari's current formulation for his natural gas proxy group includes a dividend yield of 2.45 percent, with a midpoint Cost of Equity estimate of 7.05 percent. The implied modified duration based on those estimates is 38.13[44], a 10.88 percent increase over Staff's assumptions in the Spire Missouri case. Because it implies higher modified duration, Mr. Chari's analysis implies considerably higher risk for investors, even since the Spire Missouri proceeding.

Q. WHAT CONCLUSIONS DO YOU DRAW FROM THOSE ANALYSES?

A. Mr. Chari's assessments and recommendations do not consider the risks implied by them. Even if we assume investors rely principally on the DCF method, and market prices always equal the estimate of intrinsic value produced by that method, we should not lose

42 *See*, Schedules PC-10-2, PC-10-3.

43 $34.39 = (\frac{1}{.0271}) x (\frac{1}{1.0731})$. *See*, Schedule PC-10-3.

44 $38.13 = (\frac{1}{.0245}) x (\frac{1}{1.0705})$. *See*, Schedule PC-10-2.

sight of the risk implied by the extended equity duration. As noted earlier, valuation metrics such as P/E ratios tend to vary over time, consistent with the observation that higher valuations imply higher levels of duration risk. That being the case, we should be very cautious about drawing inferences regarding investor motivations and perpetual return requirements from the DCF approach.

C. Capital Asset Pricing Model

Q. PLEASE SUMMARIZE MR. CHARI'S CONCERNS WITH YOUR CAPM ANALYSIS.

A. Mr. Chari believes my estimate of the Market Risk Premium ("MRP") is too high, because I include non-dividend paying companies in the calculation.[45]

Q. WHAT IS YOUR RESPONSE TO MR. CHARI'S CONCERN THAT YOUR ESTIMATES OF THE MRP ARE TOO HIGH?

A. I disagree. As discussed in my Direct Testimony, I gathered the annual Market Risk Premia reported by Duff & Phelps and produced a histogram of the observations. The results of that analysis, which are presented in Chart 12 in my Direct Testimony, demonstrate Market Risk Premia of at least 11.52 percent (the average of the Market Risk Premium estimates in my Direct Testimony) occurred quite frequently.[46]

Q. DO YOU HAVE ANY CONCERNS WITH MR. CHARI'S "CORRECTION" TO YOUR *EX-ANTE* MARKET RISK PREMIUM?

A. Yes, I do. Mr. Chari appears to have incorrectly updated my *ex-ante* Market Risk Premium analysis when he excluded non-dividend paying companies. As noted on page 56 of my Direct Testimony, to estimate the *ex-ante* Market Risk Premium I calculated the

[45] Rebuttal Testimony of Peter Chari, at 9.
[46] Direct Testimony of Robert B. Hevert, at 53.

market capitalization weighted average DCF result for each company in the S&P 500 (where data was available). To develop the weights for each company, I divided the market capitalization for each company by the total market capitalization for all the companies in the S&P 500 (where data was available). However, after removing the non-dividend paying companies, Mr. Chari did not update the calculation of the total market capitalization of the S&P 500. That is, Mr. Chari divided the market capitalization for each company in his analysis by the total market capitalization for all the companies in the S&P 500, *including* non-dividend paying companies, which he removed from the analysis. Doing so results in a scenario in which the weights for each company do not sum to 100.00 percent, artificially suppressing the results of his "corrected" Market Risk Premium estimates.

Had Mr. Chari correctly calculated his "corrected" version of my *ex-ante* MRP analysis, the MRPs based on Bloomberg and Value Line data would be 229 and 201 basis points higher, respectively. Similarly, the CAPM results increase approximately 115 basis points and the ECAPM results increase approximately 140 basis points. Although those results are significantly higher than the incorrectly calculated results presented by Mr. Chari, as discussed in detail below, I do not agree that it is appropriate to exclude non-dividend paying companies from the calculation of the MRP.

Q. WHAT IS YOUR CONCERN WITH EXCLUDING NON-DIVIDEND PAYING COMPANIES FROM THE CALCULATION OF THE MARKET RETURN WHEN CALCULATING THE MARKET RISK PREMIUM COMPONENT OF THE CAPM?

A. First, the expected market return is meant to reflect just that – all companies in the market. Investors recognize the investible equity market includes both dividend and non-dividend paying companies. Some of the largest companies, based on market capitalization, would be excluded from the calculation if non-dividend paying companies were excluded. For example, Alphabet Inc., Amazon.com Inc., and Facebook Inc., do not pay dividends. Based on the data presented in my Rebuttal Testimony, the combined market capitalization of those three companies is over $2.56 trillion, which is approximately 9.00 percent of the entire S&P 500.[47] Excluding those companies alone could have a significant effect on the calculated expected market return and, therefore the Market Risk Premium. Equally important, the result would not measure the expected return on the investible market.

Beyond that, my methodological concern is with internal consistency in the model's application. A fundamental assumption of the CAPM is that the required return is proportional to the risk of the investment. Under the CAPM, the Beta coefficient is the measure of risk, and is calculated by comparing the subject security's returns to the overall market returns. Because the Beta coefficient is calculated relative to the overall market, which includes both dividend paying and non-dividend paying companies, it is important that the expected market return also reflect the overall market. As such, I do

[47] Schedule RBH-R2. Based on data from Bloomberg Professional. As a point of reference, utilities as a sector represent only about 3.60 percent of the S&P 500. Source: https://my.spindices.com/indices/equity/sp-500

not believe it is appropriate to combine Beta coefficients calculated relative to the entire market with a Market Risk Premium calculated using only a subset of the market (*i.e.*, dividend paying companies).

If Mr. Chari chooses to remove non-dividend paying companies from the expected market return, he likewise should remove them from the index used to calculate the Beta coefficient. Because Beta coefficients are a positive function of the correlation of returns between the subject company and the index, removing non-dividend paying companies may increase the correlation, thereby increasing the Beta coefficient.[48]

In addition, dividend paying companies may have lower volatility than non-dividend paying companies. Because the Beta coefficient also reflects relative volatility (i.e., subject company relative to the index), if the volatility of the index falls, the relative volatility will increase, again increasing the Beta coefficient.[49] Mr. Chari's position inherently assumes the proxy companies' correlation coefficients and relative volatility would remain constant, and their Beta coefficients would remain unchanged if non-dividend paying companies are removed from the market index. But he has not shown that to be the case.

[48] As noted in my Direct Testimony, the Beta coefficient is defined as: $\beta_j = \frac{\sigma_j}{\sigma_m} \times \rho_{j,m}$ where σ_j is the standard deviation of returns for company "*j*," σ_m is the standard deviation of returns for the broad market, and $\rho_{j,m}$ is the correlation of returns in between company *j* and the broad market. The Beta coefficient therefore represents both relative volatility (*i.e.*, the standard deviation) of returns, and the correlation in returns between the subject company and the overall market. Direct Testimony of Robert B. Hevert at 54.

[49] Direct Testimony of Robert B. Hevert at 54.

Q. ARE THERE OTHER FUNDAMENTAL REASONS WHY IT IS APPROPRIATE TO INCLUDE NON-DIVIDEND PAYING COMPANIES IN THE MARKET INDEX?

A. Yes. As noted in my Direct Testimony, the Constant Growth DCF model relies on several fundamental assumptions. Among those assumptions are that earnings and dividends will grow at the same, constant rate in perpetuity (that is, the payout ratio will remain constant), and the P/E ratio will remain constant, also in perpetuity. Under those assumptions, the DCF result is the same, regardless of whether "cash flows" are dividends paid in perpetuity, or the proceeds of selling the stock at any time in the future. In that case, when the dividend yield is zero, the standard DCF model indicates the Cost of Equity equals the expected growth rate.[50] To summarize, the DCF structure focuses on cash flows, regardless of whether they are dividends, or stock sale proceeds.

Schedule RBH-S2 demonstrates that principle. Intuitively, if the P/E ratio remains constant, the stock price will grow at the expected earnings growth rate. The discount rate that sets the future stock price equal to the initial stock price (that is, the DCF estimate) therefore equals the growth rate. Consequently, I do not agree the expected market return should exclude non-dividend paying companies.

D. Empirical Capital Asset Pricing Model

Q. PLEASE SUMMARIZE MR. CHARI'S CONCERNS WITH YOUR ECAPM.

A. Mr. Chari argues that my application of the ECAPM is not appropriate because there was a range of alpha returns cited by Dr. Morin. As such, he believes that relying on the calculation reported by Dr. Morin is unreliable.

[50] ROE = $\frac{D}{P}$ +g; ROE = $\frac{0}{P}$ +g; ROE = g.

Q. HAVE YOU UNDERTAKEN ANY INDEPENDENT ANALYSES TO DETERMINE WHETHER THERE IS A RELATIONSHIP BETWEEN BETA COEFFICIENTS AND EXCESS RETURNS PRODUCED BY THE CAPM AND ECAPM?

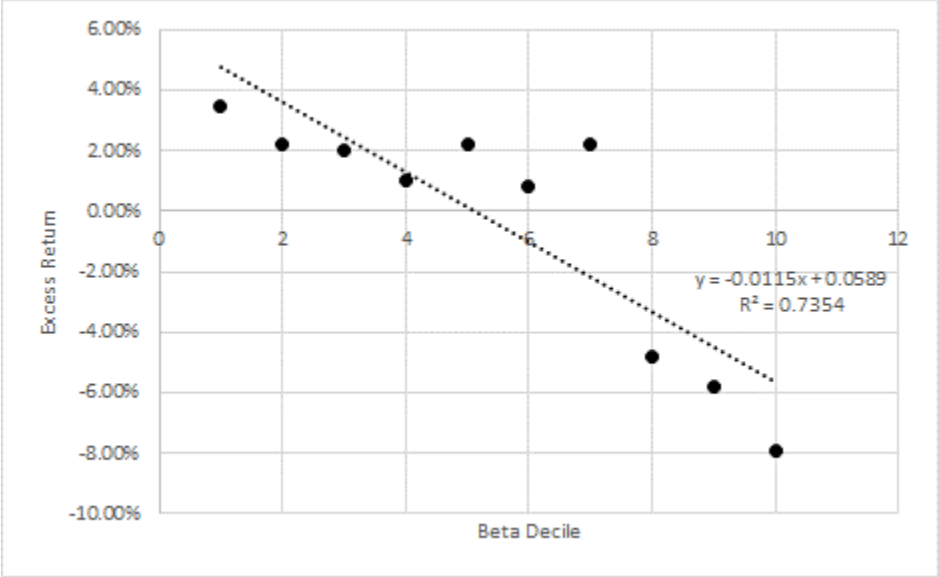
A. Yes, I performed an analysis of excess returns produced by the CAPM, by Beta coefficient decile, over the ten years ended 2019. The analysis compared the observed returns of the companies in the S&P 500 Index to expected returns based on the CAPM. Observed returns were calculated as the total return for each company from the first day of a given year to the end of that year. The expected return for each company was calculated using the CAPM as applied to the following annual data: (1) a risk-free rate equal to the average 30-year Treasury yield for that year; (2) an adjusted Beta coefficient as of the beginning of the year using Bloomberg's standard calculation method (two years of weekly return data, using the S&P 500 Index as the comparison benchmark); and (3) a market return equal to the S&P 500 Index total return for that year. The companies were grouped into deciles each year based on their Beta coefficients, and the median excess return (or return deficiency) was calculated for each decile group. Excess returns were calculated as the observed return less the return implied by the CAPM. Chart 6 (below) summarizes those results.

Chart 6: Excess Returns Under CAPM[51]

As Chart 6 demonstrates, the relationship between Excess Return and Beta coefficient deciles is strong, with deciles explaining approximately 80.00 percent of the Excess Return. Using the same data and calculating the Excess Return by reference to the ECAPM (as defined by Equation [8] in my Direct Testimony), produces the same downward sloping relationship, but not to the same degree (*see* Chart 7, below).

[51] Source: Bloomberg Professional Services.

Chart 7: Excess Returns Under ECAPM[52]



There are two principal observations to be drawn from Charts 6 and 7. First, under the ECAPM the slope coefficient falls somewhat (relative to the CAPM), suggesting a flatter relationship between Beta coefficient deciles and the excess return. The flatter slope moves closer to the point at which the excess return is zero across all deciles. Second, the excess returns are somewhat moderated under the ECAPM; the high excess returns are lower, and the low excess returns are higher than under the CAPM. Again, that finding suggests the ECAPM mitigates, but does not solve the issue of the CAPM underestimating returns for low-Beta coefficient firms.

In summary, Charts 6 and 7 support the position that the CAPM tends to underestimate returns for low-Beta coefficient firms. The ECAPM moderates that effect to some extent, but does not eliminate it. Because the ECAPM mitigates the drift in Beta coefficients, I believe it is a reasonable method.

[52] Source: Bloomberg Professional Services.

Q. DO YOU HAVE ANY OTHER OBSERVATIONS RELATED TO THE USE OF THE ECAPM?

A. As noted in my Direct Testimony, Fama and French described the empirical issue addressed by the ECAPM, noting that "[t]he returns on the low beta portfolios are too high, and the returns on the high beta portfolios are too low."[53] Similarly, Dr. Roger Morin observes that "[w]ith few exceptions, the empirical studies agree that … low-beta securities earn returns somewhat higher than the CAPM would predict, and high-beta securities earn less than predicted."[54] As Dr. Morin also explains, the ECAPM "makes use" of those findings, and estimates the Cost of Equity based on the following equation:[55]

$$k_e = R_f + \alpha + \beta(\text{MRP} - \alpha) \qquad [5]$$

where α, or "alpha", is an adjustment to the risk/return line, and "MRP" is the Market Risk Premium. Summarizing empirical evidence regarding the range of estimates for alpha, Dr. Morin explains that the model "reduces to the following more pragmatic form:"[56]

$$k_e = R_f + 0.25(R_m - R_f) + 0.75\beta(R_m - R_f) \qquad [6]$$

where:

k_e = the investor-required ROE;

R_f = the risk-free rate of return;

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53 Eugene F. Fama and Kenneth R. French, *The Capital Asset Pricing Model: Theory and Evidence*, Journal of Economic Perspectives, Vol. 18, No. 3, Summer 2004, at 33. *See*, Direct Testimony of Robert B. Hevert, at 56.

54 Roger A. Morin, New Regulatory Finance (Public Utility Reports, Inc., 2006), at 175.

55 *Ibid*., at 189.

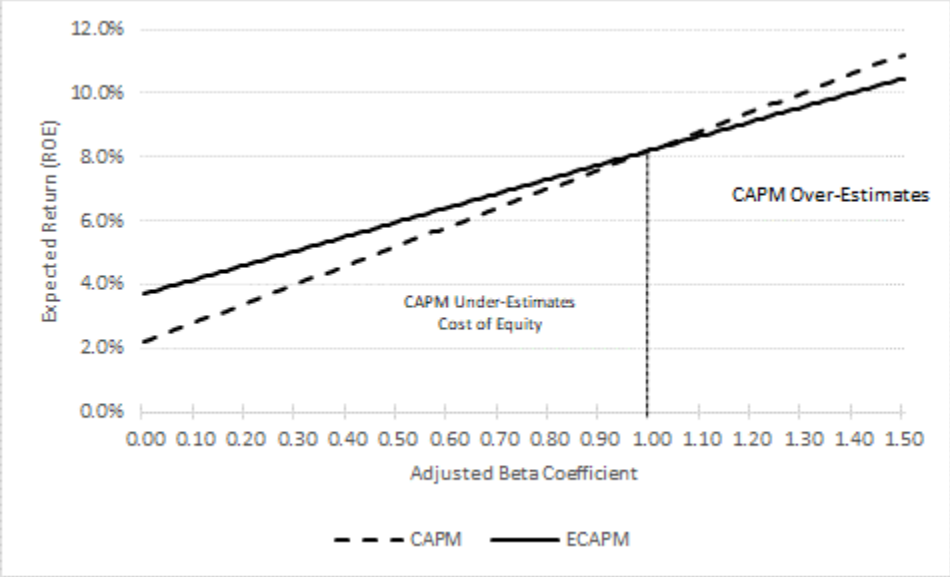
56 *Ibid*., at 190. Equations [5] and [6] tend to produce similar results when "alpha" is in the range of 1.00 percent to 2.00 percent. *See*, Schedule RBH-S3. As Dr. Morin explains, alpha coefficients in that range are highly consistent with those identified in prior published research.

β = the adjusted Beta coefficient of an individual security; and

R_m = the required return on the market.

The relationship between expected returns from the CAPM and ECAPM can be seen in Chart 8, below. Chart 8, which reflects Mr. Chari's risk-free rate and MRP, illustrates the extent to which the CAPM under-states the expected return relative to the ECAPM when Beta coefficients – whether adjusted or unadjusted – are less than 1.00.

Chart 8: CAPM and ECAPM Expected Returns[57]



Q. HAVE OTHER REGULATORY COMMISSIONS ACCEPTED THE USE OF THE ECAPM?

A. Yes, they have. In my experience the ECAPM has been accepted in past regulatory proceedings by commissions in Alaska, Maryland, Mississippi, and New York.[58]

[57] Schedule RBH-S3. Source: Staff Cost of Service Report, Schedule PC-11-1. The finding that the ECAPM is not an adjustment to the Beta coefficient also is clear in Equation [5] ($k_e = R_f + \alpha + \beta(MRP - \alpha)$), in which the alpha coefficient increases the intercept (the expected return when the Beta coefficient equals zero), and reduces the Market Risk Premium. Assumes Mr. Chari's 6.00 percent MRP and 2.21 percent risk-free rate. Please note that the use of Mr. Chari's CAPM estimates in Chart 8 is for illustrative purposes only.

[58] The ECAPM is also referred to as the "zero-beta" CAPM approach. See, Regulatory Commission of Alaska, Docket No. P-97-4 (Order No. 151) / Docket No. P-97-7 (Order No. 110), November 27, 2002;

Regulatory commission staff in Nevada, and the Department of Commerce in Minnesota, have presented the ECAPM approach in prior proceedings.[59] The application of the ECAPM by the witnesses in those rate proceedings is consistent with my application of the ECAPM in this proceeding.

Q. LASTLY, DOES THE CAPM ADDRESS, AT LEAST TO SOME EXTENT, CONCERNS WITH THE UNUSUALLY LOW LEVEL OF LONG-TERM TREASURY YIELDS?

A. Yes, it does. As Chart 8 (above) indicates, beyond flattening the SML's slope, the ECAPM shifts the SML upward, so the intercept is above the risk-free rate. By doing so, the ECAPM does mitigate, at least to some degree, the currently low Treasury yields brought about by investors' safety-seeking behavior.

E. Bond Yield Plus Risk Premium

Q. PLEASE SUMMARIZE MR. CHARI'S CONCERNS WITH YOUR BOND YIELD PLUS RISK PREMIUM APPROACH.

A. Mr. Chari believes the Bond Yield Plus Risk Premium approach is circular, because it relies on authorized returns. He also states FERC rejected the use of the Bond Yield Plus Risk Premium approach in Opinion 569.[60]

Public Service Commission of Maryland, Case No. 9311, Order No. 85724, July 12, 2013; Public Service Commission of Mississippi, Docket No. 01-UN-0548, Final Order, December 3, 2001; and New York Public Service Commission Case No. 16-G-0257, Order Establishing Rates for Gas Service, April 20, 2017.

[59] Direct Testimony and Attachments of Craig M. Addonizio, Minnesota Public Utilities Commission Docket No. G008/Gr-15-424, November 24, 2015; Prepared Direct Testimony of Yasuji Otsuka, Ph.D., Public Utilities Commission of Nevada; Docket No. 12-02019 & 12-04005, August 17, 2012.

[60] Rebuttal Testimony of Peter Chari, at 11-12.

Q. WHAT IS YOUR RESPONSE TO MR. CHARI'S CONCERN THAT YOUR BOND YIELD PLUS RISK PREMIUM APPROACH IS CIRCULAR?

A. The cases considered in my Bond Yield Plus Risk Premium approach, and their associated decisions, reflect the same type of market-based analyses at issue in this proceeding. Because authorized returns are publicly available (the proxy companies disclose authorized returns, by jurisdiction, in their 2019 SEC Forms 10-K),[61] it is reasonable to conclude that data is reflected, at least to some degree, in investors' return expectations and requirements.

Q. WHAT IS YOUR RESPONSE TO MR. CHARI REGARDING FERC'S DETERMINATION RELATED TO THE BOND YIELD PLUS RISK PREMIUM IN OPINION NO. 569?

A. A meaningful difference between the method I have applied in this case and the method considered by FERC is that my method looks to authorized returns across all jurisdictions, whereas the risk premium method considered by FERC is based on FERC-authorized returns, which may have included ROE incentive adders, or were approving a preexisting ROE.[62] Those points are not at issue under my method.

The revised approach under Opinion No. 569 is not settled policy. As FERC has acknowledged, there are multiple requests for rehearing of Opinion No. 569 currently pending.[63] Further, FERC recently has established a paper hearing to address the

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61 *See*, *for example*, American Electric Power Company, Inc., SEC Form 10-K for the year ended December 31, 2019, at 4; ALLETE Inc., SEC Form 10-K for the year ended December 31, 2019, at 14-15; Duke Energy Corporation, SEC Form 10-K for the year ended December 31, 2019, at 16; WEC Energy Group, Inc., SEC Form 10-K for the year ended December 31, 2018, at 130.

62 *See*, 169 FERC ¶ 61,129, Docket Nos. EL14-12-003, EL15-45-000 Opinion No. 569, Nov. 21, 2019, para. 342.

63 *See*, Potomac-Appalachian Transmission Highline, LLC, Opinion No. 554-A, 170 FERC ¶ 61,050 (2020), Order on Rehearing, Directing Briefs, and Accepting in Part and Rejecting in Part Compliance Filings, at para. 5.

methods proposed in its prior Coakley Briefing Order, and MISO Briefing Order, the same Briefing Orders that proposed the DCF, CAPM, Risk Premium, and Expected Earnings approaches.[64] That process is ongoing, with no current resolution. Consequently, Opinion No. 569 should not be seen as invalidating the Bond Yield Plus Risk Premium approach.

F. Small Size Premium

Q. WHAT ARE MR. CHARI'S CONCERNS WITH YOUR SMALL SIZE PREMIUM ANALYSIS?

A. Mr. Chari does not believe a small size premium is appropriate risk because Liberty-Empire is not a stand-alone company.[65]

Q. WHAT IS YOUR RESPONSE TO MR. CHARI'S CONCERN?

A. Mr. Chari's position runs counter to the widely accepted "stand-alone" regulatory principle, which treats each utility subsidiary as its own company. Parent entities, like other investors, have capital constraints and must look at the attractiveness of the expected risk-adjusted return of each investment alternative in their capital budgeting process. The opportunity cost concept applies regardless of the source of the funding. When funding is provided by a parent entity, the return still must be sufficient to provide an incentive to allocate equity capital to the subsidiary or business unit rather than other internal or external investment opportunities. That is, the regulated subsidiary must compete for capital with all the parent company's affiliates, and with other, similarly situated utility companies. In that regard, investors value corporate entities on a sum-of-the-parts basis and expect each division within the parent company to provide an

64 *Ibid*.
65 Rebuttal Testimony of Peter Chari, at 12.

appropriate risk-adjusted return. It therefore is important that the authorized ROE reflects the risks and prospects of the utility's operations and supports the utility's financial integrity from a stand-alone perspective.

III. RESPONSE TO TESTIMONY OF OPC WITNESS MURRAY

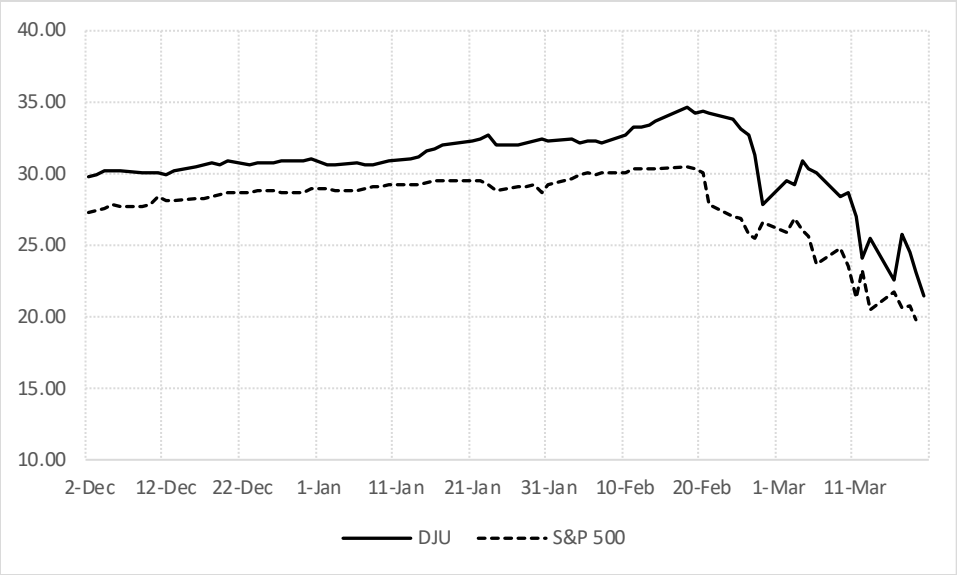
A. Utility Sector Performance

Q. AT PAGE 3 OF HIS REBUTTAL TESTIMONY, MR. MURRAY OBSERVES UTILITY P/E RATIOS PEAKED ON OR AROUND FEBRUARY 21, 2020, AND UTILITIES' COSTS OF CAPITAL ARE AT RECORD LOWS. WHAT IS YOUR RESPONSE TO MR. MURRAY REGARDING THOSE POINTS?

A Although valuations for utilities and the broad market peaked during mid-February, as discussed in Section I, they have fallen considerably since then; the utility sector and the broad market lost over 30.00 percent of their value. Utility dividend yields, measured by the XLU, increased by about 120 basis points. As to P/E ratios, the Dow Jones Utility ("DJU") Index ratio fell from 34.26 on February 21 to 21.43 on March 20, a decline of about 37.50 percent. At the same time, the market P/E ratio (measured by the S&P 500) fell by about 34.00 percent (see Chart 9, below).[66]

[66] Interestingly, the DJU Index P/E ratio corresponds quite closely to the data Mr. Murray reports: On December 2, 2019 Mr. Murray's electric proxy group average P/E ratio was 29.48 relative to the DJU P/E ratio of 29.78; on February 11 the two were 32.72 and 33.27, respectively. Sources: Rebuttal Testimony of David Murray, at 19, S&P Capital IQ.

Chart 9: Price/Earnings Ratios Over Time[67]



Because Mr. Murray's analysis ends about the time valuations peaked, he comes to the misplaced conclusion that the cost of capital "has declined significantly".[68] With the significant change in market conditions since February 21, that clearly has not been the case. Rather, the extreme volatility and loss in value has increased the Cost of Equity. I appreciate that Mr. Murray intends to update his assessment in his surrebuttal testimony[69]; I expect he will see the same market reactions.

B. Constant Growth DCF Model

Q. PLEASE SUMMARIZE MR. MURRAY'S CONCERNS WITH YOUR CONSTANT GROWTH DCF ANALYSIS.

A. Mr. Murray does not agree with my use of consensus analyst expected EPS growth rates in the Constant Growth DCF model. He also believes they are too high.[70]

67 Source: S&P Capital IQ.
68 Rebuttal Testimony of David Murray, at 33.
69 *Ibid*., at 3.
70 *Ibid*., at 11-12.

Q. WHAT IS YOUR RESPONSE TO MR. MURRAY?

A. First, as discussed in response to Mr. Chari, the growth rates provided in my Constant Growth DCF analysis are reasonable when considered relative to historical capital appreciation rates. In addition, as discussed in my Direct and Rebuttal Testimonies, the relationship between various growth rates and stock valuation metrics has been the subject of much academic research, including published articles that support the use of analysts' earnings growth projections in the DCF model.[71] That research, together with my own analyses, fully support the use of analyst earnings growth rate projections.

Lastly, the Constant Growth DCF model requires several assumptions, including that the dividend yield and P/E ratio will remain constant in perpetuity.[72] As Charts 2 and 9 (above) demonstrate, both have been extremely unstable, with significantly decreased P/E ratios and increased dividend yields. Under those circumstances, the Constant Growth DCF model results should be considered with considerable caution.

Q. AT PAGES 13 AND 14 OF HIS TESTIMONY, MR. MURRAY SEEMS TO ARGUE THAT THE PROPER USE OF ANALYSTS FORECASTS IS IN THE CONTEXT OF THEIR "DIVIDEND DISCOUNT MODELS". WHAT IS YOUR RESPONSE TO MR. MURRAY ON THAT POINT?

A I disagree. In this proceeding, we are focused on estimating the return investors require to invest in utilities such as Liberty-Empire. We do so based on observed market data – including market prices – applied to financial models. The Dividend Discount Models Mr. Murray references, on the other hand, are used by equity analysts to develop

[71] Direct Testimony of Robert B. Hevert, at 49-51; Rebuttal Testimony of Robert B. Hevert, at 21.
[72] Direct Testimony of Robert B. Hevert, at 47.

recommendations, or to determine whether, in their view, stocks are under or over-valued. As Evercore ISI explained:

> We performed a dividend discount analysis across most of the utilities within our coverage universe. Key findings: (1) utilities appear materially undervalued relative to long-term interest rates, (2) growth matters and the extent and durability of the group's long-term EPS and DPS growth prospects are arguably underappreciated by investors, and (3) the widening P/E multiple spreads within the sector are, in many cases, justifiable. We intended this exercise to be illustrative and the company-specific results are not necessarily indicative of our ratings and price targets. However, many of the findings support the underlying thought processes that drive our recommendations and help explain why we remain unapologetically bullish on names with excellent financial track records and highly visible long-term growth outlooks (i.e., ATO, CMS, NEE, WEC and XEL – all Outperform rated).[73]

Setting a price target or recommendation based on an assumed discount rate (*i.e.*, the Cost of Equity) is an altogether different analysis than determining the discount rate based on market prices. Our testimony focuses on the latter, not the former. Mr. Murray's Schedule DM-R-3 C 3/16 is a good example of the difference between the two analyses. There (Part 1), Evercore ISI analysts provide the "P/E Implied by [Dividend Discount Model] Results" relative to the actual P/E ratio. For all 26 companies reviewed, the implied P/E ratio is higher than the "current" P/E ratio. Put another way, the Dividend Discount Model is not used to determine the cost of capital based on current prices, it is used to determine implied prices based on an assumed cost of capital.

[73] Schedule DM-R-3 C 1/16.

C. Capital Asset Pricing Model

Q. PLEASE SUMMARIZE MR. MURRAY'S CONCERNS WITH YOUR CAPM ANALYSIS.

A. Mr. Murray's concerns with my CAPM analysis lie primarily with my Market Risk Premium estimates.[74] In particular, Mr. Murray argues that projected returns on the market are too high.[75] Along those lines, Mr. Murray also does not agree with the use of the Constant Growth DCF model to estimate the market return.[76]

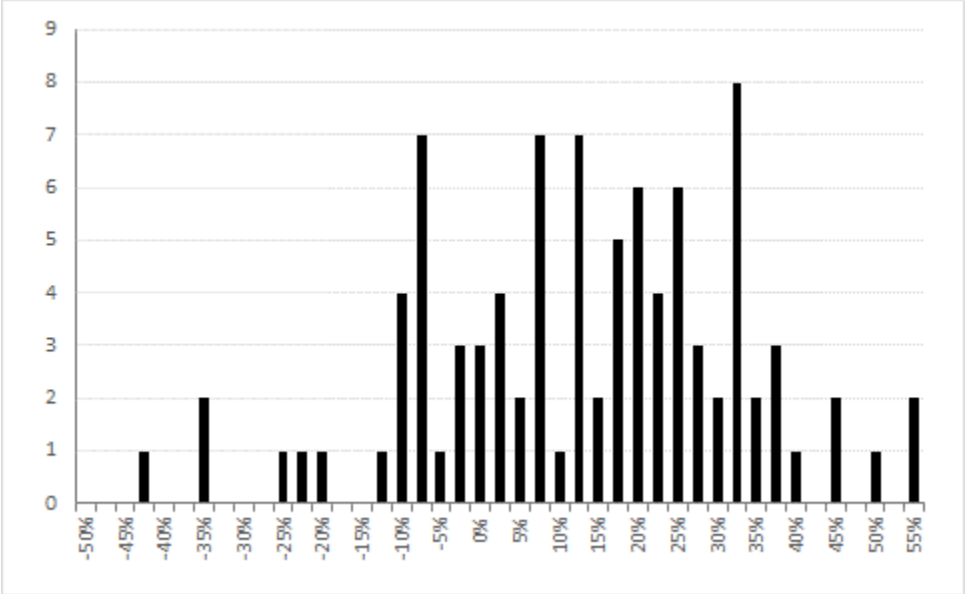
Q. WHAT IS YOUR RESPONSE TO MR. MURRAY?

A. As noted in my response to Mr. Chari and discussed in my Direct Testimony, Chart 12 in my Direct Testimony demonstrates Market Risk Premia of at least 11.52 percent (the average of the Market Risk Premium estimates in my Direct Testimony) occurred quite frequently.[77]

I have prepared a similar analysis considering how often various ranges of market returns have been observed over the 1926 to 2018 period. To perform that analysis, I gathered the annual market returns reported by Duff & Phelps and produced a histogram of those observations. The results of that analysis, which are presented in Chart 10, demonstrate that market returns of 14.83 percent (the average of my market return estimates in my Direct Testimony) and higher occurred quite often.

[74] Rebuttal Testimony of David Murray, at 17-19.
[75] *Ibid*., at 17.
[76] *Ibid*., at 17-18.
[77] Direct Testimony of Robert B. Hevert, at 53.

Chart 10: Frequency Distribution of Market Returns, 1926 -2018[78]



Q. DOES MR. MURRAY CORRECTLY CHARACTERIZE HOW YOU CALCULATE YOUR *EX-ANTE* MRP?

A. No, he does not. First, Mr. Murray suggests my estimates of the market return are 14.78 percent to 14.95 percent.[79] However, as shown in Schedule RBH-D2, pages 1 and 7, the estimated market returns in my Direct Testimony were 14.78 percent and 14.88 percent. Mr. Murray further states that I assume "market risk premiums of 12.15% and 12.25%"[80] to which I add "a current and projected risk-free rate of 2.63% and 2.70%, respectively, to arrive at these expected market returns."[81] His description is inaccurate.

As described in my Direct Testimony, I did not assume an estimate of the MRP. Rather, for each company in the S&P 500 I calculated the market capitalization weighted average Constant Growth DCF result based on data from Bloomberg and Value Line. I then summed the market capitalization weighted average Constant Growth DCF result for

78 Source: Duff & Phelps, 2019 SBBI, Appendix A-1, A-7. Schedule RBH-S4.
79 Rebuttal Testimony of David Murray, at 17.
80 *Ibid*., at 16.
81 *Ibid*., at 17.

each company to arrive at my estimate of the market return. After estimating the market return I then subtracted the current 30-year Treasury yield from that amount to arrive at the market DCF-derived *ex-ante* MRP estimate.[82] That is, contrary to Mr. Murray's discussion, I did not "assume" an MRP and then add the risk-free rate to estimate the market return to it. Rather, I estimated the market return and subtracted the risk-free rate to arrive at the MRP.

Q. TURNING TO MR. MURRAY'S POSITION THAT THE EPS GROWTH RATES USED TO DEVELOP YOUR ESTIMATED MARKET RETURN ARE TOO HIGH,[83] DID YOU CONSIDER WHERE YOUR ESTIMATE FALLS WITHIN THE RANGE OF HISTORICAL OBSERVATIONS?

A. Yes. I gathered the annual capital appreciation return on Large Company Stocks reported by Morningstar for the years 1926 through 2018, produced a histogram of those observations (*see* Chart 5, in my response to Mr. Chari), and calculated the probability that a given capital appreciation return estimate would be observed. That analysis demonstrates capital appreciation rates of 12.60 percent and 12.90 percent (as Mr. Murray calculates)[84] and higher actually occurred quite often,[85] representing approximately the 57th and 58th percentiles, respectively.

82 Direct Testimony of Robert B. Hevert, at 56.
83 Rebuttal Testimony of David Murray, at 18-19.
84 *Ibid*., at 18.
85 Under the Constant Growth DCF model's assumptions, the growth rate equals the rate of capital appreciation.

Q. IS THERE SUPPORT FOR THE USE OF THE DCF MODEL TO CALCULATE THE MARKET RETURN?

A. Yes, the approach described on page 56 of my Direct Testimony is consistent with academic literature and published texts.[86]

D. Bond Yield Plus Risk Premium

Q. PLEASE SUMMARIZE MR. MURRAY'S CONCERNS WITH YOUR BOND YIELD PLUS RISK PREMIUM APPROACH.

A. Mr. Murray states that the Bond Yield Plus Risk Premium approach "is a regression analysis of allowed ROEs to interest rates."[87] Mr. Murray's concern with my Bond Yield Plus Risk Premium approach is his view that it "does not allow sufficient compression of allowed ROEs versus the utility industry's COE" and "[i]t only serves to support the premium at which utilities trade to the S&P 500."[88] Mr. Murray further suggests the Bond Yield Plus Risk Premium approach applies an adjustment to the relationship between authorized ROEs and interest rates.[89]

Q. IS THE BOND YIELD PLUS RISK PREMIUM APPROACH "A REGRESSION ANALYSIS OF ALLOWED ROES TO INTEREST RATES" AS MR. MURRAY SUGGESTS?

A. No, it is not. As discussed in my Direct Testimony, the Bond Yield Plus Risk Premium approach recognizes the well-documented inverse relationship between the Equity Risk Premium and interest rates. As noted on page 63 of my Direct Testimony, "[t]he basic

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86 *See*, *Estimating Shareholder Risk Premia Using Analysts' Growth Forecasts* by Robert S. Harris and Felicia C. Marston, Financial Management, Summer 1992; and Roger A. Morin, Ph.D., New Regulatory Finance (2006), at 118-119.

87 Rebuttal Testimony of David Murray, at 31.

88 *Ibid*., at 32.

89 *Ibid*., at 31.

method used was regression analysis, in which the observed Equity Risk Premium is the dependent variable, and the average 30-year Treasury yield is the independent variable." The current, and near-term and long-term projected 30-year Treasury yields were then input into the resulting regression equation to estimate the Equity Risk Premium. Then the current, and near-term and long-term projected 30-year Treasury yields were added to the estimated Equity Risk Premium to arrive at the results of the analysis.

My analysis is not based on a simple regression analysis using authorized returns as the dependent variable and interest rates as the independent variable as Mr. Murray suggests. Again, Mr. Murray has mischaracterized my analysis.

Q. WHAT IS YOUR RESPONSE TO MR. MURRAY'S CONCERN THAT THE BOND YIELD PLUS RISK PREMIUM APPROACH PERPETUATES WHAT HE VIEWS AS HIGH ROES?

A. As discussed in my response to Mr. Chari, the cases considered in my Bond Yield Plus Risk Premium approach, and their associated decisions, reflect the same type of market-based analyses at issue in this proceeding. And for the reasons discussed in my response to Mr. Chari, I disagree with Mr. Murray's view that the Cost of Equity and authorized ROE are distinct concepts. In summary, Mr. Murray's position that the Bond Yield Plus Risk Premium approach perpetuates relatively high ROEs is entirely unfounded.

Q. DID YOU MAKE AN "ADJUSTMENT" TO YOUR RISK PREMIUM RESULTS, AS MR. MURRAY SUGGESTS?

A. No, I did not. As discussed above and in my Direct Testimony, my Equity Risk Premium estimate is based on a regression analysis, which shows a significant inverse relationship

between the Equity Risk Premium and Treasury bond yields.[90] Because interest rates remain low relative to historical levels, the calculated Equity Risk Premium is significantly above the historical average. As discussed in both my Direct and Rebuttal Testimonies, the inverse relationship between interest rates and the Equity Risk Premium is supported by the findings in my Bond Yield Plus Risk Premium approach and is consistent with published research.[91] As such, I disagree with Mr. Murray's characterization of my approach as being an "adjustment". It simply reflects the important and long-recognized relationship between interest rates and the Equity Risk Premium.

Q. HAVE YOU PERFORMED AN ANALYSIS TO DEMONSTRATE THE RELATIVE ACCURACY OF AN AVERAGE EQUITY RISK PREMIUM, COMPARED TO A RISK PREMIUM THAT REFLECTS THE INVERSE RELATIONSHIP BETWEEN BOND YIELDS AND THE EQUITY RISK PREMIUM?

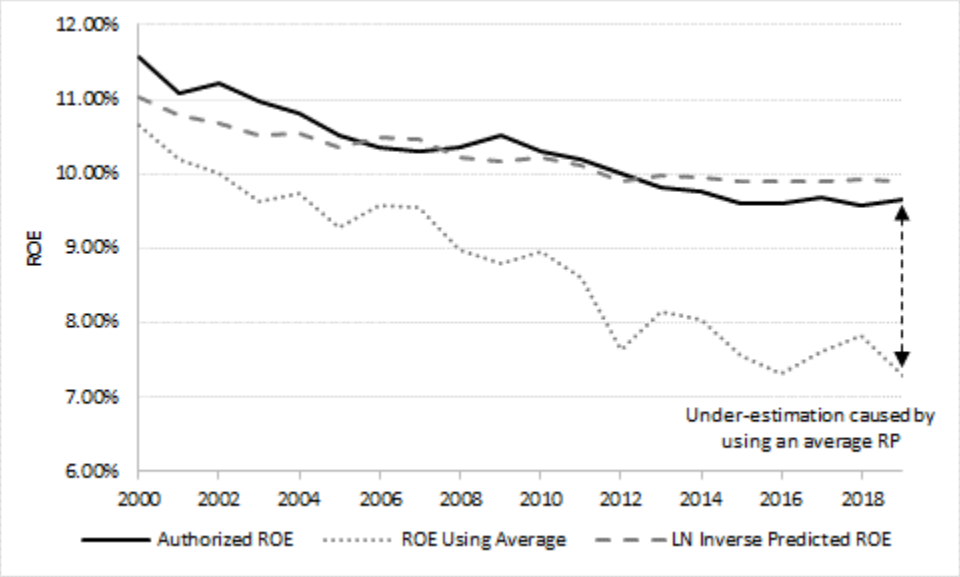
A. Yes, I have. I first calculated the ROE that the average 4.68 percent "static" risk premium would predict using 2000-2019 annual average 30-year Treasury yields, and the error between the predicted ROE and the actual observed average ROE. I then calculated the ROE predicted in each year using my methodology, which accounts for the log normal relationship discussed in my Direct Testimony, and the error between the actual and predicted observations.

As shown in Schedule RBH-S5, using the average Equity Risk Premium, produces estimates that are as much as 238 basis points removed from the actual

[90] Direct Testimony of Robert B. Hevert, at 62-63.
[91] *Ibid*.; and Rebuttal Testimony of Robert B. Hevert, at 47-48.

authorized ROE. Using a Risk Premium approach to reflect the inverse relationship between bond yields and the Equity Risk Premium, however, reduces the largest prediction error to 56 basis points. Chart 11 (*see*, also Schedule RBH-S5) demonstrates that applying a Risk Premium model that reflects the inverse relationship produces generally accurate estimates of observed average authorized ROEs. The use of a static Equity Risk Premium, however, produces significant errors, particularly in relatively low (or high) interest rate environments.

Chart 11: Accuracy of Risk Premium ROE Estimates



IV. CAPITAL STRUCTURE

Q. PLEASE SUMMARIZE MR. MURRAY'S REBUTTAL TESTIMONY AS IT RELATES TO THE COMPANY'S CAPITAL STRUCTURE.

A. Mr. Murray makes several arguments to support his view that the "economical" capital should contain only 46.00 percent common equity, and should reflect the "adjusted"

capital structure of Liberty Utilities Co. ("LUCo").[92] Principally, he argues "LUCo's capital structure, as adjusted, represents the balance of capital APUC's officers consider reasonable for purposes of financing its North America regulated utility assets, including those of Empire."[93] I assume the adjustments he notes in his rebuttal testimony are those Mr. Murray discussed in his direct testimony, and which Mr. Chari discusses in his rebuttal testimony. Mr. Murray also argues it is improper to consider the Company's capital structure related to its electric utility operations, "deconsolidated" from its gas utility operations.[94]

Although Mr. Murray concedes the Company's equity ratio "is somewhat close to that which Empire had when it was an independent publicly-traded company with a 3rd party investable capital structure", he alleges it "no longer [is] a function of balancing business and financial risk for purposes of capital access."[95] Rather, he argues "[i]t now targets a common equity ratio for purposes of justifying its revenue requirement."[96] Mr. Murray then notes he will "compare and contrast" the Company's capital structure through March 27, 2020, suggesting changes in capital structures over time are important considerations.

As to the merger conditions approved in Case No. EM-2016-0213, Mr. Murray observes neither I "nor any other Empire witness compared any of Empire's previous

92 Mr. Murray drops his proposed equity ratio to 45.00 percent if the Commission were to adopt the Company's proposed "revenue normalized rate design". *See*, Rebuttal Testimony of David Murray, at 35.
93 Rebuttal Testimony of David Murray, at 8.
94 *Ibid*., at 7-8.
95 *Ibid*., at 8.
96 *Ibid*.

capital structure requests to its current request."[97] He expected "a more detailed comparison of LUCo's capital structure to that of Empire."[98]

Q. PLEASE NOW SUMMARIZE MR. CHARI'S REBUTTAL TESTIMONY REGARDING THE COMPANY'S CAPITAL STRUCTURE.

A. Mr. Chari disagrees with Mr. Murray's position that LUCo's capital structure, rather than Liberty-Empire's is proper. As Mr. Chari points out, "[t]he correct capital structure for setting Empire's ROR is Empire's book capital structure as presented on September 30, 2019."[99] Mr. Chari finds that capital structure to include 52.90 percent common equity, and 47.10 percent long-term debt.[100]

Regarding the merger conditions specified in Case No. EM-2016-0213, Mr. Chari argues LUCo's capital structure includes 53.00 percent common equity, somewhat more than Liberty-Empire's 52.90 percent common equity ratio. He argues "[t]he higher the equity ratio, the less economical the capital structure is, all being equal"[101], because "equity costs more than the other portions (debt and preferred stock) of the capital structure."[102] Mr. Chari also disagrees with Mr. Murray's proposed adjustment to LUCo's capital structure, which is to add $395 million of LUCo-guaranteed debt to its long-term debt balance, while removing the same amount from its equity balance. Mr. Chari observes the basis of Mr. Murray's proposed adjustment, LUCo's guarantee, is misplaced in that not all the debt supports LUCo's regulated operations.[103] He finds

97 *Ibid*., at 5.
98 *Ibid*.
99 Rebuttal Testimony of Peter Chari, at 13.
100 *Ibid*.
101 *Ibid*., at 14.
102 *Ibid*.
103 *Ibid*., at 15.

including that debt "would be unfair for both LUCo and Empire to use a capital structure that is not representative of the capital they use in their operations."[104]

Q. TURNING FIRST TO MR. CHARI'S DISCUSSION OF MR. MURRAY'S PROPOSED ADJUSTMENT TO LUCO'S CAPITAL STRUCTURE, WHY DID YOU NOT ADDRESS THAT POINT IN YOUR REBUTTAL TESTIMONY?

A. It is not relevant to the central issue of whether Liberty-Empire's capital structure is "the most economical". As Mr. Chari points out, Merger Condition 5 states:

> If Empire's per books capital structure is different from that of the entity or entities in which Empire relies for its financing needs, Empire shall be required to provide evidence in subsequent rate cases as to why Empire's per book capital structure is the most economical for purposes of determining a fair and reasonable allowed rate of return for purposes of determining Empire's revenue requirement.[105]

My plain reading of Merger Condition 5 is straightforward: if Liberty-Empire's "book capital structure" differs from LUCo's, the Company must demonstrate its capital structure is "the most economical".[106] As Mr. Chari points out, the difference in book capital structures between the two is minimal; 53.00 percent common equity at LUCo relative to 52.90 percent equity at Liberty-Empire.[107] I do not see a need to reconcile that modest difference, as Mr. Murray appears to have expected.[108]

Assuming the ten-basis point difference between the two rises to the threshold of a difference for the purpose of Merger Condition 5, the central issue is whether Liberty-Empire's capital structure is the most economical. As discussed in my Rebuttal

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104 *Ibid*.
105 *Ibid*., at 14.
106 I am not qualified to offer a legal opinion, nor I am offering one.
107 Rebuttal Testimony of Peter Chari, at 14.
108 Rebuttal Testimony of David Murray, at 5.

Testimony[109], and as I explain below (in response to Mr. Chari's rebuttal testimony), determining whether a given capital structure is "economical" is a complicated assessment.

Q. AT PAGES 15 AND 16 OF HIS REBUTTAL TESTIMONY, MR. CHARI DISCUSSES MR. MURRAY'S PROPOSED ADJUSTMENT TO LUCO'S CAPITAL STRUCTURE. WHAT IS YOUR RESPONSE TO MR. CHARI ON THAT POINT?

A. As Mr. Chari points out, Mr. Murray's proposed adjustment relates to $395 million of debt issued by Liberty Utilities Financing GP1 ("LUF"), the entity responsible for raising debt "for distribution to APUC and LUCo subsidiaries." Mr. Murray's proposed adjustment, which is to increase LUCo's debt balance by $395 million and decrease its equity balance by the same amount, hinges on LUCo's guarantee of LUF's debt. That adjustment produces Mr. Murray's 46.00 percent equity ratio.[110]

Mr. Chari appears to argue Mr. Murray's proposed adjustment is improper in part because LUCo guarantees debt issued by LUF for APUC's regulated and unregulated operations. He suggests "[i]ncluding the $395 million in LUCo's capital structure incorrectly allocates the debt burden of the entirety of APUC's entities to LUCo's regulated utilities, including Empire". He then concludes "[t]he debt should not be included in a capital structure to be used for the purpose of ratemaking because it would be unfair for both LUCo and Empire to use a capital structure that is not representative of the capital they use in their operations."[111]

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109 Rebuttal Testimony of Robert B. Hevert, at 56-68.
110 Rebuttal Testimony of Peter Chari, at 15.
111 *Ibid*, at 16.

In my opinion, the question of whether the LUF debt guaranteed by LUCo applies to regulated or unregulated operations has no bearing on the "most economical" capital structure standard established in Merger Condition 5. As Mr. Chari points out, Liberty-Empire's book capital structure does not equal LUCo's capital structure whether Mr. Murray's proposed adjustment is applied, or not. That being the case, the question under Merger Condition 5 is not whether Liberty-Empire's capital structure is the same as LUCo's. Rather, it is whether Liberty-Empire's capital structure is the most economical.

Q. DO YOU AGREE WITH MR. CHARI'S POSITION THAT LIBERTY-EMPIRE'S CAPITAL STRUCTURE IS THE MOST ECONOMICAL BECAUSE IT CONTAINS SLIGHTLY LESS EQUITY THAN LUCO'S (UNADJUSTED) CAPITAL STRUCTURE?

A. No, I do not. First, it is important to define "most economical" in this context. As I explained in my Rebuttal Testimony, capital structures must be set and managed to achieve multiple objectives, subject to multiple constraints. It is a matter of optimization. Yes, it is important to ensure the lowest reasonable cost to ratepayers. It also is important to ensure the financial wherewithal to efficiently access both long-term capital and short-term liquidity, regardless of market conditions.

Further, the costs of capital (both debt and equity) are inextricably linked to the capital structure. We cannot change one without considering changes in the other. Mr. Chari's argument implies determining whether one capital structure is more economical than another largely is an algebraic exercise, in which the capital structure may change without affecting the costs of capital. As he puts it, "[t]he higher the equity ratio, the less economical the capital structure is, all being equal." Mr. Chari argues that is the case

because "equity costs more than the other portions (debt and preferred stock) of the capital structure."[112]

As a practical matter, however, all does not remain equal. As explained in my Rebuttal Testimony, increasing the proportion of debt in the capital structure magnifies risks to investors.[113] That is, as the proportion of debt increases, the costs of both debt and equity increase – they are inextricably related. Consequently, there is a point at which the additional financial risk associated with higher proportions of debt outweigh the benefit of its lower cost relative to equity. The relationships among financial leverage and risk have been formalized by Modigliani and Miller[114] who showed that the Cost of Equity may be expressed as:

$$k_{e,L} = k_{e,U} + \left(k_{e,U} - k_d\right)(1 - T)\left(\frac{D}{E}\right) \quad \text{Equation [7]}$$

where

$k_{e,U}$	=	Cost of Equity for an unlevered firm
$k_{e,L}$	=	Cost of Equity for a levered firm
k_d	=	Cost of Debt (interest rate)
D	=	Level of debt
E	=	Level of equity
T	=	Tax rate

Equation [7] expresses the Cost of Equity for a levered firm as the Cost of Equity for an unlevered firm, which reflects business risk only, plus a premium for financial risk.

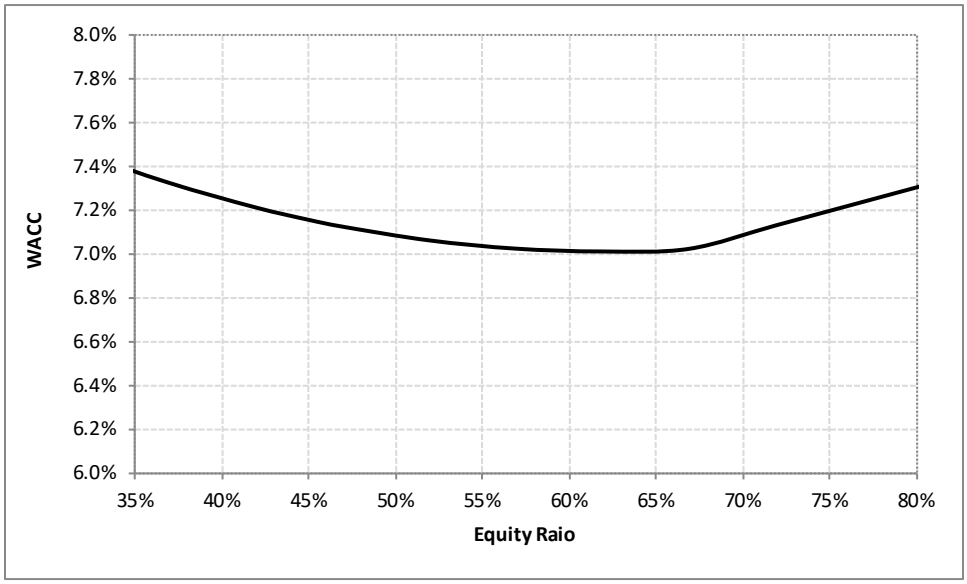
Using the Modigliani-Miller equation (and estimating the effect of increased leverage on the Cost of Debt by looking at credit spreads), we can estimate the effect of leverage on the weighted average cost of capital ("WACC") using the following formula:

112 Rebuttal Testimony of Peter Chari, at 14.
113 Rebuttal Testimony of Robert B. Hevert, at 67.
114 F. Modigliani and M. Miller, *The Cost of Capital, Corporation Finance, and the Theory of Investment*, The American Economic Review 48 No. 3, June 1958, at 261-297; F. Modigliani and M. Miller, *Corporate Income Taxes and the Cost of Capital: A Correction*, The American Economic Review 53 No. 3, June 1963, at 433-443.

$$\text{WACC} = \frac{\text{D}}{\text{TC}}\text{k}_\text{d}(1-\text{T}) + \frac{\text{E}}{\text{TC}}\text{k}_{\text{e,L}} \quad \text{Equation [8]}$$

where "TC" is Total Capital, the sum of debt ("D") and equity ("E"). Applying that approach, it becomes apparent there is point at which the WACC is minimized (*see* Chart 12, below).

Chart 12: Illustrative WACC at Varying Equity Ratios[115]



As Chart 12 illustrates, as equity is added (moving from left to right on Chart 12), the WACC falls, owing to the lower costs of debt and equity brought about by less financial risk. At equity ratios of about 60.00 percent to 65.00 percent, the WACC is minimized; it increases from there. Although directionally proper, changes in the WACC are imprecise due to the complex and the dynamic nature of the relationship between leverage and the costs of capital. As explained above, any measure of an "optimal" capital structure must consider numerous objectives and constraints. Nonetheless, the relationship is consistent with the proposition that increasing financial leverage increases the Cost of Equity; it does not remain equal.

115 Schedule RBH-S6.

Q. IN SECTION II, YOU DISCUSSED THE PRINCIPLE OF "EQUITY DURATION". IS EQUITY DURATION REFLECTED IN MR. CHARI'S ASSESSMENT?

A. No, it is not. In my Rebuttal Testimony, I explained that a common financing principle is "maturity matching".[116] I noted that the perpetual nature of common stock extends the weighted average life of the capital structure to more closely align that of the rate base. In Section II (above), I found the average Modified Duration of the companies included in Mr. Chari's analyses to be about 38 years. In my practical experience, examining the weighted average duration of the capital structure is a fundamental component of determining an "optimal", or "economical" capital structure. Again, that is an important factor Mr. Chari does not consider.

Q. WHAT ARE YOUR CONCLUSIONS REGARDING MR. CHARI'S CAPITAL STRUCTURE RECOMMENDATION?

A. I agree with Mr. Chari's conclusion that Liberty-Empire's capital structure should be used for ratemaking purposes, although for different reasons than he provides. In my opinion, the question of what constitutes an "economical" capital structure properly is viewed in the context of capital structure optimization. That is, an "economical" capital structure is one that looks to optimize the proportions of equity and debt, based on multiple factors. Because utilities have similar financing objectives and face common constraints, the practice of capital structure optimization is best viewed in the capital structures in place among utility operating companies. Doing so fully supports the

[116] Rebuttal Testimony of Robert B. Hevert, at 58-59.

Company's proposed capital structure as the "most economical," to the extent such a showing is required.

Q. TURNING NOW TO MR. MURRAY'S REBUTTAL TESTIMONY, WHAT IS YOUR RESPONSE TO HIS STATEMENT THAT HE "EXPECTED A MORE DETAILED COMPARISON OF LUCO'S CAPITAL STRUCTURE TO THAT OF EMPIRE"[117]?

A. Mr. Murray's expectation seems to be based on his view that Merger Condition 5 requires a reconciliation between LUCo's capital structure on the one hand, and Liberty-Empire's on the other. As Mr. Chari's testimony notes, with or without Mr. Murray's proposed adjustment, LUCo's book capital structure does not equal Liberty-Empire's book capital structure. Given that difference, the relevant analytical issue is whether Liberty-Empire's capital structure is the "most economical". As between Liberty-Empire's 52.90 percent equity ratio and LUCo's 53.00 percent equity ratio[118], there is no meaningful difference and one cannot be said to be the "most economical" relative to the other.

That is not the case, however, with Mr. Murray's proposed 46.00 percent equity ratio. As explained in my response to Mr. Chari, because capital structure optimization is complex, it is best observed in the capital structures in place among operating utilities. Schedule RBH-R7 to my Rebuttal Testimony demonstrated the average equity ratio among the utility my proxy companies was 53.59 percent. Mr. Murray's 46.00 percent recommended equity ratio falls over two standard deviations below that average.[119]

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117 Rebuttal Testimony of David Murray at 5.
118 Rebuttal Testimony of Peter Chari at 14.
119 The standard deviation is 3.70 percent. (0.5359 - 0.4600)/0.0370 = 2.05.

From a slightly different perspective, his recommendation falls in the bottom 3rd percentile of the proxy company equity ratios.[120]

As discussed earlier, the Cost of Equity is inextricably linked to debt leverage. Mr. Murray's recommendation is so heavily leveraged relative to industry practice that it certainly would increase risks to debt and equity investors, increasing the returns required by them (*see*, Equations [7] and [8], above). In short, regardless of how he arrived at it, Mr. Murray's 46.00 percent equity ratio cannot be seen as the "most economical".

Q. AT PAGE 9 OF HIS REBUTTAL TESTIMONY, MR. MURRAY INDICATES HE INTENDS TO VIEW CHANGES IN THE COMPANY'S CAPITAL STRUCTURE OVER TIME. IN YOUR VIEW, HAS THE COMPANY'S CAPITAL STRUCTURE MATERIALLY CHANGED SINCE 2016?

A. No, it has not. Since September 2016, the Company's year-end equity ratio has remained in the range of 50.00 percent to 51.00 percent.[121] During that time, there has been no recapitalization of which I am aware, and the Company's credit ratings have remained constant.

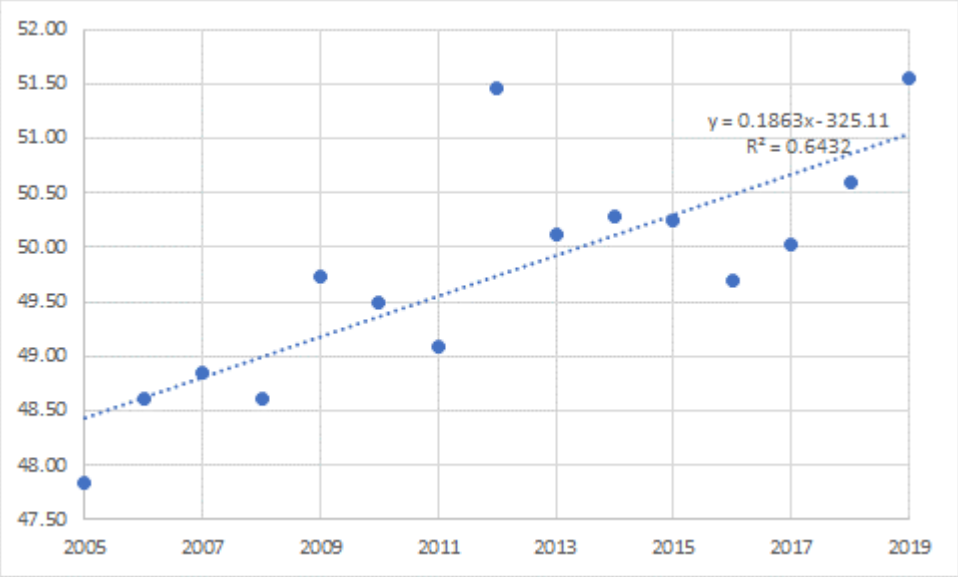
Q. HAVE AUTHORIZED EQUITY RATIOS CHANGED OVER TIME?

A. Yes, they generally have increased. Excluding capital structures authorized in jurisdictions that include non-investor supplied sources of capital (principally, Accumulated Deferred Income Taxes), authorized equity ratios have increased over time (*see*, Chart 13, below).

120 That is, 97.00 percent of the observed equity ratios were higher than 46.00 percent.

121 *See*, The Empire District Electric Company SEC Form 10-Q For the quarterly period ended September 30, 2016, at 9; Schedule DM-4, pages 1 and 3.

Chart 13: Average Authorized Equity for Electric Utilities[122]



The upward trend in equity ratios since 2005, in particular since 2008/2009, makes sense as the financial crisis focused attention on balance sheet strength and capital access. Now, as the capital markets undergo another severe dislocation, the balance sheet strength built over time has become extremely important. Mr. Murray's recommendation not only would undo the financial strength needed during volatile capital markets, it would indicate a degree of regulatory risk that would further diminish the Company's financial profile, just as that profile is most needed. From that perspective as well, Mr. Murray's proposed capital structure cannot be seen as the "most economical".

[122] Source: S&P Global Market Intelligence. Excludes equity ratios authorized in AR, FL, IN, and MI.

Q. AT PAGES 35 AND 36 OF HIS REBUTTAL TESTIMONY, MR. MURRAY NOTES HIS RECOMMENDATIONS WOULD REDUCE THE COMPANY'S *PRO FORMA* RATIO OF CFO PRE-WC/DEBT,[123] BUT HE IS NOT CONCERNED DOING SO WOULD AFFECT THE COMPANY'S CREDIT PROFILE. WHAT IS YOUR RESPONSE TO MR. MURRAY ON THAT POINT?

A. First, as Chart 10 to my Rebuttal Testimony indicates, Moody's rating process places only 15.00 percent weight to that ratio. In contrast, the "Regulatory Framework" receives 25.00 percent weight, and the "Sufficiency of Rates and Returns" is given 12.50 percent weight. As my Rebuttal Testimony explained, *pro forma* metrics are only one of a broad range of factors considered in the ratings process. The distance between Mr. Murray's recommendations and both industry and regulatory practice would be reflected in factors such as Moody's "Regulatory Framework" and the "Sufficiency of Rates and Returns". Mr. Murray's partial assessment does not address those important considerations.

Second, a wide range of CFO Pre-WC/Debt ratios fall within the Baa to A ratings categories; ratios as low as 11.00 percent and as high as 27.00 percent do so.[124] Even if Mr. Murray's recommendations produce *pro forma* ratios within that range, it does not follow that the Company's credit profile would be unaffected. As noted above, qualitative assessments of the regulatory environment weigh far more in the ratings process. Consequently, Mr. Murray's *pro forma* analyses do not demonstrate his 46.00 percent equity ratio recommendation is the "most economical".

[123] Cash Flow From Operations pre-Working Capital adjustments/Debt

[124] Moody's Investors Service, *Rating Methodology, Electric and Gas Utilities*, June 2017, at 34. Ratios based on the "Low Business Risk Grid".

Q. DOES THE CURRENT CAPITAL MARKET DISLOCATION AFFECT THE DETERMINATION OF AN "ECONOMICAL" CAPITAL STRUCTURE?

A. Yes, it does. As discussed in Section I, capital markets now are experiencing extraordinary levels of volatility. All industry sectors, including utilities, have been affected. My Rebuttal Testimony explained that capital structures are set not only to ensure efficient capital access during accommodating markets, but also during constrained markets. Given their obligation to serve, and that operation cash flows rarely are sufficient to fund capital investments over long periods, that efficient market access is imperative.[125] Companies with stronger balance sheets are better positioned to efficiently – and economically – access that capital during constrained capital markets. That point cannot reasonably be in dispute.

Mr. Murray's focus on his proposed $395 million adjustment misses that fundamental point. There simply is no basis to conclude that a capital structure containing considerably more financial risk than seen in regulatory or industry practice is the "most economical". To the contrary, Mr. Murray's approach would add financial risk to market risk, compounding the adverse effect on investors, and increasing the returns they require. That is especially true now, in this market.

The Company's proposed capital structure, on the other hand, is consistent with industry practice, reflects the many factors that must be considered in developing an optimal - or economical - capital structure, and recognizes the importance of balance sheet strength, especially during volatile capital markets. Regardless of how Mr. Murray

[125] As Mr. Murray notes on page 38 of his rebuttal testimony, Liberty-Empire's commercial paper program remains in place. It now is rated A2/P2 by Standard & Poor's and Moody's, respectively. See, Algonquin Power & Utilities, Corp., February 27, 2020, at 24.

developed his proposed 46.00 percent equity ratio, it cannot be seen as the "most economical".

Q. WHAT CAPITAL STRUCTURE DOES THE COMPANY NOW PROPOSE FOR RATEMAKING PURPOSES?

A. As Ms. Richard notes in her True-up Direct Testimony, the Company proposes a capital structure of 53.07 percent Common Equity, and 46.93 percent Long-Term Debt. I understand that capital structure includes the Company's actual balances as of January 31, 2020, excluding short-term debt.

Q. ARE COMMON EQUITY AND LONG-TERM DEBT THE TWO SOURCES OF CAPITAL COMMONLY CONSIDERED IN ESTABLISHING A UTILITY'S RATEMAKING CAPITAL STRUCTURE?

A. Yes, they are.

Q. WHY IS THAT THE CASE?

A. The principal reason is that the assets included in rate base are long-lived, and are financed with correspondingly long-lived securities. As discussed in my Direct Testimony[126] (and further, below), utilities generally follow the financing practice commonly referred to as "maturity matching," which matches the lives of assets being financed with the maturity of the securities issued to finance those assets. Under that practice, the overall term structure of the utility's long-term liabilities—including both debt and equity—correspond to the life of its long-term assets.

Whereas short-term debt has a maturity of one year or less, long-term debt may have maturities of 30 years or longer. Although there are practical financing constraints,

[126] See, Direct Testimony of Robert B. Hevert, at 39-41.

such as the need to "stagger" long-term debt maturities, the general objective is to extend the average life of long-term debt. Still, long-term debt has a finite life, which is likely to be less than the life of the assets included in rate base. Common equity, on the other hand, is perpetual—its life is indefinite.

Q. PLEASE EXPLAIN WHY, IN YOUR VIEW, SHORT-TERM DEBT SHOULD BE EXCLUDED FROM THE RATEMAKING CAPITAL STRUCTURE.

A. In my opinion, there are two fundamental reasons why short-term debt should be excluded. First, short-term debt generally is used to fund working capital requirements. Those requirements often are seasonal and variable; they are not permanent as are the assets included in rate base. Because short-term debt funds short-term variable working capital needs, it should not be included in the ratemaking capital structure.

Second, prudent financing practice calls for long-term assets (such as rate base items) to be financed with long-term securities. Doing otherwise would expose the Company's ratepayers to both refinancing risk (that is, the risk of not being able to roll-over short-term debt as it comes due), and interest rate risk (incurring higher interest costs as maturing short-term debt is refinanced). Although short-term debt may be used as an interim source of financing (that is, until a sufficiently large balance has been accumulated to be efficiently financed by long-term securities), it should not be seen as a permanent source of capital.

Q. HAS THE COMPANY'S SHORT-TERM DEBT BALANCE VARIED OVER TIME?

A. Yes, it has. I understand the Company's quarter-end short-term debt balance fell to zero in two of the five quarterly reporting periods from December 2018 through December

2019.[127] As of January 31, 2020, the short-term debt balance was **_____**.[128] That pattern is consistent with the point made earlier, that short-term debt tends to vary over time, and is not used as a permanent source of capital. I therefore agree with Ms. Richard's conclusion that short-term debt should be excluded from the ratemaking capital structure.

V. CONCLUSIONS AND RECOMMENDATIONS

Q. WHAT ARE YOUR OVERALL CONCLUSIONS AND RECOMMENDATIONS?

A. None of Messrs. Chari's or Murray's rebuttal testimonies have caused me to change the conclusions and recommendations presented in my Direct and Rebuttal Testimonies. I continue to believe my models are correctly specified and support my recommended ROE of 9.95 percent, within a range of 9.80 percent through 10.60 percent.

Regarding Liberty-Empire's capital structure, I agree with Mr. Chari's conclusion that the Company's proposal is appropriate, although for different reasons. I strongly disagree with Mr. Murray's position that an equity ratio of 46.00 percent is "most economical". Even under less volatile market conditions, Mr. Murray's proposal is far afield from industry practice. Now, when balance sheet strength is so important to capital access, and when investors already are facing extraordinarily high levels of market risk, Mr. Murray's proposal simply adds unnecessary risk. In my opinion, his proposal is counterproductive, and should be given no weight.

Q. DOES THIS CONCLUDE YOUR SURREBUTTAL TESTIMONY?

A. Yes, it does.

[127] OPC Data Request - 3006 – Supplemental; CONFIDENTIAL.
[128] MPSC Data Request - 0186 – Supplemental CONFIDENTIAL.

VERIFICATION OF ROBERT B. HEVERT

Robert B. Hevert, under penalty of perjury, declares that the foregoing surrebuttal testimony is true and correct to the best of her/his knowledge, information, and belief.

/s/*Robert B. Hevert*
Robert B. Hevert

Vertically Integrated Rate Cases 2019-2020

State	Company	Docket	Date	Decision Type	Return on Equity
Michigan	Consumers Energy Co.	C-U-20134	1/9/2019	Settled	10.00%
West Virginia	Appalachian Power Co.	C-18-0646-E-42T	2/27/2019	Settled	9.75%
Oklahoma	Public Service Co. of OK	Ca-PUD201800097	3/14/2019	Settled	9.40%
Kentucky	Kentucky Utilities Co.	C-2018-00294	4/30/2019	Settled	9.73%
Kentucky	Louisville Gas & Electric Co.	C-2018-00295 (elec.)	4/30/2019	Settled	9.73%
South Carolina	Duke Energy Carolinas LLC	D-2018-319-E	5/1/2019	Fully Litigated	9.50%
Michigan	DTE Electric Co.	C-U-20162	5/2/2019	Fully Litigated	10.00%
South Carolina	Duke Energy Progress LLC	D-2018-318-E	5/8/2019	Fully Litigated	9.50%
South Dakota	Otter Tail Power Co.	D-EL18-021	5/14/2019	Fully Litigated	8.75%
Hawaii	Maui Electric Company Ltd	D-2017-0150	5/16/2019	Settled	9.50%
Michigan	Upper Peninsula Power Co.	C-U-20276	5/23/2019	Settled	9.90%
Vermont	Green Mountain Power Corp.	C-19-1932-TF	8/29/2019	Fully Litigated	9.06%
Wisconsin	Northern States Power Co - WI	D- 4220-UR-124 (Elec)	9/4/2019	Settled	10.00%
Wisconsin	Wisconsin Electric Power Co.	D-05-UR-109 (WEP-Elec)	10/31/2019	Settled	10.00%
Wisconsin	Wisconsin Public Service Corp.	D-6690-UR-126 (Elec)	10/31/2019	Settled	10.00%
Louisiana	Entergy New Orleans LLC	D-UD-18-07 (elec.)	11/7/2019	Fully Litigated	9.35%
Idaho	Avista Corp.	C-AVU-E-1904	11/29/2019	Settled	9.50%
Indiana	Northern IN Public Svc Co.	Ca-45159	12/4/2019	Settled	9.75%
Georgia	Georgia Power Co.	D-42516	12/17/2019	Fully Litigated	10.50%
California	Pacific Gas and Electric Co.	A-19-04-015	12/19/2019	Fully Litigated	10.25%
California	San Diego Gas & Electric Co.	A-19-04-017 (Elec)	12/19/2019	Fully Litigated	10.20%
California	Southern California Edison Co.	A-19-04-014	12/19/2019	Fully Litigated	10.30%
Arkansas	Southwestern Electric Power Co	D-19-008-U	12/20/2019	Settled	9.45%
Montana	NorthWestern Corp.	D2018.2.12	12/20/2019	Settled	9.65%
Nevada	Sierra Pacific Power Co.	D-19-06002	12/24/2019	Settled	9.50%
Iowa	Interstate Power & Light Co.	D-RPU-2019-0001	1/8/2020	Settled	10.02%
Michigan	Indiana Michigan Power Co.	C-U-20359	1/23/2020	Settled	9.86%
California	PacifiCorp	A-18-04-002	2/6/2020	Fully Litigated	10.00%
Colorado	Public Service Co. of CO	D-19AL-0268E	2/11/2020	Fully Litigated	9.30%
North Carolina	Virginia Electric & Power Co.	E-22, Sub 562	2/24/2020	Settled	9.75%

Rate Cases	Period	Return on Equity (%)
All	2019-20	9.74%
All	2019	9.73%
Fully Litigated	2019-20	9.73%
Fully Litigated	2019	9.74%

Source: Regulatory Research Associates

Proof Concept: Earnings, Dividends, Book Value and
Stock Price Growth Rate Equivalence in Constant Growth DCF

Line Description	IMPLIED GROWTH RATE AT ALLOWED ROE:		
Input	Dividend Yield	4.00%	[1]
Assumes g = Allowed ROE - Div. Yield	Assumed Growth Rate	6.00%	[1]
Input	Total Return	10.00%	[1]
Input	Payout Ratio	66.00%	[1]
Input	Book Value/Share	20	[1]

		0	1	2	3	4	5	6	7	8	9	10		250
BV/S Escalates at Constant Growth g	Book Value/Share	$ 20.00	$ 21.20	$ 22.47	$ 23.82	$ 25.25	$ 26.76	$ 28.37	$ 30.07	$ 31.88	$ 33.79	$ 35.82		$ 42,412,738.21
Demonstrating Constant BV/S growth			6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%		6.00%
Earnings based on ROE applied to BV/S	Earnings/share	$ 2.00	$ 2.12	$ 2.25	$ 2.38	$ 2.52	$ 2.68	$ 2.84	$ 3.01	$ 3.19	$ 3.38	$ 3.58		$ 4,241,273.82
Demonstrating Constant EPS growth			6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%		6.00%
Demonstrating Constant Return Earned based on BV/S and EPS	Allowed ROE	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%		10.00%
Div/S based on EPS and Constant Payout ratio	Dividends/Share	$ 1.32	$ 1.40	$ 1.48	$ 1.57	$ 1.67	$ 1.77	$ 1.87	$ 1.98	$ 2.10	$ 2.23	$ 2.36		$ 2,799,240.72
Demonstrating Constant Div/S growth			6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%		6.00%
Retained Earnings based on difference between EPS and Div/S	Earnings retained to book value	$ 0.68	$ 0.72	$ 0.76	$ 0.81	$ 0.86	$ 0.91	$ 0.96	$ 1.02	$ 1.08	$ 1.15	$ 1.22		$ 1,442,033.10
Demonstrating Constant growth in Retained Earnings			6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%		6.00%
Demonstrating Constant Market/Book ratio	Market/Book Ratio	1.749	1.749	1.749	1.749	1.749	1.749	1.749	1.749	1.749	1.749	1.749		1.749
DCF calculation of market price = [Div/S]*[1+g]/[ROE-g]	Market Price	$ 34.98	$ 37.08	$ 39.30	$ 41.66	$ 44.16	$ 46.81	$ 49.62	$ 52.60	$ 55.75	$ 59.10	$ 62.64		$ 74,179,879.13
Demonstrating Price Appreciation equals Long Term Growth Rate	Price Appreciation	6.00%	OK	<== Price appreciation should equal long term growth rate										
Demonstrating Constant Price/Earnings Ratio	Price/Earnings	17.49	17.49	17.49	17.49	17.49	17.49	17.49	17.49	17.49	17.49	17.49		17.49
Present Value Factor calculated based upon the current period and the Constant ROE	Present Value Factor		0.9091	0.8264	0.7513	0.6830	0.6209	0.5645	0.5132	0.4665	0.4241	0.3855		0.00

CASE 1	**DIVIDENDS IN PERPETUITY**											
Present value of Div/S obtained by multiplying nominal Div/S by the Present Value Factor for the period	Present Value Dividend	1.2720	1.2257	1.1812	1.1382	1.0968	1.0569	1.0185	0.9815	0.9458	0.9114		0.00
Total Value of investment sum of all Present Value Dividends in perpetuity (250 instances for demonstration purposes)	Value of Investment	$ 34.98											

CASE 2	10-YEAR HOLDING PERIOD										
Present value of Div/S obtained by multiplying nominal Div/S by the Present Value Factor for the period	Present Value of Dividend	$ 1.27	$ 1.23	$ 1.18	$ 1.14	$ 1.10	$ 1.06	$ 1.02	$ 0.98	$ 0.95	$ 0.91
Present value of Stock Price obtained by multiplying nominal Stock Price by the Present Value Factor for the 10th Period (Terminal Value)	Present Value of Stock Price	--	--	--	--	--	--	--	--	--	24.15
Value of dividends = sum of all Present Value Dividends for periods 1-10	Value of Dividends	$ 10.83									
Present value of Stock Price obtained by multiplying nominal Stock Price by the Present Value Factor for the 10th Period (Terminal Value)	Value of Stock Price	$ 24.15									
Total Value of investment sum of all Present Value Dividends for periods 1-10 and Present Value of Stock in period 10 (Terminal Value)	Value of Investment	$ 34.98									

CASE 3	5-YEAR HOLDING PERIOD					
Present value of Div/S obtained by multiplying nominal Div/S by the Present Value Factor for the period	Present Value of Dividend	$ 1.27	$ 1.23	$ 1.18	$ 1.14	$ 1.10
Present value of Stock Price obtained by multiplying nominal Stock Price by the Present Value Factor for the 5th Period (Terminal Value)	Present Value of Stock Price	--	--	--	--	29.07
Value of dividends = sum of all Present Value Dividends for periods 1-5	Value of Dividends	$ 5.91				
Present value of Stock Price obtained by multiplying nominal Stock Price by the Present Value Factor for the 5th Period (Terminal Value)	Value of Stock Price	$ 29.07				
Total Value of investment sum of all Present Value Dividends for periods 1-5 and Present Value of Stock in period 5 (Terminal Value)	Value of Investment	$ 34.98				

[1] Note, for purposes of this exhibit, these data are illustrative only.

CAPM and ECAPM Expected Returns

	Risk-Free Rate	2.21%			ECAPM	0.35	0.25
	MRP	6.00%	ECAPM alpha		Factors	0.67	0.75

Beta	CAPM	ECAPM	1.00%	2.00%	Raw Beta	Alt. ECAPM	Raw Beta ECAPM
0.00	2.21%	3.71%	3.21%	4.21%	-0.52	2.21%	1.36%
0.01	2.27%	3.76%	3.26%	4.25%	-0.51	2.27%	1.43%
0.02	2.33%	3.80%	3.31%	4.29%	-0.49	2.33%	1.49%
0.03	2.39%	3.85%	3.36%	4.33%	-0.48	2.39%	1.56%
0.04	2.45%	3.89%	3.41%	4.37%	-0.46	2.45%	1.63%
0.05	2.51%	3.94%	3.46%	4.41%	-0.45	2.51%	1.70%
0.06	2.57%	3.98%	3.51%	4.45%	-0.43	2.57%	1.76%
0.07	2.63%	4.03%	3.56%	4.49%	-0.42	2.63%	1.83%
0.08	2.69%	4.07%	3.61%	4.53%	-0.40	2.69%	1.90%
0.09	2.75%	4.12%	3.66%	4.57%	-0.39	2.75%	1.96%
0.10	2.81%	4.16%	3.71%	4.61%	-0.37	2.81%	2.03%
0.11	2.87%	4.21%	3.76%	4.65%	-0.36	2.87%	2.10%
0.12	2.93%	4.25%	3.81%	4.69%	-0.34	2.93%	2.17%
0.13	2.99%	4.30%	3.86%	4.73%	-0.33	2.99%	2.23%
0.14	3.05%	4.34%	3.91%	4.77%	-0.31	3.05%	2.30%
0.15	3.11%	4.39%	3.96%	4.81%	-0.30	3.11%	2.37%
0.16	3.17%	4.43%	4.01%	4.85%	-0.28	3.17%	2.43%
0.17	3.23%	4.48%	4.06%	4.89%	-0.27	3.23%	2.50%
0.18	3.29%	4.52%	4.11%	4.93%	-0.25	3.29%	2.57%
0.19	3.35%	4.57%	4.16%	4.97%	-0.24	3.35%	2.64%
0.20	3.41%	4.61%	4.21%	5.01%	-0.22	3.41%	2.70%
0.21	3.47%	4.66%	4.26%	5.05%	-0.21	3.47%	2.77%
0.22	3.53%	4.70%	4.31%	5.09%	-0.19	3.53%	2.84%
0.23	3.59%	4.75%	4.36%	5.13%	-0.18	3.59%	2.90%
0.24	3.65%	4.79%	4.41%	5.17%	-0.16	3.65%	2.97%
0.25	3.71%	4.84%	4.46%	5.21%	-0.15	3.71%	3.04%
0.26	3.77%	4.88%	4.51%	5.25%	-0.13	3.77%	3.11%
0.27	3.83%	4.93%	4.56%	5.29%	-0.12	3.83%	3.17%
0.28	3.89%	4.97%	4.61%	5.33%	-0.10	3.89%	3.24%
0.29	3.95%	5.02%	4.66%	5.37%	-0.09	3.95%	3.31%
0.30	4.01%	5.06%	4.71%	5.41%	-0.07	4.01%	3.37%
0.31	4.07%	5.11%	4.76%	5.45%	-0.06	4.07%	3.44%
0.32	4.13%	5.15%	4.81%	5.49%	-0.04	4.13%	3.51%
0.33	4.19%	5.20%	4.86%	5.53%	-0.03	4.19%	3.58%
0.34	4.25%	5.24%	4.91%	5.57%	-0.01	4.25%	3.64%
0.35	4.31%	5.29%	4.96%	5.61%	0.00	4.31%	3.71%
0.36	4.37%	5.33%	5.01%	5.65%	0.01	4.37%	3.78%
0.37	4.43%	5.38%	5.06%	5.69%	0.03	4.43%	3.84%
0.38	4.49%	5.42%	5.11%	5.73%	0.04	4.49%	3.91%
0.39	4.55%	5.47%	5.16%	5.77%	0.06	4.55%	3.98%
0.40	4.61%	5.51%	5.21%	5.81%	0.07	4.61%	4.05%
0.41	4.67%	5.56%	5.26%	5.85%	0.09	4.67%	4.11%
0.42	4.73%	5.60%	5.31%	5.89%	0.10	4.73%	4.18%
0.43	4.79%	5.65%	5.36%	5.93%	0.12	4.79%	4.25%
0.44	4.85%	5.69%	5.41%	5.97%	0.13	4.85%	4.31%
0.45	4.91%	5.74%	5.46%	6.01%	0.15	4.91%	4.38%
0.46	4.97%	5.78%	5.51%	6.05%	0.16	4.97%	4.45%
0.47	5.03%	5.83%	5.56%	6.09%	0.18	5.03%	4.52%
0.48	5.09%	5.87%	5.61%	6.13%	0.19	5.09%	4.58%
0.49	5.15%	5.92%	5.66%	6.17%	0.21	5.15%	4.65%
0.50	5.21%	5.96%	5.71%	6.21%	0.22	5.21%	4.72%

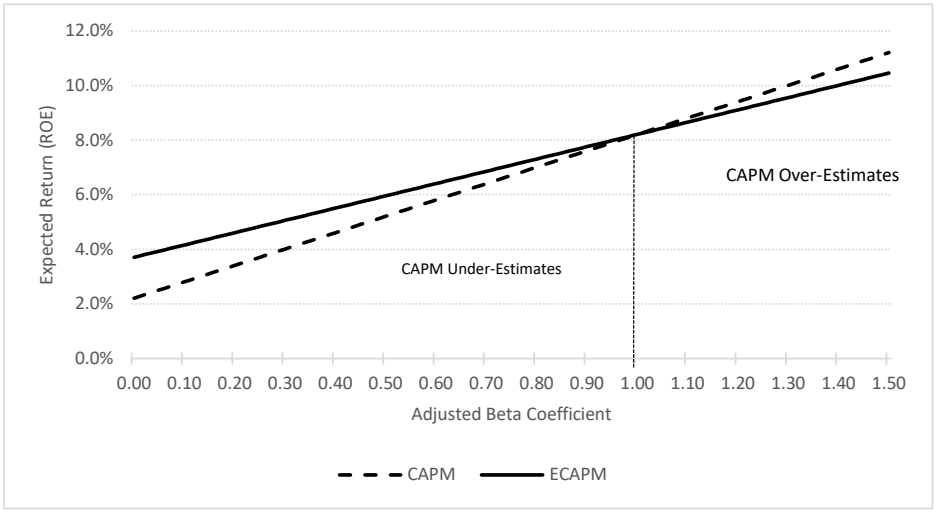
	Risk-Free Rate	2.21%			ECAPM	0.35	0.25
	MRP	6.00%	ECAPM alpha		Factors	0.67	0.75

Beta	CAPM	ECAPM	1.00%	2.00%	Raw Beta	Alt. ECAPM	Raw Beta ECAPM
0.51	5.27%	6.01%	5.76%	6.25%	0.24	5.27%	4.78%
0.52	5.33%	6.05%	5.81%	6.29%	0.25	5.33%	4.85%
0.53	5.39%	6.10%	5.86%	6.33%	0.27	5.39%	4.92%
0.54	5.45%	6.14%	5.91%	6.37%	0.28	5.45%	4.99%
0.55	5.51%	6.19%	5.96%	6.41%	0.30	5.51%	5.05%
0.56	5.57%	6.23%	6.01%	6.45%	0.31	5.57%	5.12%
0.57	5.63%	6.28%	6.06%	6.49%	0.33	5.63%	5.19%
0.58	5.69%	6.32%	6.11%	6.53%	0.34	5.69%	5.25%
0.59	5.75%	6.37%	6.16%	6.57%	0.36	5.75%	5.32%
0.60	5.81%	6.41%	6.21%	6.61%	0.37	5.81%	5.39%
0.61	5.87%	6.46%	6.26%	6.65%	0.39	5.87%	5.46%
0.62	5.93%	6.50%	6.31%	6.69%	0.40	5.93%	5.52%
0.63	5.99%	6.55%	6.36%	6.73%	0.42	5.99%	5.59%
0.64	6.05%	6.59%	6.41%	6.77%	0.43	6.05%	5.66%
0.65	6.11%	6.64%	6.46%	6.81%	0.45	6.11%	5.72%
0.66	6.17%	6.68%	6.51%	6.85%	0.46	6.17%	5.79%
0.67	6.23%	6.73%	6.56%	6.89%	0.48	6.23%	5.86%
0.68	6.29%	6.77%	6.61%	6.93%	0.49	6.29%	5.93%
0.69	6.35%	6.82%	6.66%	6.97%	0.51	6.35%	5.99%
0.70	6.41%	6.86%	6.71%	7.01%	0.52	6.41%	6.06%
0.71	6.47%	6.91%	6.76%	7.05%	0.54	6.47%	6.13%
0.72	6.53%	6.95%	6.81%	7.09%	0.55	6.53%	6.20%
0.73	6.59%	7.00%	6.86%	7.13%	0.57	6.59%	6.26%
0.74	6.65%	7.04%	6.91%	7.17%	0.58	6.65%	6.33%
0.75	6.71%	7.09%	6.96%	7.21%	0.60	6.71%	6.40%
0.76	6.77%	7.13%	7.01%	7.25%	0.61	6.77%	6.46%
0.77	6.83%	7.18%	7.06%	7.29%	0.63	6.83%	6.53%
0.78	6.89%	7.22%	7.11%	7.33%	0.64	6.89%	6.60%
0.79	6.95%	7.27%	7.16%	7.37%	0.66	6.95%	6.67%
0.80	7.01%	7.31%	7.21%	7.41%	0.67	7.01%	6.73%
0.81	7.07%	7.36%	7.26%	7.45%	0.69	7.07%	6.80%
0.82	7.13%	7.40%	7.31%	7.49%	0.70	7.13%	6.87%
0.83	7.19%	7.45%	7.36%	7.53%	0.72	7.19%	6.93%
0.84	7.25%	7.49%	7.41%	7.57%	0.73	7.25%	7.00%
0.85	7.31%	7.54%	7.46%	7.61%	0.75	7.31%	7.07%
0.86	7.37%	7.58%	7.51%	7.65%	0.76	7.37%	7.14%
0.87	7.43%	7.63%	7.56%	7.69%	0.78	7.43%	7.20%
0.88	7.49%	7.67%	7.61%	7.73%	0.79	7.49%	7.27%
0.89	7.55%	7.72%	7.66%	7.77%	0.81	7.55%	7.34%
0.90	7.61%	7.76%	7.71%	7.81%	0.82	7.61%	7.40%
0.91	7.67%	7.81%	7.76%	7.85%	0.84	7.67%	7.47%
0.92	7.73%	7.85%	7.81%	7.89%	0.85	7.73%	7.54%
0.93	7.79%	7.90%	7.86%	7.93%	0.87	7.79%	7.61%
0.94	7.85%	7.94%	7.91%	7.97%	0.88	7.85%	7.67%
0.95	7.91%	7.99%	7.96%	8.01%	0.90	7.91%	7.74%
0.96	7.97%	8.03%	8.01%	8.05%	0.91	7.97%	7.81%
0.97	8.03%	8.08%	8.06%	8.09%	0.93	8.03%	7.87%
0.98	8.09%	8.12%	8.11%	8.13%	0.94	8.09%	7.94%
0.99	8.15%	8.17%	8.16%	8.17%	0.96	8.15%	8.01%
1.00	8.21%	8.21%	8.21%	8.21%	0.97	8.21%	8.08%
1.01	8.27%	8.26%	8.26%	8.25%	0.99	8.27%	8.14%
1.02	8.33%	8.30%	8.31%	8.29%	1.00	8.33%	8.21%
1.03	8.39%	8.35%	8.36%	8.33%	1.01	8.39%	8.28%
1.04	8.45%	8.39%	8.41%	8.37%	1.03	8.45%	8.34%

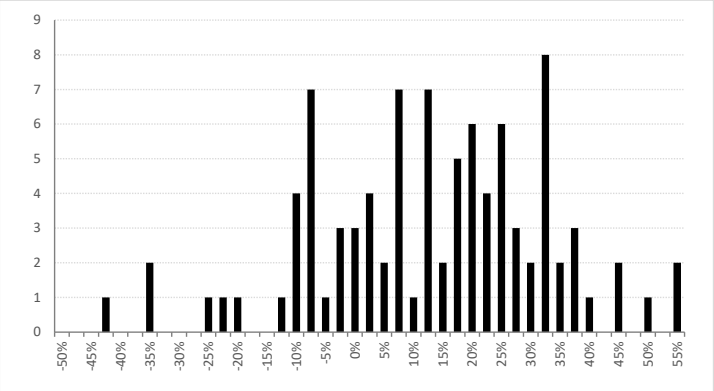
	Risk-Free Rate	2.21%			ECAPM	0.35	0.25
	MRP	6.00%	ECAPM alpha		Factors	0.67	0.75

Beta	CAPM	ECAPM	1.00%	2.00%	Raw Beta	Alt. ECAPM	Raw Beta ECAPM
1.05	8.51%	8.44%	8.46%	8.41%	1.04	8.51%	8.41%
1.06	8.57%	8.48%	8.51%	8.45%	1.06	8.57%	8.48%
1.07	8.63%	8.53%	8.56%	8.49%	1.07	8.63%	8.55%
1.08	8.69%	8.57%	8.61%	8.53%	1.09	8.69%	8.61%
1.09	8.75%	8.62%	8.66%	8.57%	1.10	8.75%	8.68%
1.10	8.81%	8.66%	8.71%	8.61%	1.12	8.81%	8.75%
1.11	8.87%	8.71%	8.76%	8.65%	1.13	8.87%	8.81%
1.12	8.93%	8.75%	8.81%	8.69%	1.15	8.93%	8.88%
1.13	8.99%	8.80%	8.86%	8.73%	1.16	8.99%	8.95%
1.14	9.05%	8.84%	8.91%	8.77%	1.18	9.05%	9.02%
1.15	9.11%	8.89%	8.96%	8.81%	1.19	9.11%	9.08%
1.16	9.17%	8.93%	9.01%	8.85%	1.21	9.17%	9.15%
1.17	9.23%	8.98%	9.06%	8.89%	1.22	9.23%	9.22%
1.18	9.29%	9.02%	9.11%	8.93%	1.24	9.29%	9.28%
1.19	9.35%	9.07%	9.16%	8.97%	1.25	9.35%	9.35%
1.20	9.41%	9.11%	9.21%	9.01%	1.27	9.41%	9.42%
1.21	9.47%	9.16%	9.26%	9.05%	1.28	9.47%	9.49%
1.22	9.53%	9.20%	9.31%	9.09%	1.30	9.53%	9.55%
1.23	9.59%	9.25%	9.36%	9.13%	1.31	9.59%	9.62%
1.24	9.65%	9.29%	9.41%	9.17%	1.33	9.65%	9.69%
1.25	9.71%	9.34%	9.46%	9.21%	1.34	9.71%	9.75%
1.26	9.77%	9.38%	9.51%	9.25%	1.36	9.77%	9.82%
1.27	9.83%	9.43%	9.56%	9.29%	1.37	9.83%	9.89%
1.28	9.89%	9.47%	9.61%	9.33%	1.39	9.89%	9.96%
1.29	9.95%	9.52%	9.66%	9.37%	1.40	9.95%	10.02%
1.30	10.01%	9.56%	9.71%	9.41%	1.42	10.01%	10.09%
1.31	10.07%	9.61%	9.76%	9.45%	1.43	10.07%	10.16%
1.32	10.13%	9.65%	9.81%	9.49%	1.45	10.13%	10.22%
1.33	10.19%	9.70%	9.86%	9.53%	1.46	10.19%	10.29%
1.34	10.25%	9.74%	9.91%	9.57%	1.48	10.25%	10.36%
1.35	10.31%	9.79%	9.96%	9.61%	1.49	10.31%	10.43%
1.36	10.37%	9.83%	10.01%	9.65%	1.51	10.37%	10.49%
1.37	10.43%	9.88%	10.06%	9.69%	1.52	10.43%	10.56%
1.38	10.49%	9.92%	10.11%	9.73%	1.54	10.49%	10.63%
1.39	10.55%	9.97%	10.16%	9.77%	1.55	10.55%	10.70%
1.40	10.61%	10.01%	10.21%	9.81%	1.57	10.61%	10.76%
1.41	10.67%	10.06%	10.26%	9.85%	1.58	10.67%	10.83%
1.42	10.73%	10.10%	10.31%	9.89%	1.60	10.73%	10.90%
1.43	10.79%	10.15%	10.36%	9.93%	1.61	10.79%	10.96%
1.44	10.85%	10.19%	10.41%	9.97%	1.63	10.85%	11.03%
1.45	10.91%	10.24%	10.46%	10.01%	1.64	10.91%	11.10%
1.46	10.97%	10.28%	10.51%	10.05%	1.66	10.97%	11.17%
1.47	11.03%	10.33%	10.56%	10.09%	1.67	11.03%	11.23%
1.48	11.09%	10.37%	10.61%	10.13%	1.69	11.09%	11.30%
1.49	11.15%	10.42%	10.66%	10.17%	1.70	11.15%	11.37%
1.50	11.21%	10.46%	10.71%	10.21%	1.72	11.21%	11.43%

Source: Schedule PC-11-1


12.0%
10.0%
8.0%
6.0%
4.0%
2.0%
0.0%
Expected Return (ROE)
CAPM Over-Estimates
CAPM Under-Estimates
0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50
Adjusted Beta Coefficient
CAPM
ECAPM

Frequency Distribution of Market Returns, 1926 - 2018



	Large Company Stocks Total Returns
Year	**Jan-Dec***
1926	0.1162
1927	0.3749
1928	0.4361
1929	-0.0842
1930	-0.2490
1931	-0.4334
1932	-0.0819
1933	0.5399
1934	-0.0144
1935	0.4767
1936	0.3392
1937	-0.3503
1938	0.3112
1939	-0.0041
1940	-0.0978
1941	-0.1159
1942	0.2034
1943	0.2590
1944	0.1975
1945	0.3644
1946	-0.0807
1947	0.0571
1948	0.0550
1949	0.1879
1950	0.3171
1951	0.2402
1952	0.1837
1953	-0.0099
1954	0.5262
1955	0.3156
1956	0.0656
1957	-0.1078
1958	0.4336
1959	0.1196
1960	0.0047
1961	0.2689
1962	-0.0873
1963	0.2280
1964	0.1648
1965	0.1245
1966	-0.1006
1967	0.2398
1968	0.1106
1969	-0.0850
1970	0.0386
1971	0.1430
1972	0.1899
1973	-0.1469
1974	-0.2647
1975	0.3723

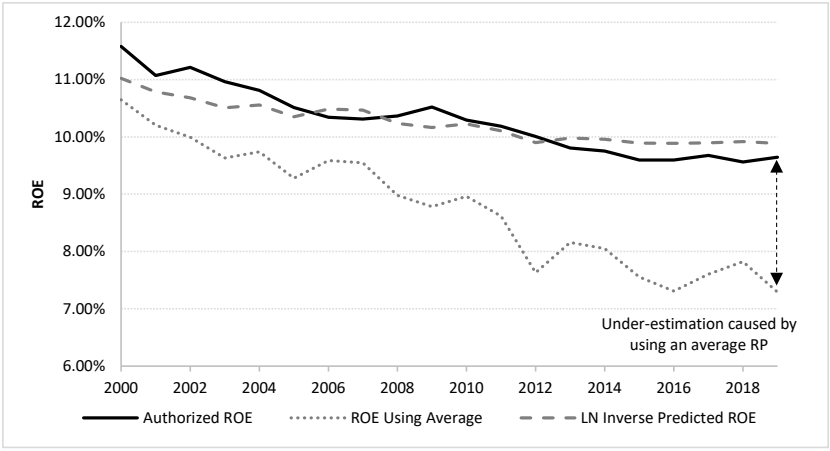
Market Return		
Bin	*Frequency*	*Cumulative %*
-50.00%	0	0.0%
-47.50%	0	0.0%
-45.00%	0	0.0%
-42.50%	1	1.1%
-40.00%	0	1.1%
-37.50%	0	1.1%
-35.00%	2	3.2%
-32.50%	0	3.2%
-30.00%	0	3.2%
-27.50%	0	3.2%
-25.00%	1	4.3%
-22.50%	1	5.4%
-20.00%	1	6.5%
-17.50%	0	6.5%
-15.00%	0	6.5%
-12.50%	1	7.5%
-10.00%	4	11.8%
-7.50%	7	19.4%
-5.00%	1	20.4%
-2.50%	3	23.7%
0.00%	3	26.9%
2.50%	4	31.2%
5.00%	2	33.3%
7.50%	7	40.9%
10.00%	1	41.9%
12.50%	7	49.5%
15.00%	2	51.6%
17.50%	5	57.0%
20.00%	6	63.4%
22.50%	4	67.7%
25.00%	6	74.2%
27.50%	3	77.4%
30.00%	2	79.6%
32.50%	8	88.2%
35.00%	2	90.3%
37.50%	3	93.5%
40.00%	1	94.6%
42.50%	0	94.6%
45.00%	2	96.8%
47.50%	0	96.8%
50.00%	1	97.8%
52.50%	0	97.8%
55.00%	2	100.0%
Count:	93	

	Large Company Stocks Total Returns
1976	0.2393
1977	-0.0716
1978	0.0657
1979	0.1861
1980	0.3250
1981	-0.0492
1982	0.2155
1983	0.2256
1984	0.0627
1985	0.3173
1986	0.1867
1987	0.0525
1988	0.1661
1989	0.3169
1990	-0.0310
1991	0.3047
1992	0.0762
1993	0.1008
1994	0.0132
1995	0.3758
1996	0.2296
1997	0.3336
1998	0.2858
1999	0.2104
2000	-0.0910
2001	-0.1189
2002	-0.2210
2003	0.2868
2004	0.1088
2005	0.0491
2006	0.1579
2007	0.0549
2008	-0.3700
2009	0.2646
2010	0.1506
2011	0.0211
2012	0.1600
2013	0.3239
2014	0.1369
2015	0.0138
2016	0.1196
2017	0.2183
2018	-0.0438
Average	0.1188
Std. Dev.	0.1976

Source: Duff & Phelps, 2019 SBBI, Appendix A-1

Relative Accuracy of Average Equity Risk Premiums and Predicted Risk Premiums

Rate Case Year	Auth. ROE [1]	Avg 30-Yr Treasury [2]	Average RP [3]	ROE Using Average	Error	LN Inverse Predicted RP [4]	LN Inverse Predicted ROE	Error
2000	11.58%	5.93%	4.71%	10.65%	-0.93%	5.09%	11.02%	-0.56%
2001	11.07%	5.49%	4.71%	10.20%	-0.87%	5.29%	10.78%	-0.29%
2002	11.21%	5.28%	4.71%	9.99%	-1.22%	5.40%	10.68%	-0.53%
2003	10.96%	4.92%	4.71%	9.63%	-1.33%	5.59%	10.51%	-0.46%
2004	10.81%	5.03%	4.71%	9.74%	-1.07%	5.53%	10.56%	-0.25%
2005	10.51%	4.57%	4.71%	9.28%	-1.23%	5.78%	10.35%	-0.16%
2006	10.34%	4.88%	4.71%	9.59%	-0.75%	5.61%	10.49%	0.14%
2007	10.31%	4.84%	4.71%	9.55%	-0.76%	5.63%	10.47%	0.16%
2008	10.37%	4.27%	4.71%	8.98%	-1.39%	5.97%	10.23%	-0.13%
2009	10.52%	4.07%	4.71%	8.78%	-1.74%	6.09%	10.16%	-0.36%
2010	10.29%	4.25%	4.71%	8.96%	-1.33%	5.98%	10.23%	-0.07%
2011	10.19%	3.90%	4.71%	8.62%	-1.57%	6.20%	10.11%	-0.08%
2012	10.01%	2.92%	4.71%	7.63%	-2.38%	6.98%	9.90%	-0.11%
2013	9.81%	3.45%	4.71%	8.16%	-1.65%	6.54%	9.98%	0.18%
2014	9.75%	3.34%	4.71%	8.05%	-1.70%	6.62%	9.96%	0.21%
2015	9.60%	2.84%	4.71%	7.55%	-2.04%	7.05%	9.89%	0.29%
2016	9.60%	2.60%	4.71%	7.31%	-2.28%	7.29%	9.89%	0.29%
2017	9.68%	2.89%	4.71%	7.61%	-2.07%	7.00%	9.90%	0.22%
2018	9.56%	3.11%	4.71%	7.82%	-1.74%	6.81%	9.92%	0.36%
2019	9.64%	2.58%	4.71%	7.29%	-2.35%	7.31%	9.89%	0.24%
Average:	10.29%	4.06%	4.71%	8.77%	-1.52%	6.19%	10.25%	-0.05%



Notes

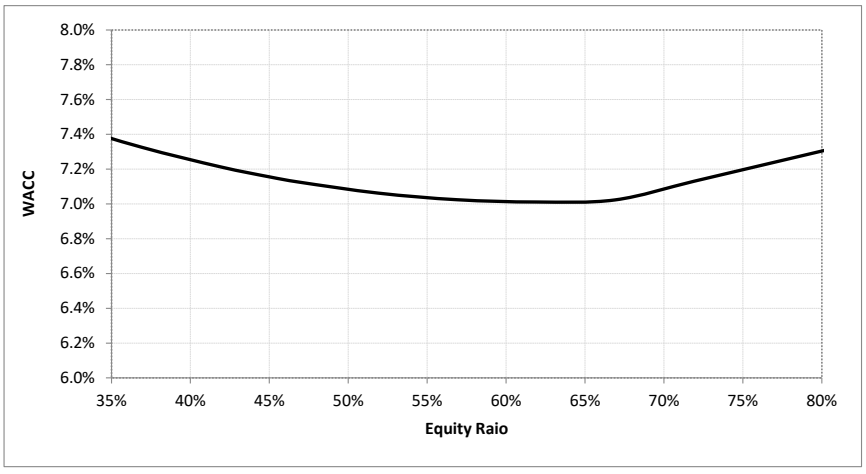
[1] Source: Regulatory Research Associates: Regulatory Focus, Major Rate Case Decisions January - December 2019, January 31, 2020
[2] Source: Bloomberg Professional
[3] Source: Schedule RBH-D5 Average Risk Premium
[4] Source: Schedule RBH-D5 Regression coefficients

Effects of Leverage on the Company's Return on Equity

Inputs/Assumptions	
Moody's A Utility Index	3.50%
Moody's Baa Utility Index	4.00%
Spread	0.50%
Liberty-Empire	51.90%
Levered ROE	9.90%
Embedded Cost of Debt	4.65%
Effective Tax Rate	24.16%

DCF Adjustment	
Debt/Total Capital Ratio	48.10%
Debt/Equity Ratio	92.68%
Calculated Unlevered ROE	7.73%
Check: Re-Levered ROE	9.90%

Equity Ratio	D/E Ratio	Re-Levered DCF Cost of Equity	Cost of Debt	Weighted Average Cost of Capital
11.90%	7.40	25.04%	5.25%	7.61%
16.90%	4.92	19.23%	5.25%	7.61%
21.90%	3.57	16.07%	5.25%	7.62%
26.90%	2.72	14.09%	5.25%	7.63%
31.90%	2.13	12.72%	5.00%	7.46%
36.90%	1.71	11.73%	4.75%	7.33%
41.90%	1.39	10.98%	4.50%	7.21%
45.00%	1.22	10.59%	4.35%	7.16%
46.90%	1.13	10.38%	4.25%	7.13%
51.90%	0.93	9.90%	4.00%	7.06%
56.90%	0.76	9.50%	3.75%	7.02%
61.90%	0.62	9.17%	3.50%	7.01%
66.90%	0.49	8.89%	3.25%	7.02%
71.90%	0.39	8.65%	3.25%	7.13%
76.90%	0.30	8.44%	3.25%	7.24%
81.90%	0.22	8.25%	3.25%	7.34%
86.90%	0.15	8.09%	3.25%	7.45%
91.90%	0.09	7.94%	3.25%	7.56%
96.90%	0.03	7.81%	3.25%	7.67%
100.00%	0.00	7.73%	3.25%	7.73%



Effects of Leverage on the Company's Return on Equity

Notes:

Under Modigliani-Miller Proposition:

$$R_e = R_a + \frac{D}{E} (R_a - R_d) \text{ X } (1 - T)$$

or, rearranged:

$$R_a = \frac{(Re + \frac{D}{E} \text{ x } R_d \text{ x } (1 - T))}{(1 + \frac{D}{E} \text{ x } (1 - T))}$$

R_a	= Unlevered Return on Equity
R_e	= Levered Return on Equity
R_d	= Cost of Debt
T	= Tax Rate
D/E	= Debt/Equity Ratio