BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA

In the Matter of the Application of Otter Tail Power Company for Authority to Increase Its Electric Rates	)))	**Docket No. EL18-021**

RATE OF RETURN ON EQUITY

TESTIMONY OF BASIL L. COPELAND JR.
ON BEHALF OF
THE COMMISSION STAFF

February 19, 2019

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I. BACKGROUND AND QUALIFICATIONS

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Basil L. Copeland Jr. and my business address is 14619 Corvallis Road, Maumelle, AR, 72113.

Q. WHAT IS YOUR OCCUPATION, BY WHOM ARE YOU EMPLOYED, AND FOR WHOM ARE YOU TESTIFYING?

A. I am an economist, specializing in energy and utility economics and a principal in Chesapeake Regulatory Consultants, Inc., Annapolis, MD. I am testifying on behalf of the Staff of the South Dakota Public Utilities Commission.

Q. PLEASE DESCRIBE YOUR EDUCATION AND PROFESSIONAL EXPERIENCE.

A. I received my education at Portland State College (1967-1969), New Mexico Institute of Mining and Technology (1969), and Oregon State University (1972-75). In 1974 I received a Bachelor of Science degree in Economics from Oregon State University and in 1976 a Master of Science degree in Resource Economics (with a minor in Business Finance) from the same institution.

From August 1975 to February 1977 I worked as a financial analyst and staff economist for the Arkansas Public Service Commission. From March 1977 to August 1978 I worked in a similar position for the Iowa State Commerce Commission. In September of 1978 I went to work for the Attorney General of Arkansas in a U.S. Department of Energy-funded office of consumer services with responsibility for economic analysis in electric utility rate cases. While with the Attorney General I assisted in the development of legislation that created the Arkansas Department of Energy. In July of 1979, soon after the Department was officially created, I became Deputy Director for Forecasting. In that position I directed a staff with broad

responsibilities that included the development of an energy management information system for monitoring energy supply and demand in Arkansas, including comprehensive forecasts of energy demand by fuel source and sector.

I left the Arkansas Department of Energy in January 1981 and worked briefly as an independent consultant before joining the consulting firm of Hess and Lim, Inc. in April 1981. While employed by Hess and Lim, I served as a consultant on numerous rate cases before the FERC and various state utility commissions. I left Hess & Lim in October 1986 to join with two other consultants in the founding of Chesapeake Regulatory Consultants. I have testified or provided technical assistance in over 150 proceedings before the FERC, the FCC, and regulatory bodies in: Alabama, Arizona, Arkansas, California, Colorado, Georgia, Illinois, Iowa, Kansas, Maine, Maryland, Mississippi, Montana, New Jersey, New Mexico, New York, Oklahoma, Pennsylvania, Rhode Island, South Dakota, Texas, Vermont, Washington State, West Virginia, and the District of Columbia. On four occasions I have been invited to appear on the program of the annual conference of Michigan State University's Institute of Public Utilities and I have served as faculty for the Michigan State-NARUC summer training program for regulatory commission personnel.

I have published numerous articles, set forth in Appendix A, on a variety of utility issues, including articles or comments in *Land Economics, American Economic Review, Public Utilities Fortnightly, Journal of Business Research, Yale Journal on Regulation, Journal of Portfolio Management, Energy Law Journal*, and the *Financial Analysts Journal*. My 1982 article in the *Financial Analysts Journal* on the equity risk premium received a Graham and Dodd award from the Financial Analysts Federation. I have also served as an academic referee for two academic journals

where I reviewed articles on utility economics and finance. My article in the Spring 1991 issue of the *Energy Law Journal*[1] dealt with the constitutional standards for due process as applied to utility ratemaking under the celebrated Hope case. It offers a comparative analysis and critique of the 1989 Duquesne decision.[2] A list of publications is provided at the end of my testimony.

II. OVERVIEW OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. This is a filing by Otter Tail Power Company ("OTP"), a subsidiary of Otter Tail Corporation ("OTC" or "OTTR"), for authority to increase its electric rates. The purpose of my testimony is to present evidence with respect to the cost of equity capital for OTP and to recommend a fair and reasonable rate of return on equity based upon that evidence. I will also review and respond to OTP's testimony on this matter.

Q. PLEASE SUMMARIZE YOUR CONCLUSIONS REGARDING THE COST OF EQUITY AND YOUR RECOMMENDED RATE OF RETURN ON EQUITY.

A. Based on the evidence presented in my testimony I conclude that the required rate of return on equity ("cost of equity") is presently about 7 percent. Taking into consideration the impact upon OTC's stock price in relation to its book value ("market-to-book ratio") I recommend a return on equity ("ROE") for OTP of 8.25 with a range of 25 base points on either side, e.g., 8.0 percent to 8.5 percent. Though I am recommending a rate of return on equity of 8.25 percent, as just noted my analysis of the cost of equity indicates that it is probably about 7 percent at the present time. The following

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[1] "Procedural vs. Substantive Economic Due Process for Public Utilities," with Walter Nixon. ***Energy Law Journal*** 12 No. 1 (Spring 1991): 81-110.

[2] Federal Power Comm'n v. Hope Natural Gas, 320 U.S. 591 (1944); Duquesne Light Co. v. Barasch, 488 U.S. 591 (1989).

table summarizes the evidence for this conclusion based upon three different methodologies I employed, as well as two others employed by Mr. Hevert after taking into consideration fundamental errors in his applications of those methodologies:

Cost of Equity Estimates

Methodology	Result	Testimony Page Reference
Constant Growth Discounted Cash Flow (DCF)	7.71%	15
Non-Constant Growth Discounted Cash Flow (DDM)	7.05%	17
Market-to-Book/Excess Returns Analysis (XROE)	7.03%	29
Capital Asset Pricing Model (CAPM)	6.74%	71
Bond Yield Plus Risk Premium	7.00%	76

Though the cost of equity is presently about 7 percent, using this as the allowed rate of return would have a significant impact on OTC's market price and market-to-book ratio. While I think that the Commission should move OTP's allowed rate of return on equity toward a market-to-book ratio of no more than 1.25, I recognize that it would not be prudent to do this all at once. My recommended rate of return of 8.25 percent is adequate to support a market-to-book ratio of 1.37 at the present time. I will explain how I arrived at this number and discuss further its implications for a fair and reasonable rate of return in Section V, Part B, of my testimony.

Q. YOUR RECOMMENDED RETURN ON EQUITY IS BELOW THE 9.25 PERCENT THAT THE COMMISSION GRANTED IN DOCKET NO. EL11-019. PLEASE ADDRESS THAT.

A. Capital costs have declined since the issue of rate of return was adjudicated in that docket. This is apparent from the results shown in the above table for the first two methodologies, which are exactly the same as I employed in Docket No. EL11-019 except for the inputs which reflect current financial market realities. The stock market is near all-time highs and interest rates are near all-time lows, indicative of lower

capital costs than at the time the Commission set that rate of return on equity. I will discuss this further in Section IV of my testimony and present evidence in support of this decline in the cost of capital since the Commission ruled in Docket No. EL11-019.

Q. PLEASE DESCRIBE HOW YOU HAVE ORGANIZED THE REMAINDER OF YOUR TESTIMONY.

A. In Section III, I present a brief discussion of basic principles regarding rate of return and the cost of equity in regulation. In Section IV, I discuss recent trends in capital markets and capital costs and their relevance to determining an allowed return on equity. Section V describes the cost of equity methodologies I employ and presents my findings based upon those methodologies. In Section VI, I discuss OTP's testimony and evidence regarding cost of equity capital and rate of return on equity. Section VII summarizes my conclusions and recommendations.

III. ROLE OF RATE OF RETURN AND THE COST OF EQUITY IN REGULATION

Q. PLEASE EXPLAIN THE RELATIONSHIP BETWEEN RATE OF RETURN AND THE COST OF EQUITY.

A. Regulated utilities typically have utilized three sources of capital to capitalize their utility assets: common stock, preferred stock, and long-term debt (though not all utilities issue preferred stock). The rate of return for a regulated firm is usually based on its “weighted average cost" of this capital. This weighted average cost of capital represents the cost of the individual sources of capital weighted by their proportion as represented in the capital structure.

Q. HOW ARE CAPITAL COSTS MEASURED?

A. The cost of long-term debt (and preferred stock) can be directly measured from the interest (dividend) rate and related costs on the various issues of debt (or preferred

stock) used to support the capital structure and is only rarely a direct source of significant controversy in establishing a rate of return for a regulated utility. The cost of common equity however cannot be directly measured or estimated. It must be inferred from market-based common stock dividend and price information using one or more cost of equity estimation methodologies.

Q. WHY IS IT IMPORTANT TO BASE THE ALLOWED RATE OF RETURN ON EQUITY ON THE MARKET COST OF EQUITY?

A. Basing the allowed rate of return on equity on the market cost of equity accomplishes two significant and desirable regulatory objectives. First, it fairly balances the competing interests of ratepayers and shareholders. Ratepayers are interested in receiving safe and reliable service at the lowest possible cost. Shareholders are interested in receiving the highest rate of return they can. A rate of return based on the market cost of equity fairly and reasonably balances these competing interests. If the allowed rate of return on equity is significantly below the market cost of equity the impairment of the firm's financial integrity undermines its ability to render safe and reliable service. So, it is usually in the ratepayer's interest to allow a rate of return on equity at least equal to the market cost of equity. Ratepayers however have no interest in paying a rate of return significantly above the market cost of equity. And while shareholders might delight at the opportunity to earn the excess profits associated with a return on equity above the market cost of equity, they will not complain if the allowed equity return is consistently established on the basis of the market cost of equity. Such a return is commensurate with the financial risks they incur and with the returns they could earn elsewhere in the marketplace on comparable investments.

Second, an allowed rate of return on equity for the Company equal to the market cost of equity provides the appropriate management incentives to operate the firm safely, reliably and efficiently. An allowed rate of return on equity equal to the market cost of equity provides the same kind of incentive to the managers of a regulated firm as do earnings per share and market value goals for a competitive, unregulated firm. If management has a reasonable opportunity to earn a rate of return on equity equal to the market cost of equity, it should be able to meet all reasonable goals and expectations of both shareholders and ratepayers.

IV. COST OF EQUITY CAPITAL – A CURRENT CAPITAL MARKET PERSPECTIVE

Q. WHAT IS THE PURPOSE OF THIS PORTION OF YOUR TESTIMONY?

A. The last adjudicated rate of return on equity in South Dakota was the 9.25 percent return on equity allowed in Docket No. EL11-019, in an order issued July 2, 2012. The capital market data upon which the Commission relied in that docket spanned the latter months of 2011 and the early months of 2012. There is persuasive evidence that capital market costs, including the cost of equity, have declined since that time. This portion of my testimony presents evidence of that.

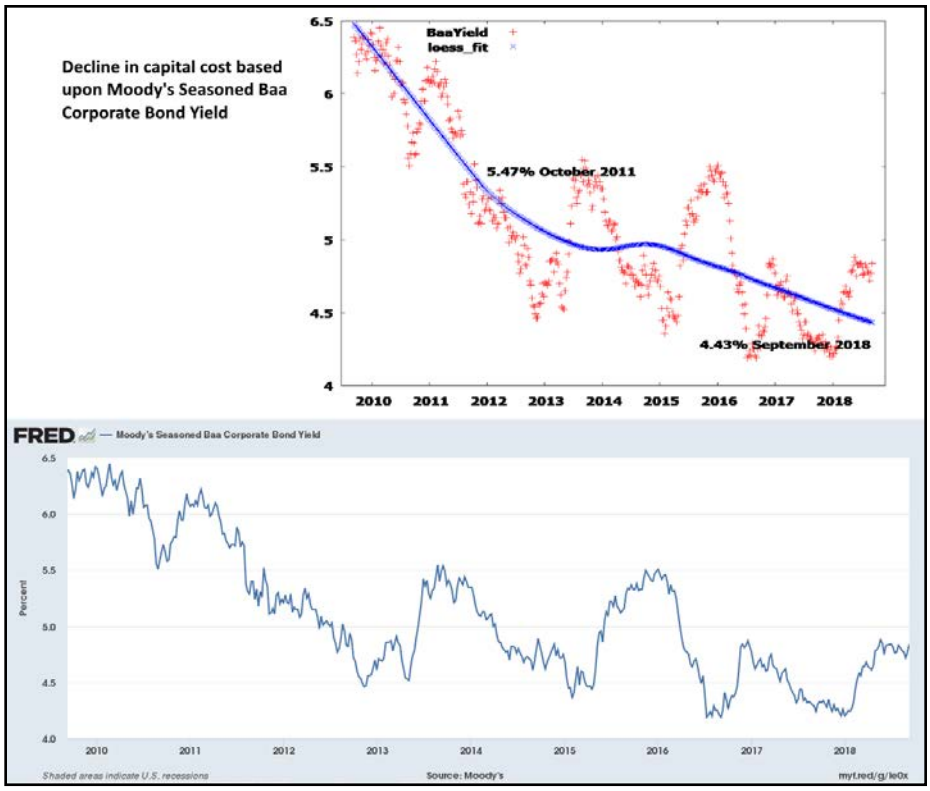
Q. TO WHAT KIND OF EVIDENCE DO YOU REFER?

A. Since the Commission's decision in Docket No. EL11-019 there has been a remarkable and steady downward trend in equity market risk as evinced by the Standard & Poor's Volatility Index (VIX). The following chart graphically depicts this trend:

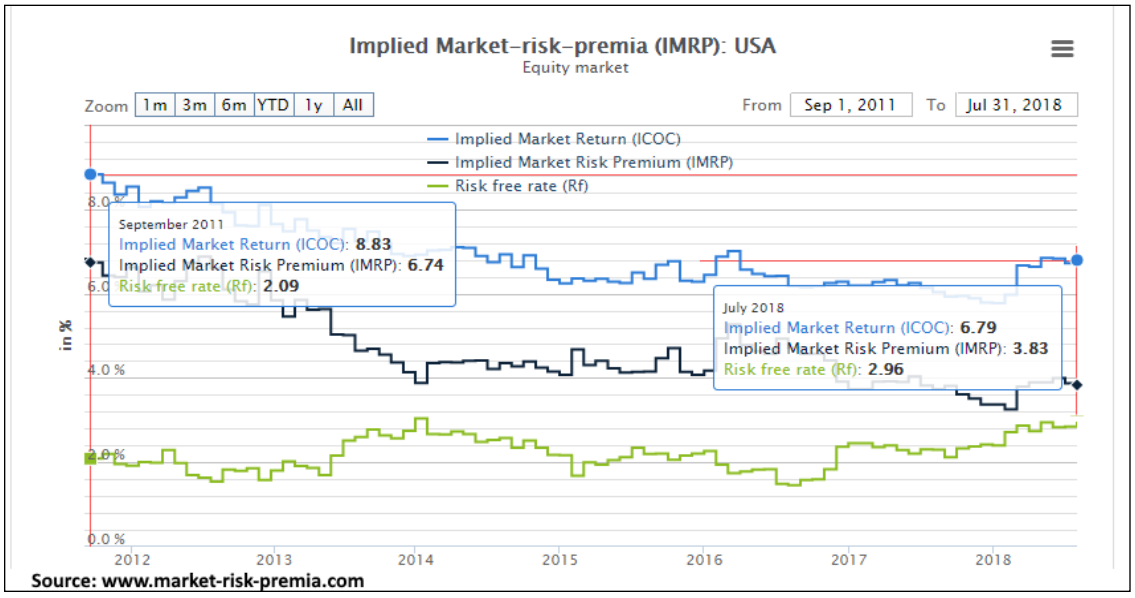
In the latter months of 2011, the VIX index was above 40. It fell sharply in the early months of 2012 and has generally trended downward since then as shown by the 180-day moving average. While it increased briefly in late 2016, it fell sharply through 2017 before spiking in early 2018. Yet, the overall trend remains downward, especially relative to what it was at the time rate of return was being considered in Docket No. EL11-019. This is an indication that market perceptions of equity risk are below the levels that existed during Docket No. EL11-019.

The trend in corporate interest rates since 2011 likewise suggests a decline in risk and cost of capital since the time of the Commission's decision in Docket No. EL11-019. As shown in the chart on the next page, the trend in Moody's Seasoned Corporate Baa Bond Yield generally matches the pattern of decline in VIX since 2011, with upward ticks in yields in 2014, 2016, and early 2018, but with the overall trend remaining downward. Also shown in the chart is a trend line for the data based on a "loess" regression line showing an "average" decline in yield of just over 100 basis

points (5.47% versus 4.43%).[3]



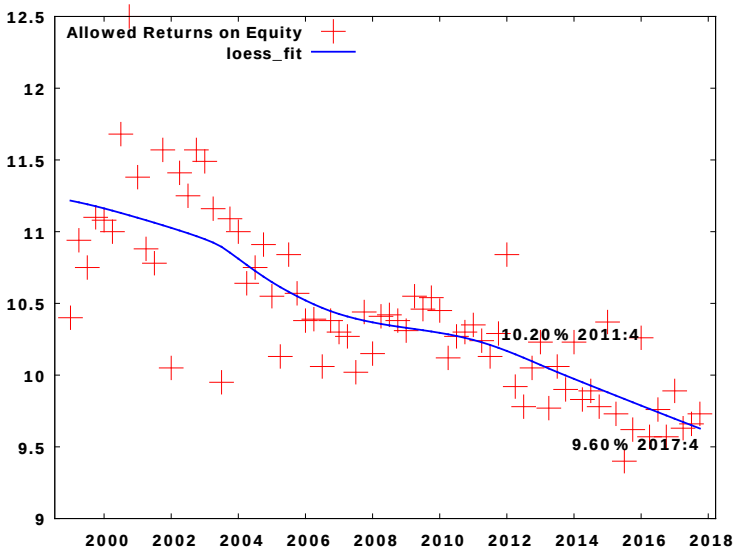
A decline in the cost of equity since the 2012 decision is also seen in following chart:



[3] Rather than fitting a straight line through the data, loess regression is a method of producing a smooth "best fit" through the data. Though not a strict acronym it refers to "local [weighted] regression.

In it the implied market required rate of return on equity (for the market as a whole) is estimated to have declined from 8.83 percent in October 2011 to 6.79 percent as of July 2018, a decline of 204 basis points.

A decline in the market required rate of return on equity is not implausible given the steady, heady, and even meteoric rise in stock prices since 2011. In 2011, the average market-to-book ratio for a broad sample of electric utilities was 1.46; by the end of 2017 it had risen to 1.96. The intervening years have been *more* than kind to the electric utility industry. A rising market-to-book ratio reflects either a falling cost of equity, or earnings that are rising significantly faster than costs. The latter is more or less unheard of in utility rate regulation. In my view (and backed up by the evidence in Section V, Part B, of my testimony) the rising market-to-book ratio reflects a falling cost of equity *that has not been passed on to ratepayers in the form of reduced rates*. We can see that when we look at the pattern of allowed rates of return on equity over time. Shown at right is a plot of allowed rates of return on equity as tracked quarterly by the Edison Electric Institute. Based on the "loess" trend line the average allowed return on equity has only declined 60 basis points since 2011. That has clearly been inadequate to pass on to ratepayers the full effect of declining capital costs since 2011 or the market-to-book ratio would not have increased by 50 percent of book value since then. I will return to this later in my testimony in Section V, Part B, where I discuss the



relationship between cost of equity, allowed rates of return on equity, and market-to-book ratios and how these metrics should be viewed in a proper balancing of rate-payer and investor interests.

For now, the point should be clear: 2018 is not 2011, and the improvement in financial market conditions since 2011, both for stocks and bonds, make a presumptive case for a lower rate of return on equity than was allowed in 2011.

V. OTP'S COST OF EQUITY CAPITAL

Q. WHAT METHODS DID YOU USE TO DETERMINE OTP'S COST OF EQUITY CAPITAL?

A. I used two variations of the "Discounted Cash Flow" ("DCF") methodology. I also undertook a supplemental analysis of market-to-book ratios and excess returns on equity reflected in current market-to-book ratios.

A. DCF ANALYSIS

Q. PLEASE EXPLAIN THE BASIC PROCEDURES INVOLVED IN USING THE "DISCOUNTED CASH FLOW" METHODOLOGY.

A. In its most basic form, the DCF theory is a "constant growth" model in which the investor's required return on common stock equity equals the dividend yield on the stock plus the expected rate of growth in the dividend. This relationship is commonly represented mathematically as:

$$k = D/P + g$$

where k is the cost of equity capital (the investor's required return), D/P is the dividend yield (the dividend divided by market price), and g is the expected rate of growth in the dividend. Depending on the nature of the assumptions and mathematical procedures employed in the derivation of the model, the dividend yield portion of the total return is variously represented as D_0/P_0 or D_1/P_0 where D_0 and D_1 represent

the "current dividend" and the "next period dividend," respectively. Depending further on what is assumed about the frequency of the dividend payout and the compounding of intra-period retained earnings, an annual yield D_0/P_0 will tend to understate the effective yield, while D_1/P_0 will tend to overstate it. A valid conceptual argument can be made for using an average of the two, sometimes presented in the form $D_0(1+ 0.5g)/P_0$. This is the general form of the constant growth model I used in my initial DCF analysis.

Q. WHAT OTHER STEPS ARE INVOLVED IN IMPLEMENTING THE DCF METHODOLOGY?

A. The principal steps in implementing the DCF approach are the selection of a sample of companies to which to apply the method, and the selection of measures of expected growth. On the selection of a sample of companies to which to apply the method, I will ordinarily rely on the sample used by the applicant's cost of capital witness unless there is a reason not to. Here I used the same 9-company sample of utilities used by OTP's witness.

Q. WHAT DATA DID YOU EXAMINE IN ORDER TO ESTIMATE THE INVESTOR EXPECTED GROWTH RATE FOR YOUR DCF ANALYSIS?

A. For my constant growth DCF study, I utilized industry analysts' projected growth in earnings per share ("EPS") from Zacks and Yahoo (they may come from the same source so I use a simple average of the two) and Value Line estimates of growth in dividends per share ("DPS"), growth in book value per share ("BVPS") and the Value Line estimate of "% Retained to Common Equity" (a measure of long-term sustainable growth).[4] Theoretically, if the constant growth assumptions are valid earnings,

[4] Zacks, Yahoo and Value Line are sources of financial data widely used by investors. Besides basic financial data, Zacks and Yahoo both publish survey results of expected earnings growth (referred to

dividends, and book value per share should all grow at the same rate. Where this is the case, it is sometimes possible to derive reasonable and accurate estimates of the cost of equity using only one of these growth measures as a "proxy" for the expected rate of growth in dividends. But if the payout ratio is not constant then using just projected earnings or dividend growth can result in distorted estimates of the DCF cost of equity.

Q. WHAT ARE YOUR ESTIMATES OF THE PROJECTED GROWTH RATE USING THESE MEASURES?

A. The projected growth rates used in my constant growth DCF study for the sample of 9 electric utilities are shown on Exhibit ___(BLC-1), Schedule 1. As can be seen from Columns F and G there is substantial disparity between the EPS growth rates projected by Zacks and Yahoo and the DPS growth rates projected by Value Line. The median (which is a better measure of central tendency if there are outliers) projected EPS growth rate, 4.56 percent, is lower than the median DPS growth rate of 5.50 percent. However, the median "% Return to Common Equity" in Column I, 3.50 percent, is well below the median analyst projected EPS growth forecast of 4.56 percent, implying that the projected earnings growth rate is unsustainable for the long-term. But the constant growth DCF model is a model of investors' long-term dividend growth expectations.

Q. WHAT IS THE BEST WAY TO ESTIMATE THE CONSTANT GROWTH DCF COST OF EQUITY TO AVOID OVERSTATING OR UNDERSTATING INVESTORS LONG-TERM GROWTH EXPECTATIONS?

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as "consensus" estimates of expected earnings growth). Value Line's "% Retained to Common Equity" is a measure of the ratio of retained earnings to common equity, or the "plowback ratio." It is equivalent to the "br" measure of expected dividend growth used in some presentations of the DCF model.

A. The best way to estimate the constant growth DCF cost of equity is to rely upon an average of the EPS, DPS, and BVPS projections, along with the "% Return to Common Equity" measure of growth. Short-run or near-term changes in payout ratio do not impact BVPS growth as significantly as they do EPS and DPS growth, and over time EPS and DPS growth rates will always revert to the rate of growth in BVPS.[5] In the non-constant growth method which I discuss below, we can make more specific allowances for differences in the rates of growth in these parameters. But for the constant growth rate approach an average of these various growth rate measurements is required to reasonably estimate investors' long-term growth expectations. The averages are shown in Column J; the mean expected growth rate is 4.38 percent and the median is 4.41 percent.

Q. PLEASE DESCRIBE THE RESULTS OF YOUR CONSTANT GROWTH DCF STUDY FOR THE ELECTRIC UTILITY SAMPLE.

A. The results are shown on Exhibit___(BLC-1), Schedule 1, Column K. Column K is the sum of Column E and the average of Columns F, G, H and I (the average is shown in Column J). Column E is the dividend yield portion of the DCF cost of equity, and is computed using a 180-day moving average stock price.[6] By averaging the growth

[5] A trend in the payout ratio faces two limits – a payout ratio of 100 percent if the payout ratio is rising, and a payout ratio of zero if the payout ratio is declining. At these limits growth in dividends or earnings becomes equal to the rate of growth in book value per share. If the trend in payout ratio levels off, so that payout ratio stabilizes, growth in dividends and earnings will equal growth in book value per share. So regardless of the trend in payout ratio, growth in dividends and earnings will always, ultimately, revert to growth in book value per share.

[6] However, I compare the 180-day moving average to "Bollinger Bands" around the recent stock price. Bollinger Bands are bands used in charting stock prices, and plot a range of two standard deviations around a 20-day moving average. If the 180-day moving average is outside the Bollinger Band, I use the price indicated by the Bollinger Band in the place of the 180-day moving average. Thus, the stock price I use is always within two standard deviations of a 20 day moving average, answering any concern that use of a 180 day moving average represents stale price data. While "Bollinger Bands" are most commonly associated with "technical" analysis of stock price movements, their use here implies no agreement with the theory or practice of technical analysis. They simply

rates in Columns F, G, H and I, we avoid the bias that arises from relying solely upon a single measure of expected growth. The mean and median estimate of "k" are 7.60 percent and 7.71 percent respectively.

Q. DID YOU UNDERTAKE ANY ADDITIONAL DCF ANALYSIS?

A. Yes, I did. In addition to the more traditional form of the DCF methodology, I developed DCF estimates using a "dividend discount model" ("DDM"). DDMs are more general forms of the DCF methodology which embody less restrictive assumptions than the traditional methodology. The traditional methodology is sometimes referred to as the "constant growth model," and assumes that dividends, earnings, book value per share, and share price all grow at the same uniform rate of growth into perpetuity. While this is rarely the case in actuality, it is not an unreasonable assumption if the differences are small, a condition which implicitly requires a relatively constant dividend payout ratio. Where dividend payout ratios are expected to trend upward or downward over extended periods of time the use of five-year earnings growth projections of the type published by Zacks, Value Line, or other investment services in a constant growth form of the DCF model can produce distorted and unreliable results. Multiple-period dividend discount models provide more reliable and accurate measures of the expected DCF return under such conditions.

Q. PLEASE EXPLAIN IN FURTHER DETAIL HOW THE MULTIPLE PERIOD DIVIDEND DISCOUNT MODEL IS DERIVED.

A. Multiple period dividend discount models are based on finite horizon DCF models of the form:

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provide a readily available means of adjusting for the effect of dramatic short term price movements in developing an "average" price for DCF analysis.

$$P_0 = \frac{D_1}{(1+k)^1} + \frac{D_2}{(1+k)^2} + ... + \frac{D_t}{(1+k)^t} + \frac{P_t}{(1+k)^t}$$

where

$$P_t = \frac{D_t(1+g)}{(k-g)}$$

Here *t* is a finite time period at the end of which the stock would be sold for P_t. By postponing the period of constant growth to some finite point of time in the future, dividends can be projected during the interim that follow any pattern consistent with expected earnings growth and dividend payout ratios.

Q. ARE SUCH DDM MODELS ACTUALLY USED BY INVESTORS TO ESTIMATE EXPECTED RETURNS?

A. Yes. Firms such as Prudential-Bache and Merrill Lynch have used such models to develop expected returns, which are then used by their investment analysts in making stock buy-hold-sell recommendations. Standard textbooks also present them along with constant growth models. The New York Public Service Commission uses a variation of this approach to determine allowed return on equity.

Q. PLEASE DESCRIBE IN FURTHER DETAIL YOUR IMPLEMENTATION OF THIS METHODOLOGY.

A. The basic data employed in my implementation of this methodology is presented, for the 9-company sample of electric utilities, in Exhibit___(BLC-1), Schedule 2. This is a summary sheet with input data and the resulting DDM estimates of the cost of equity. The basic input data consists of the current dividend yield, an estimated EPS projection for 2018, the current analysts' consensus EPS growth projection, an estimate of long-term growth into perpetuity, and estimated retention ratios for 2018, 2022, and 2037. The DDM analysis assumes that earnings grow from 2018 to 2022

at the indicated analysts' consensus EPS growth rate (as noted for each company), and at the long-term growth rate (3.50 percent, the median value of Value Line's "% Retained to Common Equity") in perpetuity after 2037. The period from 2022 to 2037 is a transition period during which the retention ratio changes from the value projected by Value Line in the year 2022 to a common value of 0.36 (the median Value Line estimate for 2022) for all companies in the sample in the year 2037. The use of a common retention rate or payout ratio, and growth rate, reflect the statistical property of "mean reversion," that statistical observations tend to revert, or regress, toward the sample mean over time. Constant growth assumptions — long-term growth of 3.50 percent, and a retention ratio of 0.36 percent — apply after the year 2037, allowing the determination of a terminal share price for the year 2037.[7] These long-term conditions after 2037 are applied to all the companies in the sample. Having generated a series of cash flows, the model generates an expected return, *k*, by solving the following equation:

$$0 = \frac{D_1}{(1+k)^1} + \frac{D_2}{(1+k)^2} + \ldots + \frac{D_t}{(1+k)^t} + \frac{P_t}{(1+k)^t} - P_0$$

The solution to this equation is the value of *k* which makes the right-hand side of the equation zero. This can only be done by trial and error. However, there are generally available computer algorithms for finding the solution to such formulas automatically. The DDM returns shown on Exhibit___(BLC-1), Schedule 2, were developed using the "Goal Seek" option in an Excel spreadsheet. The mean DDM return for the 9-company sample was 6.92 percent and the median DDM return was 7.05 percent.

[7] To determine the terminal sale price, the final year's dividend is adjusted for half a year's growth beyond the terminal year, equivalent to a (1 +0.5g) adjustment to the dividend yield.

Q. WHAT ARE YOUR CONCLUSIONS USING THE DCF AND DDM APPROACHES TO ESTIMATE THE COST OF EQUITY?

A. Based just upon the DCF and DDM approaches to estimating the cost of equity, the cost of equity appears to be about 7.0 percent to 7.5 percent at the present time.

Q. ARE THESE THE SAME METHODOLGIES YOU USED IN DOCKET NO. EL11-019?

A. Yes, they are. The methodologies are *exactly* the same. Only the input variables differ. That the methodologies result in a much lower estimate of the cost of equity at the present time is consistent with the evidence presented above in Part IV of a declining cost of capital since the Commission's last adjudicated return on equity finding in Docket No. EL11-019.

B. MARKET-TO-BOOK RATIOS, EXCESS RETURNS, AND THE COST OF EQUITY

Q. WHAT IS THE MARKET-TO-BOOK RATIO?

A. The market-to-book ratio is the ratio of a stock's selling price to its book value. If a stock has a book value per share of $10.00 and it is selling for $12.50 per share, the market-to-book ratio is 1.25.

Q. WHAT CAN MARKET-TO-BOOK RATIOS TELL US ABOUT THE COST OF EQUITY?

A. Market-to-book ratios can tell us at a glance whether a firm's return on book equity is above or below its market cost of equity. When a firm is expected to earn a return on book equity greater than the cost of equity, investors will bid up the price of the stock to capture the "excess return" the stock is offering on its book equity in relation to the required rate of return. In other words, the market-to-book ratio will exceed 1.0. If a firm is expected to earn return on book equity less than the cost of equity, investors will sell the stock, driving its price below its book value per share. The stock price will

be driven down to where the return on the lower market value equals the cost of equity. In this case the market-to-book ratio will be less than 1.0. A firm expected to earn a return on its book equity equal to the cost of equity will have a market-to-book ratio of 1.0. So, at a glance we can tell from the market-to-book ratio whether a firm is earning (or is expected to earn) a return on book equity above, below, or equal to its cost of equity.

It is also possible to precisely quantify the level of excess return (or deficit) investors are expecting when the market-to-book ratio is above (or below) 1.0. It can be demonstrated mathematically (as shown in Exhibit____(BLC-1), Schedule 3) that the excess return – which I designate "XROE" – is equal to the difference between the dividend-to-book ratio and the dividend-to-price ratio (i.e., "dividend yield"): [8]

$$XROE = D/B - D/P$$

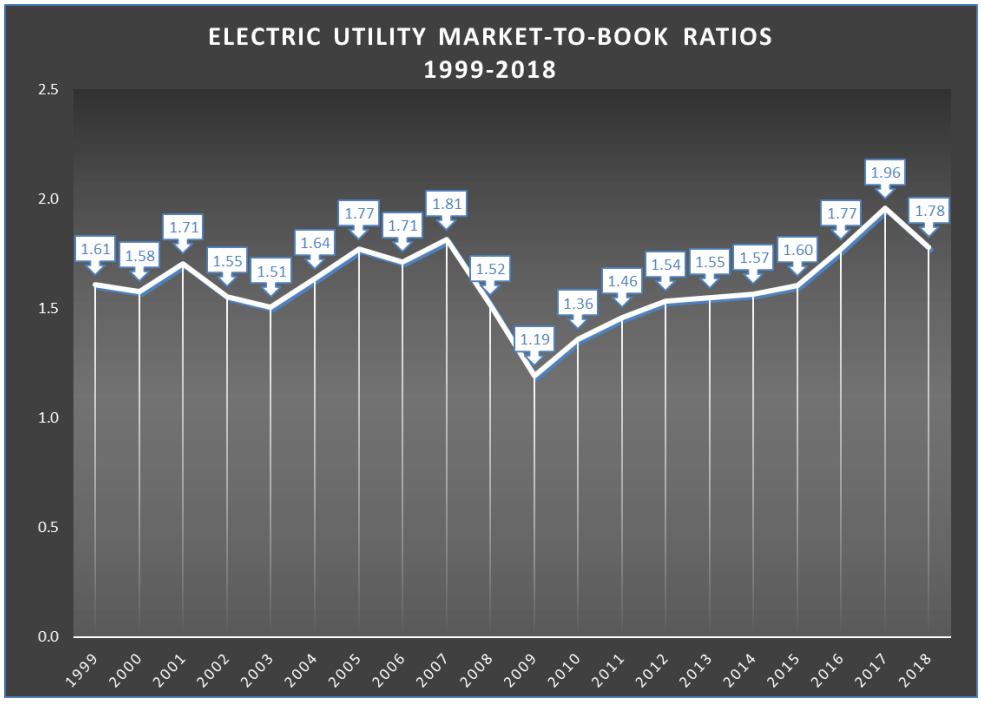
The logic of this should be self-evident. When the market-to-book ratio is 1.0, P=B, and XROE is zero. If P > B then D/B > D/P and XROE is positive. When P < B then D/B < D/P and XROE is negative. From the actions of investors in driving prices (P) above or below book value (B) we can calculate the level of excess (or deficit) return on book equity investors are expecting in relation to the market required rate of return, or cost of equity. For example, Otter Tail Corporation's stock (ticker OTTR)

[8] The relationship between market-to-book ratios and rate of return on equity was a matter of intense interest back in the late 1970's and early 1980's. Two of my publications from that time period explored the theoretical and empirical implications of this relationship within the context of the discounted cash flow model: "Estimates of the Cost of Equity for Public Utilities, 1961-1976." ***Journal of Business Research*** 7 No. 1 (1979): 9-17, and "The Cost of Equity Capital: A Model for Regulatory Review," in **Issues in Public Utility Regulation**, edited by Harry M. Trebing, 342-66. East Lansing: Michigan State University, Graduate School of Business Administration, Institute of Public Utilities, 1979. The relationship derived in Schedule 3 is an extension of that work.

currently has a market-to-book ratio of 2.60. (See my Schedule 5, Line 11.) It is clearly earning a return on book equity that is substantially above its cost of equity. We can estimate its excess return on equity (XROE) from the difference between its dividend-to-book (D/B) ratio and its dividend yield (D/P):

Otter Tail XROE = 7.48% - 2.87% = 4.61%

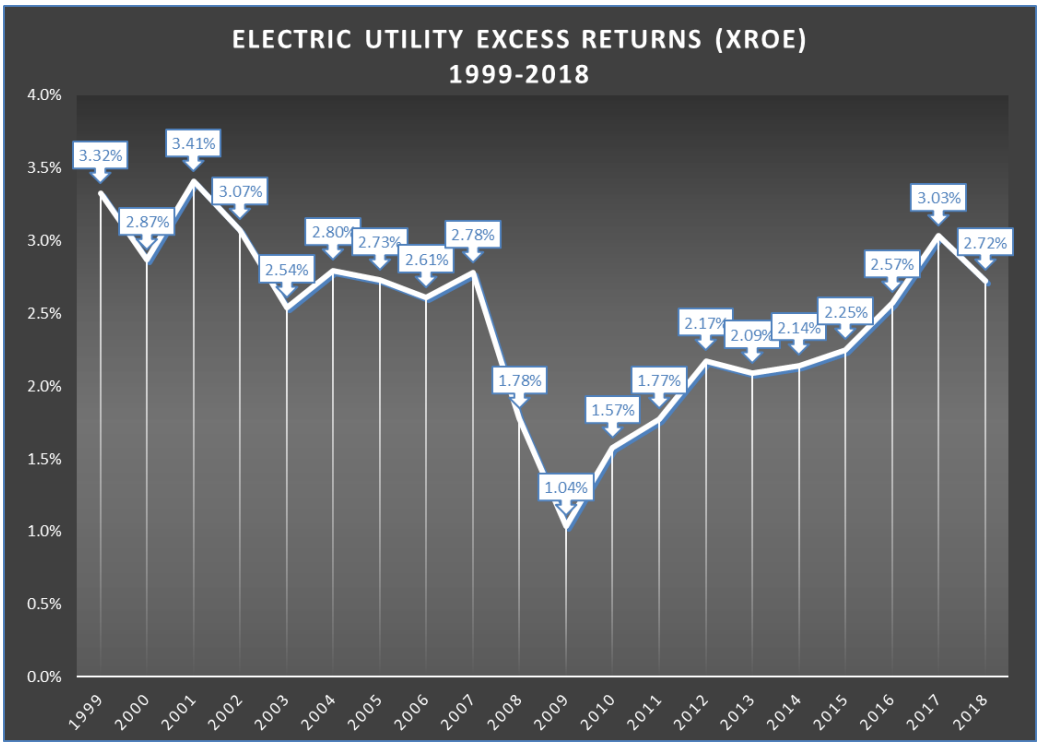
Later I will show how to use this kind of analysis to determine the cost of equity and evaluate what is a fair and reasonable rate of return on equity. For now, I simply want to use this discussion to make some observations about the relative financial health of the electric utility industry from an equity market point of view. The figure below shows median market-to-book ratios for the electric utility industry (based on all utilities followed by Value Line for which relevant data was available) for the past two decades. For most of this period the median electric utility market-to-book ratio was above 1.5. It fell to 1.19 during the 2008-2009 recession, but rebounded after that, rising steadily to 1.96 in 2017, before dropping back to 1.78 in early 2018. Throughout



the past two decades, even during the recession of 2008-2009, the investor owned electric utility industry enjoyed rates of return on equity substantially above the market cost of equity.

Q. HAVE YOU QUANTIFIED THESE EXCESS RETURNS?

A. Yes, I have. The results are shown in the following chart. From 1999 up until 2007 the



median XROE was above 2 percent. While the XROE dropped off in the wake of the 2008-2009 recession, by 2012 it had climbed back to 2 percent and has remained above 2 percent since then. In other words, during the past two decades, in all but four years electric utilities have enjoyed a median return on equity more than 200 basis points above the market required return, or cost of equity.[9]

Q. YOUR "XROE" ANALYSIS PRESUMES THAT EARNED BOOK RATES OF

[9] The data for the preceding charts is from Value Line reports for the electric utility industry from 2014 and 2018. Those Value Line reports, and all associated analysis discussed in my testimony are part of my workpapers.

RETURN ON EQUITY ARE EXPECTED BOOK RATES OF RETURN ON EQUITY. IS THAT A REASONABLE ASSUMPTION?

A. Yes, it is, especially for a large sample of electric utilities. Earned book rates of return for electric utilities do not usually change drastically from year to year and are generally very predictable. The effect of individual exceptions for electric utilities is minimized by excluding companies that have reduced their dividends, and then further minimized by the effect of using the industry median.

The reasonableness of this assumption can be demonstrated further by taking a look at the data for Otter Tail Corporation used in the 2018 analysis of XROE's and market-to-book ratios. The expected earned book return on equity derived from Value Line's EPS and BVPS estimates for 2018 used in the XROE analysis is 10.45 percent. This is right in line with OTC's "guidance" for expected earnings shown in the following graphic:

The Value Line projected earned return on book equity, 10.45 percent is so close to the midpoint of OTC's guidance range of 10.1 percent to 10.9 percent that one might think the Value Line analyst relied directly on OTC's guidance. In any case, 10.45 percent is a completely reasonable estimate of what investors may be expecting OTTR to earn on the book value per share of its common equity. It bears noting that this expected rate of return on equity is associated with a market-to-book ratio for OTTR of 2.22 in the 2018 XROE analysis. Since that analysis was

2018 EARNINGS GUIDANCE

OTTER TAIL CORPORATION

	2017 EPS by Segment			2018 EPS Guidance	
	GAAP-Basis	Impact of Tax Reform	Before Impact of Tax Reform	Low	High
Electric	$1.24	$0.02	$1.26	$1.34	$1.37
Manufacturing	$0.28	($0.07)	$0.21	$0.26	$0.30
Plastics	$0.54	($0.08)	$0.46	$0.36	$0.40
Corporate	($0.25)	$0.18	($0.07)	($0.16)	($0.12)
Total – Continuing Operations	$1.81	$0.05	$1.86	$1.80	$1.95
Return on Equity	10.6%		10.8%	10.1%	10.9%

Source: OTC Industry Presentation, April 13, 2018

undertaken, OTTR's market-to-book ratio has risen to 2.60.

Q. WHAT DO PERSISTANT EXCESS RETURNS (XROE) AND HIGH MARKET-TO-BOOK RATIOS TELL US ABOUT THE EFFECTIVENESS OF RATE OF RETURN REGULATION IN BALANCING CONSUMER INTERESTS?

A. They tell us that electric utility regulation is not doing a very good job in balancing consumer and investor interests. On balance, it *heavily* favors the investor interest over the consumer interest. While there may be a variety of reasons for this, two in particular probably account for most of the disparity. The first is that utilities are rarely held accountable for excess returns. If a utility is earning an excess return it is not going to voluntarily file for rate reductions. For the most part, rate filings occur only when initiated by the utility, and the utility is only motivated to initiate rate filings if it thinks it is earning an inadequate return. This would be balanced out if rate filings were routinely initiated in the public interest when utilities are earning excess returns. But that rarely happens.

A second major structural impediment to correctly balancing consumer and investor interests is in the way rate of return testimony is adjudicated. It is not uncommon for the difference between a consumer sponsored estimate of the cost of equity and a utility sponsored estimate of the cost of equity to vary by 2 percent (200 basis points) or more. Given the technical complexities of cost of equity estimation and the extreme variation between consumer and utility estimates, it is not at all uncommon for utility commissions to conclude that they are "balancing" consumer and investor interests by *splitting the difference* (or adopting some kind of allowed rate of return between the two extremes). This imparts a fundamental bias in favor of the investor interest.

To properly balance consumer and investor interests, the goal of rate of return regulation should *not* be to "split the difference" but to allow the *lowest* reasonable estimate of the cost of equity as the allowed rate of return. Splitting the difference in a range of *reasonable* estimates of the cost of equity merely imparts an upward bias in favor of the investor interest and will perpetuate excess returns on equity (XROE). As an illustration of my point I call attention to a 2015 KCP&L rate case before the Kansas State Corporation Commission. I use this particular case not because of any unusual conduct on the part of the participants in this litigation but because the facts of the case are all clearly spelled out in a decision on appeal to the Kansas Court of Appeals.[10] In that case three witnesses testified on cost of equity. The consumer witness recommended a cost of equity of 8.55 percent. A staff witness recommended a return on equity of 9.0 to 9.5 percent. And the utility witness recommended a return on equity of 10.3 percent. The Commission "split the difference" and allowed a return on equity of 9.3 percent, which was upheld by the Kansas Court of Appeals.

On its face, I would suggest that this decision "baked in" an implicit XROE of at least 0.75 percent (9.3 – 8.55). I say "at least" because the consumer witness presented testimony that a reasonable return on equity was in the range of 8.1 percent to 8.55 percent. Based on evidence presented below, there was *reasonable* evidence available at the time that the cost of equity was even below the 8.1 percent estimated by the consumer witness in 2015. Moreover, it is not uncommon for consumer witnesses to go to the upper end of a range of what they have found to be reasonable

[10] Court of Appeals of Kansas, KANSAS CITY POWER & LIGHT, Petitioner/Appellant, v. The STATE CORPORATION COMISSION OF THE OF THE STATE OF KANSAS, Respondent/Appellee, No. 114, 781, Decided: March 9, 2016. https://caselaw.findlaw.com/ks-court-of-appeals/1728478.html last accessed 9/17/2018.

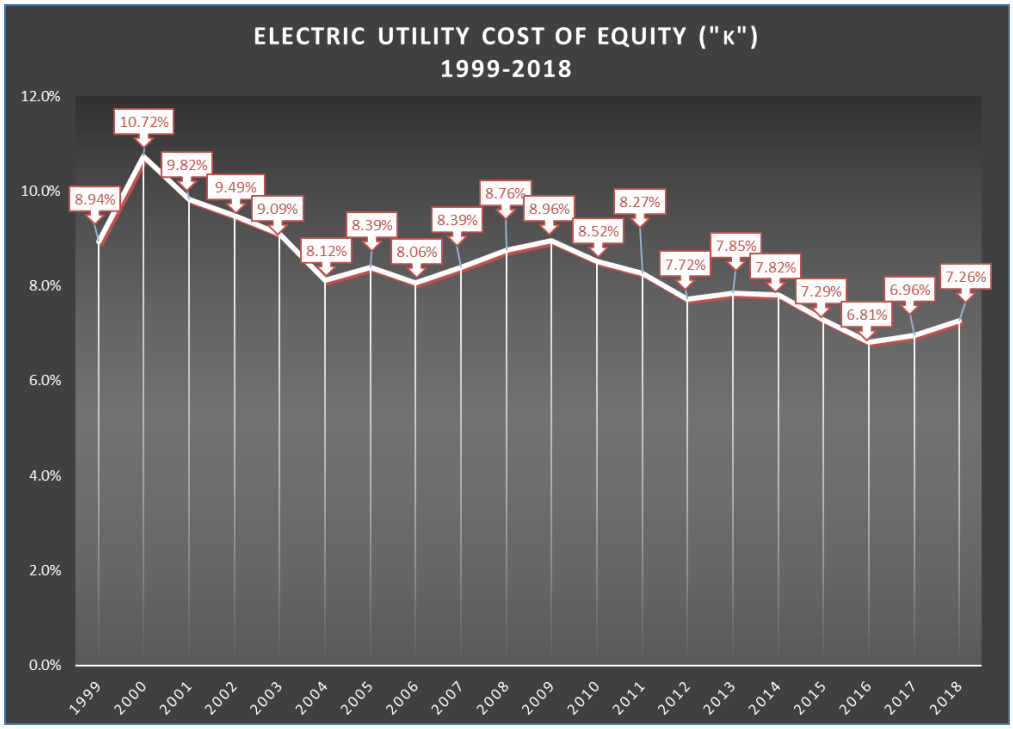
precisely because the inherent bias of rate of return regulation is to discount the bottom end of such ranges. On this basis, it would not be unreasonable to conclude that the Commission allowed a return on equity that would generate an XROE of at least 1.2 percent (9.3 – 8.1, or 120 basis points). And again, I think the evidence shows that the excess return created by an allowed return on equity was even higher than 120 basis points.

While commissions and courts of appeal seem to think that "splitting the difference" is "balancing" investor and consumer interests, in truth it usually amounts to ignoring the consumer interest. The inherent adversarial approach to rate of return regulation induces both consumer and utility rate of return witnesses to strive for some semblance of credibility in their rate of return presentations. In the 2015 KCP&L rate case the utility witness presented a wide range of evidence, including evidence that supported a cost of equity estimate below 9 percent (though he chose to ignore it). And as noted, while the consumer witness came up with an estimated cost of equity of 8.1 percent to 8.55 percent, he chose to moderate his recommendation by moving to the upper end of his range. Given the range of evidence in the case, a proper balancing of consumer and utility interests would have been to allow a rate of return based on the testimony of the consumer witness. From my reading of the case there was no credible evidence that the return recommended by the consumer witness would result in a market-to-book ratio of less than 1.0. In fact, in hindsight, and again drawing on evidence presented below, a return on equity of 8.55 percent would have supported a market-to-book ratio of 1.35 in 2015 for the publicly traded owner of KCP&L (Great Plains Energy). The return on equity granted by the Commission in that case, 9.3 percent, would have supported a market-to-book ratio of 1.56 in 2015.

Even the lowest end of the consumer witness range, 8.1 percent, would have been sufficient to support a market-to-book ratio of 1.22 in 2015. The common practice of "splitting the difference" between consumer and investor rate of return testimony is tantamount to ignoring the consumer interest and perpetuating excess returns on equity (XROE).

Q. PLEASE DESCRIBE WHAT MARKET-TO-BOOK RATIOS IMPLY ABOUT THE HISTORICAL COST OF EQUITY.

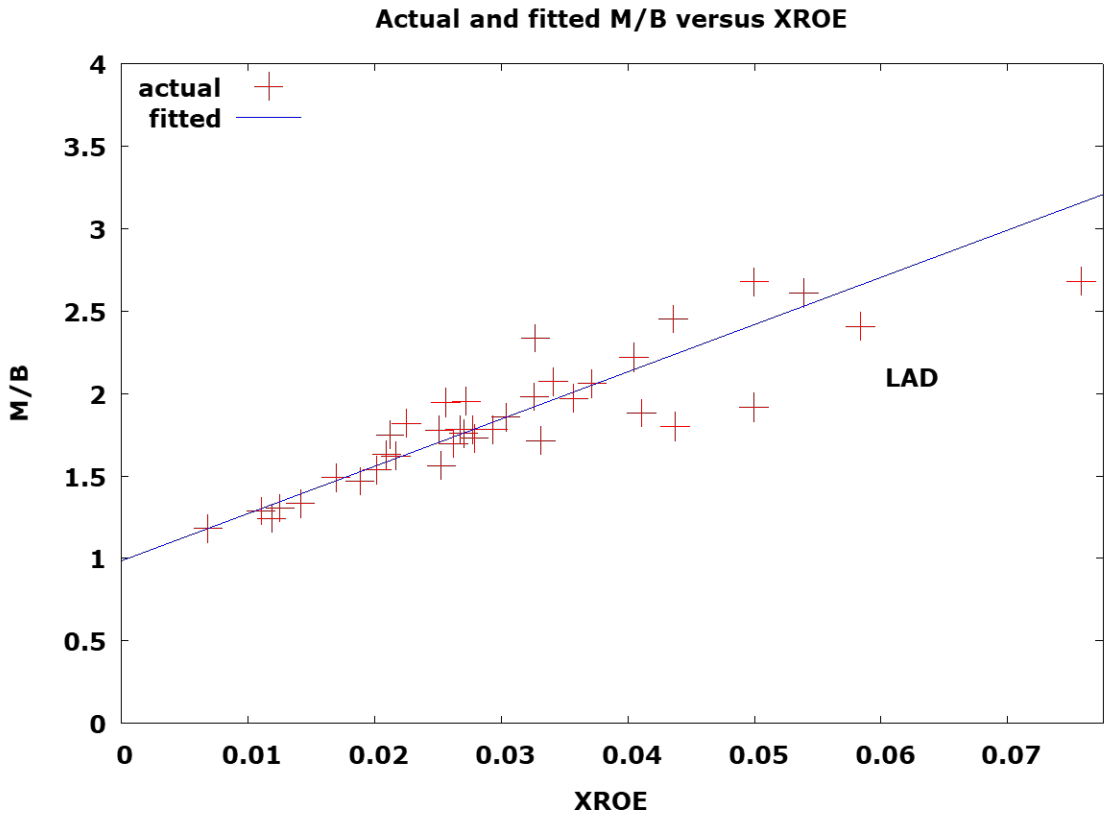
A. Estimates of the cost of equity for electric utilities for the period 1999-2018 are shown on the following chart. The general trend throughout the period, like capital costs



generally, has been downward. In keeping with our focus on market-to-book ratios, keep in mind that these are estimates of the rate of return on book equity that would maintain a market-to-book ratio of 1.0. Regarding the discussion just concluded about the KCP&L rate case where I noted that the low end of the consumer sponsored cost of equity estimate of 8.1 percent would have been sufficient to maintain a

market-to-book ratio of 1.22 in 2015, the rate of return that would, in a perfect world, result in a market-to-book ratio of 1.0, and yield a theoretical balance of consumer and investor interest, would have been 7.3 percent (rounded from 7.29%).

Exhibit____(BLC-1), Schedule 4, Pages 2 and 3, present statistical results from the study for 2018. The discounted cash flow model predicts a specific and testable relationship between market-to-book ratios (P/B) and excess returns on equity (XROE). Page 3 of Schedule 4, reproduced below, is a chart of the statistical relationship between electric utility market-to-book ratios and excess returns for the 2018 data. Because the data are not "normal" (note how it becomes sparser and more variable as M/B and XROE increase) I used a "robust" non-parametric regression method called Least Absolute Deviation (LAD) rather than the better known Ordinary Least Squares (OLS) regression method. *Theoretically* (according to the discounted cash



flow model) the slope of the regression line should equal the inverse of D/P (dividend yield), and the intercept – the point where XROE is zero – should be 1.0. The actual slope, coefficient, and confidence intervals for the regression were:

coefficient confidence intervals
t(36, 0.025) = 2.028

VARIABLE	COEFFICIENT	95% CONFIDENCE INTERVAL	
const	0.984813	0.773759	1.19587
XROE	28.6689	20.1970	37.1408

The inverse of the slope coefficient – 1/28.6689 – is 3.49 percent. The expected value of the slope coefficient based on the sample median D/P of 3.55 percent was 28.1690 (1/3.55). This represents a strong statistical corroboration of the discounted cash flow model. While the results were not always as "near perfect" in other years as they are here for 2018, in every year except 2009 the null hypothesis – that the intercept was not 1.0 and the slope coefficient not the inverse of the sample median dividend yield – was rejected (implying corroboration of the expected values).[11]

Q. HOW IS THIS OF ANY PRACTICAL BENEFIT FOR ESTIMATING THE COST OF EQUITY OR A FAIR AND REASONABLE RATE OF RETURN ON EQUITY FOR OTP?

A. Understanding how the allowed rate of return impacts a utility's market-to-book ratio can help immensely in assessing how a proposed or recommended return on equity impacts the balancing of consumer and investor interests. The implied relationship between market-to-book ratios and excess returns can be easily used to develop estimates of the cost of equity. This is demonstrated with respect to the sample of

[11] In two years, 2015 and 2016, the fit was even better than in 2018. In 2009 the predicted intercept coefficient was just barely (1.00000 vs. 1.00027) outside the lower bound of the 95% Confidence Interval, while the predicted slope coefficient was within the 95% Confidence Interval. With 39 of 40 of the predicted values within the 95% Confidence Interval, this is impressive corroboration of the DCF/XROE hypothesis. See Schedule 4, Page 1, for a year-by-year statistical summary.

comparable risk companies used in my earlier DCF analysis in Exhibit____(BLC-1), Schedule 5.

Columns A, B, C (Company, dividends per share, and share price) use data imported from my Schedule 1. Column E (dividend yield) of Schedule 5 replicates Column E of Schedule 1 as a cross-check. Column D is average book value per share for 2018 as estimated from Value Line data. Column F (dividends divided by book value per share) is derived from Columns B and D. Column G (market-to-book ratio) is derived from Columns C and D. Column H (excess return) is derived from Columns F and E.

With all of these as inputs, we lack just one additional metric for estimating cost of equity: an estimate of what rate of return on book equity is expected by investors. In Columns I and J, I show estimates of the expected return on equity based upon Value Line data, one for 2018, and the other for 2022. These estimates are similar to what Value Line refers to as "Return on Com Equity," except calculated more precisely. Since the discounted cash flow model is a forward-looking model, I have used the estimates for 2022 to develop the implied cost of equity. Thus, Column K (implied cost of equity) is Column J (expected return on equity) minus Column H (excess return). Focusing on the median results for Columns J and H, the median expected return on equity is 9.67 percent of which 2.64 percent is an *excess* return that accounts for the median market-to-book ratio of 1.85 shown in Column G. To derive the cost of equity, or the rate of return that would result in a market-to-book ratio of 1.0, we subtract the excess return from the expected return: 9.67% - 2.64% = 7.03% (the result shown in Column K).

This result, an estimated cost of equity of 7.03 percent, is almost identical to

the median 7.05 percent derived using the non-constant growth DCF model on my Schedule 2. If these seem implausibly low, they are *not* when viewed from the perspective of market-to-book ratios (or, as we will see later, from a consensus of estimates of the current overall market return[12]). If a return on equity of 9.67 percent – the median expected rate of return on equity for the sample group of comparable companies – can support a market-to-book ratio of 1.85, then it is not at all implausible that the rate of return required for a market-to-book ratio of 1.0 would be as low as 7.03 percent.

Q. HOW MUCH WEIGHT SHOULD THE COMMISSION GIVE THIS RELATIONSHIP BETWEEN MARKET-TO-BOOK RATIOS AND RATE OF RETURN ON EQUITY IN ESTABLISHING A FAIR AND REASONABLE RATE OF RETURN ON EQUITY FOR OTP?

A. It should give this relationship considerable weight. Before I suggest how it might do so specifically, I want to address objections that might be made to doing so. The question of the relationship between market-to-book ratios and rate of return was a matter of considerable testimony in a recent New Hampshire PUC docket in which OTP's rate of return witness in this case, Mr. Hevert, participated.[13] Witnesses for the Office of Consumer Advocate (OCA) and Staff both presented testimony and analysis regarding market-to-book ratios and return on equity; Mr. Hevert presented testimony and analysis in rebuttal to those witnesses. My aim here is to preemptively distinguish what I am contending for from what the OCA and Staff witnesses did in the

[12] See below, Page 60 ff., and the evidence for an overall market return on equity of 8.2 percent from Fernandez, et. al. An estimate of the cost of equity of 7.03 percent for electric utilities is not at all out of line with an overall market cost of equity of 8.2 percent.

[13] New Hampshire PUC Docket No. DG 17-048, Liberty Utilities (EnergyNorth Natural Gas) Corp. d/b/a Liberty Utilities.

New Hampshire case. All three witnesses in that case demonstrated an inadequate understanding of the relationship between market-to-book ratios and returns on equity.

Witnesses for OCA and Staff in the New Hampshire case both performed regression analyses in which they regressed market-to-book returns on returns on equity and found "evidence" of a significant statistical correlation. In rebuttal, Mr. Hevert contended that Staff's analysis resulted in a market-to-book ratio of 1.10 with a ROE of just 1.95 percent. OCA's analysis fared better, resulting in a market-to-book ratio of 1.10 with a ROE of 5.89 percent. But none of the parties really understood what they were doing. For me, this is "déjà vu all over again." Regressions like these were all the rage in the late 1970's but at that time they were being championed by consultants for utilities. At that time the industry was struggling with market-to-book ratios *below* 1.0, and such regressions were implying the need for very *high* returns on equity to bring the market-to-book ratio back up to 1.0 (or 1.1, which was considered an appropriate target at the time). Below is a diagram from my 1979 JBR paper (included in my workpapers) demonstrating the "structural misspecification" that

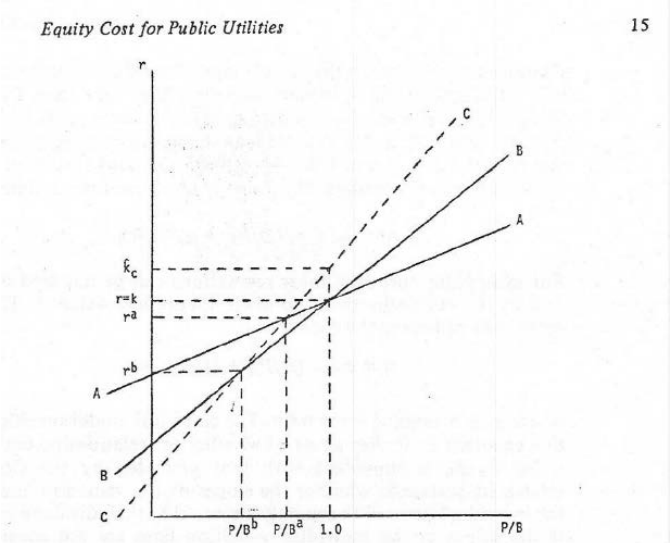


FIGURE 2: An Example of Structural Misspecification in a Single-Equation Model of the Valuation Line.

comes from regressions of returns on equity and market-to-book ratios. In the accompanying text I said:

> But unless the firms in the sample have comparable payout ratios and dividend yields, such a regression will be *structurally* misspecified. To illustrate the significance of this problem, consider Fig. 2 where we assume we are faced with the problem of specifying a cross-sectional model of valuation for a sample, which, for the sake of convenience, only contains two firms, A and B. The valuation of line A is drawn flatter than the valuation line of B on the assumption that A has a lower payout ratio; then, as the figure indicates, A has a lower dividend yield (slope) and a higher growth rate (intercept) than B. Now suppose that we observe the data points (P/B^a, r^a) for firm A, and (P/B^b, r^b) for firm B. A regression of r on P/B will result in the "perfect fit" indicated by the line CC. But the line CC does not bear any particular relationship to the structural relations that are posited to actually exist between r and P/B. In particular neither the slope nor the intercept are useful for making inferences concerning the true slope or intercept of either AA or BB. This example illustrates that a regression of r on P/B can be "statistically significant" but tells us nothing about the *structural* relationships in the data being evaluated.

While circumstances have changed in that market-to-book ratios are now above 1.0 (quite a bit above 1.0!) rather than below 1.0, the point is still the same: because utilities have varying payout ratios and dividend yields, simple linear regressions of market-to-book ratios and returns on equity of the kind that occupied the witnesses in the New Hampshire case are *structurally misspecified* and unless the data points are clustered around a market-to-book ratio of 1.0 are unable to produce valid inferences about what rate of return is required to produce a market-to-book of 1.0.

None of this has any bearing on the analysis I have performed in this case. The "XROE formula" – i.e., XROE = D/B - D/P – is the same regardless of payout ratio and dividend yield; firms that follow a higher payout policy will have higher dividend yields but lower market-to-book ratios for the same return on equity with the difference reflected in the dividend-to-book ratio than firms which have a lower payout ratio (but higher market-to-book ratios for the same return on equity as a result of greater expected growth). These differences will be reflected in their individual D/B

and D/P ratios. There is no "structural misspecification" here like there is in correlations of P/B and ROE.

Beyond this, Mr. Hevert launched an all-out assault in his New Hampshire rebuttal on the constant growth DCF model in order to deny any meaningful implications regarding market-to-book ratios. In essence he contends that if the assumptions of the constant growth DCF model are not satisfied *perfectly* then we cannot draw any inferences from the model about the relationship between market-to-book ratios and returns on book equity. Mr. Hevert here is falling for the fallacy of "proving too much," a form of the *reductio ad absurdum* argument. If anything less than *perfect* satisfaction of all theoretical assumptions means that we cannot draw any inferences about the relationship between market-to-book ratios and returns on book equity, it *also* means that we cannot draw any conclusions about the cost of equity or required rate of return either. In the early days of consideration and adoption of the constant growth DCF model for rate regulation, the same argument now being used by Mr. Hevert against using DCF theory to evaluate market-to-book ratios was used to oppose the constant growth DCF model *altogether*. But that tactic has been long relegated to the ash heap of regulatory practice, and while the constant growth DCF model does have known and recognized limitations, it remains useful and accepted by most regulatory agencies (if often just as one of multiple methods of estimating the cost of equity).

Mr. Hevert's testimony in this docket is a case in point: he utilizes the constant growth DCF model along with several other methods of estimating the cost of equity. It is clear that he does not care much for the kind of cost of equity estimates it produces – he arbitrarily rejects some of them as too low – but that is a matter I take up

later in my testimony when I review his testimony in this docket.[14] I acknowledge limitations in the constant growth form of the model as a reason to also employ a non-constant growth analysis of the DCF cost of equity. None of this negates the validity of inferences about the relationship between market-to-book ratio and return on equity that I made back in the very second Q&A of this section of my testimony on Page 18. That assessment remains true regardless of the specific valuation model one might use to estimate the cost of equity. Market-to-book ratios above 1.0, and especially well above 1.0, for *public utilities* are a clear indication that they are earning excess returns, returns above the required rate of return on equity.

That does not stop Mr. Hevert from trying to argue otherwise in his New Hampshire testimony. He devotes several pages against making any inference about excess returns from market-to-book ratios by pointing to the market-to-book ratios of *unregulated* firms. This, too, has a "déjà vu all over again" quality about it because it is essentially a "comparable earnings" argument. "Comparable earnings" refers to a standard or method of establishing a regulated rate of return on equity that was still around when I broke into the field back in the mid 1970's. It essentially compared utility returns to the earned *book* returns of unregulated "comparable" companies. At the time, it was being displaced by greater reliance upon market-based methods, the most successful of which was the discounted cash flow method. Many of the arguments that Mr. Hevert now makes for why utilities should be allowed to have market-to-book ratios above 1.0 mimic the arguments that were made to justify "comparable

[14] There is actually a significant inconsistency on the part of Mr. Hevert about this: he does not care much for the low the estimates of the cost of equity produced by the constant growth model for his sample of electric utilities, but he thinks the outrageous market risk premium produced using the constant growth model for firms in the S&P 500 is just fine. I return to this later when I discuss his testimony in this case in more detail.

earnings." So, it is no surprise, to me at least, that the arguments he makes to justify market-to-book ratios above 1.0 suffer from some of the same problems that the "comparable earnings" approach suffered.

I addressed some of the key problems in the "comparable earnings" approach in my 1978 *Land Economics* article on "Alternative Cost of Capital Concepts in Regulation."[15] Some of the same arguments apply to Mr. Hevert's attempt to justify utility market-to-book ratios above 1.0. The most important is probably the basic distinction in the way utility regulation works as opposed to how competitive markets operate. I'm referring here to competitive *product* markets, not financial markets (though competition there works similarly). In competitive product markets innovative firms will earn *economic profits* as new products and facilities to produce them are brought to market. The term "economic profit" has a very specific connotation and refers to returns that are *above* the "cost of equity capital." In economic terms, the "required return" on capital is a *cost*, it is not "profit." In competitive markets innovation would never occur without the attraction of earning *abnormal* rates of return (in relation to the cost of equity). It is the opportunity to earn those *abnormal* rates of return that encourages and provides incentives for exposing capital to *extraordinary* risk. But such abnormal rates of return are, in truly competitive markets, never permanent. When new technology and products capable of producing such returns come to market, competitors soon follow. Marginal costs rise (because competitive markets face rising cost curves, something else different with respect to traditional "natural

[15] "Alternative Cost of Capital Concepts In Regulation." ***Land Economics*** 54 (August 1978): 348-61. *Land Economics* was a major journal for publication of academic research on public utilities at the time.

monopolies" subject to rate of return recognition) and *economic profits* will begin to fall. "At the margin" economic profit dissipates. But because this process is continual and never ending (Joseph Schumpeter referred to this engine of capitalism as "the gale of creative destruction") there are always competitive firms earning extraordinary returns or economic profits. In terms of market-to-book ratio the *average* market-to-book ratio of competitive firms will always be above 1.0 and well above 1.0 for firms that are in dynamic and technologically innovative industries.

The environment of the regulated firm is fundamentally different. Regulated industries are usually declining cost industries, meaning they have high startup costs so that average total costs decline as output increases. They are typically given charters to operate free from the pressure of competitors, which when allowed in the 19th century led to "ruinous competition."[16] And most important, under rate of return regulation they earn the return on each unit of capital invested. With the replacement of market-based methods of estimating rate of return, which *aims* (if often so poorly) to allow a return on equity just equal to the *cost* of equity, there is no reasonable expectation for the regulated firm to earn *economic profit*. For this reason, in the abstract, there is *never any reason or justification for a utility's market-to-book ratio to be above 1.0*. Indeed, the essential "social contract" of rate of return regulation is that the public utility will have a reasonable opportunity to earn its *cost of capital* free from ruinous competition, but gives up the opportunity to earn *economic profit*. When all is said and done, Mr. Hevert's special pleading for allowing regulated utilities to have market-to-book ratios above 1.0 is an argument for allowing utilities to

[16] For an explanation of the term "ruinous competition," see: https://stats.oecd.org/glossary/detail.asp?ID=3186. Accessed 9/21/2018.

enjoy economic profit (excess returns) without being exposed to the kinds of risks that are ordinarily undertaken in the pursuit of economic profit.

Regulated utilities are not entitled, either by law or by analogy to competitive markets, to economic profits. They are essentially "cost plus" industries where "cost" includes the costs of capital *and no more*. When they earn the cost of capital, they earn it on all of the regulated investment. *Any* earnings *above* the cost of capital, if capitalized in *financial* markets, *will* be reflected in market-to-book ratios above 1.0. The only significant qualification to consider here is when regulated firms have operations in unregulated markets where there is the opportunity to earn economic profit. In such cases, such firms might have a market-to-book ratio above 1.0 on the strength of their profits in unregulated operations. But nothing like that accounts for the level of market-to-book ratios we see for public utilities currently. Most of the "profit" of firms that are recognized as being in a regulated industry like the electric utility industry comes from utility operations. In *some* cases, the earnings from unregulated operations may make a significant contribution to market-to-book ratio but the impact of this for developing a reasonable rate of return on equity can be minimized by judicious selection of "comparables" in developing the sample used to estimate the cost of equity. However, there is no warrant to adopt the agnosticism being promoted by Mr. Hevert about what we can infer from the relationship between market-to-book ratios and returns on equity.

Q. SHOULD UTILITY COMMISSIONS MAKE MARKET-TO-BOOK RATIOS OF 1.0 A POLICY GOAL?

A. In the late 1970's and early 1980's, a period where market-to-book ratios were often below 1.0, a market-to-book ratio of 1.1 was frequently used as a policy

recommendation in order to allow for the recovery of flotation costs and to prevent market-to-book ratios from falling below one because of "market pressure" when new shares are publicly issued.[17] The difference between the actual cost of equity and the required return on equity required to maintain share prices 10 percent above book value (i.e., market-to-book ratio = 1.1) is actually quite small especially in relationship to the range of uncertainty that exists when estimating cost of equity.

Equation 4 on my Schedule 3 showing the derivation of the XROE formula shows the relationship between return on equity and market-to-book ratios:

$$r = k + \frac{\Delta\left(\frac{P}{B}\right)}{1/\left(\frac{D}{P}\right)}$$

where $\Delta(\frac{P}{B})$ is the premium above a market-to-book ratio of 1.0 that we wish to allow. This relationship is non-linear and depends upon the inverse of the dividend yield. In my Schedule 5 the median estimate of the cost of equity in Column K is 7.03 percent, and the median dividend yield in Column E is 3.26 percent. Were we to decide that a market-to-book ratio of 1.1 is a reasonable policy goal, the incremental return on equity above the cost of equity would be 0.33 percent:

$$0.1/(1/0.0326) = 0.1/30.67 = 0.0033$$

In other words, the *r* required to keep the market-t0-book ratio at 1.1 when the cost of equity is 7.03 percent is 7.36 percent (0.0703 + 0.0033 = 7.36%).

To demonstrate the non-linearity involved let's consider two other market-to-book ratios: 1.25 and 1.85. For 1.25 the incremental return on equity required over the

[17] "Market pressure" is the *theory* that when new shares are publicly issued that this causes some downward pressure on equilibrium share price. Ultimately this is an empirical issue that will depend on how large the new public issue is in relation to the number of shares previous outstanding.

cost of equity would be 0.82 percent:

$$0.25/(1/0.0326) = 0.25/30.67 = 0.0082$$

for an *r* of 7.85 percent (7.03 + 0.82; cf. the 7.84 percent in Column L, Line 10, of my Schedule 5, the difference attributable to rounding), while for a market-to-book ratio of 1.85 the incremental return on equity over the cost of equity would be 2.77 percent:

$$0.85/(1/0.0326) = 0.85/30.67 = 0.0277$$

for an r of 9.80 percent. The non-linearity observed here can be seen in the following table:

Market-to-Book Ratio	%Δ(P/B) above 1.0	%Δ*r* above *k*
1.10	10%	4.7%
1.25	25%	11.7%
1.85	85%	39.4%

The increment allowed on *r* above *k* produces a proportionately greater impact on market-to-book ratio. Presently the proxy group is earning about 40 percent above the indicated cost of equity, and this is producing an *85 percent* increase in market value relative to book value.

While a market-to-book ratio of 1.1 is an appropriate policy goal under normal circumstances, the present circumstances are not normal (the level of excess return on equity being capitalized in the market for utility stocks is simply too excessive to characterize current conditions as "normal" from a standpoint of what should be the "norm" for utility regulation), and in the next section I consider what might be an appropriate market-to-book ratio the Commission might wish to consider as a policy goal in this proceeding.

C. CONCLUSIONS REGARDING COST OF EQUITY AND A FAIR AND REASONABLE RATE OF RETURN ON EQUITY

Q. PLEASE SUMMARIZE YOUR CONCLUSIONS REGARDING OTP'S COST

OF EQUITY AND WHAT YOU RECOMMEND AS A FAIR AND REASONABLE RATE OF RETURN ON EQUITY.

A. The median estimate of the cost of equity from the constant growth model (Schedule 1) was 7.71 percent. The median estimate of the cost of equity from the non-constant growth model (Schedule 2) was 7.05 percent. The median estimate of the cost of equity implied by an analysis of market-to-book ratios and expected returns on book equity (Schedule 5) was 7.03 percent. Taking all three together, but giving greater weight to the latter two estimates, I estimate the cost of equity for OTP at the present time to be about 7.0 percent. If this seems low, I would once again point out that Schedules 1 and 2 rely on exactly the same methodology that the Commission approved and relied upon in Docket EL11-019 in 2012. In EL11-019 the constant and non-constant growth DCF models produced a median cost of equity 8.95 percent and 8.42 percent; here they produced a median cost of equity of 7.71 percent and 7.05 percent, declines of 124 and 137 basis points. This is not out of line at all with the decline in capital costs discussed above in Part IV of my testimony. With the sample median market-to-book ratio of 1.85 shown in Schedule 5, a cost of equity as low as 7.0 percent at the present time is not implausible at all.

The *big* question is what to do about it. What are we to do with a situation where a median expected return on equity of 9.69 percent produces a market-to-book ratio of 1.85 (Schedule 5, Line 10, Columns I and G)? A return on equity of 9.69 percent would perpetuate the excess returns embodied in the market-to-book ratio of 1.85 and would be completely unacceptable from any standard of fairly balancing consumer and investor interests. On the other hand, reducing the rate of return on equity to 7.0 percent would *theoretically* drive the market-to-book price down to 1.0.

In this case, however, the impact is likely to be very small because South Dakota represents such a small proportion of OTP's service territory.

But before we contemplate further any implied reduction in market-to-book ratio, I should address the concern always raised in a situation like this of the capital losses that would be experienced by investors from this decline in market-to-book ratio. There is no valid argument here that this is somehow "unfair" to investors. At the most, it merely offsets the excess returns that were earned from prices rising to such a high market-to-book ratio leaving investors *as a class* having still earned an adequate rate of return on balance. The "as a class" qualifier simply acknowledges that it is impossible to determine how such a change would impact any given individual investor. In any case, any profit from excess returns investors earned in the past came with no guarantee. So, the mere existence of capital losses for investors does not impact the balancing of competing interests calculus at all. But for investors as a class, losses as market-to-book ratios get pushed back down to where they ought to be are simply a "refund" of the excess returns which they should not have received in the first place. And unless this "refund" is accompanied with interest, investors still come out ahead on a net present value basis. We should consider the excess returns that utility shares have earned as an interest free loan that it is now time to repay.

Still, I fully comprehend the situation as one where it is not practical to redress past wrongs all at once. But a *significant* reduction in return on equity of some kind is essential if the concept of balancing investor and consumer interests is to have any meaning at all in this matter. Columns L and M of my Schedule 5 show (1) the implied return on equity required to maintain a market-to-book ratio of 1.25, and (2) the implied market-to-book ratio if the return on equity is 8.25%. A return on equity of 7.84

percent would be required to produce a market-to-book ratio of 1.25; my recommended rate of return on equity would maintain a market-to-book ratio of 1.37 at the present time. I think a market-to-book ratio of 1.25 should be a stated goal to strive for *at the present time*.[18] It is more than fair to investors. In fact, in the early years of the adoption of the Gordon constant growth model it was customary to use a target market-to-book ratio of 1.10. This was considered an ample cushion for recovery of flotation costs and to prevent stock prices from falling below book value per share from "market pressure" when new shares are issued. A target of 1.25 provides for that and even more. But I recognize that it is a road too far to travel all at once. A return on equity of 8.25 percent would imply a reduction in market-to-book ratio from 1.85 to 1.37, bringing it closer to where it should be (which would give fuller effect to the consumer interest) but still giving greater weight to the investor interest by leaving the market-to-book ratio higher than investors really have any right to expect.

Given my practice of recommending a range around the recommended rate of return on equity, I recommend a rate of return on equity of 8.0 to 8.5 percent at the present time. In my view this is the *very minimum* that the consumer interest is entitled to under any meaningful balancing of consumer and investor interests. It is a significant reduction, but the elevated market-to-book ratios and implied excess returns that exist in the electric utility industry at the present time are a significant *problem* and deserve to be taken seriously (contra Mr. Hevert). Absent any other specific considerations, I recommend a rate of return on equity at the middle of this range, or 8.25 percent.

[18] In the future this could be revisited and a lower target market-to-book ratio like the one discussed in the following sentences might be warranted.

Q. HAVE YOU NOT IN PAST CASES RECOMMENDED A RANGE OF 50 BASIS POINTS ON EITHER SIDE OF YOUR POINT ESTIMATE, RATHER THAN THE RANGE OF 25 BASIS POINTS THAT YOU ARE RECOMMENDING IN THIS CASE?

A. Yes, I have. That is my practice when the point estimate is an estimate of the cost of equity or required rate of return on equity. In that case the broader range is to recognize the range of *uncertainty* in estimating the cost of equity. But my recommended rate of return on equity of 8.25 percent is not an estimate of the cost of equity. Were I recommending a rate of return based on my estimate of the cost of equity I would be recommending a ROE of 7.0 percent. In that instance, to be consistent with my past practice, I would recommend a range of 50 basis points on either side of that estimate, i.e., 6.50 percent to 7.50 percent. In *this* instance, however, my recommended rate of return is already above the upper end of a range that would reflect uncertainty in estimating the cost of equity. Thus, the broader range is not appropriate or required. Instead, the range I am using recognizes the degree of *judgment* involved in deciding what the allowed ROE should be in relation to market-to-book ratio. Here the objective is to recommend a ROE that will move the market-to-book ratio *closer* to a value that more reasonably balances utility and ratepayer interests, for which I have suggested 1.25 as a reasonable policy goal at the present time.

Perhaps the following table, derived from the results of my market-to-book/XROE analysis in my Schedule 5 will help to illustrate the matter:

Utility Sample					
7.03%	8.25%	8.50%	8.75%	9.25%	10.30%
1.00	1.37	1.45	1.53	1.68	2.00
Otter Tail					
7.03%	8.25%	8.50%	8.75%	9.25%	10.30%
1.00	1.42	1.51	1.60	1.77	2.14

For the utility sample as a whole, the indicated cost of equity, i.e., the rate of return

on equity that will result in a market-to-book ratio of 1.00, is 7.03 percent. The market-to-book ratio associated with my recommended ROE of 8.25 percent is 1.37. Were the Commission to allow an ROE at the top of my recommended range, i.e., 8.50 percent, the resulting market-to-book ratio would be 1.45. In balancing ratepayer and utility interests I think that enough consideration has already been given to the investor interest that there is no need to add another 25 basis points to my range, taking the ROE up to 8.75 percent and the market-to-book ratio to 1.53. If the target market-to-book ratio is 1.25, as I think it should be, I think a market-to-book ratio of 1.45 is a more than adequate consideration of the utility interest, and a higher ROE and market-to-book ratio would simply continue to disadvantage the ratepayer and unfairly favor the investor. I have shown numbers for Otter Tail based on its dividend yield, which is lower than the dividend yield for the utility sample. But the point remains the same: whether the market-to-book ratio is 1.45 or 1.51, I consider 8.50 percent as an upper bound to a balancing of utility and ratepayer interests at the present time.

Q. YOUR MARKET-TO-BOOK RATIO/XROE ANALYSIS IS BASED ON THE MATHEMATICAL PROPERTIES OF THE CONSTANT GROWTH DCF MODEL. HOW IS THAT AFFECTED IF THE STRICT ASSUMPTIONS OF THE CONSTANT GROWTH DCF MODEL ARE NOT ALWAYS MET IN "THE REAL WORLD?"

A. The effect this might have is "lost in the noise," by which I mean that given a plausible range of uncertainty in estimating the DCF cost of equity either by the constant growth DCF model or by the more flexible non-constant growth model any effect is statistically indiscernible. In other words, the effect is too small to measure. This is demonstrated on the record in this case by the fact that the market-to-book ratio/XROE analysis produced almost the exact same estimate of the cost of equity as

the *non-constant growth* DCF model, 7.03 percent versus 7.05 percent. It is also demonstrated by the empirical data plotted in the chart on Page 3 of my Schedule 4 (and also referenced and reproduced above on Page 27). Regardless of whether the constant growth or the non-constant growth form of the DCF model is the more accurate reflection of how investors actually value utility stocks, the data show that market-to-book ratios behave in the manner predicted by the constant growth DCF model.

Whenever attention is called to the high market-to-book ratios of utilities as evidence of excess returns, voices can be found to challenge this relationship. Almost always the basis for pushing back is to make the perfect the enemy of the good. That is to say, various *theoretical* issues will be raised to call into question this relationship, but if the theoretical arguments are carried to their logical conclusion, regulation would have to disavow use of the DCF methodology altogether. In other words, if the DCF methodology cannot be trusted to give reliable inferences about how ROE will influence P/B, it cannot be trusted to give reliable inferences about how dividend yield and expected growth can tell us anything about the total return expected by investors. A good economic model or theory is one that both helps explain or provide insight into economic behavior *and* yields assumptions that are empirically testable. The DCF model succeeds on both fronts. It posits a certain kind of behavior or relationship between market prices and book value depending on what the expected book equity return is in relationship to the required rate of return ("cost of equity") and what we see in the market (empirically) is consistent with what the theory predicts. Attempts to discredit or deny any useful inferences at all from market-to-book ratios are simply resorts to special pleading.

VI. ANALYSIS OF COMPANY TESTIMONY ON RATE OF RETURN ON EQUITY

Q. PLEASE DESCRIBE THE BASIS FOR OTP'S REQUESTED RETURN ON EQUITY OF 10.3 PERCENT.

A. Testimony in support of OTP's request is presented by Robert B. Hevert. Mr. Hevert recommends that OTP be allowed a 10.3 percent return on equity, but only after taking us along on an exhausting road tour of two different *basic* approaches to estimating the cost of equity which is multiplied into *thirteen* different cost of equity estimates which, when further iterated into "low," "medium," and "high" results along with other input choices yields a staggering 29 different cost of equity estimates ranging from a low of 7.91 percent to a high of 13.13 percent. And this only after Mr. Hevert decides to ignore certain results on the low side of all of this, which would drive the "low" down to 7.49 percent (while apparently never experiencing a result so high that he would consider ignoring it).[19] If we throw all these results into a blender to produce a smoothie *median*, the result is 9.97 percent (which is not changed if we replace the low end with 7.49 percent). But where do we begin to make heads or tails of all this?

In my experience, differences in rate of return recommendations between staff or consumer advocate witnesses and utility witnesses usually boil down to a few *key* differences in methodology. So rather than fret over the minutiae (should we use 30 days, 60 days, or 180 days of stock prices to calculate dividend yield?) I propose to zero in on these key differences. To organize my overall response to Mr. Hevert's

[19] The full panoply of results is in the tables on pp. 67 and 68 of his direct testimony. The lowest result shown there, 7.91 percent includes flotation costs. When the excluded results are added back the corresponding result is 7.49, found on his Exhibit____(RBH-1), Schedule 1, Page 3 of 3. As for the remark about never seeing a return too high to ignore, see Page 57 of my testimony.

testimony, I will do so under the following headings:

A. Discounted Cash Flow Methodologies

B. Risk Premium Methodologies

C. Size Premium

D. Flotation Costs

E. Impact of Tax Cuts & Jobs Act (TCJA)

Exhibit___(BLC-1), Schedule 10, is a one-page synopsis of eight "major issues" with respect to Mr. Hevert's efforts to justify the reasonableness of a 10.3 percent return on equity.

A. Discounted Cash Flow Methodologies

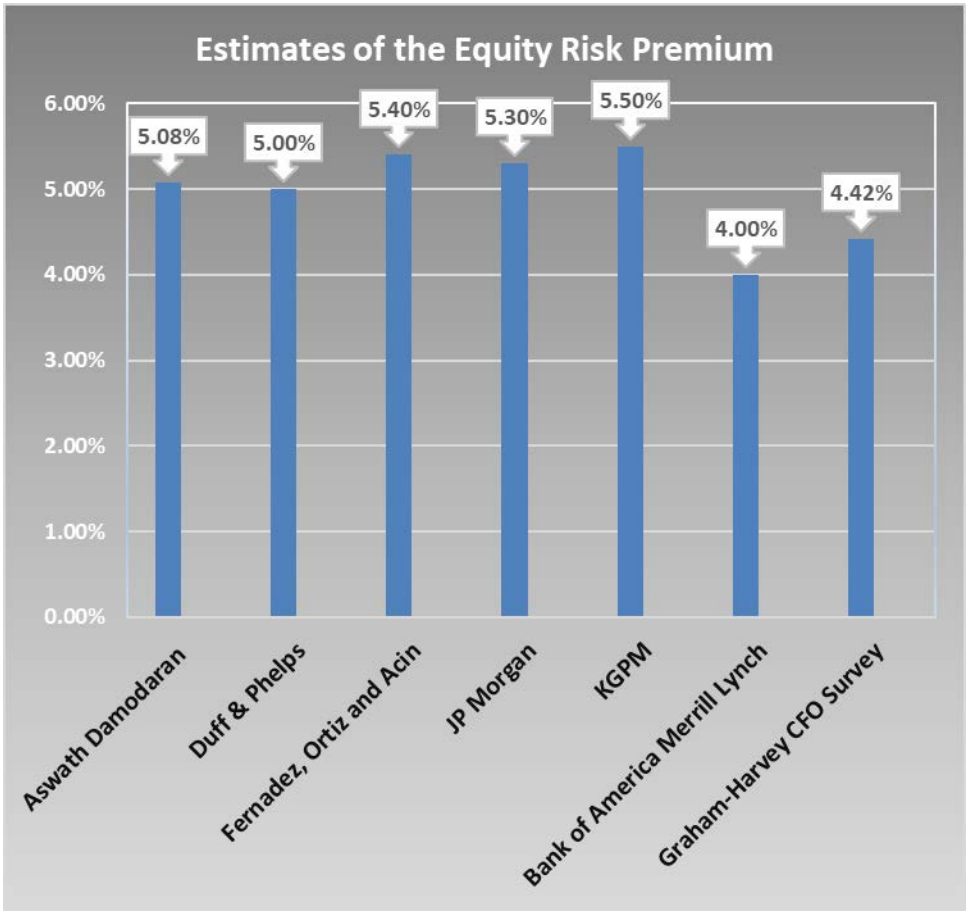
Q. WHAT ARE THE KEY ISSUES WITH RESPECT TO DISCOUNTED CASH FLOW METHODOLOGIES IN ESTIMATING THE COST OF EQUITY CAPITAL?

A. The first key issue where Mr. Hevert and I disagree is in the choice of inputs to estimate the growth rate in the constant growth form of the DCF model. If we look at Pages 1, 2, and 3 of Mr. Hevert's Schedule 1, we see that he has relied entirely on *earnings* growth projections (from three different sources). In my Exhibit____(BLC-1), Schedule 1, I employ earnings growth projections along with three other metrics of future growth relevant to estimating the cost of equity using the DCF constant growth model: (1) dividend growth, (2) book value per share growth, and (3) the Value Line metric of "% Retained to Common Equity." The latter two are conceptually the same, but one is a forecast of book value growth in the near term, and the other is a projected growth beyond the near term. In my discussion of the implementation of the constant growth model I discuss thoroughly the reasons not to rely solely upon

earnings growth and why it is appropriate or even necessary to consider other growth estimates. Bottom line? Relying solely upon earnings projections, the median expected growth rate in Mr. Hevert's analysis is 5.20 percent. In my implementation the median expected growth rate is 4.56 percent, lower by 64 basis points.

A second key issue here is Mr. Hevert's decision to ignore any cost of equity estimate below 8 percent. As a result, he eliminated a *third* of his sample from consideration (El Paso Electric Company, IDACORP, Inc., and Northwestern Corporation). The only reasons he gives for rejecting these results as too low is by reference to *allowed* rates of return. Would anyone ever think that maybe allowed rates of return are way too high? (I would.) A more substantive evaluation would be whether they are too low in terms of *investor* perceptions and considerations. To address that I will introduce here some evidence that I will be making use of again in my evaluation of Mr. Hevert's CAPM (Capital Asset Pricing Model) estimates of the cost of equity. The threshold question here is "just *how low* might investors think a reasonable rate of return on equity is in today's capital markets?"

To address this question, I would call attention to the estimates of the market risk premium in the chart on the next page. I will describe the sources in more detail later when I address Mr. Hevert's estimate of the market risk premium. For now, this suffices to show that many knowledgeable market analysts would consider 4.0 to 5.5 percent a reasonable premium for equity market risk. Presently, yields on long-term treasury bonds, a standard metric for the "risk-free rate of return," are about 3.0 percent. Taken together we have a range of experienced and knowledgeable market



analysts who would consider a return of 7.0 to 8.5 percent to be a reasonable rate of return for an equity investment of *average market risk*. As we will see when we consider Mr. Hevert's various risk premium approaches, utility stocks are of *below average market risk*. Thus, expected returns on equity for electric utilities below 8 percent are not only reasonable, but *expected* on the basis of current norms regarding expected capital market returns. Not only is there no objective basis for excluding returns on equity below 8 percent for electric utilities, if we are going to take a scalpel to our data, we should be ignoring anything above 8.5 percent! But rather than go there, I suggest that the Commission simply ignore the truncated results of Mr. Hevert's constant growth DCF model.

Doing that, we get the following three ranges of "low, mean, and high" from his

Schedule 1:

	Proxy Group Median		
	No Flotation Costs		
	Low	Mean	High
Page 1	7.71%	8.70%	9.53%
Page 2	7.49%	8.45%	9.29%
Page 3	7.52%	8.44%	9.30%

And when we "adjust" these results by 64 basis points to account for relying solely upon earnings growth rates we get:

	Proxy Group Median		
	No Flotation Costs		
	Less 64 Basis Points		
	Low	Mean	High
Page 1	7.17%	8.16%	8.99%
Page 2	6.95%	7.91%	8.75%
Page 3	6.98%	7.90%	8.76%

Two of the means (Page 2 and Page 3 of Hevert's Schedule 1) now produce returns – 7.91 percent and 7.90 percent – close to my median constant growth DCF estimate of 7.71 percent.

What this indicates, clearly, is that the only real difference in our implementations of the constant growth DCF is Mr. Hevert's exclusive reliance upon analysts' EPS forecasts, and my use of other growth measures (Value Line DPS, BVPS, and % Ret to Com Equity) in addition to analysts' EPS forecasts. It bears noting here Mr. Hevert is employing the same approach that the Commission considered and rejected in Docket No. EL11-019, whereas I am employing the same approach that the Commission adopted in that docket.

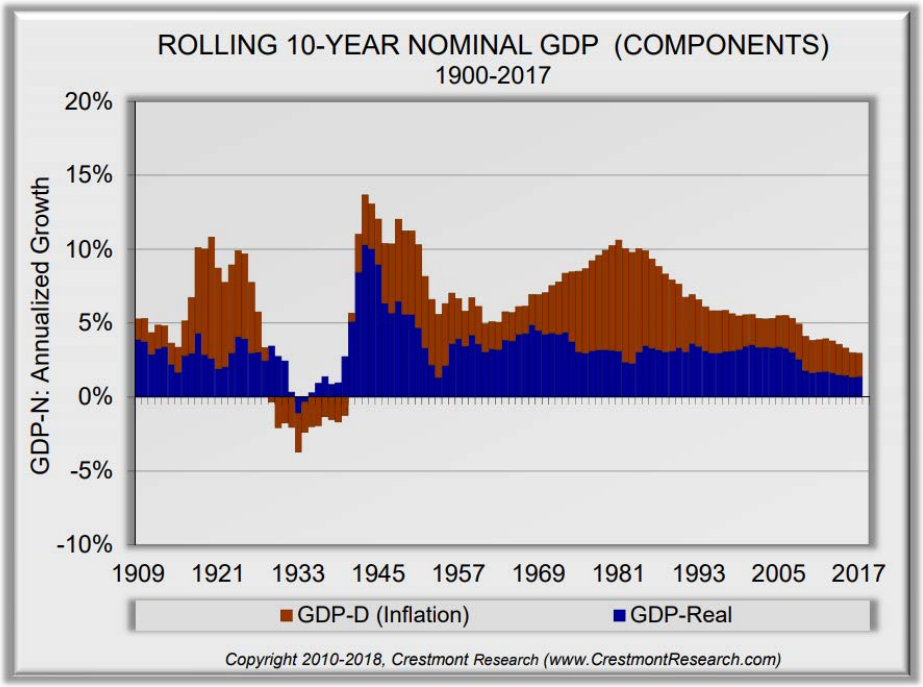
Finally, in this assessment of Mr. Hevert's constant growth DCF analysis I would return to the point made earlier in my testimony that to properly *balance* consumer and investor interest the Commission should be looking for *the lowest*

reasonable estimate of the required rate of return on equity. With that in mind we should be focusing on the columns labeled "low" in the above two matrices. Taking a blunt instrument to the data in the bottom table above, the "low" estimates are about 7 percent. If experienced and knowledgeable market analysts think that 7 to 8.5 percent is a reasonable return for equity investments of average market risk, it is not hard to believe that 7 percent is a reasonable return for utility equity investments. Mr. Hevert has no good reason to eliminate returns below 8 percent from his analyses.

Q. MOVING ON TO MR. HEVERT'S MULTI-STAGE DCF ANALYSIS, WHAT ARE THE KEY ISSUES WITH THAT APPROACH?

A. Far and away the key issue with this approach is the growth rate assumed for the terminal stage of the analysis, 5.45 percent. Mr. Hevert puts this forth as an estimate of long-term future growth in gross domestic product (GDP). While it is not uncommon to see GDP used as a terminal growth rate in multi-stage DCF models for *unregulated* firms, it is wholly inappropriate for use in a multi-stage DCF model *for public utilities*. I'll explain why below. But first I want to address whether 5.45 percent is even reasonable for a projected rate of growth in GDP for unregulated firms in today's economic environment. Mr. Hevert explains the basis for his 5.45 percent estimate of growth in GDP on lines 4-5 of Page 28 of his Direct Testimony: "The long-term growth rate of 5.45 percent is based on the real GDP growth rate of 3.21 percent from 1929 through 2017, and an inflation rate of 2.16 percent." The embedded inflation rate is not particularly unreasonable (though a bit on the high side) but the expectation of future real GDP growth is certainly unreasonable.

Note the pattern of historical real and nominal GDP shown in the following chart:



Any realistic expectation of long-term nominal GDP above 5 percent or real GDP above 2 percent collapsed with the 2008-2009 recession. While some might be optimistic about the chances for economic growth under President Trump, the latest Congressional Budget Office update to its economic outlook as of August 2018 projects real GDP growth for the period 2023-2028 (as far out as the projection goes, and the projection most appropriate for a terminal growth rate for a multi-stage DCF model) is just 1.7 percent and the nominal GDP growth rate is 3.9 percent.[20] Substituting 3.9 percent for 5.45 percent in Mr. Hevert's multi-stage DCF analyses will result in substantially lower estimates of the multi-stage DCF cost of equity. As an example, the mean DCF cost of equity shown on his Schedule 3, Page 1 of 19 using a 30-Day Average Stock Price is 9.20 percent. When 3.9 percent is used for the terminal stage growth rate, the mean DCF cost of equity falls to 7.95 percent and the median to 7.60

[20] CBO, "An Update to the Economic Outlook:2018-2028," August 2018, P. 12. https://www.cbo.gov/system/files?file=2018-08/54318-EconomicOutlook-Aug2018-update.pdf, accessed 02/02/2019. The relevant chart is reproduced in my testimony below on Page 65.

percent. I did not do the same calculation for the other 17 iterations of his estimation procedure but they would all be off (which is to say, "too high") by a similar order of magnitude. But if 3.9 percent is what we might expect for the economy overall, we must expect something less for public utilities.

Q. PLEASE EXPLAIN WHY THAT IS.

A. Long-term growth in GDP will be determined in large part by the earned returns on equity and earnings retention rates of unregulated companies. Unregulated companies typically have a life cycle and financial characteristics completely different from the typical regulated public utility. During the early stages of the life cycle of a typical unregulated company, the company will grow rapidly, paying little or no dividend to its investors and reinvesting (retaining) all of its earnings to fuel this period of rapid growth. In time, it begins to pay a dividend, and to adopt a dividend payout ratio and earnings retention rate more typical of the unregulated sector of the economy. Few unregulated firms will ever adopt long-term dividend payout ratios and earnings retention rates that are common among regulated public utilities. As illustration of this, according to data using Bloomberg in Mr. Hevert's Exhibit ____ (RBH-1,), Schedule 4, Pages 1-6, 94.4 percent (472 of 500) of the companies in the S&P 500 have dividend yields below 4 percent, and the median dividend yield for those companies is 1.83 percent. Clearly the S&P 500, and the market as a whole, is dominated by companies which have higher earnings retention rates than the typical public utility. To the extent that these unregulated companies drive the expected rate of growth in GDP, the expected rate of growth in GDP will always exceed the long-term growth experienced by a regulated public utility.

Differences with respect to earnings retention between unregulated companies and regulated public utilities are only part of the reason why the long-term growth of a typical public utility can *never* equal the long-term rate of growth in GDP. Just as important are differences in returns on equity. Utilities are less risky than the market as a whole. This is unequivocal from the consistently lower beta coefficients we see for public utility stock. If regulation is effective, then utilities will consistently earn somewhat lower returns on equity than are typically earned by unregulated companies. When you combine lower expected returns on equity with higher dividend payout ratios, it is *impossible* for the long-term growth of a normal public utility to equal the long-term growth of GDP.

The issues here can be demonstrated further with some simple numerical analysis. Mr. Hevert's long-term growth rate based on GDP is 5.45 percent. His multi-stage DCF models show long-term earnings retention converging on 34.1 percent (100 minus the 65.91 percent payout ratio shown in his Schedule 3, Column [9]). With long-term earnings retention of 0.341 public utilities would have to earn a return on equity of about 16.0 percent (5.45/0.341 = 15.9824 to be more precise) to produce a growth rate of 5.45 percent. So implicitly Mr. Hevert is projecting a long-term return on equity for public utilities of nearly 16 percent. Without that kind of return, there is no way for public utilities to produce a growth rate close to the rate of growth in GDP.

Therefore, Mr. Hevert's long-term growth rate based on an estimate of growth in GDP requires one of two equally implausible assumptions. It either requires that public utilities earn a higher return on equity than is even typical of unregulated companies or it requires public utilities to have an earnings retention rate that far exceeds

the norm for public utilities. Since neither of these conditions is likely or even plausible, Mr. Hevert's long-term GDP growth rate is completely inappropriate for any kind of DCF analysis for OTP or any other typical public utility. Thus, the results of his multi-stage DCF analyses should be rejected.

I should note, however, that when a 3.50 percent long term growth rate (the long-term growth I used in my nonconstant growth analysis, based on Value Line projections) is substituted for the 5.45 percent figure that Mr. Hevert used, the median nonconstant DCF cost of equity for Mr. Hevert's Schedule 3, Page 1, drops to 7.28 percent. This is not too far off the 7.05 percent median shown in my Schedule 2. The remaining difference is probably attributable entirely to the fact that prices rose and dividend yields fell between the time Mr. Hevert performed his analysis and the time I performed mine. The point of which is to say that when a reasonable long-term growth rate is used in Mr. Hevert's worksheets, the result is not significantly different than what I have found to be the case. The current cost of equity for the sample of comparable companies based on this approach and using more recent and appropriate data is close to 7 percent, and provides no justification whatsoever for Mr. Hevert's recommended return on equity of 10.3 percent.

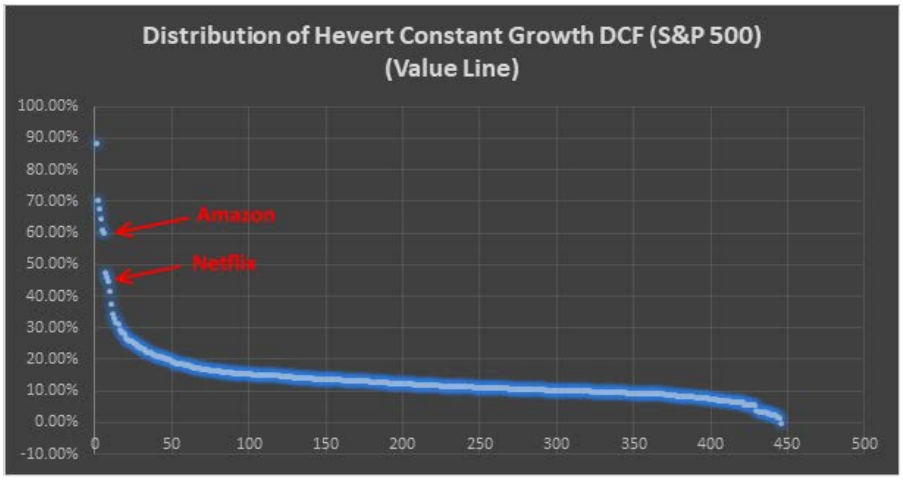
B. Risk Premium Methodologies

Q. WHAT IS THE KEY CONCERN OR ISSUE WITH RESPECT TO MR. HEVERT'S CAPM ESTIMATES OF THE COST OF EQUITY?

A. By far the key issue here is his attempt to estimate the required return on the market as a whole and, as a derivative, his resulting estimate of the equity risk premium. His initial description of what he did, from lines 10-11 of Page 32 of his testimony, dooms his analysis from the very start: "I calculated the market capitalization weighted

average total return based on the *Constant Growth* DCF Model." (Emphasis mine.) He performed what is known as a "bottom up" forecast. That is, he estimated the DCF cost of equity for each firm in the S&P 500 for which there are earnings forecasts. Then he calculated a weighted average based on their relative market capitalization. Right off we have the problem of using only earnings forecasts. But in this case the problem is compounded by the fact that if any firms call for the use of a *non-constant* growth DCF analysis it is *most of the firms in the S&P* 500. In fact, in one of the most bizarre things I've ever seen, he included numerous companies that do not pay any dividend at all! How are we to imagine that a constant growth *dividend* discount model can account for how stocks that pay no dividend are valued? A normal approach here would be to use a two-stage model in which dividends are not paid in the initial stage, but begin to be paid "down the road" and then those dividends are discounted back to derive a present value to associate with the stock. But to think we can use the constant growth model for such companies is just unreal.

This is no small concern. The following image shows the distribution of Mr. Hevert's DCF constant growth estimates for his Value Line analysis of the S&P 500, Exhibit____(RBH-1), Schedule 4, Pages 7-12:



The results are definitely skewed with a longer "tail" at the high end than at the low end. Moreover, many of the estimates at the high end of the distribution have greater market weight than those at the low end of the distribution, and this imparts a substantial upward bias to his results that I will describe in a moment.

But I first want to call attention to the sheer absurdity of the numbers at the high end. Note that I've called attention to Amazon and Netflix. That is for two reasons. First because they are so high, but second because together they make up over 2 percent of Mr. Hevert's estimate because of their massive market value. Both pay no dividend, so Mr. Hevert's "DCF estimate" is simply the current analysts' expected earnings growth rate *for the next 3 to 5 years*. For Amazon this estimated earnings growth rate is 60.0 percent, and in Mr. Hevert's simplistic application of the constant growth rate DCF model this becomes his estimate of Amazon's cost of equity – 60.0 percent! But who in their right mind would expect Amazon to produce earnings growth of 60 percent *perpetually*? Remember, no firm can grow *perpetually* at a rate of growth faster than the rate of growth in GDP. Netflix is another example of a company which pays no dividend, and has a high projected EPS growth rate over the next 3 to 5 years: 44.50 percent. So, in Mr. Hevert's constant growth DCF analysis of the S&P 500 it is given an estimated cost of equity of 44.50 percent. Once again, such numbers are impossible. Yet, while Mr. Hevert removes from his proxy group DCF analysis any result below 8 percent, here he retains results that are simply impossible.

The median DCF constant growth rate cost of equity for the 446 companies included in Mr. Hevert's Value Line constant growth DCF analysis was 11.63 percent while his market-weighted average cost of equity for the 446 companies was 15.54 percent. That is a *huge* upward bias attributable directly to the high market value of

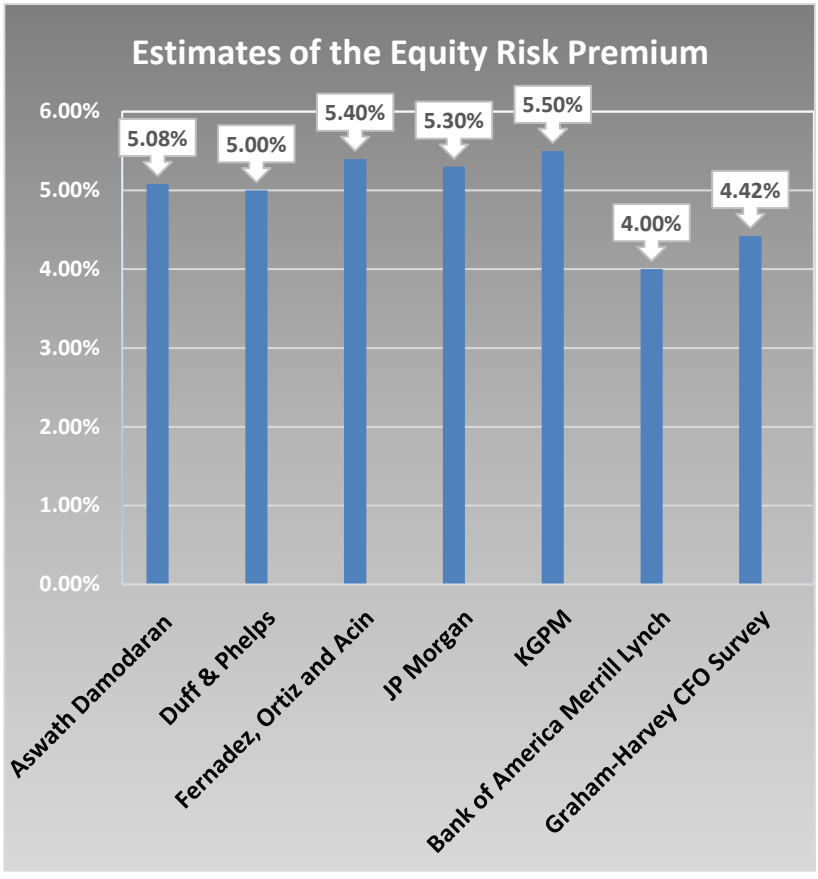
many low or zero dividend paying utilities with extremely high expected earnings growth rates over the next 3 to 5 years. The constant growth DCF model is simply inappropriate to estimate the cost of equity for the S&P 500. With problems like this we should not be surprised if Mr. Hevert's bottom up effort to estimate the market risk premium should overestimate what could be considered a *reasonable* estimate of the premium. I would point out that in his testimony itself on Pages 32 and 33, he does not specifically mention the estimates of the market risk premium produced by his bottom up methodology. But they are found on his Schedule 4, Pages 1 and 7: 11.78 percent using Bloomberg data and 12.49 percent using Value Line data. For discussion purposes, let us just round this off to 12 percent. Is there any possibility whatsoever that this is even plausible, let alone *reasonable*? No. Remember, this is an estimate of the premium on common stock versus long-term government bonds. Anyone with any familiarity with long-term historical stock returns vis-à-vis long-term government bond returns will realize that stocks have *never even come close* to producing an average return premium of this magnitude. Not even *close*. Here is a spreadsheet output of S&P 500 total returns versus long-term government bonds over three different lengths of time:

	Arithmetic Average		*Geometric Average*	
	Stocks - T. Bills	Stocks - T. Bonds	Stocks - T. Bills	Stocks - T. Bonds
1928-2017	8.09%	6.38%	6.26%	4.77%
Std Error	*2.10%*	*2.24%*		
1968-2017	6.58%	4.24%	5.28%	3.29%
Std Error	*2.39%*	*2.70%*		
2008-2017	9.85%	5.98%	8.01%	4.56%
Std Error	*6.12%*	*8.70%*		

(For the source of this data see the footnote on Page 63.) The relevant data for the present discussion are the two columns headed "Stocks – T. Bonds." There is a debate

over whether the appropriate basis for calculating the historical risk premium is an arithmetic basis or a geometric basis but that is irrelevant here. Even on an arithmetic basis, the *highest* historical risk premium shown in the data above is 6.38 percent. Yet Mr. Hevert would have us to think that rational investors are expecting stocks to earn an average premium of *12 percent* over long-term government bonds for the foreseeable future. Again, seriously, where is the sanity check here? This is not to say that there are not a *few* market analysts who might be predicting return premiums on this order of magnitude, but I am sure the Commission is not interested in what a *few* market analysts might think about the matter, but what *most* analysts think about it.

So, what do *most* analysts think about what is the expected equity market risk premium? First, I would begin by presenting again the chart that appeared above on Page 49, shown again below. The estimates of the equity market risk premium



shown here range from a low of 4.0 percent to a high of 5.5 percent. But it is worth looking a little more closely at some of these sources and what they have to say about current market expectations regarding the equity risk premium.

The first I would call attention to is the estimate attributed to "Fernandez, Ortiz and Acin." Pablo Fernandez has been producing research papers surveying various estimates of the market risk premium for a number of years. In the most recent survey, Fernandez (assisted by Alberto Ortiz and Isabel F. Acin) requested information from a variety of academics and professionals.[21] Results for the US, based on replies from 1,348 respondants, are shown in the following image:

Pablo Fernandez, Vitaly Pershin and Isabel F. Acin
IESE Business School

Market Risk Premium and Risk-Free Rate used for 59 countries in 2018

Table 2. Market Risk Premium (MRP) used for 59 countries in 2018

MRP	Number of Answers	Average	St. Dev.	Median	MAX	min	St.Dev. / Average
USA	1348	5,4%	1,7%	5,2%	17,8%	1,3%	32,1%

Table 3. Risk Free Rate (RF) used for 59 countries in 2018

RF	Number of Answers	Average	St. Dev.	Median	MAX	min	St.Dev. / Average
USA	1348	2,8%	0,8%	2,8%	7,0%	-0,3%	30,0%

Table 4. Km [Required return to equity (market): RF + MRP)] used for 59 countries in 2018

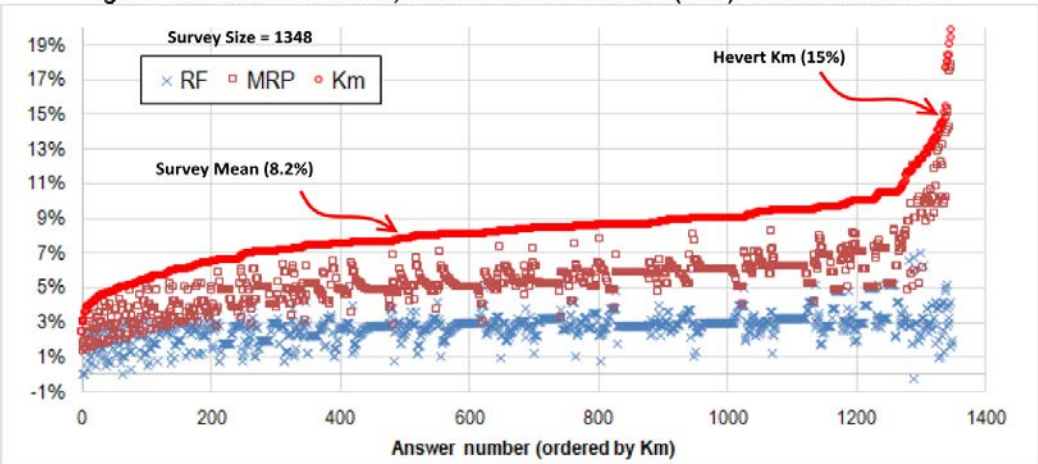
Km	Number of Answers	Average	St. Dev.	Median	MAX	min	St.Dev. / Average
USA	1348	8,2%	2,0%	8,3%	19,8%	2,4%	23,9%

The average market risk premium ("MRP") of 1,348 respondents was 5.4 percent. Not 12 percent, and not even close to 12 percent. Moreover, Fernandez and his coauthors have a chart that allows us to assess just how far from the norm Mr. Hevert's estimate of the market risk premium and expected total market return used in his CAPM analysis actually are:

[21] Pablo Fernandez, Alberto Ortiz, Isabel F. Acin. "Market Risk Premium and Risk-Free Rate used for 59 countries in 2018: a survey." Electronic copy available at: https://ssrn.com/abstract=3155709

2. Distribution of the answers for the USA

Figure 2. Answers for USA. RF, and Market Risk Premium (MRP) and Km used in 2018



I have annotated the chart to call attention to Mr. Hevert's estimate of the total market return ("Km" in the chart) and will say more about that in a minute. But first notice the distribution of the equity market premium ("MRP") estimates: I count about 20 that are 12 percent or higher which would put Mr. Hevert above the 98th percentile in his estimate of the market risk premium. That is a measure of how far out of the norm he is. The same holds true of his estimate of the total expected market return in his CAPM model, which is 15 percent. Here, I only count about 10 out of 1,348 at 15 percent or above, that would place him above the 99th percentile. Note as well that when looking at the expected total return (the top row of data points in the chart), it does not begin its sharp turn upward at the end (to the right) until the survey count passes 1,200. At that point, the expected total market return (Km) is about ten percent. To make the point perfectly clear, 1,200 of 1,348 respondents think that the total expected market return is no more than 10 percent, and a majority of those think it is less: the survey average is 8.2 percent. Note also that with a standard deviation of 2.0 percent around the sample mean of 8.2 percent, the 95th percentile for the maximum

estimate of the expected total market return would be 12.2 percent. At 15 percent, Mr. Hevert is well, well, outside any "zone of reasonableness." [22]

All of this has a profound and significant impact on the credulity (or *incredulity*) of Mr. Hevert's CAPM estimates of the cost of equity. Suppose we accept the upper limit of what 1,200 analysts think and presume that the expected total market return is 10.0 percent. The current 30-year Treasury bond rate is about 3 percent, leaving us with an expected market risk premium of 7.0 percent. Mr. Hevert uses beta coefficients from two different sources, one (Bloomberg) averaging 0.634 for his sample and the other (Value Line) averaging 0.778. I have problems with these estimates of the beta coefficients to use with public utility stocks, but I will ignore that for now and for purposes of this back of the napkin analysis use a beta coefficient of 0.70. Given all these assumptions, the CAPM estimate of the cost of equity for Mr. Hevert's sample would be about 7.9 percent:

$$k = 3\% + (0.7 \times 7.0\%) = 3\% + 4.9\% = 7.9\%$$

Under the most favorable assumptions imaginable, the CAPM cost of equity for Mr. Hevert's sample is no more than 7.9 percent. But the more plausible expectation is that it is something less than this. Assuming that the expected market return is only 8.2 percent, the equity market risk premium is only 5.2 percent and the CAPM estimate of the cost of equity for the sample falls to 6.64 percent:

$$k = 3\% + (0.7 \times 5.2\%) = 3\% + 3.64\% = 6.64\%$$

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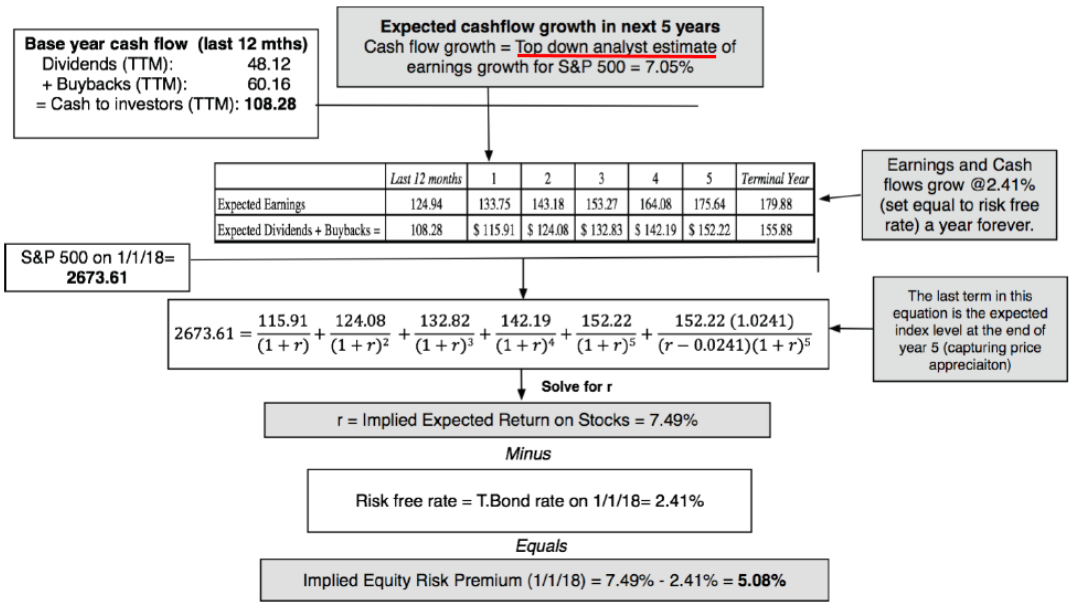
[22] In round numbers, the 95th percentile would be two standard deviations above the mean:

$$8.2\% + (2 \times 2\%) = 8.2\% + 4\% = 12.2\%$$

Mr. Hevert's estimate of the expected market return, about 15 percent, is more than *three* standard deviations above the mean ($8.2\% + (3 \times 2\%) = 14.2\%$).

These estimates corroborate the reasonableness of my three estimates of the cost of equity: 7.71 percent (Schedule 1), 7.05 percent (Schedule 2), and 7.03 percent (Schedule 5). Any estimate of the cost of equity much above 8 percent for the sample of utilities under consideration in this proceeding is beyond the realm of reason.

This contention, that 8 percent is an upper limit of a reasonable estimate of the cost of equity for this proceeding, is reinforced when looking at the other sources of market risk premium estimates shown in the chart above. For example, the market risk premium estimated by Professor Aswath Damodaran is 5.08 percent:[23]



Professor Damodaran is using a two-stage DCF model to estimate the expected total return on the S&P 500. If we did not know better we *might* think that it should produce a result similar to Mr. Hevert's constant growth DCF model of the average cost of equity for the S&P 500. But it does not. Damodaran's expected total return on the

[23] Aswath Damodaran, "Equity Risk Premiums (ER): Determinants, Estimation and Implications, The 2018 Edition," (Updated: March 14, 2018), P. 87. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3140837 accessed 02/02/2019.

S&P 500 is almost exactly *half* of Mr. Hevert's estimate: 7.49 percent, rather than 15 percent. The reason for this dramatic difference is that Damodaran's method is "top down" rather than "bottom up" like Mr. Hevert's. (Notice the red underscore in the preceding image.) That is, rather than apply the DCF methodology to *individual companies* like Mr. Hevert does (and we saw above how that produces results that are simply not credible), Professor Damodaran is using expected earnings forecasts for the S&P 500 *as a whole*. Analysts who estimate expected earnings on the S&P 500 as a whole typically do so in a framework that is *macroeconomic*. In other words, they will take into account such factors as expected GDP growth, interest rates, and similar variables that are macroeconomic and consider how these will impact the S&P 500, i.e., they consider the market and the economy "as a whole." This is known as "top down" analysis.

We should be able to understand the value of this top down approach over the bottom up approach simply by looking at the results of the two approaches. Mr. Hevert's approach produced an average expected total return of about 15 percent. Of this, about 1.8 percent was from the dividend yield, leaving an implied expected earnings growth rate for the S&P of about 13.2 percent. No one, looking at the S&P 500 in a macroeconomic context, would ever anticipate earnings growth of *anywhere near* 13.2 percent. Recall the discussion above where I noted that for unregulated companies the expected rate of growth in GDP is a plausible upper limit for a terminal growth rate in a multi-stage DCF model. It would be ludicrous to use 13.2 percent as the terminal or long-term growth rate for the S&P 500 because the economy could never sustain such a growth rate.

Now, I will point out that Professor Damodaran may go too far to the other

extreme, and uses an implausibly low 2.41 percent for the terminal earnings growth rate of his two-stage DCF analysis of the S&P 500. In Damodaran's defense, he uses this because it was the long-term treasury bond rate at the time he did his analysis, and in macroeconomic *theory* the long-term treasury bond rate is equal to inflation plus the real rate of growth in GDP. But presently, any linkage between long run GDP and long-term treasury bond rates seems broken by Federal Reserve interest rate policy. Recall from the discussion above about long-term GDP growth that the present CBO forecast for GDP nominal growth is 3.9 percent. This is the product of an expected inflation rate of 2 percent and expected real growth of about 1.7 percent:

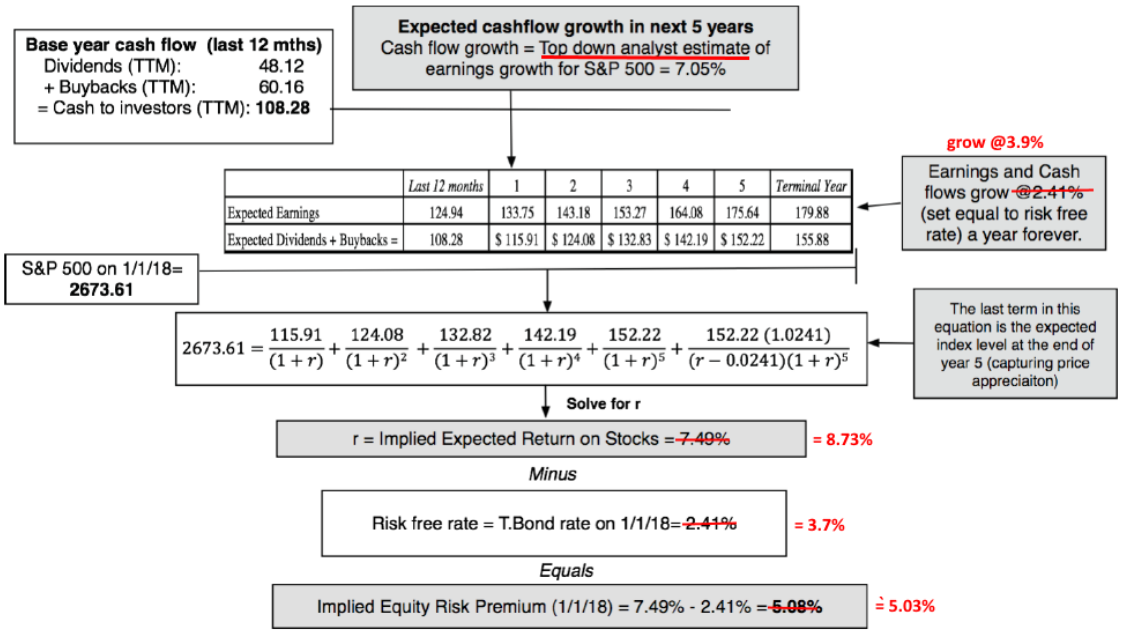
Table 1.

CBO's Economic Projections for Calendar Years 2018 to 2028

	Actual, 2017	2018	2019	2020	Annual Average 2021–2022	Annual Average 2023–2028
	Percentage Change From Year to Year					
Gross Domestic Product						
Real[a]	2.3	3.0	2.8	1.9	1.6	1.7
Nominal	4.1	5.1	4.9	4.1	3.8	3.9
Inflation						
PCE price index	1.7	2.1	2.0	2.1	2.1	2.0
Core PCE price index[b]	1.5	1.9	2.1	2.2	2.1	2.0
Consumer price index[c]	2.1	2.5	2.2	2.5	2.5	2.4
Core consumer price index[b]	1.8	2.2	2.4	2.7	2.6	2.4
GDP price index	1.8	2.0	2.1	2.2	2.2	2.1
	Annual Average					
Interest Rates (Percent)						
Three-month Treasury bills	0.9	1.9	2.8	3.1	3.2	2.8
Ten-year Treasury notes	2.3	3.0	3.6	3.9	3.9	3.7

Note well that there is a rough internal consistency to the CBO numbers that is consistent with Professor Damodaran's use of a risk-free rate (in CBO numbers, the Ten-Year Treasury notes) to approximate nominal GDP: for the period 2023-2028 in the table above, the Ten-year treasury rate is 3.7 percent vs. 3.9 percent for nominal GDP growth. As shown in the markup on the next page (which comes from replicating Professor Damodoran's methodology as shown on Exhibit____ (BLC-1), Schedule 6),

changing the long-term growth rate from 2.41 percent to 3.9 percent, and the Treas-



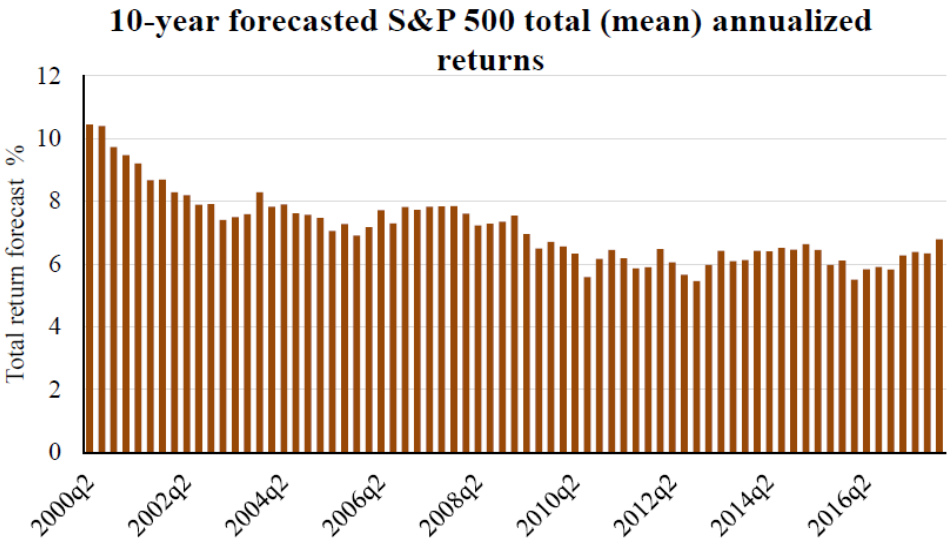
ury bond rate for determining the risk premium to 3.7 percent, the implied market risk premium (MRP) falls from 5.08 percent to 5.03 percent. So, despite my objection to Professor Damodaran's inputs, selecting what I consider to be more plausible inputs does not significantly change the output. We are still in a completely different ballpark than the one Mr. Hevert is playing in.

Before leaving this long discussion of Mr. Hevert's 12 percent market risk premium, I would call particular attention to a third source shown on the chart of market risk premium estimates on Page 60, the Graham-Harvey CFO Survey. Professors Graham and Harvey have been analyzing results of a quarterly survey of CFOs by Duke University since 2001. In each survey, they ask the respondents what they think the expected return over 10-years on the S&P 500 will be. The following chart tracks the average responses from all surveys:[24]

[24] John R. Graham and Campbell R. Harvey, "The Equity Risk Premium in 2018." https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3151162 accessed 02/02/2019.

Graham-Harvey: The equity risk premium in 2018

Figure 1b



Since 2010 the expected total return on the S&P 500 reported by CFOs has hovered around 6 percent. Note well that this not the expected *risk premium*, it is the expected *total return*. Assuming an efficient market, the expected return will equal the required return, and the expected *risk premium* can be implied by subtracting the current "risk-free rate" from the expected total return. Graham and Harvey use the 10-year Treasury bond rate as the risk-free rate. In the most recent survey the average expected 10-year total return on the S&P 500 was 6.79 percent while the 10-year Treasury bond rate was 2.72 percent, leaving an implied risk premium of 4.42 percent. The following excerpt from their Table 1 summarizes results from the most recent quarter and averages for all quarters:

Table 1
Summary statistics based on the responses from the
71 CFO Outlook Surveys from June 2000 to Sept 2017 (Maximums in red, minimums in green)

A. By quarter

#	Survey date	Survey quarter	Number of survey responses	10-year bond yield	Total market return forecast	Average risk premium	Median risk premium	Disagreement (standard deviation of risk premium estimates)	Average of individual standard deviations	Average of individuals' worst 10% market return scenario	Average of individuals' best 10% market return scenario	Skewness of risk premium estimates	Average of individuals' asymmetry	% who forecast negative excess return
71	12/7/2017	2017Q4	212	2.37	6.79	4.42	3.63	3.49	3.80	0.85	10.97	2.06	-0.66	4.25
	Average of quarters		351	**3.48**	**7.11**	**3.63**	**3.39**	**2.81**	**3.56**	**1.46**	**10.90**	**1.58**	**-0.48**	**5.73**
	Standard deviation			1.20	1.13	0.58	0.62	0.38	0.33	1.29	0.81	0.66	0.14	3.03

Admittedly, the CFO based estimates are lower than what a majority of individual analysts and academics are projecting (based on the larger survey results of Fernandez, et al). But it is not the only *informed* estimate of the expected annualized 10-year return on the S&P 500 to fall this far on the low side of the bell curve. The most recent forecast of the annualized 10-year return on the S&P 500 by the Society of Professional Forecasters conducted by The Federal Reserve Bank of Philadelphia is even lower than the 6.79 percent expected by CFOs, 6 percent:[25]

Survey of Professional Forecasters

Median Long-Term (10-Year) Forecasts (%)		
	First Quarter 2017	Current Survey
Real GDP Growth	2.45	2.15
Productivity Growth	1.60	1.50
Stock Returns (S&P 500)	6.00	6.00
Rate on 10-Year Treasury Bonds	3.86	3.70
Bill Returns (3-Month)	2.50	2.75

I would not suggest that the Commission use these lower estimates of expected returns on the S&P 500 to estimate the risk premium. I *would* suggest that they support the reasonableness of an expected overall market return suggested by the Fernandez, et al, survey, i.e., 8.2 percent, and the associated estimate of the market risk premium of 5.4 percent. I would further suggest that Mr. Hevert's estimate of the overall market return, 15 percent, and corresponding risk premium of 12 percent, are simply not even in the realm of reasonableness and should be ignored.

Q. BEFORE LEAVING YOUR DISCUSSION OF MR. HEVERT'S CAPM ANALYSIS, WHAT ARE YOUR CONCERNS ABOUT THE BETA COEFFICIENTS

[25] Survey of Professional Forecasters, First Quarter 2018, February 9, 2018. Electronic copy available at: https://www.philadelphiafed.org/-/media/research-and-data/real-time-center/survey-of-professional-forecasters/2018/spfq118.pdf accessed: 9/19/2018.

HE USES?

A. Mr. Hevert describes the beta coefficients he used on Pages 32-33 of his Direct Testimony:

> As shown in Exhibit __(RBH-1), Schedule 5, I considered the Beta coefficients reported by Bloomberg and Value Line. Both services adjust their calculated (or "raw") Beta coefficients to reflect the tendency of the Beta coefficient to regress to the market mean of 1.00, although Value Line calculates the Beta coefficient over a five-year period, whereas Bloomberg's calculation is based on two years of data.

The use of betas adjusted this way is a common but not universal practice in investment finance. My concern is that there is evidence to suggest that "the tendency of the Beta coefficient to regress to the market mean of 1.00" does not apply to public utilities and thus the adjustment is improper and leads to an overestimate of the cost of equity for a public utility when using the CAPM methodology.

The following is from the abstract of a 1998 University of Oklahoma Ph.D. dissertation by Michael Kent Knapp entitled "Observations of the Empirical Capital Asset Pricing Model in Estimating a Public Utility's Cost of Equity Capital:"

> The literature of the Capital Asset Pricing Model describes a fundamental bias in its empirical application. The most notable problem is that the Empirical Capital Asset Pricing Model which overestimate the returns of high-beta stocks and underestimate the returns of low-beta stocks. This has proven problematic in estimating public utilities' stocks expected returns in regulatory proceedings. The literature prescribes the use of a shift parameter, alpha, to correct for this bias. This dissertation aims to find the value of alpha and its statistical significance. In contrast to the literature, the following empirical analysis finds that alpha is statistically insignificant [for public utilities].[26]

I added the "for public utilities" for clarification. If the "alpha" parameter of the security market line for public utilities is not significant, there is no basis for "adjusting" the betas of public utilities. The finding reported in this dissertation supports what

[26] https://shareok.org/handle/11244/5726 accessed 9/19/2018.

has long been observable by casual empiricism about public utility betas: they do not tend to revert to the norm for the market as a whole (which is a beta of 1.0). As long as I can remember, Value Line betas for public utilities have averaged about 0.75, or between 0.70 or 0.80. Individual public utility betas fluctuate around this industry average, but the industry average shows no tendency to regress toward 1.0. This indicates that in a CAPM estimate of the cost of equity for public utilities that we should give preference to unadjusted betas.

Exhibit____(BLC-1), Schedule 7, shows beta coefficients from Value Line, Reuters, and Zacks for the sample of companies being used to estimate a fair rate of return for OTP in this proceeding. I show two values for Value Line: the adjusted beta, and the adjusted beta "de-adjusted." Value Line does not publish "raw" betas, but it is believed that the following formula describes the Value Line adjustment process:

$$\text{Adjusted beta} = 0.67(\text{Raw beta}) + 0.35(1.0)$$

I have used this formula to "de-adjust" the published Value Line betas, with the results in Column C.[27] The salient results are the sample medians at the bottom of Schedule 7:

Value Line Adjusted	0.70
Value Line De-adjusted	0.52
Reuters Raw	0.26
Morningstar Raw	0.27

Using the "back of the napkin" CAPM estimates performed earlier (on Page 62) but

[27] The formula is presented in Michael C. Ehrhardt & Eugene F. Brigham, *Financial Management Theory and Practice*, 13th Edition (2010), p. 950.

substituting 0.52 (the Value Line de-adjusted beta) for 0.70 we get:

$$k = 3\% + (0.52 \times 7.2\%) = 3\% + 3.74\% = 6.74\%$$

Using a "raw" beta of 0.27 we get:

$$k = 3\% + (0.27 \times 7.2\%) = 3\% + 1.94\% = 5.94\%$$

If 5.94 percent seems implausibly low for a cost of equity estimate for electric utilities at the present time, 6.74 percent certainly is not. The following image is a chart comparing estimates of the cost of equity for public utilities versus utility pre-

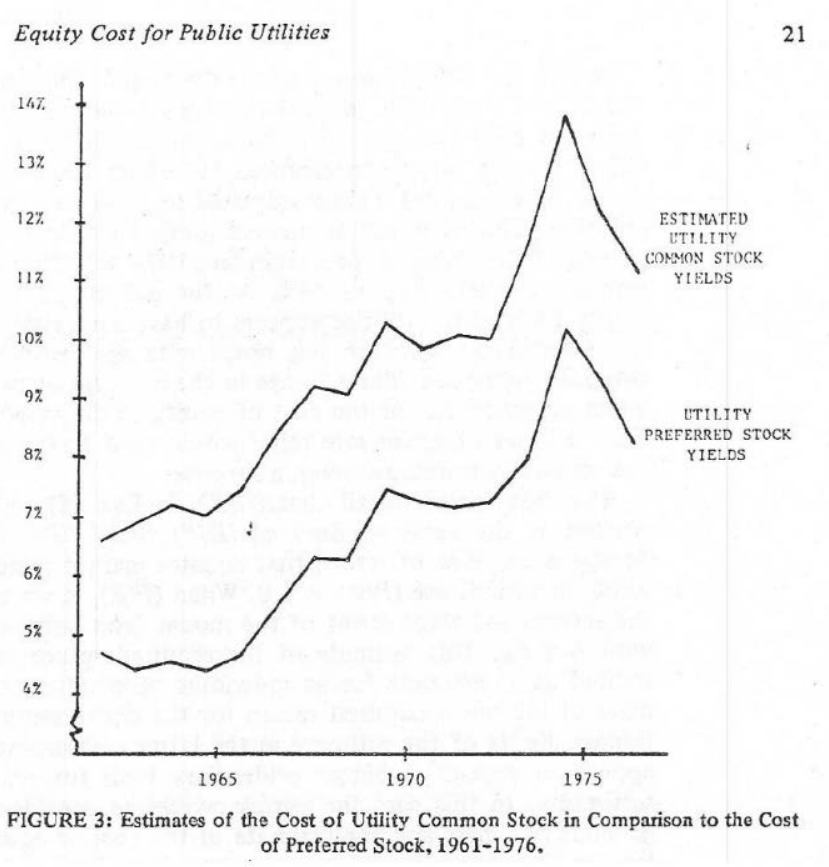
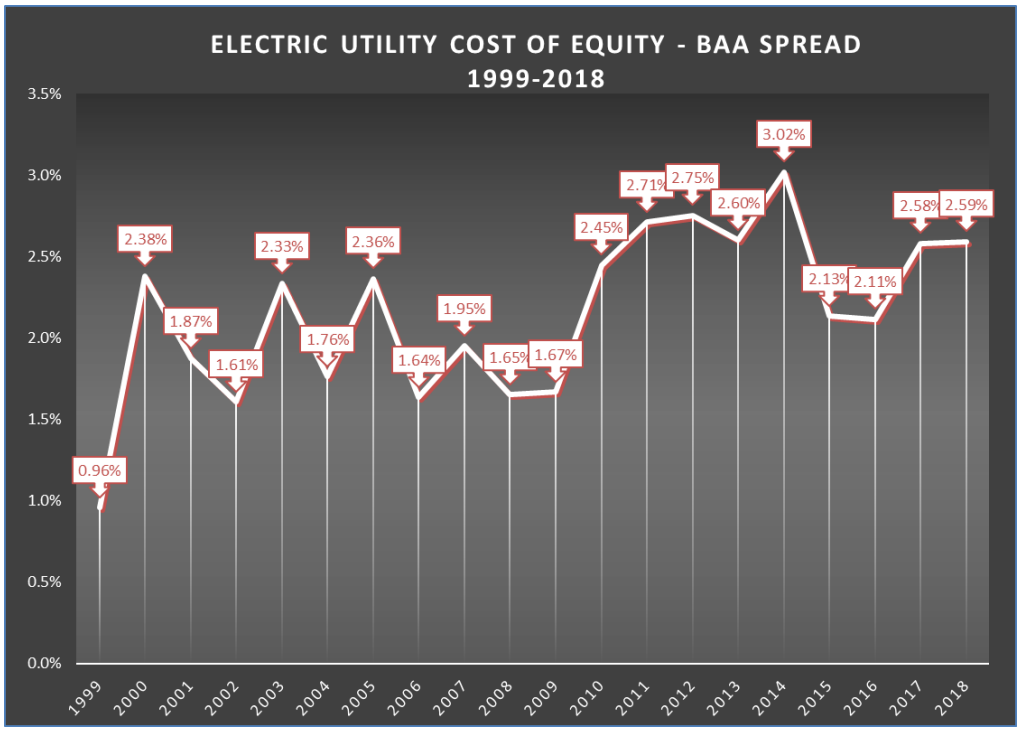


FIGURE 3: Estimates of the Cost of Utility Common Stock in Comparison to the Cost of Preferred Stock, 1961-1976.

ferred stock yields published in my 1979 article in the *Journal of Business Research*: The use of preferred stock is no longer widespread, but a comparison of estimates of the cost of equity to corporate BAA bond yields shows a similar spread:



I have long – ever since my analysis of equity capital costs in the late 1970's – casually observed a spread between utility cost of equity and utility or corporate BAA debt of about 200 basis points. In the chart tracking this spread for 1999-2018, it hovers around 200 basis points until 2008. It creeps upwards, hovering around 250 basis points, after the 2008-2009 recession. This is not likely caused by an increase in risk differential raising the cost of equity relative to corporate debt, but to the effect of Federal Reserve monetary policy pushing down interest rates.

In any case it suggests that a CAPM estimate of the cost of equity of 6.74 percent is not out of line with historical spreads between the cost of equity and BAA bond yields. Before I leave this topic and move on, I have one other point I would like to address in this regard. Mr. Hevert eliminated three companies from his DCF analyses because he did not consider their results reasonable. These were El Paso Electric, IDACORP, and Northwestern. Using the results shown on his Schedule 1, Page 2, the mean estimates of the cost of equity for these three firms were 7.59 percent, 6.23

percent and 6.99 percent respectively, for an average of 6.94 percent. These are *completely reasonable* returns on equity for an electric utility in the current market environment. For the past few months BAA yields have hovered around 4.8 percent. A return on equity of 6.94 percent would provide a risk premium for utility equity of 214 basis points. The average spread in the chart above for the two decades is 222 basis points, with a standard deviation of 0.44 percent. The current spread of 214 basis points is a completely reasonable reward for the risk associated with utility equity vis-à-vis corporate bonds. Keep in mind that utility equity, using a Value Line de-adjusted beta of 0.52, only has about *half* the systematic risk of the average (beta = 1.0) common stock. Mr. Hevert's belief that a return on equity for a public utility of less than 8 percent is unbelievable can only be explained by a lack of understanding what is an adequate premium for equity risk in current (and past) capital markets. The Commission could well dispense with all of his testimony *and all of mine* and simply set the allowed rate of return on equity for utilities in its jurisdiction at 200 basis points over the corporate BAA yield and utility investors would receive a rate of return on equity that is fair and reasonable in relation to what they can expect to earn on investments of comparable risk. I have shown that to be the case from two long-term studies, one for the years 1961-1976 and more recently 1999-2018.

I will just offer one more argument on this point. *Assume* for the moment that utilities were to earn 200 basis points over the yield on corporate BAA bonds. The present yield spread between Corporate BAA and the 10-Year Treasury bond is about 200 basis points, so we are implicitly assuming a yield for utilities of 400 basis points over the risk-free rate. Further assume that the total expected market return is 8.2 percent based upon the abundant evidence presented above. Presently the 180-day

moving average of the 10-Year Treasury bond is 2.9 percent. A return of 400 basis points above the 10-Treasury bond would be 6.9 percent. A return on the market as a whole of 8.2 percent yields a premium relative to 2.9 percent of 530 basis points. Dividing 400 by 530 we have an *implied beta coefficient* of 0.75. Even using Value Line's adjusted betas this indicates that 200 basis points above the yield of Corporate BAA provides a perfectly reasonable premium for risk in today's capital market. And then to turn all of this on its head, suppose the Commission were to follow Mr. Hevert's recommendation and allow a 10.3 percent return on equity. That would produce a premium of 740 basis points over the 10-year Treasury bond rate. Dividing 740 by 530 would yield an implicit beta coefficient of 1.40. Utilities are not that risky, and thus 10.3 is not a fair and reasonable rate of return on equity in relation to risk.

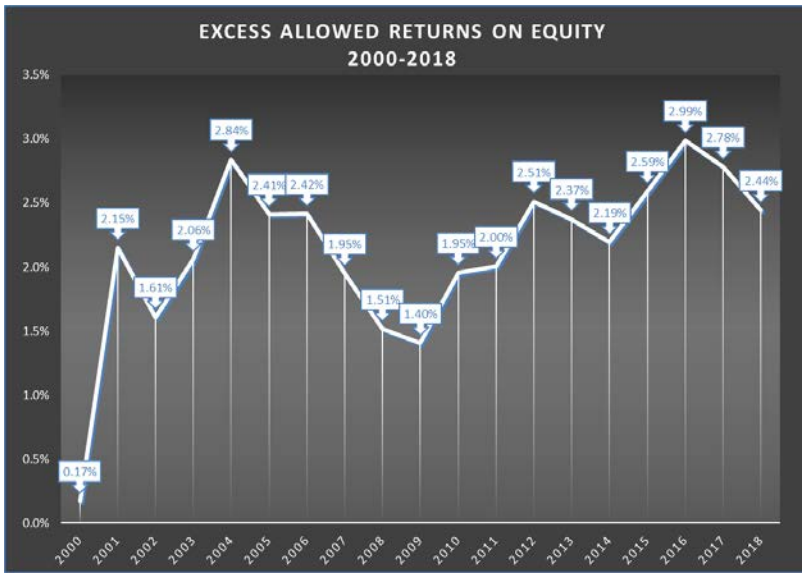
So, a return on equity of 200 basis points over the corporate BAA yield produces a *reasonable* return on relation to risk (as measured by beta). But Mr. Hevert's recommended ROE is a return far above anything reasonable in relation to risk. His CAPM estimates are even higher and amount to implied betas of 1.44 to 1.93:

Figures in parentheses are implied betas relative to an 8.2% overall market cost of equity and 2.9% risk-free rate.	*Bloomberg Derived Market Risk Premium*	*Value Line Derived Market Risk Premium*
Average Bloomberg Beta Coefficient		
Current 30-Year Treasury (3.05%)	10.52% (1.44)	10.97% (1.52)
Near Term Projected 30-Year Treasury (3.42%)	10.89% (1.51)	11.33% (1.59)
Average Value Line Beta Coefficient		
Current 30-Year Treasury (3.05%)	12.22% (1.76)	12.76% (1.86)
Near Term Projected 30-Year Treasury (3.42%)	12.58% (1.83)	13.13% (1.93)

The bottom line is that Mr. Hevert's CAPM estimates do not provide the Commission with any viable information on what is a reasonable return on equity in relation to risk.

Q. ARE THERE ANY PROBLEMS OR ISSUES WITH RESPECT TO MR. HEVERT'S OTHER "RISK PREMIUM" APPROACH WHICH HE CALLS A "BOND YIELD PLUS RISK PREMIUM APPROACH?"

A. Yes, there are. First and most important is the proxy that Mr. Hevert uses for the risk premium: allowed returns on equity. This lands us squarely back with the issue already discussed at length about the abundant evidence of excess returns from historical earned rates of return on equity reflected in market-to-book ratios. The evidence is clear that *earned* rates of return in the past were producing excess returns, so that using earned rates of return to imply a risk premium would overstate the actual risk premium. Now we have Mr. Hevert using allowed rates of return to calculate an implied risk premium. *That just makes matters worse.* It is well known that earned rates of return lag allowed rates of return so that utilities often fail to earn their allowed rates of return. Using data from the Edison Electric Institute on allowed rates of return the following chart depicts the annual excess *allowed* rate of return in relation to the required rate of return in the previous year[28]:



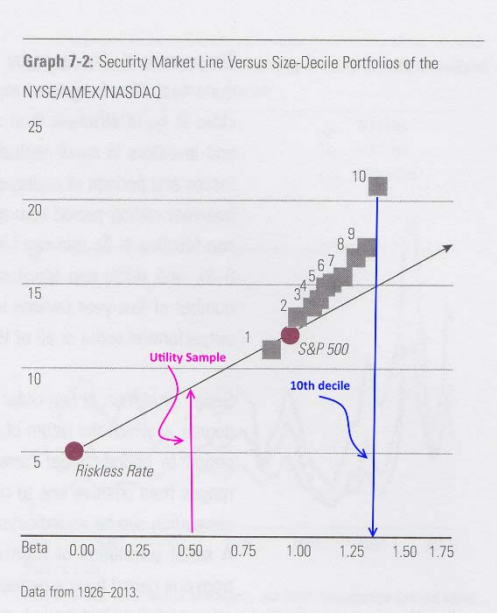
[28] The one-year lag is to recognize "regulatory lag."

The median excess *allowed* return for the past two decades has been 2.2 percent. The average (and median) "risk premium" since 1999 in Mr. Hevert's "bond yield plus risk premium" analysis is 6.2 percent. This is the average spread between allowed returns and the 30-Year Treasury yield. If we remove the 2.2 percent median *excess allowed* return we have an implied equity risk premium of 400 basis points relative to a "risk-free rate." With the 30-Year Treasury yield presently about 3.0 percent, the resulting cost of equity estimate is 7.0 percent (3.0% plus the 4% "risk premium"). This is right in line with the other estimates of the cost of equity in my affirmative testimony and in the techniques applied by Mr. Hevert when appropriate adjustments are made.

C. Size Premium

Q. MR. HEVERT DISCUSSES EVIDENCE FOR A SIZE PREMIUM FOR SMALL COMPANIES. IS THERE GOOD EVIDENCE FOR THIS?

A. No. With respect to public utilities there is none whatsoever. What evidence that does exist, for unregulated "small cap" equities, is disputed. The following chart illustrates the purported evidence upon which the claim for a size effect has been thought to exist:



When ex post equity returns are grouped into deciles based upon market capitalization, the smallest companies have, in the past, seemed to have higher returns than can be explained on the basis of their systematic risk (the risk measured by a stock's "beta coefficient"). This is illustrated in the chart above by the squares representing returns by size classes showing a steeper pattern than the straight line that represents the theoretically correct relationship between risk and return. The distance between the straight line and the return represented by a size class's diamond is the supposed "size premium." Mr. Hevert cites evidence from the 2017 edition of Duff & Phelps' *Valuation Handbook* of a size premium of 0.98 percent for the companies that make up his proxy group based on their median capitalization putting them into the 4th decile. Otter Tail Corporation is much smaller, falling into the 10th decile, which is purported to have a 5.59 percent size premium. The following chart summarizes the data that Mr. Hevert is using:

Decile	OLS Beta	Size Premium (%)
1-Largest	0.92	-0.35
2	1.04	0.61
3	1.11	0.89
4	1.13	0.98
5	1.17	1.51
6	1.17	1.66
7	1.25	1.72
8	1.30	2.08
9	1.34	2.68
10-Smallest	1.39	5.59

Whatever merit these results have, and as I stated above the matter is disputed, *they do not apply to public utilities*. Note how in this chart that the companies in the 10th decile have a beta coefficient of 1.39. *This is not the case with utilities*, which typically have betas below one. I have illustrated the issue here in the chart on

Page 76 by showing where utilities in the sample under consideration in this case fall on the security market line. Just as important, the size premium is an "alpha" factor and so it is relevant to recall here the dissertation cited above on Page 69 which found that public utilities do not have statistically significant alpha coefficients. Since "alpha" may not be as familiar to some as the "beta" coefficient is, "alpha" is simply the excess return on an equity investment that is not explained by its systematic risk. In CAPM, if markets are efficient, alpha is expected to be zero. The size premium is an attempt to explain what appear to be systematic excess returns ("alpha") for small firms that are not accounted for by beta risk. But if public utilities do not have statistically significant alphas, then there is no CAPM excess return to attribute to something like a size premium. So whatever merit the size effect may have for small capitalization companies that are unregulated, it has no merit in the case of public utilities.

Before leaving this, I will offer my explanation for why there is no size effect for public utilities. Systematic risk, measured by beta, is affected by the earnings retention rates and payout ratios that companies employ. Public utilities typically pay out a large fraction – about 65 percent on average – of their earnings as dividends. This, along with the relatively predictable earnings stream utilities generate, leads to their having beta coefficients below 1.0, and well below 1.0 on an adjusted or "raw" basis. Small capitalization unregulated companies on the other hand often, and in fact usually, pay no dividends and reinvest all of their earnings. Such companies trade on the basis of expected price appreciation driven entirely by highly unpredictable earnings and so their stock prices are more typically extremely volatile and are stocks with high beta coefficients. If there are in fact statistically significant "size effects" in market returns this is most likely due to survivorship bias, a bias that reflects that the high

returns of the companies in the 10th decile are the returns of the small capitalization firms that survive and omit the returns of the companies that have gone out of business. In any case, the literature on the size effect suggests a lack of agreement on what it means and there is even evidence that if it once existed it does not exist any longer.

D. Flotation Costs

Q. MR. HEVERT APPLIES AN ADJUSTMENT OF 0.13% TO HIS ESTIMATES OF THE COST OF EQUITY FOR FLOTATION COSTS. IS THIS ADJUSTMENT REASONABLE?

A. No, it is not. The formula that Mr. Hevert uses *is* suggested in some financial management textbooks as a way to recover flotation costs, but the formula presumes that new stock is being issued every year. In response, some may contend that this does not matter but it does. On my Exhibit____(BLC-1), Schedule 8, I show mathematically that the appropriate adjustment is "*zf*" where *f* is the flotation cost percentage and *z* is the rate of growth in new shares. I have no problem with Mr. Hevert's estimate of 3.60 percent shown on his Schedule 2 as the flotation cost percentage. Value Line is projecting an increase in the number of shares for OTTR from 2018 to 2022 (the middle of its 2021-2023 forecast range) of 4 million shares, from 40 million to 44 million. This works out to a compound annual growth rate of 1.9 percent. From 2004 to 2018 (the time frame used by Mr. Hevert in his Schedule 2 to estimate average flotation costs for OTTR) Value Line records an historical increase in the number of shares from 29 million to 40 million, a compound annual increase of 2.3 percent. If we use the projected rate of growth of 1.9 percent, the required adjustment would be 7 basis points; if we use the historical projected rate of growth, the required adjustment

would be 9 basis points.[29] Thus, 13 basis points is higher than what is necessary to recover flotation costs. Were I recommending a rate of return on equity equal to the cost of equity, I would recommend a flotation cost allowance of 7 to 9 basis points. But since I am recommending a rate of return on equity that is substantially greater than the cost of equity, there is no need for a specific flotation cost adjustment. My recommended rate of return on equity will more than compensate OTTR and its investors for flotation costs.

E. Tax Cuts & Jobs Act (TCJA)

Q. WHAT ARE YOUR CONCERNS WITH MR. HEVERT'S THOUGHTS ABOUT THE IMPLICATIONS OF THE TAX CUTS & JOBS ACT FOR A FAIR AND REASONABLE RETURN ON EQUITY?

A. Mr. Hevert begins with this dire assessment:

> Since shortly before the TCJA was signed, electric utilities (as measured by my proxy group) have significantly underperformed the overall market. As Chart 7 (below) demonstrates, from November 1, 2017 through February 28, 2018 the S&P 500 gained about 5.21 percent in value. In stark contrast, my proxy group lost about 12.95 percent, underperforming the overall market by more than 18.00 percentage points.[30]

If this was indeed a market reaction to the TCJA, the market has since shrugged off any concern about the TCJA. Since February 1 of last year, every single utility in Mr. Hevert's proxy group has *outperformed* the market. Before I show that, however, I want to express a caveat. Over any long period of time, we should *expect* the stocks in Mr. Hevert's proxy group to *underperform* the market. That is a fundamental "take away" from their having stock betas below 1.0. So, it will take more than evidence of "underperforming" the market to demonstrate that the TCJA has had a significant or

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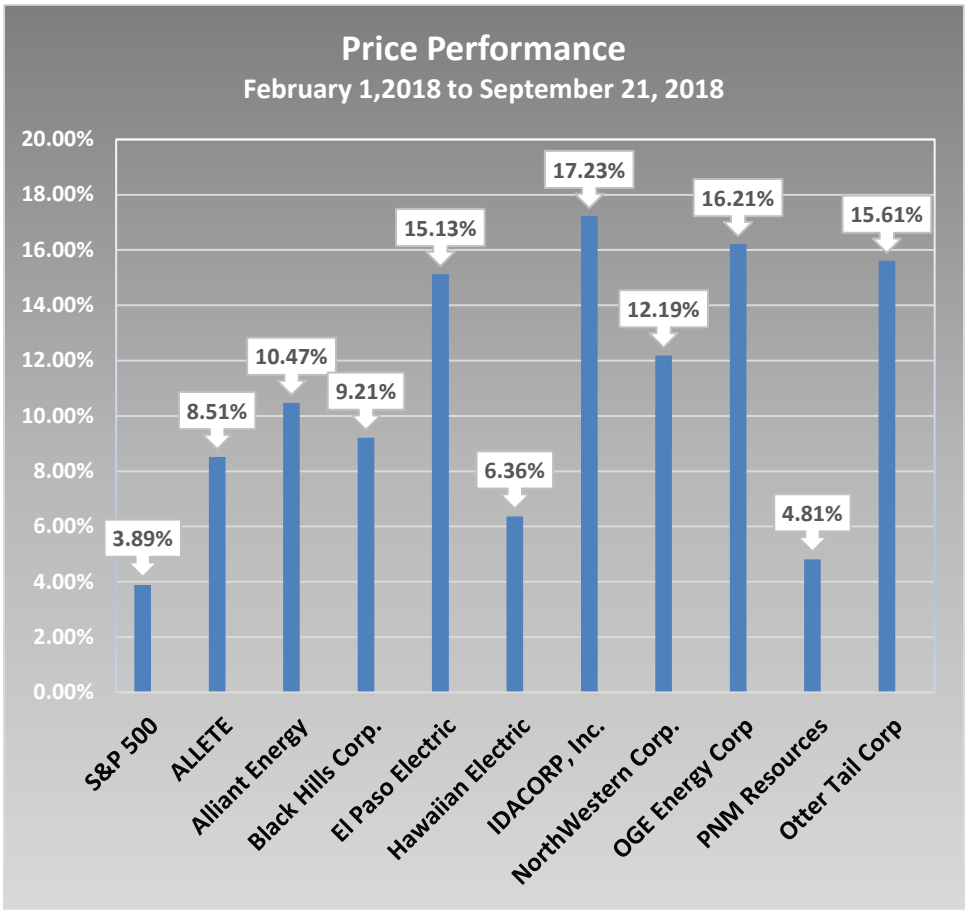
[29] 0.036 x 0.019 = 0.000684
0.036 x 0.023 = 0.000897

[30] Hevert Direct, Page 49, Lines 20-24.

meaningful impact upon their performance.

The following chart shows the performance of the S&P 500, the electric utilities in the proxy group, and OTTR since February 1, 2018, through September 21, 2018:[31]



[31] The relative performance of Otter Tail and most of the comparable companies relative to the S&P 500 has only improved since September of last year. Exhibit___(BLC-1), Schedule 9, is a performance chart updating the time period under consideration from February 1, 2018 through January 29, 2019. In the chart below the spread between OTTR and the S&P 500 through September 21, 2018 was 11.72 percent (15.61% - 3.89%). Through January 29, 2019, the spread increased to 21.26 percent (14.81% minus -6.45%). The increase in the spread is primarily due to an overall decline in the S&P 500 since September of last year that did not have a comparable impact upon OTTR or most of the comparable companies. At the end of January 2019, OTTR and most of the comparable companies were in about the same situation as in September 2018, and did not experience the recent market downturn experienced by the market as a whole.

There is no evidence that the TCJA is having a measurable impact on the cost of equity for OTTR or the proxy group we are using to estimate the cost of equity.

Q. BUT MR. HEVERT CLAIMS THAT THE TCJA IS IMPACTING UTILITY VALUATIONS TO SUCH AN EXTENT THAT "WE SHOULD RECOGNIZE THE MEAN DCF RESULTS LIKELY ARE NOT RELIABLE INDICATORS OF THE COMPANY'S COST OF EQUITY."[32] WHAT IS YOUR RESPONSE?

A. When Mr. Hevert wrote this, dividend yields were rising. Since then they have fallen as suggested by the strong price performance. Mr. Hevert also wrote:

> the results of the DCF model should be viewed with caution when they change significantly over short periods of time, because the model assumes that current market conditions will exist on an ongoing basis.[33]

To assume "that current market conditions will exist on an ongoing basis" is not just a feature of DCF methodologies, it is a feature of all methodologies used to estimate cost of equity. But the DCF approach is not as frail as Mr. Hevert wants us to believe. One way we deal with this is by looking at dividend yields over various lengths of time rather than use the latest "spot" yield. In the CAPM approach, with the risk-free rate measured by some long-term government bond yield, we have the same issue, and there too we can look at yields over various periods of time rather than rely on the latest number. These practices go a long way to making DCF and other cost of equity methodologies less sensitive to sudden changes in share valuations. All that said, significant movements in dividend yield most likely do *not* signal a change in the cost of equity but a change in investor expected growth rates. If, for instance, dividend yields suddenly rise because of changes in valuation fundamentals, say by something like the TCJA, that should be accompanied in short order by *declines* in the expected

[32] Hevert Direct, Page 62, Lines 1-2.
[33] Loc cit., Lines 4-6.

growth rate. We cannot look just to the dividend yield to divine what effect the TCJA might be having on utility capital costs. In looking over the Value Line reports for the companies in Mr. Hevert's proxy, I do not see any indication that expected growth rates are expected to take a hit from the TCJA. I think that the TCJA is a non-issue with respect to cost of equity at the present time.

Q. WHAT ABOUT CONCERNS THAT THE TCJA MIGHT NEGATIVELY IMPACT CASH FLOW?

A. Rating agencies have expressed some concerns about this impacting the credit quality of corporate debt but have also acknowledged that this will be company specific and may not seriously impact all electric utilities to the same degree. Rather than use something like this as justification for a higher rate of return on equity, a more appropriate and measured response is to consider whether it (e.g., TCJA) will negatively impact utilities' capital structure. Specifically, in the case of OTC there is no indication that the effect of the TCJA will negatively impact its capital structure.

VIII. CONCLUSIONS AND RECOMMENDATIONS

Q. PLEASE SUMMARIZE YOUR CONCLUSIONS AND RECOMMENDATIONS.

A. The purpose of my testimony is to provide the Commission with a recommendation as to what would be a fair and reasonable rate of return on equity for Otter Tail Power. The aim in being "*fair and reasonable*" is to strike a balance between the competing interests of the Company's customers and ratepayers and its shareholders and investors. From the point of view of the Company's customers and ratepayers the return should be as low as possible, consistent with the ability of Otter Tail Power to continue to provide safe and reliable electric service. Implicit in this is a need to ensure that Otter Tail Power can attract the capital necessary to provide safe and reliable service. By longstanding practice and legal precedent, the interest of Otter Tail

Power's shareholders and investors is satisfied if the return on rate base and its constituent elements are commensurate with the returns that investors could expect to earn elsewhere on investments of comparable risk.[34] And by equally longstanding practice and legal precedent, utility regulation has recognized that what investors could expect to earn elsewhere on investments of comparable risk is a *market-based rate of return*.

As usual, in this case the issue of what is a fair and reasonable rate of return from the investor point of view is focused upon return on equity. And as if this were not enough, I have put before the Commission for its consideration the implication of utility market-to-book ratios in determining the cost of equity capital and the return that OTP's investors could expect to earn *on investments of comparable risk*. Though I discussed this at length earlier in my testimony, I would like to drive home the importance of considering market-to-book ratios in light of the accepted standard of "what can be earned on investments of comparable risk." The Company's witness, Mr. Hevert, has proposed the use of 9 companies as the standard in this case for "investments of comparable risk", and I have accepted that group of companies as an appropriate standard. So, the question is simply "*what return could OTP's investors expect to earn if they sold their shares in OTTR and invested in the shares of the nine comparable companies*?" That's the question of the day. *And this question cannot be*

[34] This is *not* to say that investors are *entitled* under all circumstances to the opportunity to earn a return commensurate with the return on they could earn elsewhere on investments of comparable risk. The U.S. Supreme Court has recognized that under some circumstances that the balancing of customer and investor interests might well justify a return lower than this as "fair and reasonable." I discussed this at length in the 1991 *Energy Law Journal* article I co-authored (as senior author). But nothing in this case warrants considering a return less than what investors could earn elsewhere on investments of comparable risk.

answered correctly without considering the implications of market-to-book ratios.[35]

As shown on my Exhibit____(BLC-1), Schedule 5, Columns I and J, using Value Line estimates and projections, the expected return on *book* equity for the sample of comparable returns is just a little bit under 9.7 percent. The question of the moment is "What return on equity would OTTR investors earn if they sold their shares and bought a 'portfolio' of these comparable companies?" Could they earn the 10.3 percent that Mr. Hevert says is "fair and reasonable?" No. They could not even earn the (approximately) 9.7 percent that these companies are expected to earn on their book equity. Why? *Because they will have to pay <u>market</u> value for the shares they buy; they cannot buy the shares for <u>book</u> value.* That is why understanding the significance of market-to-book value is so important.[36] As shown in Column G of my Schedule 5, the median market to book ratio for the sample of comparable companies is 1.85. This means that they will pay 85 percent more than book value for the shares of these comparable companies were they to sell their OTTR stock and buy the hypothetical portfolio. Since they are paying 85 percent more than book value, there is no way they will earn anything close to 9.7 percent from selling their OTTR shares and buying shares in the comparable companies.

The only question that remains is *how much less* than 9.7 percent will they earn? That question is answered with the "XROE" formula (D/B – D/P). In Columns F and E of my Schedule 5, D/B is 5.89 percent and D/P is 3.26 percent, producing an

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[35] The *emphasis* in using italics here is directed toward those, like Mr. Hevert, who would claim that market-to-book ratios do not matter, or cannot be used to make inferences regarding expected returns in relation to risk. The following two paragraphs show clearly why market-to-book ratios matter.

[36] It is also the hill on which dies any argument that market-to-book ratios are irrelevant to a determination of the relationship between *r* (return on book equity) and *k* (cost of equity).

XROE of 2.6 percent (rounding downwards from 2.64 percent). In other words, 2.6 percentage points of the 9.7 percent return on *book* equity is the excess return driving the market-to-book ratio to 1.85. Thus, the return on *market* value that OTTR investors could expect to earn selling their shares and investing in the comparable companies is only 7.1 percent (9.7% - 2.6%), not the 9.7 percent return on book value.[37]

I have demonstrated with abundant evidence that this – 7.1 percent – is a reasonable estimate of what investors could expect to earn were they to sell their shares in OTTR and invest in the comparable companies. Below I repeat the table shown on Page 4 of my testimony summarizing the evidence that I have presented:

Methodology	Result	Testimony Page Reference
Constant Growth Discounted Cash Flow (DCF)	7.71%	15
Non-Constant Growth Discounted Cash Flow (DDM)	7.05%	17
Market-to-Book/Excess Returns Analysis (XROE)	7.03%	29
Capital Asset Pricing Model (CAPM)	6.74%	71
Bond Yield Plus Risk Premium	7.00%	76

In addition to this direct evidence, I have demonstrated that a return on equity on this order of magnitude is reasonable in relation to the abundance of evidence showing an overall expected market return of about 8.2 percent (see Page 59 and following of my testimony).

In the final analysis I believe that the evidence presented is clear, and even beyond reasonable doubt: the rate of return on equity requested by OTP and recommended by its rate of return witness – 10.3 percent – is unjust and unreasonable. It would not just perpetuate a market-to-book ratio on the level enjoyed by the comparable utilities, 1.85, it would drive it even higher. On no reasonable calculus

[37] The 7.1 percent result here differs from the 7.03 percent shown in Column K of Schedule 5 only because of rounding.

whatsoever can this said to be a return that fairly balances consumer and investor interests. The evidence is clear and indisputable that the fair *market* return on equity is even less than 9.7 percent. The only question is how much less, and I have shown it to be on the order of about 7.0 percent. I have acknowledged the problem of trying to reduce elevated market-to-book ratios down closer to 1.0 (in my view 1.25 would constitute a proper balance of consumer and investor interests at present), and have recommended a rate of return on equity of 8.0 – 8.5 percent. As shown in Column M of my Schedule 5, this would still leave the market-to-book ratio at an elevated level of 1.37. In effect, I am still giving greater weight to the investor interest than to the consumer interest. But OTP's request, in effect, gives no weight to the consumer interest at all and is unreasonably biased in favor of the investor interest.

One final observation. I have testified that the economic and legal considerations for a fair and reasonable rate of return are met by allowing the *lowest* reasonable rate of return. A first step in doing this is to define a reasonable *range* of returns. On the matter of return on equity, I have shown that a reasonable estimate of the cost of equity at the present time is on the order of about 7 percent. OTP is requesting 10.3 percent. These two "extremes" do not define a reasonable range for return on equity. I have shown over and over, and over again, that 10.3 is well outside any reasonable estimate of the cost of equity in this case. Even 9.7 percent (the approximate average ROE of the sample of comparable companies) would not be reasonable, because that would only perpetuate an elevated and unreasonable market-to-book ratio of 1.85. Not even the rate of return on equity allowed in EL11-019, 9.25 percent, would be a reasonable return on equity at the present time, first because of the evidence showing a decline in capital market costs since 2012 (Part IV of my testimony, above), and

because it would not move the market-to-book ratio enough to more fairly balance ratepayer and investor interests. On that, I would repeat here the table showing the market-to-book ratios associated with various ROE's from Page 43 of my testimony:

Utility Sample					
7.03%	8.25%	8.50%	8.75%	9.25%	10.30%
1.00	1.37	1.45	1.53	1.68	2.00
Otter Tail					
7.03%	8.25%	8.50%	8.75%	9.25%	10.30%
1.00	1.42	1.51	1.60	1.77	2.14

I would suggest, respectfully, that in determining a range for a reasonable ROE in this case, that the Commission will need to start at 9.25 percent *and work down from there* to determine the upper end of a reasonable range. My recommendation is that the Commission find that the upper end of a reasonable range is 8.50 percent. This would support a market to book ratio of approximately 1.5 for Otter Tail. More is not needed, and less would more fairly balance ratepayer interests with the interests of Otter Tail and its shareholders and investors.

Q. DOES THAT CONCLUDE YOUR TESTIMONY?

A. Yes, except for the list of publications on the following page.

APPENDIX A

Publications of Basil L. Copeland, Jr.

"Double Leverage One More Time." ***Public Utilities Fortnightly***, August 18, 1977, 19-24.

"Alternative Cost of Capital Concepts In Regulation." ***Land Economics*** 54 (August 1978): 348-61.

"Estimates of the Cost of Equity for Public Utilities, 1961-1976." ***Journal of Business Research*** 7 No. 1 (1979): 9-17.

"The Cost of Equity Capital: A Model for Regulatory Review." In **Issues in Public Utility Regulation**, edited by Harry M. Trebing, 342-66. East Lansing: Michigan State University, Graduate School of Business Administration, Institute of Public Utilities, 1979.

"Capacity Planning, Reliability, and Outage Costs in Electricity Supply: Comments." In **Challenges for Public Utility Regulation in the 1980's**, edited by Harry M. Trebing, 511-516. East Lansing: Michigan State University, Graduate School of Business Administration, Institute of Public Utilities, 1981.

"Inflation, Interest Rates, and Equity Risk Premia." ***Financial Analysts Journal*** (May/June 1982): 32-43.

"Do Stock Prices Move Too Much to be Justified by Subsequent Changes in Dividends? Comment." ***American Economic Review*** 73 No. 1 (1983): 234-35.

"Inflation, Monetary Policy, and the Equity Risk Premium." In **Regulatory Reform: The State of the Regulatory Art, Emerging Concepts and Procedures** edited by J. Rhoads Foster, 183-201. Washington: Institute for Study of Regulation, 1984.

"Ratemaking Treatment of Excess Capacity: Reconciling Regulation with Consumer Sovereignty." In **Changing Patterns in Regulation, Markets, and Technology: The Effect on Public Utility Pricing** edited by Patrick C. Mann and Harry M. Trebing, 407-40. East Lansing: Michigan State University, Graduate School of Business Administration, Institute of Public Utilities, 1984.

"Bailing Out Public Utilities with Troubled Nuclear Power Plants: Who wins, Who Loses?" In **The Impact of Deregulation and Market Forces on Public Utilities: The Future Role of Regulation** edited by Patrick C. Mann and Harry M. Trebing, 371-91. East Lansing: Michigan State University, Graduate School of Business Administration, Institute of Public Utilities, 1985.

"Price Theory and Telecommunications Regulation: A Dissenting View," with A. Severn. ***Yale Journal on Regulation*** 3 No. 1 (Fall 1985): 53-85.

"Capital Gains Taxes After Tax Reform," with Alan K. Severn. ***Journal of Portfolio Management*** 13 No. 3 (Spring 1987): 69-75.

"Escape from the Black Hole of FERC: A Proposal to Restore ***Pike*** Prudence Review," with Robert E. Johnston. ***The Electricity Journal*** 2 No. 4 (May 1989): 12-25.

"Telecommunications Regulation - The Continuing Dilemma: Commentary." In **Public Utility Regulation, The Economic and Social Control of Industry**, edited by Kenneth Nowotny, David B. Smith, and Harry M. Trebing, 131-36. Boston: Kluwer Academic Publishers, 1989.

"Procedural vs. Substantive Economic Due Process for Public Utilities," with Walter Nixon. ***Energy Law Journal*** 12 No. 1 (Spring 1991): 81-110.

OTTER TAIL POWER
DCF Rate of Return Analysis Using Dividend Cash Flow Model (Constant Growth)

Company	Dividend 2018	Dividend 2019	Stock Price	Dividend Yield	Analyst Proj. EPS Growth	Proj. DPS Growth (VL)	Proj. BVPS Growth (VL)	% Ret. To Com. Eq. (VL)	Avg. Growth	DCF Cost of Equity k
A	B	C	D	E	F	G	H	I	J	K
ALLETE	2.24	2.34	75.86	3.02%	6.00%	4.78%	2.93%	3.00%	4.18%	7.20%
Alliant Energy	1.34	1.42	42.15	3.27%	6.61%	5.50%	4.73%	4.00%	5.21%	8.48%
Black Hills Corp.	1.93	2.05	61.09	3.26%	4.56%	6.15%	4.68%	4.00%	4.85%	8.10%
El Paso Electric	1.42	1.52	52.56	2.80%	4.75%	6.84%	3.04%	3.00%	4.41%	7.20%
Hawaiian Electric	1.24	1.24	35.31	3.51%	7.10%	3.08%	4.46%	3.50%	4.53%	8.04%
IDACORP, Inc.	2.40	2.56	94.62	2.62%	2.59%	6.17%	4.29%	4.00%	4.26%	6.88%
NorthWestern Corp.	2.20	2.30	58.53	3.84%	2.49%	4.26%	2.77%	3.00%	3.13%	6.97%
OGE Energy Corp	1.40	1.54	38.16	3.85%	1.46%	7.22%	3.27%	3.50%	3.86%	7.71%
PNM Resources	1.09	1.18	39.86	2.85%	4.40%	5.49%	5.43%	4.50%	4.96%	7.80%
			Mean:	**3.22%**	**4.44%**	**5.50%**	**3.96%**	**3.61%**	**4.38%**	**7.60%**
			Median:	**3.26%**	**4.56%**	**5.50%**	**4.29%**	**3.50%**	**4.41%**	**7.71%**

Sources
- Columns B, C and I: Value Line
- Column D: Stockcharts.Com
- Column F: Average of Analysts Forecasts from Yahoo Financial and Zacks Investment Research
- Column E: ((Column B + Column C) / 2) / Column D
- Columns G and H: Computed from Value Line data
- Column J: Average of Colums F through I
- Column K: Column E plus Column J

Exhibit___(BLC-1)
Schedule 1

Otter Tail Power
DCF Rate of Return Analysis Using Dividend Discount Model (DDM)

Company	Inputs:							Output:
	Dividend Yield	2018 EPS	Analyst Growth	Long-Term Growth	Retention Ratios 2018	2022	2037	DDM (k) Return
ALLETE	3.02%	3.35	6.00%	3.50%	0.33	0.25	0.36	6.76%
Alliant Energy	3.27%	2.15	6.61%	3.50%	0.38	0.36	0.36	7.20%
Black Hills Corp.	3.26%	3.40	4.56%	3.50%	0.43	0.42	0.36	7.15%
El Paso Electric	2.80%	2.30	4.75%	3.50%	0.38	0.33	0.36	6.52%
Hawaiian Electric	3.51%	1.90	7.10%	3.50%	0.35	0.38	0.36	7.34%
IDACORP, Inc.	2.62%	4.50	2.59%	3.50%	0.47	0.42	0.36	6.41%
NorthWestern Corp.	3.84%	3.40	2.49%	3.50%	0.35	0.31	0.36	7.21%
OGE Energy Corp	3.85%	2.10	1.46%	3.50%	0.33	0.26	0.36	7.05%
PNM Resources	2.85%	1.95	4.40%	3.50%	0.44	0.46	0.36	6.68%
Mean:			**4.44%**	**3.50%**	**0.38**	**0.35**		**6.92%**
Median:			**4.56%**	**3.50%**	**0.38**	**0.36**		**7.05%**

DERIVATION OF THE EXCESS RETURN ON EQUITY FORMULA

Starting with the basic Gordon model (with no *sv* term[1]):

$$P = \frac{(1-b)rB}{k-br} \quad [1]$$

and rearranging

$$r(1-b) = (k-br)\frac{P}{B}$$

we get

$$r = br + (k-br)\frac{P}{B} \quad [2]$$

But

$$br = k - \frac{D}{P}$$

and

$$(k-br) = \frac{D}{P}$$

so substituting into [2] we get

$$r = k - \frac{D}{P} + \frac{D}{P}\text{x}\frac{P}{B}$$

or

$$r - k = \frac{D}{B} - \frac{D}{P} \quad [3]$$

In other words, the difference between dividend-to-book and dividend-to-price is equal to the difference between expected return on book value and expected return on market value (cost of equity). Furthermore, the implied relationship between *r* and *k* for various levels of the market-to-book ratio is

$$r = k + \frac{\Delta\left(\frac{P}{B}\right)}{1/\left(\frac{D}{P}\right)} \quad [4]$$

where where $\Delta(\frac{P}{B})$ is the difference between the market-to-book ratio and 1.0.

---

[1] The "*sv*" term is an extension to the Gordon model to capture expected growth from the sale of shares at prices above book value. It implicitly capitalizes growth that owes to the *expectation* of excess returns. Thus it is inapplicable to a DCF return for a regulated utility where there should not be any expectation of excess returns.

Summary Statistics for Least Absolute Deviation Regression of P/B on XROE, 1999-2018

[t-ratios test regression results against predicted values, not zero]

	Intercept		Statistics				
Year	Regression	Predicted	Std. Error	t-ratio	p-value	95% Conf.	Interval
1999	1.03173	1.00000	0.06345	0.50	0.62128	0.90130	1.16216
2000	0.98709	1.00000	0.04661	-0.28	0.78188	0.89088	1.08330
2001	1.04020	1.00000	0.04024	1.00	0.32653	0.95748	1.12292
2002	1.02733	1.00000	0.03773	0.72	0.47795	0.94978	1.10488
2003	0.98343	1.00000	0.02500	-0.66	0.51506	0.93205	1.03482
2004	1.01892	1.00000	0.03936	0.48	0.63483	0.93841	1.09942
2005	0.97906	1.00000	0.05426	-0.39	0.69866	0.86930	1.08882
2006	0.93222	1.00000	0.09432	-0.72	0.47593	0.74128	1.12317
2007	0.98898	1.00000	0.13269	-0.08	0.93664	0.72080	1.25715
2008	0.90584	1.00000	0.06982	-1.35	0.18544	0.76424	1.04745
2009	1.01999	1.00000	0.00974	2.05	0.04731	1.00027	1.03970
2010	1.00233	1.00000	0.01055	0.22	0.82696	0.98102	1.02364
2011	0.99790	1.00000	0.01707	-0.12	0.90506	0.96345	1.03234
2012	0.97667	1.00000	0.02229	-1.05	0.29987	0.92938	1.02397
2013	0.95919	1.00000	0.02613	-1.56	0.12592	0.90652	1.01185
2014	0.94772	1.00000	0.04893	-1.07	0.29174	0.84848	1.04696
2015	1.00000	1.00000	0.04431	0.00	1.00000	0.91022	1.08978
2016	1.00000	1.00000	0.07110	0.00	1.00000	0.85593	1.14407
2017	1.26714	1.00000	0.18870	1.42	0.16398	0.88479	1.64949
2018	0.98481	1.00000	0.10407	-0.15	0.88160	0.77376	1.19587

	Slope		Statistics				
Year	Regression	Predicted	Std. Error	t-ratio	p-value	95% Conf.	Interval
1999	17.56950	19.04762	2.04196	-0.72	0.47795	13.37220	21.76680
2000	17.75760	18.34862	2.31975	-0.25	0.80472	12.96990	22.54540
2001	20.13030	21.73913	2.72342	-0.59	0.56028	14.53230	25.72840
2002	19.58160	21.97802	2.06958	-1.16	0.25659	15.32750	23.83560
2003	22.52900	22.72727	2.06080	-0.10	0.92111	18.29300	26.76500
2004	22.62260	23.80952	2.45653	-0.48	0.63483	17.59850	27.64680
2005	26.69520	26.31579	3.00763	0.13	0.89724	20.61170	32.77870
2006	29.80430	26.31579	4.49466	0.78	0.44022	20.70530	38.90320
2007	28.90160	28.57143	6.31837	0.05	0.96037	16.13170	41.67150
2008	32.05190	24.69136	4.76870	1.54	0.13231	22.38050	41.72320
2009	21.90600	19.60784	1.61851	1.42	0.16376	18.62950	25.18250
2010	20.36730	20.83333	1.49865	-0.31	0.75813	17.34070	23.39390
2011	23.30000	22.98851	1.16504	0.27	0.78848	20.94890	25.65120
2012	25.56730	23.80952	1.65332	1.06	0.29535	21.97720	29.15740
2013	27.25680	25.64103	1.40873	1.15	0.25636	24.41770	30.09590
2014	28.91270	27.02703	2.29722	0.82	0.41761	24.25370	33.57160
2015	27.02700	27.02703	2.07729	0.00	1.00000	22.81800	31.23600
2016	29.41180	29.41176	3.03419	0.00	1.00000	23.26390	35.55960
2017	22.39640	32.25806	6.40093	-1.54	0.13207	9.42693	35.36600
2018	28.66890	28.16901	4.17727	0.12	0.90515	20.19700	37.14080

Predicted value of Slope coefficient is 1/(D/P), i.e., the reciprocal of dividend yield.

2018-1

LAD: LAD, using observations 1-38
Dependent variable: M_B

	coefficient	std. error	t-ratio	p-value	
const	0.984813	0.104065	9.463	2.65e-011	***
XROE	28.6689	4.17727	6.863	4.97e-08	***

Median depend. var	1.780902	S.D. dependent var	0.385408
Sum absolute resid	4.940209	Sum squared resid	1.375400
Log-likelihood	13.18719	Akaike criterion	−22.37437
Schwarz criterion	−19.09920	Hannan-Quinn	−21.20909

coefficient confidence intervals

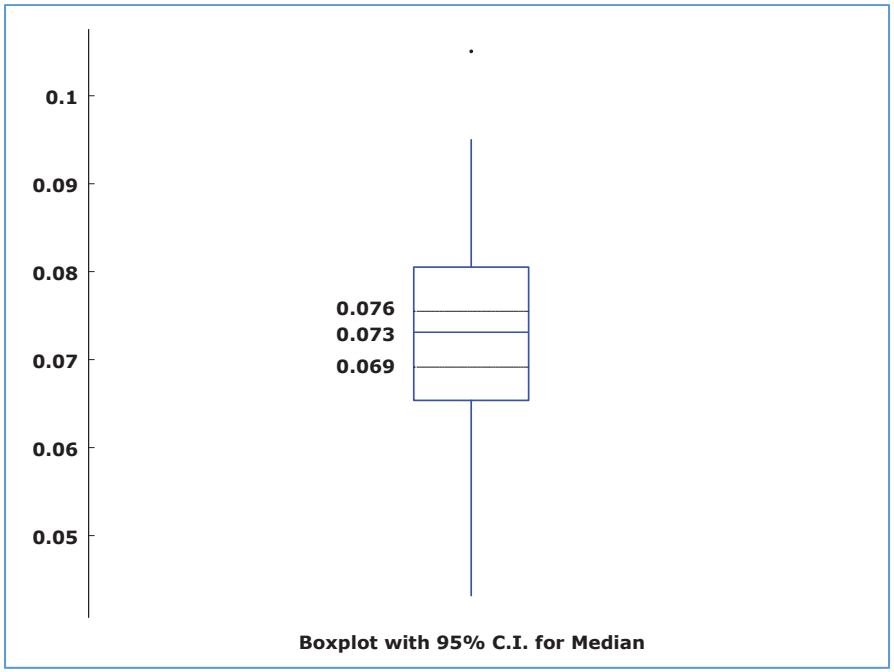
t(36, 0.025) = 2.028

VARIABLE	COEFFICIENT	95% CONFIDENCE INTERVAL	
const	0.984813	0.773759	1.19587
XROE	28.6689	20.1970	37.1408

2018 D/P = 0.0355 1/(D/P) = 28.169014084507042253521126760563

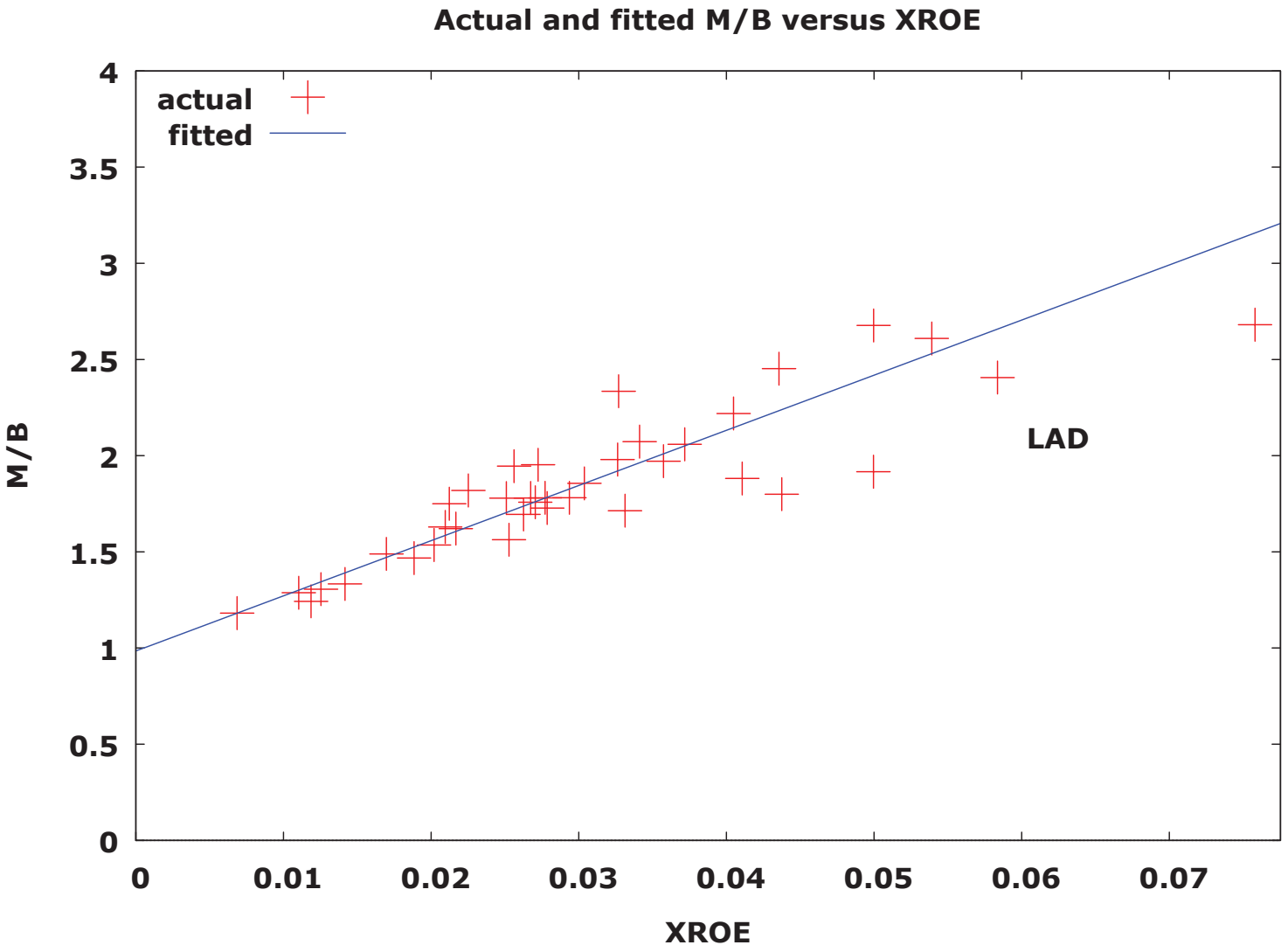
Summary statistics, using the observations 1 - 38
for the variable 'K' (38 valid observations)

Mean	0.073179
Median	0.073125
Minimum	0.043170
Maximum	0.10505
Standard deviation	0.011996
C.V.	0.16393
Skewness	0.083283
Ex. kurtosis	1.0401
5% percentile	0.045708
95% percentile	0.095503
Interquartile range	0.015161
Missing obs.	0



2018	Sample Median M/B		M/B as a function of XROE implied by Regression						
	ΔM/B	-	0.10	0.25	0.50	0.75	0.78	1.00	2.00
	const|XROE	28.669	0.35%	0.87%	1.74%	2.62%	2.72%	3.49%	6.98%
	M/B		1.10	1.25	1.50	1.75	1.78	2.00	3.00
			M/B as a function of XROE implied by D/P						
D/P	ΔM/B	-	0.10	0.25	0.50	0.75	0.78	1.00	2.00
3.55%	const|XROE	28.169	0.36%	0.89%	1.78%	2.66%	2.77%	3.55%	7.10%
	M/B		1.10	1.25	1.50	1.75	1.78	2.00	3.00

2018-2



Exhibit____(BLC-1)
Schedule 4, Page 3 of 3

OTTER TAIL POWER
Cost of Equity Analysis Using Market-to-Book (P/B) Ratios and Excess Returns (XROE)

Line No.	Company	Expected DPS	Price	BVPS	D/P	D/B	P/B	XROE	Expected ROE 2018	Expected ROE 2022	Implied COE (k)	Implied ROE for P/B = 1.25	Implied P/B for ROE = 8.25%
	A	B	C	D	E	F	G	H	I	J	K	L	M
								(Col. F - Col. E)			(Col. J - Col. H)		
1	ALLETE	2.29	75.86	41.06	3.02%	5.58%	1.85	2.56%	8.16%	7.81%	5.25%	6.00%	1.99
2	Alliant Energy	1.38	42.15	19.14	3.27%	7.21%	2.20	3.94%	11.23%	10.93%	6.99%	7.81%	1.38
3	Black Hills Corp.	1.99	61.09	33.76	3.26%	5.89%	1.81	2.64%	10.07%	10.15%	7.52%	8.33%	1.23
4	El Paso Electric	1.47	52.56	28.60	2.80%	5.14%	1.84	2.34%	8.04%	8.52%	6.17%	6.87%	1.74
5	Hawaiian Electric	1.24	35.31	19.62	3.51%	6.32%	1.80	2.81%	9.69%	9.67%	6.86%	7.74%	1.40
6	IDACORP, Inc.	2.48	94.62	45.68	2.62%	5.43%	2.07	2.81%	9.85%	9.69%	6.88%	7.54%	1.52
7	NorthWestern Corp.	2.25	58.53	37.27	3.84%	6.04%	1.57	2.19%	9.12%	8.94%	6.75%	7.71%	1.39
8	OGE Energy Corp	1.47	38.16	19.64	3.85%	7.48%	1.94	3.63%	10.69%	11.16%	7.53%	8.49%	1.19
9	PNM Resources	1.135	39.86	21.37	2.85%	5.31%	1.87	2.46%	9.13%	9.66%	7.20%	7.91%	1.37
10			**Median (Cols. E - J):**		**3.26%**	**5.89%**	**1.85**	**2.64%**	**9.69%**	**9.67%**	**7.03%**	**7.84%**	**1.37**
11	Otter Tail Corp.	1.36	47.34	18.19	2.87%	7.48%	2.60	4.61%	11.82%	10.00%			1.42

Exhibit___(BLC-1)
Schedule 5

Damodaran Market Risk Premium Model (with January 2018 inputs)

Inputs									
EPS:	124.94								
DPS + Buybacks:	108.28								
S&P 500 Price	2673.61			Expected Cash Flows					
									Terminal
Analyst EPS Growth:	7.05%			Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year
T-Bond Rate:	2.41%			124.94	133.7483	143.1775	153.2715	164.0772	175.6446	179.8777
				108.28	115.9137	124.0857	132.8337	142.1985	152.2235	155.8921
Implied Return:	7.49%	Net Present Value:	2673.61							
T-Bond Rate:	-2.41%	Solver cell:	0							
Implied MRP:	5.08%									

Damodaran Model With Modified Inputs (in yellow)

Inputs									
EPS:	124.94								
DPS + Buybacks:	108.28								
S&P 500 Price	2673.61			Expected Cash Flows					
									Terminal
Analyst EPS Growth:	7.05%			Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year
Nominal GDP growth:	3.90%			124.94	133.7483	143.1775	153.2715	164.0772	175.6446	182.4948
				108.28	115.9137	124.0857	132.8337	142.1985	152.2235	158.1602
Implied Return:	8.73%		2673.61							
T-Bond Rate:	-3.70%		0							
Implied MRP:	5.03%									

Exhibit___(BLC-1)
Schedule 6

Otter Tail Power
CAPM Rate of Return Analysis
Beta Coefficients

Company	Value Line Beta Adjusted	Value Line Beta Deadjusted	Reuters Beta Raw	Zacks Beta Raw
A	B	C	D	E
ALLETE	0.70	0.52	0.16	0.18
Alliant Energy	0.65	0.45	0.22	0.22
Black Hills Corp.	0.85	0.75	0.35	0.37
El Paso Electric	0.75	0.60	0.35	0.31
Hawaiian Electric	0.65	0.45	0.26	0.28
IDACORP, Inc.	0.65	0.45	0.26	0.27
NorthWestern Corp.	0.65	0.45	0.11	0.13
OGE Energy	0.90	0.82	0.62	0.63
PNM Resources	0.75	0.60	0.15	0.16
Median Beta =	0.70	0.52	0.26	0.27

Formula for Adjusting the Cost of Equity to Allow for Stock Expense and Underpricing

Let

$$RR = kB(N + n) + fnB \quad (1)$$

where

$RR =$ total dollars of required return on equity;

$k =$ cost of equity;

$B =$ book value per share;

$N =$ number our shares outstanding before the issue;

$n =$ number of new shares;

$f =$ allowance for stock expense and underpricing

In Equation (1) the total dollars of required return are equated to the total fair return, $kB(N + n)$, plus the dollar cost of the stock issue, fnB, effectively expensing the dollar cost of the stock issue. The required return on equity, adjusted to allow for stock expense and underpricing, is therefore

$$r = \frac{RR}{N(N + n)} \quad (2)$$

and by substituting (1) into (2) and rearranging we get

$$r = k + \frac{nf}{N + n} \quad (3)$$

The adjustment to the cost of equity to allow for stock expense and underpricing is therefore the quantity nf/(N + n). Recognizing n/(N + n) as the rate of growth in new shares, we can further simplify this to

$$r = k + zf \quad (4)$$

where z is the rate of growth in new shares, and f is the percentage allowance for stock expense and underpricing, and zf is the flotation cost allowance as an addition to the cost of equity.

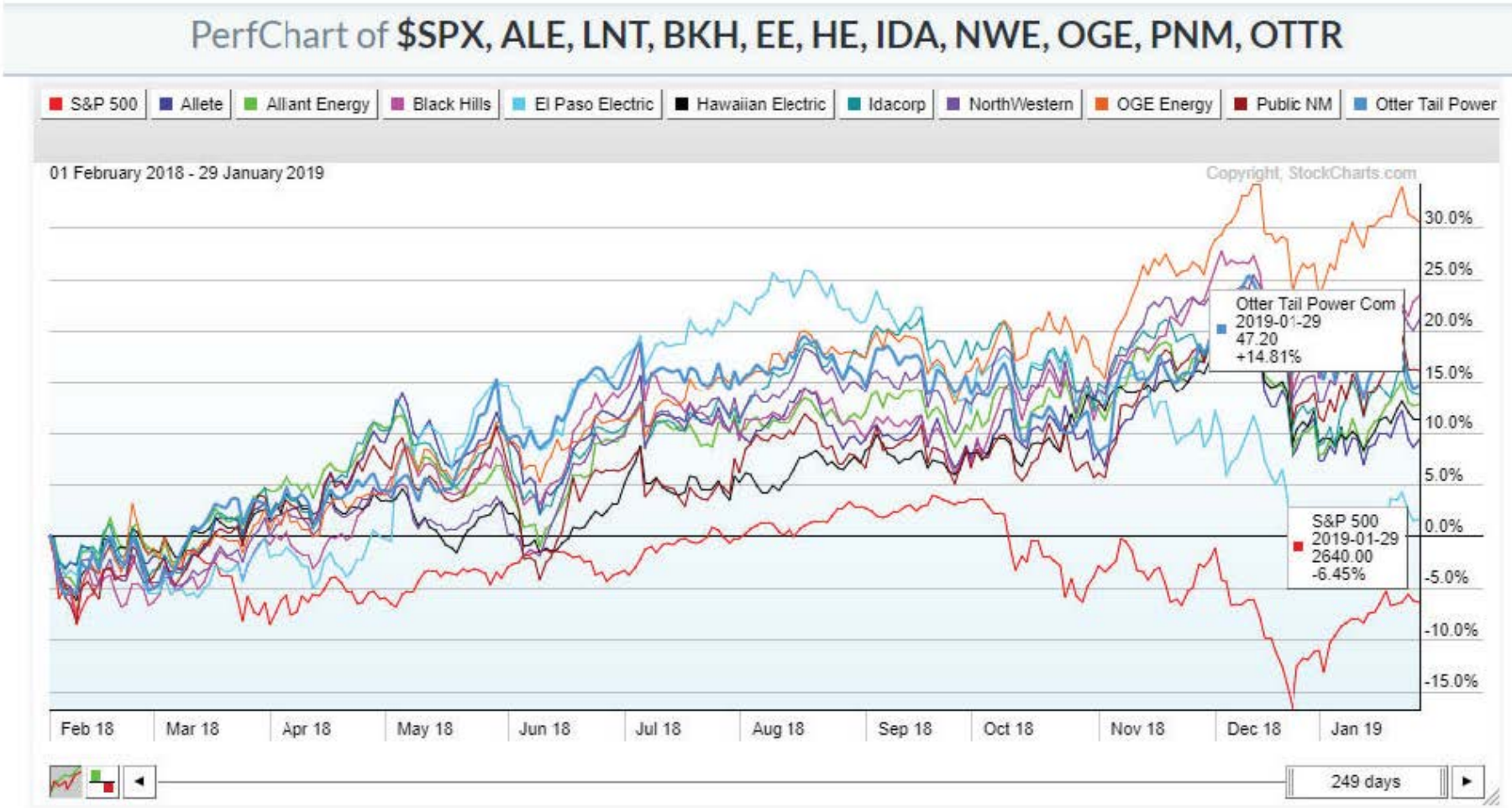


EXHIBIT ____(BLC-1)
Schedule 9

Major Issues in Mr. Hevert's Estimation of Cost of Equity and Required Rate of Return on Equity	
Issue	**Results and Implications**
Relies exclusively on EPS forecasts, and ignores DPS, BVPS, and Retained Earnings	Overstates median growth by 64 basis points. When his DCF constant growth results are corrected for this, they are close to the 7.71% in Exhibit___(BLC-1), Schedule 2.[1]
Inconsistent use of DCF Constant Growth model	Rejects results below 8%, but accepts results as high as 60%.[2]
Implausible and unrealistic long-term growth rate in his nonconstant DCF model	Uses 5.45%. A more realistic and plausible long-term growth rate for unregulated companies is 3.9%; for the sample of comparable companies, 3.5%. When corrected for this, the result, ≈7.28%, is comparable to the 7.05% in Exhibit___(BLC-1), Schedule 3 (with remaining difference owing to different price and dividend yield data).[3]
Claims the expected total return on the S&P 500 is approximately 15 percent.	Impossible. Would require expected long-term growth of about 13%. The S&P 500 cannot, over the long-term, grow faster than the economy (GDP) as a whole. In the post WWII era, a 10-year rolling average of nominal GDP peaked at just over 10% during the inflation of the late 1970's and has declined steadily since then. Current CBO forecast for GDP through 2028 is 3.9%. A 15% expected total return *just for the next few* years is outside *three* standard deviations (8.2% + 3x2% = 14.2% upper limit) of a survey of 1348 respondents (Fernandez, et. al). That it could be 15% in perpetuity is impossible.[4]
Claims the equity market risk premium is about 12 percent.	Incredulous. This is outside *three* standard deviations (5.4%, + 3x1.7% = 10.5% upper limit) of a survey of 1348 respondents (Fernandez, et. al).[5]
CAPM results are totally implausible for regulated utilities.	CAPM results range from 10.52% to 13.13%. Such returns, relative to a 5.3% market risk premium imply stock betas of 1.44 to 1.93 percent. Hevert's own data show stock betas only averaging 0.63 to 0.78.[6]
Assumes that *allowed* rates of return on equity have historically equaled *required* rates of return on equity (in "Bond Yield Plus Risk Premium" method).	This assumption is contradicted by two decades in which market-to-book ratios have exceeded 1.0, often by a substantial amount. Adjusting for this, the estimated risk premium is reduced from 6.2 percent to 4.0 percent. Relative to a present yield of 3.0% on long-term government bonds, the resulting estimate of cost of equity is just 7.2 percent.[7]
Claims that a "size premium" should be taken into consideration in determining the cost of equity for a public utility.	The evidence for a "size premium" is disputed, but in any case, is inapplicable to public utilities. It applies only to small companies with high beta coefficients and significant "alpha" coefficients. Utilities have low beta coefficients and evidence suggests that they do not have significant "alpha" coefficients.[8]

Footnotes (Page References to Copeland Direct Testimony)

[1] 47-48, 50.
[2] 48, 56-57.
[3] 51-55.
[4] 51-55, cf. 64-65.
[5] 59-62.
[6] 73-74.
[7] 75-76.
[8] 76-81, cf. 69-70.