BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA

IN THE MATTER OF THE APPLICATION	**)**	
OF MONTANA-DAKOTA UTILITIES CO.	**)**	**Docket No. NG12-008**
FOR AUTHORITY TO INCREASE ITS	**)**	
NATURAL GAS RATES	**)**	

RATE OF RETURN AND COST OF CAPITAL AND WEATHER NORMALIZATION

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

October 1, 2013

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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] deals with the constitutional standards for due process as applied to utility ratemaking under the celebrated

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

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. The purpose of my testimony is to present evidence with respect to the cost of capital for Montana-Dakota Utilities Co. ("MDU") and to recommend a fair and reasonable rate of return based upon that evidence. I will also review and respond as to MDU's testimony on these matters. In addition, I review MDU's proposal to use a 60 degree base for computing heating degree days ("HDD") in its weather normalization, and explain why the traditional base of 65 degrees should be retained.

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

A. Based on the evidence presented in my testimony, I conclude that the return on equity for MDU should be in the range of 8.2 to 9.2 percent, and I recommend a rate of return on equity at the midpoint of the range, 8.7 percent. Using my recommended rate of return on equity and the capital structure and debt costs described later in my testimony, the overall cost of capital and fair rate of return is 7.23 percent. My recommendations are summarized in the following table, and in Exhibit____(BLC-1), Schedule 1:

Montana Dakota Utilities
Cost of Capital

	Component	Percent	Cost	Weighted Cost
1	Debt	50.000%	5.934%	2.970%
2	Preferred Stock	2.128%	4.585%	0.100%
3	Common equity	47.872%	8.700%	4.160%
4	Total	100.000%		7.230%

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

Q. YOUR RECOMMENDATION IS BELOW THE 9.25 PERCENT THAT THE COMMISSION GRANTED NORTHERN STATES POWER IN DOCKET NO. EL11-019. WHY IS THAT?

A. Capital costs have continued to decline since the issue of rate of return was adjudicated in that docket. The stock market is at all time highs, leading to lower capital costs than at the time the Commission set that rate of return on equity. I will discuss this in more detail later in 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 present a survey of current research on the equity risk premium I believe is important to framing judgments concerning the reasonableness of rate of return recommendations. In Section V, I present a detailed discussion of the cost of equity methodologies I employ, and present my findings based on those methodologies. In Section VI, I calculate an overall rate of return and discuss issues relating to capital structure and cost of debt. In Section VII, I discuss MDU's testimony and evidence regarding cost of capital and rate of return. In Section VIII, I discuss the issue of the appropriate base for determining heating degree days for use in weather normalization. I conclude with a summary of conclusions and recommendations in Section IX.

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. Typically, regulated utilities have utilized three sources of capital to capitalize their utility assets: common stock, preferred stock, and long-term debt. The rate of return for a

regulated firm is usually based on its "weighted average cost of 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 can be directly measured from the interest rate (and related costs) on the various issues of debt 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 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 may delight at the opportunity to earn the excess profits associated with a return on equity above the market cost of equity, they should 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. EQUITY RISK PREMIUM SURVEY

Q. WHAT IS THE EQUITY RISK PREMIUM?

A. The equity risk premium ("ERP") is the additional return that investors require on stock relative to a risk-free investment to compensate for market risk. It is implicit in rate of return methodologies like the Discounted Cash Flow ("DCF") method, and explicit in methodologies like the Capital Asset Pricing Model ("CAPM"). While every equity investment has its own inherent risk premium required by investors, most discussion and research of the equity risk premium focuses on the market risk premium – the equity risk premium for the market as a whole.

Q. WHY SHOULD THE COMMISSION BE INFORMED ABOUT THE EQUITY RISK PREMIUM?

A. In the case of methodologies like CAPM, the market risk premium is an explicit component of the methodology, and an accurate rate of return using this methodology is highly dependent upon the accuracy of the estimated market risk premium. But even with methodologies where the risk premium is implicit, knowledge of the market risk premium provides a

benchmark for assessing the plausibility of cost of equity estimates. Furthermore, there has been a groundswell of research on the equity risk premium in recent years that is fundamentally undermining some long-held beliefs about the equity risk premium. I believe familiarity with this research can help the Commission make a more informed decision about the appropriate rate of return for MDU.

Q. WHAT HAS SPARKED THE INTEREST IN RECENT YEARS IN THE EQUITY RISK PREMIUM?

A. The reasons are varied. For many, it is the quest to solve what has come to be known as the "Equity Premium Puzzle." This quest, and the term "equity premium puzzle," stems from a highly influential article published in 1985 by Ranjish Mehra and Edward Prescott.[3] The puzzle is that through much of the 20th century, returns on stocks relative to risk-free investments have been much higher than what can be explained by economic theory. A veritable cottage industry of academic research has grown up trying to solve this puzzle. While there is almost no end to the suggestions on how to reconcile theory and evidence on the ERP, there is widespread consensus that the ERP has declined in recent decades, and is not as great as was once believed necessary to attract investment. This has very important implications for determining the cost of equity.

Second, recent interest in the equity risk premium has been sparked by attempts to explain, or understand, the unprecedented "bull market" of the 1990's. Were the returns earned on stocks during the 1990's rational? Were they part of the "required return?" Do (or can) investors rationally expect such returns to persist in the future? These questions are extremely pertinent to regulatory decisions about the cost of capital because of the widespread use of the Ibbottson Associates' (now Morningstar) data on market returns in rate of return testimony. I cover this in more detail below.

[3]Mehra, Rajnish, and Edward C. Prescott, "The. Equity Premium: A Puzzle," Journal of Monetary Economics, March 1985, 15, 145-62.

Third, with proposals (during the Bush administration) to modify social security to allow investments in the stock market, and more recently (during the Obama administration) the debate over the cost of health care reform, the question of the future performance of the stock market and future investment returns has become an important public policy issue. More specifically, the ERP is an explicit public policy variable in various proposals to modify social security and price the cost of health care reform. What are public policy planners assuming about the future of the stock market? Are those assumptions plausible? How do they compare with the rates of return that rate case witnesses are proposing? As I note below in discussing these estimates of the ERP, I think they should be of interest to regulatory commissions because they provide an independent perspective on the ERP that is nevertheless similar to what regulatory commissions face from a public policy point of view.

Fourth, somewhat related to the use of market returns as a public policy variable in matters of entitlement reform is the role of market returns in assessing pension fund liability. There is growing concern over pensions being underfunded because expected future returns are being overestimated by unrealistic expectations of future asset returns. Here, too, the market risk premium, either implicitly or explicitly, is influencing a major public policy concern.

For a variety of reasons, the ERP is no longer an issue of narrow interest to utility regulation and utility rates of return. I believe that the Commission should be informed of developments in this area, and that this information should factor into the Commission's decision regarding the fair rate of return for MDU.

Q. HOW WOULD YOU CHARACTERIZE THE CONSENSUS OF CURRENT RESEARCH IN THIS AREA?

A. I will present a survey of the evidence below so the Commission can reach its own conclusion about what might be the consensus view here. Broadly, though, I think that current thinking about the ERP falls into one of three categories. Before I summarize these categories, it is helpful to have a historical perspective. The most common historical

perspective is realized return data published by Morningstar (formerly Ibbotson Associates). For the period 1926 through 2007, the historical equity return premium for common stocks averaged 7.10 percent above the income return on long term government bonds, and this has, in the past, often been touted as evidence of the equity risk premium. For the period 1926 to 2008, the average historical equity return premium fell dramatically to 6.5 percent because of the market "crash" of 2008. Through 2012, as the market rebounded somewhat, the historical equity return premium for common stocks averaged 6.7 percent.

It is important to note this historical estimate is based on an arithmetic mean (or average), and were we to use a geometric mean, the historical data through 2010 yielded a return premium of only 4.7 percent. I discuss the relative merits of the two ways of measuring historical returns in detail later in my testimony. In any case, these returns – 6.7 percent arithmetic, and 4.7 percent geometric – give us a historical "benchmark" from which to characterize current thinking about the ERP.

Q. PLEASE DESCRIBE THE THREE BROAD CATEGORIES OF CURRENT THINKING REGARDING THE EQUITY RISK PREMIUM.

A. In the first category are those who believe that the ERP remains relatively high. Today, few predict that the future ERP will be as high as the historical return on stocks vis-à-vis risk-free investments, but some still believe that the future will come close to realizing the same kind of returns. Estimates of the ERP in this category tend to fall into the 4-6 percent range.

In the second category, which is as close as we get to a consensus, are those experts who believe that future stock returns will be substantially lower than returns historically realized through much of the 20th Century, but still comfortably above bond returns. These estimates of the ERP tend to fall into the 2-4 percent range.

The third category is characterized as those who believe that the current ERP is very low, if not zero, and that stocks are not likely to significantly outperform bonds in the

foreseeable future. Here we are looking at ERP estimates of 0-2 percent, and in some cases even less.[4]

Q. WHY IS THERE SUCH A DISPARITY OF OPINION ABOUT THE EQUITY RISK PREMIUM?

A. With few exceptions, there is uniform agreement across all three groups that the current or foreseeable future ERP is lower than the historical realized premium on stocks vis-à-vis bonds.[5] They disagree mainly over how much lower, not that it is lower per se. Thus Peter Arnott, editor of the Financial Analysts Journal, and a contributor to recent research on the ERP, thinks it fair to say:

> Few serious observers of the capital markets argue that the future risk premium for stocks relative to bonds can rival the lofty excess return that stocks have delivered in the past.[6]

That said, it is still common to see rate of return witnesses simply extrapolating historical returns for an equity risk premium. But one can find little serious research these days to back up such an approach.

As to the disparity in views as to how far the risk premium has fallen, I think the differences owe to a combination of the following factors:

- The extent to which researchers use strictly forward-looking fundamental valuation models versus analysis of historical return data;
- The selection of time frames when analyzing historical data;

and

[4] The equity risk premium can be negative, or less than zero, when investors have an absolute preference for stocks over bonds. This can occur during times of rapid inflation. Inflation erodes the value of bonds, because the coupon rate is fixed; stocks can better adapt to inflation because firms can pass on the inflationary effect of higher input prices in the output prices of goods sold. This makes stocks a "hedge against inflation" and can lead to a situation where stocks are considered less risky than bonds.

[5] In other words, lower than the 6.7 percent arithmetic and 4.7 percent geometric means realized historically. Keep this in mind when viewing the results presented below.

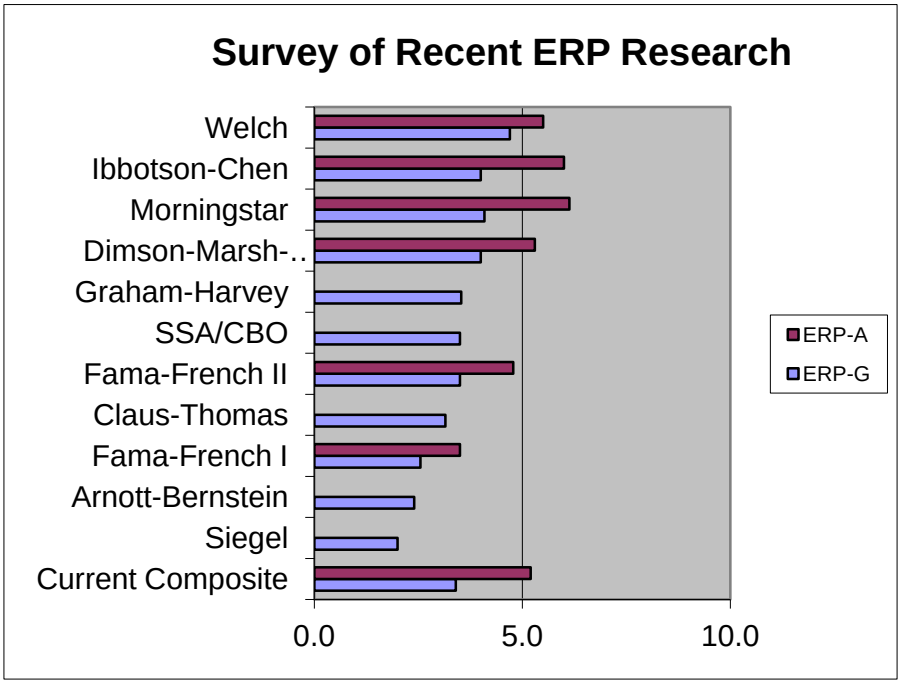
[6] Arnott, Peter, "The Meaning of a Slender Risk Premium," Financial Analysts Journal, March/April 2004, pp. 6-8.

- Methodological issues such as whether to use geometric or arithmetic averages in estimating the ERP, and whether to use Treasury bills or bonds as the proxy for determining the risk-free rate.

I will highlight examples of these kinds of differences in surveying recent studies of the ERP.

Q. WHAT STUDIES OR EVIDENCE ABOUT THE ERP DOES YOUR REVIEW ENCOMPASS?

A. The studies I review in this survey are summarized in the following chart:



Details and sources used in composing the chart are presented in Exhibit____(BLC-1), Schedule 2. The darker (red) bars, labeled "ERP-A", represent arithmetic estimates of the ERP; the lighter (blue) bars, labeled "ERP-G" represent geometric estimates of the ERP. As just noted, the upper end of recent estimates falls in the 4 to 6 percent range. But even this can be misleading because they do not all use the same base for a risk-free rate, and some of these higher estimates are actually lower than they appear. I bring this out in the discussion below, and take it into account when summarizing the results in terms of a Current Composite.

Q. PLEASE DESCRIBE THE WELCH AND IBBOTSON-CHEN STUDIES.

A. These studies fall toward the upper end of the range of recent estimates of the market risk premium. In 2001, Ivo Welch, then Professor of Economics and Finance at Brown University, and a National Bureau of Economics Research Associate in the Corporate Finance group, published survey results, updating an earlier survey, of the views of finance and economics professors on the ERP. With results from over 400 respondents, Welch reported 30-year equity premium forecasts of 4.7 percent (geometric) and 5.5 percent (arithmetic).[7] He observed that this was a significant decline from a survey taken just three years earlier. It is further notable that the survey used Treasury bills for the risk-free rate. The ERP measured relative to long term Treasury bonds would be even lower (the 6.7 arithmetic and 4.7 geometric risk premium averages from Morningstar/Ibbotson Associates are relative to bonds). Professor Welch posted an online update in early 2009 in which he reported that "[t]ypical expected equity premia are between 5% and 6% per year."[8] The lower end of this range is based on a geometric mean return, and the upper end is based on an arithmetic mean return. Again, it should be noted that Professor Welch's survey asks for premiums relative to Treasury bills, so these results would be lower if measured relative to long term Treasury bonds.

Recent studies by Pablo Fernandez help place Welch's results in perspective. In one study, Fernandez publishes results based on responses from 1400 economic and finance professors.[9] The mean ERP, 6.3 percent, is similar to the results obtained by Professor Welch. But Fernandez includes this telling quote from Aswath Damodaran, a finance professor at the Stern School of Business at New York University:

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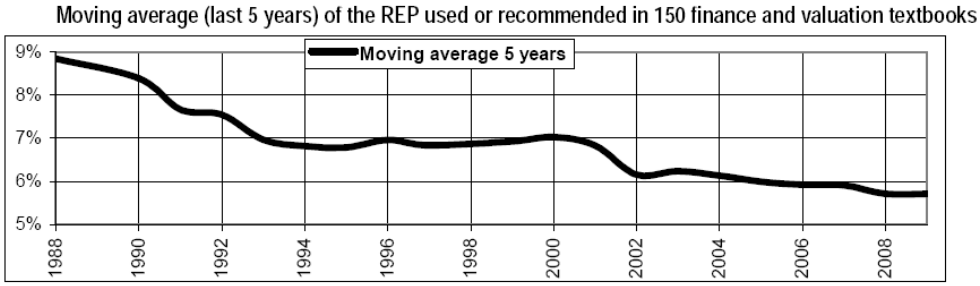
[7]Welch, Ivo, "The Equity Premium Consensus Forecast Revisited" (September 2001). Cowles Foundation Discussion Paper No. 1325. http://ssrn.com/abstract=285169.

[8]The updated results are posted online at http://research.ivo-welch.info/equpdate-results2009.html.

[9]Fernandez, Pablo, "Market Risk Premium used in 2008 by Professors: a survey with 1,400 answers." http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1344209. For a more recent survey, see Fernandez, Pablo, Aguirreamalloa, Javier, and Avendano, Luis Corres, "US Market Risk Premium Used in 2011 by Professors, Analysts and Companies: A Survey with 5,731 Answers," http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1805852 .

> the risk premiums in academic surveys indicate how far removed most academics are from the real world of valuation and corporate finance and how much of their own thinking is framed by the historical risk premiums [e.g. Ibbotson Associates/Morningstar]... The risk premiums that are presented in classroom settings are not only much higher than the risk premiums in practice but also contradict other academic research.[10]

We will see further proof of this when examining evidence from surveys of corporate CFO's (Chief Financial Officers) later in my testimony. In other research, Fernandez documents how the ERP used in textbooks has been falling, demonstrated visually in the following graph ("REP" in the graph refers to what we are referring to as ERP):[11]



Academic references to the equity risk premium have steadily declined, and according to Fernandez, the latest textbooks use an equity risk premium of 5.7 percent, down from nearly 9 percent two decades ago. Bear in mind that most professors, and even textbook authors, do not do original ERP research. They simply repeat "the conventional wisdom," which has until recent years been dominated by the historical return research of Ibbotson Associates/Morningstar. Nevertheless, it is significant to observe that even among finance professors and textbook authors the ERP they use has been falling, and is now no more than about 6 percent.

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[10]The quotation will be found on page 8 of the 2009 Fernandez paper. The bracketed reference to Ibbotson Associates/Morningstar is here supplied to clarify the meaning of "historical risk premiums." Fernandez shows that historical returns are the most often cited source of the ERP used by professors in the classroom. For a fuller and harsher presentation of Professor Damodaran's view of this, see Damodaran, Aswath, "Equity Risk Premiums (ERP): Determinants, Estimation and Implications - A post-crisis Update," October 2009, http://www.stern.nyu.edu/~adamodar/pdfiles/papers/ERP2009.pdf.

[11]Fernandez, Pablo, "The Equity Premium in 150 Textbooks," September 14, 2009, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1473225.

In my view, though, the exemplary study supporting a high ERP is by Roger Ibbotson and Peng Chen.[12] Using a variety of historical and supply-side (forward-looking) data, they concluded that the ERP was about 4 percent geometrically, and 6 percent arithmetically. In light of the controversy that often surrounds the question of geometric versus arithmetic returns when measuring the ERP, which I discuss in more detail later, it is notable that they present estimates of both, and in an interview Ibbotson cites the lower geometric mean as his basis for estimating the current risk premium.[13] But the more important thing to note is that they find their 4-6 percent ERP to be 1.25 percent lower than the historical averages. In other words, they agree with Arnott that future stock returns will not produce as high of a premium over bonds as has been realized historically.

Q. IS WHAT IBBOTSON AND CHEN PUBLISHED IN THE FINANCIAL ANALYSTS JOURNAL INCONSISTENT WITH WHAT MORNINGSTAR PUBLISHES IN ITS YEARBOOK?

A. No. Morningstar has recently been presenting a “supply-side” estimate of the ERP in its annual yearbooks. In the 2007 edition of Morningstar this “supply-side” estimate was 6.35 percent arithmetically, and 4.33 percent geometrically. In the 2013 edition, the "supply side" estimate of the ERP is 6.13 percent on an arithmetic mean basis, and 4.09 percent on a geometric return basis. So while Morningstar still publishes the historical returns, they now use the “supply-side” estimate of the ERP for forward looking expectations of the ERP. In the survey chart above, I have included both the original Ibbotson-Chen results, as well as the 2013 Morningstar "supply side" ERP.

Q. PLEASE EXPLAIN WHAT IS MEANT BY A “SUPPLY-SIDE” ESTIMATE AND HOW IT DIFFERS FROM THE HISTORICAL RETURN.

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[12]Ibbotson, Roger, and Peng, Chen, "Long-Run Stock Returns: Participating in the Real Economy," Financial Analysts Journal, January/February 2003, 88-98.

[13]Lord, Mimi, “Is the Equity Risk Premium Still Thriving, or a Thing of the Past?” Journal of Financial Planning, April 2002, Article 7. http://www.fpanet.org/journal/articles/2002_Issues/jfp0402-art7.cfm

A. A "supply-side" estimate recognizes that historical returns may incorporate unanticipated capital gains or losses. There is no quarrel that over the time frame under consideration (here 1926-2012), investors actually received a return of 4.7 percent (geometric) or 6.7 percent (arithmetic) relative to the income return on long term government bonds. But is this what investors were actually expecting? There is now growing awareness that over long periods of time, stocks and bonds may be realizing unanticipated capital gains or losses as a result of changes in the cost of capital. The "supply-side" approach recognizes this and seeks to remove the unanticipated component of the return from the historical series in order to more accurately estimate what investors were actually expecting, as opposed to what they actually received. This is typically done either by adjusting the historical return for long-term changes in Price/Earnings ("P/E") ratios, or dividend yields (Dividend/Price). Ibbotson and Chen use changes in P/E ratios to develop their "supply-side" estimate. Had they used dividend yields, as some researchers have done, the "supply-side" ERP would have been even lower.

Q. PLEASE DESCRIBE THE FAMA-FRENCH ESTIMATES OF THE ERP.

A. The best way to summarize their findings is to quote from the abstract of their article in the Journal of Finance:

> We estimate the equity premium using dividend and earnings growth rates to measure the expected rate of capital gain. Our estimates for 1951 to 2000, 2.55 percent and 4.32 percent, are much lower than the equity premium produced by the average stock return, 7.43 percent. Our evidence suggests that the high average return for 1951 to 2000 is due to a decline in discount rates that produces a large unexpected capital gain. Our main conclusion is that average stock returns of the last half-century is a lot higher than expected.[14]

In other words, as the cost of equity capital (the "discount rate" for equity capital) fell, it produced large, unanticipated capital gains. This is just another way of reflecting the intuition behind the "supply-side" estimate of the ERP discussed above: historical returns themselves only tell us what investors realized on an ex post or after-the-fact basis. The cost of capital, though, is an ex ante or forward-looking concept.

[14]Fama, Eugene F., and French, Kenneth R., "The Equity Premium," Journal of Finance, V57, No. 2 (2002), 637-659.

What Fama and French did, to avoid extrapolating ex post returns that are not indicative of what investors actually expected, was to use forward looking valuation models essentially identical to the familiar DCF (discounted cash flow) model we use in regulation to estimate the cost of equity for public utilities. In one model they used dividends; this model yields the 2.55 percent ERP cited in the abstract. When they used earnings, the estimated ERP was the 4.32 percent.[15] Either result is considerably below the 6.7 percent arithmetic return premium, or the 4.7 percent geometric return premium, that has been realized historically. Again, what this indicates is that investors historically realized unanticipated returns, and that these cannot be realistically extrapolated in estimating the current expected ERP.

Q. PLEASE DESCRIBE THE DIMSON-MARSH-STAUNTON AND GRAHAM-HARVEY STUDIES.

A. Somewhat in the vein of the classic historical analysis of Morningstar/Ibbotson Associates, the Dimson-Marsh-Staunton research goes further by using a longer historical dataset – beginning in 1900 rather than 1926 – and extending the analysis to equity markets in countries other than just the US. But in what now is becoming conventional wisdom, they recognize that the historical series includes unanticipated capital gains, and subtract these to yield what is essentially a "supply-side" estimate of the historical equity risk premium. For the US, the 1900-2001 realized return premium was 5.6 percent (geometric); adjusted for unanticipated capital gains and a declining cost of equity capital, they derived a 4.0 percent (geometric) ERP for the US over the entire 1900-2001, and projected a 5.3 percent

[15]The ranges presented in the chart for the Fama-French study are the "bias-adjusted" figures shown in Table IV of the article, with the "annual" result being interpreted as "arithmetic" and the "long-term" result being interpreted as "geometric." In the table, the ERP estimated from dividend growth is labeled "Fama-French I" and the ERP estimated from earnings growth is labeled "Fama-French II."

(arithmetic) ERP going forward.[16] Based on evidence I will present later, I'm sure these numbers would be much smaller if they used only the latter half of the 20th century. These results also measure the ERP relative to Treasury bills, which makes them higher than the ERP one would use for longer term investments.[17]

The Graham-Harvey study takes a different, and somewhat unique, perspective to estimating the ERP. Since June of 2000 Duke University has been including in its quarterly survey of CFO's a question about expected 10-year average returns on the S&P 500. Graham and Harvey compare these estimates to 10-year Treasury bond rates at the time of the survey to derive implied expectations regarding the ERP. The lowest expected ERP reported by CFO's since this question was added to the survey was 2.39 percent in Quarter 1 of 2006; the highest ERP was 4.78 percent, in Quarter 2 of 2009, and the latest ERP, for Quarter 1 of 2013 was 3.83 percent. The average for all quarters since the survey began is 3.53 percent, and this is what is depicted in the chart on Schedule 2 of my exhibit, and on Page 11 above.[18]

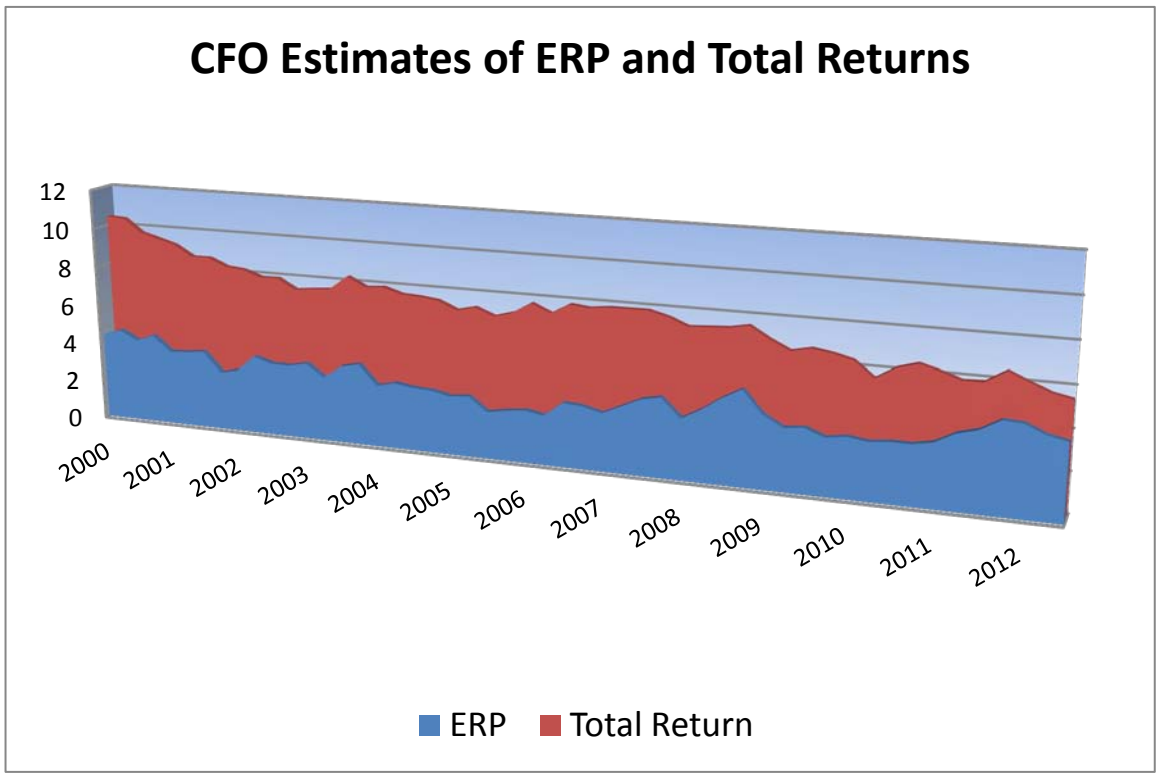
I think it is important to emphasize how the ERP from the CFO surveys is determined. They are not asked what they think the ERP is directly. They are asked what they think the market return will be relative to 10 year government bonds, and the ERP is derived by determining the difference between the two. This means that we can compute what the total expected market return was from the CFO surveys, and I think the results are highly

[16]Dimson, E., Marsh, P.R., and Staunton, M., "Global evidence on the equity risk premium," Journal of Applied Corporate Finance, Vol. 15, No. 4 (2003), 27-38.

[17]As explained below, I take into account whether a study used Treasury bills or bonds in deriving my "current composite" of the ERP.

[18]Graham, J.R., Campbell, R.H., "The Equity Risk Premium in 2013," January 28, 2013 http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2206538

informative. The following chart depicts the ERP and the total expected return since the surveys began:



Since early 2001, the total expected market return projected by the surveyed CFO's has been in the single-digit range, i.e. below 10 percent. This is notable because there seems to be resistance among public utilities and some rate of return witnesses to the notion that expected market returns and the cost of equity capital are in the single digits. Yet here we have several hundred CFO's being surveyed, and over 17,000 survey results now over the past 12 years, and the consensus is clearly that the total expected market return, i.e. the cost of equity capital for the market as a whole, is well below 10 percent. Somewhat in the vein of Professor Damodaran's observation that academic and classroom assessments of the ERP are often unrealistic and at odds with real world expectations, I would suggest the same of regulated utilities and witnesses who cannot conceive that the cost of equity might currently be in the single digits.

Q. PLEASE DESCRIBE THE EQUITY RISK PREMIUM SHOWN FOR SOCIAL SECURITY ADMINISTRATION AND THE CONGRESSIONAL BUDGET OFFICE.

A. The ERP used by actuaries of the Social Security Administration (SSA) to project expected stock returns in analyzing proposals for reforming Social Security during the Bush administration was 3.5 percent.[19] More recently, the same ERP -- 3.5 percent -- has been used by the Congressional Budget Office (CBO) in its analysis of budget projections.[20] I think these are very important examples of what a credible estimate of the ERP is from a public policy perspective. The Commission, of course, is making a "public policy" decision about the ERP when it sets an allowed rate of return on equity for the utility. However, the Commission's decision only affects the utility and its customers. Social Security, or the impact of other issues on the Federal government budget, are public policy issues that affect the nation as a whole, which means that ERP assumptions made by these agencies will be subjected to even more intense scrutiny.

Q. WHAT DO YOU BELIEVE WOULD HAVE BEEN THE RESULT OF PROPOSALS TO MODIFY SOCIAL SECURITY THAT ASSUMED AN ERP OF 6.7 PERCENT (THE HISTORICAL ARITHMETIC RETURN PREMIUM TO COMMON STOCK THROUGH 2012)?

A. I can assure the Commission that such proposals would have been rejected out of hand. The adverse effects of using a 6.7 percent ERP would have been monumental, and would have provoked considerable opposition. In the case of Social Security, this would have resulted in wholly unrealistic estimates of the returns that retirees might expect on funds invested in the stock market. Critics of the proposal would have blasted this. In the case of budget

[19] Goss, S.C., Wade, A.H., Chaplain, C., "OASDI Financial Effects of the Social Security Guarantee Plus Act of 2005 (H.R. 750), http://www.ssa.gov/OACT/solvency/CShaw_20050512.pdf . See also Campbell, J. Y., Diamond, P. A., and Shoven, J. B., "Estimating the Real Return on Stocks Over the Long Term," papers presented to the Social Security Advisory Board, August 2001. http://www.ssab.gov/Publications/Financing/estimated rate of return.pdf .

[20] Congressional Budget Office, "How CBO Projects the Real Rate of Interest on 10-Year Treasury Notes, December 2007. http://www.cbo.gov/ftpdocs/88xx/doc8842/12-21-10-Yr_Rates.pdf.

projections, and the pricing of the cost of health care, this would have added further fuel to those opposed to the health care reform proposals of the Obama administration.

Q. **IF IT IS UNREASONABLE FOR THE SSA OR THE CBO TO ASSUME THAT THE STOCK MARKET WILL RETURN 6.7 PERCENT (OR MORE) ABOVE A RISK-FREE RETURN, HOW DOES 6.7 PERCENT (OR MORE) SUDDENLY BECOME REASONABLE WHEN PRESENTED IN RATE OF RETURN TESTIMONY?**

A. It does not. A 6.7 percent ERP is simply not in the realm of a reasonable projection of the current ERP in the current economy. I would point out here that MDU's rate of return witness, Mr. Gaske, uses a risk premium derived from the Morningstar historical returns, though relative to long-term corporate bonds. But even that will be excessive in the current market environment.

Q. PLEASE DESCRIBE THE CLAUS-THOMAS, ARNOTT-BERNSTEIN, AND SIEGEL ESTIMATES OF THE ERP SHOWN IN THE CHART ON SCHEDULE 2 OF YOUR EXHIBIT, AND ABOVE ON PAGE 11 OF THIS TESTIMONY.

A. These studies bring us to the lower end of current thinking about the ERP. The Claus-Thomas study was published in the *Journal of Finance* under the provocative title "Equity Premia as Low as Three Percent? Evidence From Analysts Earnings Forecasts For Domestic and International Stock Markets." These studies used what they call an "abnormal earnings" version of the discounted cash flow model of stock valuation. While it is an over-simplification to describe it this way, it is similar in construct to a two-stage or non-constant DCF model (which I discuss and utilize later in my testimony). In my view, the key intuition in their approach is recognizing that analysts' forecasts, such as the I/B/E/S or Zacks consensus forecasts often used in DCF analysis, are abnormally high and cannot be projected indefinitely or into perpetuity. When this is taken into account, the studies find that *the implied* ERP from analysts' forecasts averaged 3.36 percent from 1985 to 1998.[21]

The Arnott-Bernstein study, published in the *Financial Analysts Journal*, looks at an even longer period of time – 1802 to 2001 – to estimate what can reasonably be called a "normal" risk premium.[22] One finding from their analysis is that stock returns, especially in the 20th century, have been the product of "happy accidents," while bond returns experienced the opposite. Putting this in the language used earlier, stocks have enjoyed a series of unanticipated capital gains, while bonds have experienced an unanticipated capital loss. When historical returns are adjusted for these "accidents," Arnott and Bernstein find that the "normal" ERP is just 2.4 percent. Moreover, almost all of the "happy accidents" for stocks have accumulated since 1981, and when they take this into account they suggest that the current ERP could be zero, or even negative! But what I depict in the chart is their "normal" ERP of 2.4 percent.

The final ERP shown in the chart (Schedule 2 of my exhibit) is a forecast by Jeremy Siegel. Siegel is the author of several well known studies and books analyzing historical returns. In a 2001 forum on the equity risk premium, he projected an ERP of 2 percent.[23]

Q. PLEASE DESCRIBE THE CURRENT COMPOSITE SHOWN IN THE CHART ON SCHEDULE 2.

A. The Current Composite takes into account all the ERP's presented in the chart, taking into consideration whether they were based on Treasury bills or bonds, and whether they represent geometric or arithmetic means. In deriving this Current Composite I associate geometric means with Treasury bond yields, and arithmetic means with Treasury bill returns.

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[21]Claus, J., and Thomas, J., "Equity Premia as Low as Three Percent? Evidence From Analysts Earnings Forecasts For Domestic and International Stock Markets," Journal of Finance, Vol. 56, No. 5 (2001), 1629-1666.

[22]Arnott, R.D., and Bernstein, P.L., "What Risk Premium is 'Normal'", Financial Analyst Journal, March/April 2002, 64-86.

[23]Siegel, Jeremy, "Historical Results I," Equity Risk Premium Forum, November 8, 2001, AIMR, 30-34. http://www.cfapubs.org/doi/pdf/10.2469/op.v2002.n1.4018 (the link is no longer active, but a hard copy is provided in Mr. Copeland's workpapers).

As shown on the chart, the studies show an approximate average geometric ERP of 3.40 percent, and an approximate average arithmetic ERP of 5.21 percent.

Q. HOW SHOULD THE COMMISSION MAKE USE OF THIS INFORMATION IN DETERMINING A RATE OF RETURN FOR MDU?

A. Schedule 2 provides the basis for at least one benchmark in judging the reasonableness of rate of return on equity recommendations. For example, in this case, MDU is requesting a return on equity of 10.50 percent. Relative to a recent 30-year Treasury yield of 3.6 percent, that would imply an ERP of 6.9 percent, above even the high end of credible estimates of the ERP. Simply stated, this puts MDU's requested return on equity of 10.50 percent outside the realm of possibility in meeting the test of what is a fair and reasonable rate of return on equity, which must balance investor interests with ratepayer interests. While I will take into consideration other evidence in determining what is a reasonable ROE to recommend, I believe the evidence of a "low" or "slender" expected risk premium at the present time is important for putting into perspective how unreasonable is MDU's requested ROE of 10.25 percent.

V. MDU'S COST OF EQUITY CAPITAL

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

A. I used two variations of the “Discounted Cash Flow” (“DCF”) methodology.

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, as 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 $D_0(1+.5g)/P_0$. 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 have used the same sample of eight natural gas distribution utilities used by MDU'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 the Zacks consensus estimate of projected growth in earnings per share (“EPS”), 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).[24] Theoretically, if the constant growth assumptions are valid, earnings, dividends, and book value per share should all grow at approximately 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, 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 RATES FOR THESE MEASURES?

A. The projected growth rates used in my constant growth DCF study for the sample of 8 natural gas distribution utilities are shown on Exhibit __ (BLC-1), Schedule 3. As can be seen from Columns F and G, there is some disparity between the EPS growth rates projected by Zacks and the DPS growth rates projected by Value Line, especially in median (which is a better measure of central tendency for a sample this small). The median projected EPS growth rate, 4.30 percent, is somewhat higher than the median DPS growth rate of 3.57 percent. The median % Return to Common Equity in Column I, 4.00 percent, is also below the median Zacks forecast of 4.30 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. Consequently, based on current projections, relying solely upon projected EPS growth rates will overstate the investors' long-term growth expectations. Similarly, relying solely upon projected DPS growth rates would understate the investors' long-term growth expectations.

[24] Zacks and Value Line are sources of financial data widely used by investors. Besides basic financial data, Zacks surveys institutional investors to collect data on expected earnings growth (referred to as "consensus" estimates of expected earnings growth). "% 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.

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

A. Under these conditions, 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.[25] For this reason, 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 median expected growth rate is 4.01 percent, and the mean is 3.86 percent.

Q. PLEASE DESCRIBE THE RESULTS OF YOUR CONSTANT GROWTH DCF STUDY.

A. The results are shown on Exhibit __(BLC-1), Schedule 3, 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.[26] By averaging the growth 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 7.90 percent and 7.64 percent,

[25] 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.

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

respectively. The difference between the median and the mean reflects the impact of "outliers," or atypical observations, in the calculation of the mean. For that reason the median is the more reliable measure of central tendency, especially for small samples.

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, 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:

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

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.

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 28 company sample of electric utilities, in Exhibit____(BLC-1), Schedule 4. 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 2013, the current Zacks consensus EPS growth projection, an estimate of long-term growth into perpetuity, and estimated retention ratios for 2013, 2017, and 2032. The DDM analysis assumes that earnings grow from 2013 to 2017 at the indicated Zacks consensus EPS growth rate (as noted for each company), and at the long-term growth rate (5.75 percent, the median value of Value Line's "% Retained to Common Equity") in perpetuity after 2032. The period from 2017 to 2032 is a transition period during which the retention ratio changes from the value projected by Value Line in the year 2017 to a common value of 0.48 (the median Value Line estimate for 2017) for all companies in the sample in the year 2032. 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 5.75 percent, and a retention ratio of 0.48 percent — apply after the year 2032, allowing the determination of a terminal share price for the year 2032.[27] These long-term conditions after 2032 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:

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

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 4, were developed using the "Goal Seek" option in an Excel spreadsheet. The mean and median DDM cost of equity were both 8.70 percent.

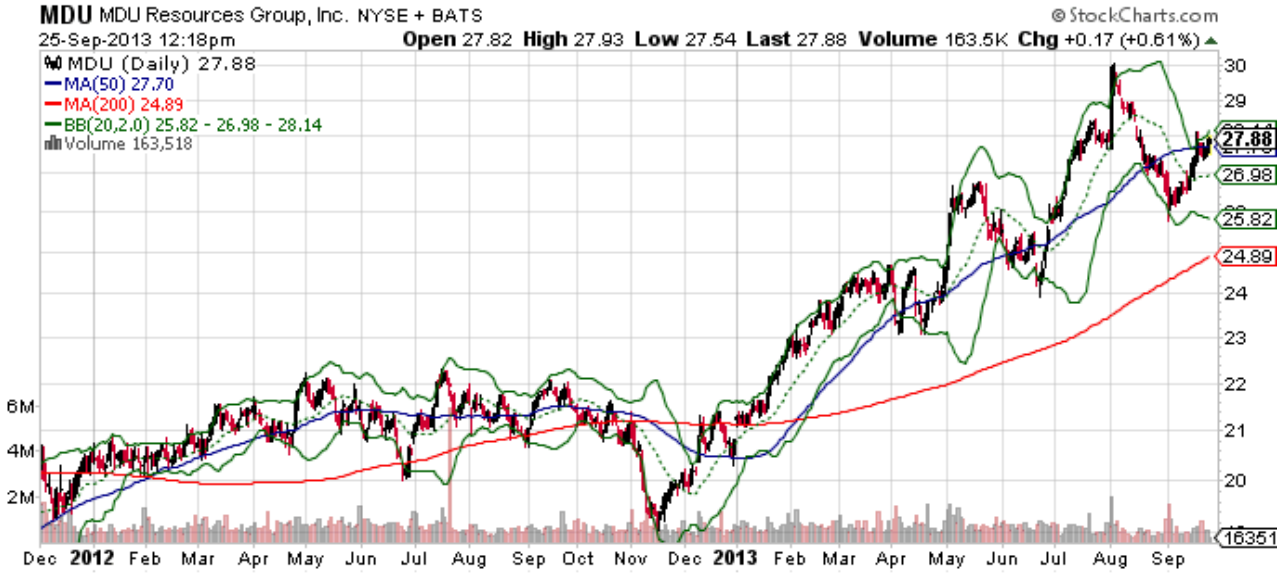
Q. CONSIDERING THE EVIDENCE YOU PRESENT, WHAT IS YOUR ESTIMATE OF THE REASONABLE COST OF EQUITY FOR MDU?

A. Based on the DCF results presented on Schedules 3 and 4, I believe that the best estimate of MDU's cost of equity at the present time is 8.7 percent. It is my normal practice to recommend a range of 100 basis points around the best estimate, to recognize the uncertainty in estimating the cost of equity. The resulting range for a reasonable rate of return on equity is 8.2 to 9.2 percent.

Q. YOUR RECOMMENDED RETURN ON EQUITY -- 8.70 PERCENT -- IS BELOW THE LAST ADJUDICATED RETURN ON EQUITY DETERMINED BY THE COMMISSION IN DOCKET NO. EL11-019. HAVE YOU ANY OTHER EVIDENCE TO SUPPORT SUCH A REDUCTION IN THE ALLOWED RATE OF RETURN ON EQUITY?

[27] 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.

A. Yes. Capital costs have declined considerably since the Commission adjudicated the issue in Docket No. EL11-019. My testimony in that docket utilized market data from late 2011. Since then, stock prices have soared to record highs, and interest rates have fallen significantly. For example, in December 2011, MDU's stock was selling in the low 20's, and has since risen to over $27 per share:



And market risk, as measured by the VIX index (an index of market volatility) has also steadily declined:

This evidence indicates a notable decline in market risk and capital costs since rate of return was adjudicated in Docket No. EL11-019.

Q. IS THE ESTIMATE OF MDU'S COST OF EQUITY AND FAIR RATE OF RETURN PRESENTED HERE BASED ON THE SAME METHODOLOGY ACCEPTED BY THE COMMISSION IN DOCKET NO. EL11-019?

A. Yes, it is.

VI. CAPITAL STRUCTURE, COST OF DEBT, AND OVERALL RATE OF RETURN

Q. WHAT CAPITAL STRUCTURE AND COST OF DEBT DO YOU PROPOSE FOR DETERMINING THE OVERALL RATE OF RETURN?

A. The capital structure and cost of debt I propose is shown in Exhibit____(BLC-1), Schedule 1. This capital structure is based on MDU's target capitalization of 50 percent debt and 50 percent equity, with the 50 percent equity composed of 2.128 percent preferred stock (reflects actual June 30, 2013 data per MDU's updated Statement G) and 47.872 percent common stock. The debt cost of 5.934 percent is a weighted average of long term and short term debt derived from MDU's updated Statement G.

Q. WHY HAVE YOU NOT USED THE ACTUAL CAPITAL STRUCTURE AS FILED BY MDU?

A. MDU employs a considerable amount of short term debt in its capital structure. While ratepayers benefit at the present time from the very low cost of short term debt, there are two potential concerns about the utilization of this short term debt in developing an overall rate of return. First, some of the short term debt is used for working capital, and this may cause the actual capital ratios to vary significantly relative to MDU's stated target capital ratios. For example, in the original Statement G, the resulting debt ratio (Pro Forma June 30, 2013, combining both long and short term debt) was 47.259 percent and the common equity ratio was 50.708 percent. In its updated Statement G, the corresponding debt ratio was 45.801 percent, and the common equity ratio was 52.071 percent. The difference owes to differences in the level of short term debt. Second, while ratepayers presently benefit from

including short term debt in the capital structure, at times short term debt costs have exceeded long term debt costs and under those circumstances a capital structure including short term debt might not be appropriate. For these reasons, I've used the capital structure ratios described above as indicative of MDU's target capital structure, which I think is prudent and appropriate for determining a rate of return on rate base.

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

Q. PLEASE DESCRIBE MDU'S TESTIMONY ON RATE OF RETURN ON EQUITY.

A. MDU's testimony on rate of return on equity is presented by J. Stephen Gaske. To determine the cost of equity, Mr. Gaske uses a DCF methodology with various approaches to estimating the expected growth rate, and a risk premium analysis. While there are relevant implementation issues with Mr. Gaske's use of both methodologies, his DCF approach yields results that, with qualifications, largely agree with my conclusions regarding the DCF cost of equity for MDU.

Q. WHAT ISSUES ARE THERE WITH RESPECT TO MR. GASKE'S DCF ESTIMATES OF THE COST OF EQUITY?

A. As discussed in more detail below, there is a slight overestimation of the dividend yield component of the DCF rate of return in Mr. Gaske's analysis. He also makes a flotation cost adjustment which is excessive. Despite these flaws, his median DCF estimate on his Exhibit____(JSG-2), Schedule 4, Page 8 of 8, as shown in the following markup, is within the range of 8.2 to 9.2 percent that I would recommend:

Montana-Dakota Utilities Co.

Selected Natural Gas Distribution Companies
Blended Growth Rate DCF Calculation

Incorrect to multiply against total return

1+0.5, not 1+0.625

		Dividend Yield	Dividend Yield x (1 + 0.625g)	Expected Growth Rate (g)	Secondary Market: Investor Required Return	Flotation Cost Adjustment	Primary Market: Cost of Capital
AGL Resources Inc.	GAS	4.64%	4.81%	5.68%	10.49%	1.0400	10.91%
Atmos Energy Corp.	ATO	3.93%	4.04%	4.72%	8.77%	1.0400	9.12%
Laclede Group, Inc.	LG	4.07%	4.17%	3.89%	8.06%	1.0400	8.38%
New Jersey Resources Corp.	NJR	3.47%	3.58%	5.27%	8.85%	1.0400	9.20%
Northwest Natural Gas Co.	NWN	3.74%	3.85%	4.71%	8.56%	1.0400	8.91%
Piedmont Natural Gas Co., Inc.	PNY	3.81%	3.91%	4.37%	8.28%	1.0400	8.62%
South Jersey Industries, Inc.	SJI	3.16%	3.29%	6.75%	10.04%	1.0400	10.44%
Southwest Gas Corp.	SWX	2.72%	2.81%	5.28%	8.08%	1.0400	8.41%
High					10.49%		10.91%
3rd Quartile					9.15%		9.51%
2nd Quartile (Median)					**8.67%**		**9.01%**
1st Quartile					8.23%		8.56%
Low					8.06%		8.38%

Within recommended range of 8.2% to 9.2%

Q. WHY DO YOU DISAGREE WITH MR. GASKE'S (1 + 0.625) ADJUSTMENT TO THE DCF DIVIDEND YIELD?

A. Mr. Gaske's adjustment is based on a false premise, and a common misunderstanding about the relevance of quarterly payment of dividends to the derivation of a DCF cost of equity. He explains his adjustment (from Page 14 of his Direct Testimony) as follows:

> There can be many different versions of the basic DCF formula, depending on the assumptions that are most reasonable regarding the timing of future dividend payments. In my opinion, it is most appropriate to use a model that is based on the assumptions that dividends are paid quarterly and that the next annual dividend increase is a half year away. One version of this quarterly model assumes that the next dividend payment will be received in three months, or one quarter. This model multiplies the dividend yield by *(I + 0. 75g).* Another version assumes that the next dividend payment will be received today. This model multiplies the dividend yield by *(I + 0.5g).* Since, on average, the next dividend payment is a half quarter away, the average of the results of these two models is a reasonable approximation of the average timing of dividends and dividend increases that investors can expect from companies that pay dividends quarterly. The average of these two quarterly dividend models is:

$$K = \frac{D_0(1 + 0.625g)}{P} + g$$

Though perhaps one of the most common misperceptions in the estimation of a DCF cost of equity, adjusting the dividend yield for growth has nothing to do with the frequency of dividend payout. With respect to the frequency of dividend payout, rational investors will be indifferent to whether payment is received at the beginning of a period or at the end of the period. This indifference owes to the fact that the dividend will grow in value, or "compound," *in either case*. There is, therefore, no reason to make an explicit adjustment to the dividend yield for growth (or "compounding"). To understand why, consider the following hypothetical. Assume, first, that the dividend is received at the beginning of a period. A rational investor will not simply sit on it, but will reinvest it, so that it grows in value. A real world analogy would be to a dividend paid, but reinvested through an automatic "dividend reinvestment program" (often referred to with the acronym "DRIP"). A dividend reinvested this way is indistinguishable from a firm's retained earnings which are reinvested in productive assets and will provide the basis for a larger dividend paid at the end of the quarter. The alternative, where the dividend is paid at the end of the quarter, yields the same compound value because the firm will have the funds employed during the period in productive assets. There is simply no basis whatsoever to adjust the dividend yield of a DCF return for growth *per se*.

Q. YOU ADJUST THE DIVIDEND YIELD BY (1 + 0.5g). IF THERE IS NO NEED TO ADJUST FOR GROWTH, WHAT IS THE PURPOSE OF THIS ADJUSTMENT?

A. As I noted earlier in my own presentation of the DCF methodology, 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, as an annual yield D_0/P_0 will tend to understate the effective yield, while D_1/P_0 will tend to overstate it. The reason for this actually has less to do with assumptions

about growth and compounding that it does with making sure that the "D" is properly matched with the value of the capital stock which produced it. Essentially the issue is one of properly matching "stocks" and "flows." Stocks and flows are elementary concepts in accounting, finance, and economics. A "flow" is an accounting or economic variable measured *over a period of time*. A "stock" is an accounting or economic variable measured *at a point in time*. The most familiar example here will probably be the income statement and balance sheet of a corporation. The income statement represents a "flow" over the course of a period of time, such as a quarter, or a year. The balance sheet represents a stock of productive assets (and corresponding liabilities) at a point in time.

Accountants and economists will have various measures of financial and economic performance correlating these stocks and flows that measure the *rate* of something. One of the more common examples will be the *rate of return on equity*. How do we calculate or express this, for example on a per share basis? Do we take the earnings per share, and divide it by book value per share at the beginning of the period, or at the end of the period? If we divide it by the book value per share at the end of the period, we will overstate the actual rate of return produced by the book value of the equity because the book value of the equity is *growing* during the period of time for which we are trying to measure the rate of return. But for the same reason, if we divide earnings per share by the book value at the end of the period we will understate the rate of return. So what we do is calculate the rate of return using the period *average* book value per share. Notionally, if we represent this as *f/S*, where "*f*" is a flow, and "*S*" is the stock that produces it, then "*S*" should always represent the *average* value of the stock for the period represented by the flow.

It is precisely this correlation between a flow and the stock which produces it which provides the basis for the (1 + 0.5g) adjustment to the dividend yield in the DCF formula. The dividend, by analogy to the earnings out of which it is paid, is an economic and accounting "flow." Price, in the dividend yield D/P, is simply the capitalized value of the *stock* that

produces the dividend. For any given *annual* value of D, P should represent the *average* value of the capital stock used to produce it. That is exactly what the (1 + 0.5g) adjustment accomplishes in my DCF analysis. I can demonstrate this by explaining the dividend yield calculation in my DCF analysis in my Exhibit____(BLC-1), Schedule 3. Note that in Columns B and C I have Value Line's estimates of the *annual* dividend for 2013 and 2014. In the dividend yield calculation presented in Column E, these two annual dividends are averaged, i.e. added together and divided by two. Implicitly, this is a "spot" *annual* dividend as of the end of 2013. An annual period *centered* on year end 2013 will include 6 months of 2013 and 6 months of 2014. To estimate the *annual* dividend corresponding to this 12-month period ending 6 months into 2014, I multiply the "spot" dividend at year end 2013 by (1 + 0.5g).

And so there it is. The (1 + 0.5g) adjustment has nothing to do with the frequency of payout or compounding *per se*. It has to do with making sure that the D in the numerator is properly matched to an estimate of the stock of capital that produces it. Now, an astute reader may have observed that the "P" in my dividend yield is not a price for year end 2013, but is a price for a more recent period of time. All that means is that I *may* have *overestimated* the dividend yield component of the DCF return slightly. But that is simply a concession to expediency. I perform these kinds of DCF analyses at various times of the year. It would be tedious to always insure that the dividend used in the computation is exactly centered on the period used for the price in the dividend yield. In many cases, this would be much ado about nothing, because there are frequently annual periods where the dividend is not increased at all. In the more common case, the quarterly dividend is only increased once a year, and thus would have only one quarter of impact on the annual dividend. As a concession to expediency, the approach I use will never *underestimate* the appropriate dividend yield. As to any overestimation, it is likely to be quite small, especially in relationship to the overall level of uncertainty in DCF cost of equity estimation.

Q. WHAT IS THE ISSUE WITH RESPECT TO MR. GASKE'S FLOTATION COST ADUSTMENT?

A. There are two issues. The first issue is his multiplication of the "1.04" adjustment factor times the entire DCF rate of return, rather than just the dividend yield portion of the DCF rate of return. Technically, the DCF rate of return adjusted for flotation cost is:

$$k = \frac{D}{P(1-f)} + g$$

where the flotation cost factor is applied only to the dividend yield portion of the DCF rate of return, not the entire rate of return. But even this, under normal circumstances, produces an excessive rate of return. When this formula is used to reflect the flotation cost allowance, the allowance is allowed on all shares. But not all shares represent common stock raised through public market offerings, and this approach would allow the recovery of this expense on shares of stock where the expense was not incurred. For instance, a substantial source of new equity is through automatic dividend reinvestment, and flotation costs are not incurred on equity raised in this way. That is part of the problem. The other part of the problem is that the return is an annual allowance, but common stock is not issued every year (through new stock sales). Thus, while the allowance might be appropriate in the year in which the common stock was issued, in the following year(s) the allowance would still be received (presuming the company is earning its cost of equity capital) even though the expense is not being incurred.

To prevent recovery of flotation cost where not appropriate, the rate of return required to recover flotation costs can be expressed as

$$r = k + zf$$

where *k* is the "bare bones" cost of equity before adjusting for flotation, *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, producing *r*, the cost of

equity adjusted for flotation costs.[28] According to Value Line, MDU's shares outstanding are projected to grow from 189.5 million in 2013 to 193.0 million in 2017, a compound annual rate of growth of just 0.46%. Multiplying this times the 4% flotation cost factor Mr. Gaske derived yields an adjustment factor of just two basis points:. zf = 0.46% x 4% = 0.02%. By way of contrast, Mr. Gaske would add over 30 basis points to the cost of equity as a flotation cost allowance. Mr. Gaske's adjustment is excessive and should be rejected. In truth, since some of the share growth projected by Value Line will likely come from DRIP, for which market flotation cost is not a factor, even a 2 basis point allowance would be excessive. I see no reason to make any explicit adjustment to the allowed rate of return for flotation cost.

Q. WHAT SHORTCOMINGS ARE THERE IN MR. GASKE'S RISK PREMIUM ANALYSIS?

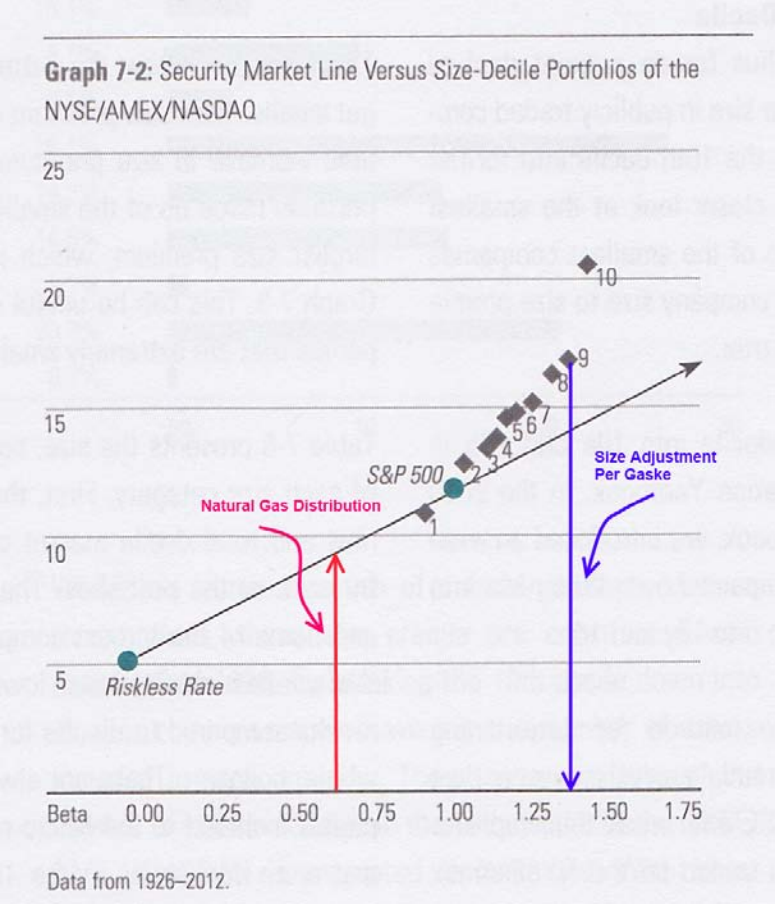
A. The principal shortcoming of Mr. Gaske's analysis is his unrealistic estimate of the market risk premium. Using the Morningside historical return data from the 2011 Yearbook, he calculates a historical risk premium relative to corporate bonds of 5.4 percent. One problem with this approach is that Morningstar does not break out the historical return on corporate bonds between the "income return" and "capital appreciation" as it does for long term government bonds. With respect to the latter, capital appreciation added 0.8 percent to the total historical return, and even Morningstar recognizes this is not a proper component of an ex ante risk premium. It is likely that the historical corporate bond return embodied a similar element of capital appreciation that should be excluded from the risk premium. Mr. Gaske estimated a total return, with this inflated risk premium, of 9.7 percent. Reducing it by 0.8 percent, to remove the effect of capital appreciation, we're back down to an estimate of the required rate of return -- 8.9 percent -- that is within the range that I've recommended.

Mr. Gaske also makes a mistake in contending for a "size adjustment" from the Morningstar data to reflect the smaller company size of MDU. According to Mr. Gaske, "companies in the same size range as Montana-Dakota's South Dakota natural gas

[28] The derivation of this equation is presented in Schedule 5, Exhibit____(BLC-1).

distribution have had a premium of 1,420 basis points (14.2 percent) over the average return on long-term corporate bonds" (Gaske Direct Testimony, Page 26). But the Morningstar "size adjustment" does not apply to the kinds of companies that make up his utility proxy group. The "size adjustment" -- or "size premium" -- is an artifact of the effect of low dividend payout ratios on stock price volatility, and hence systematic risk. Stock price volatility, and systematic risk, is inversely related to dividend payout: stocks with a low payout will tend to be more volatile than stocks with a high payout. Thus stocks with a low payout (and low or non-existent dividend yields) tend to have high systematic risk, and high stock "betas." These are the stocks that tend to earn what appears to be a "size premium."

The issue here can be demonstrated in the following image, taken from the Morningstar Valuation Yearbook (marked up as noted):



The "size premium" is represented by the deviation of the gray diamonds from the capital market line (the straight line originating with the "Riskless Rate" circle). The numbers next to the gray diamonds represent size deciles, with 10 representing the smallest decile. As shown, the size premium increases as the size of the company decreases. *But so does the beta.* In other words, the size premium increases as beta increases, and is greatest for high beta stocks. I have superimposed on the Morningstar figure red markings indicating the median beta for the natural gas distribution group and where this would fall in relation to the capital market line.

As should be obvious, the natural gas distribution group is completely outside the "universe" or "sample" used to derive the size premium. More specifically, according to Mr. Gaske, the size adjustment he proposes would be in the 9th decile. I have superimposed, in blue on the diagram, the approximate beta corresponding to the ninth decile: approximately 1.40 . But the median beta for the natural gas distribution group is 0.65, not 1.40. This is a classic example of extrapolating outside the range of observed values. Moreover, on Table 7-5 accompanying this chart on Page 89 of the Morningstar 2012 Valuation Yearbook, the size premium associated with the lowest beta group in the analysis, with a beta of 0.91, is -0.38, i.e. the size "premium" is negative. If we were to extrapolate down to a beta of 0.75, the size "premium" would be even more negative! But again, that requires an extrapolation outside the range of observation, and simply reinforces my point: the size premium data in the Morningstar Valuation Handbook has no applicability to the case of public utilities. Statistically, to apply this data to MDU is a case of "epic fail" and Gaske's "size adjustment" to the risk premium simply has no merit.

Q. PLEASE SUMMARIZE YOUR CONCLUSIONS REGARDING MR. GASKE'S TESTIMONY.

A. Mr. Gaske's risk premium analysis is completely without merit. Notwithstanding some methodological issues with respect to his DCF analysis, he still came up with a DCF rate of

return that is within the range of 8.2 to 9.2 percent that I recommend. Nothing in Mr. Gaske's testimony undermines the reasonableness of a rate of return on equity within this range.

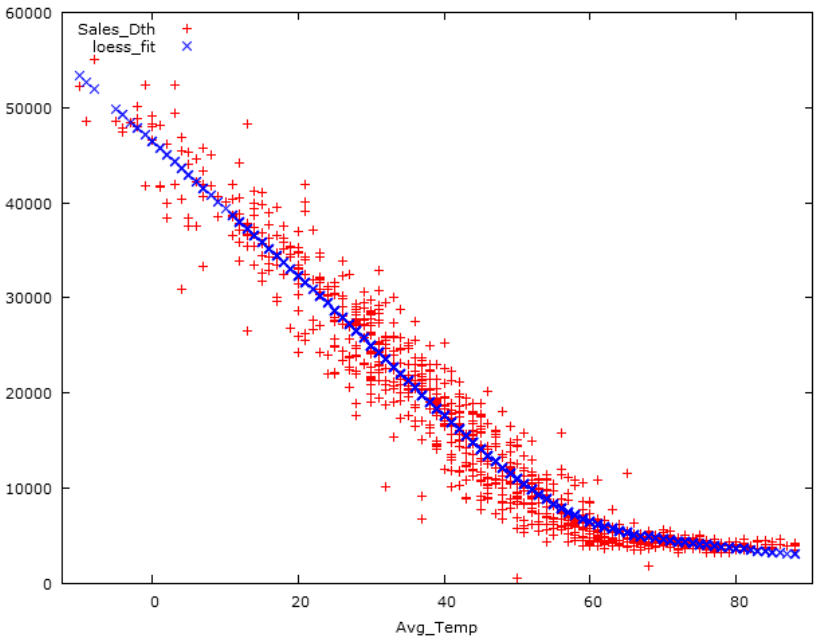
VIII. WEATHER NORMALIZATION -- BASE FOR HEATING DEGREE DAYS

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY WITH RESPECT TO WEATHER NORMALIZATION?

A. MDU has proposed a weather normalization that departs from the traditional use of 65 degrees to develop heating degree days, and substitutes heating degree days based upon a temperature of 60 degrees. The purported justification for this departure from normal practice is presented in the testimony of Robert C. Morman. I was asked to examine the evidence presented by Mr. Morman to determine whether it justified departing from the normal base of 65 degrees for calculating HDD's.

Q. WHAT DID YOU FIND?

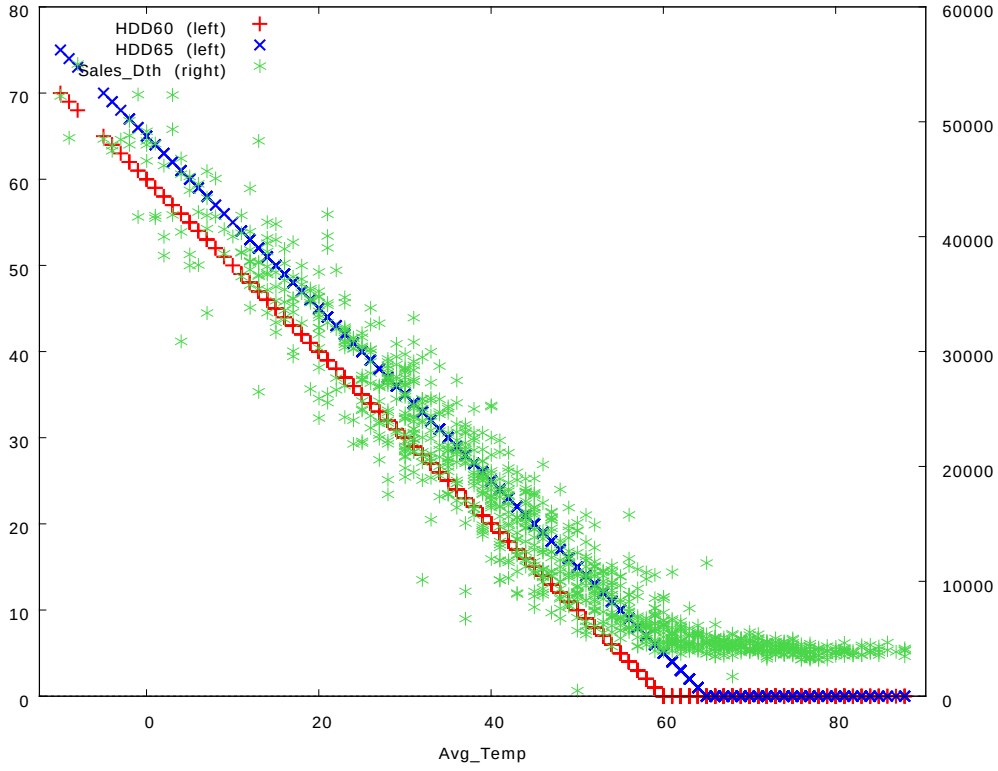
A. While MDU's heating load accelerates at temperatures below 60 degrees, MDU is incorrect in concluding that load at temperatures above 60 degrees is not temperature sensitive. This is clearly seen in the following chart, which plots the same data for the Black Hills System as shown in the comparable chart in Mr. Morman's direct testimony (Page 9):



The red + symbols are the individual observations and the blue x symbols are a locally weighted regression fit through the data. As can be seen, while the relationship begins to flatten out above temperatures of 60 degrees, it is not *completely* flat. This indicates that there is some degree of temperature sensitivity in the load even at temperatures above 60 degrees.

Q. MIGHT IT STILL BE POSSIBLE THAT HDD'S USING A BASE OF 60 DEGREES PROVIDE A BETTER FIT THAN HDD'S USING A BASE OF 65 DEGREES?

A. That does not seem to be the case. The following chart shows that HDD's based on 60 degrees do a *poorer* job of representing the temperature sensitivity of the Black Hills System than HDD's based on 65 degrees:



Here the green symbols represent the actual temperature sensitivity of MDU's load, the blue symbols represent the relationship implied with HDD's using 65 degrees as the base, and the red symbols represent the relationship implied with HDD's using 60 degrees as the base. Clearly, the relationship implied with HDD's using 65 degrees as the base is a better fit, with

the relationship using 60 degrees as the base being shifted to the left and away from the central tendency of the heating load/temperature relationship. There does not appear to be any valid basis to depart from the traditional use of 65 degrees as the base for computing HDD's.

Q. DO YOU HAVE ANY OTHER COMMENTS OR OBSERVATIONS ABOUT MDU'S WEATHER NORMALIZATION ADJUSTMENT?

A. Yes, I do. Rather than use NOAA normals, MDU appears to develop its own "normals" from raw temperature data. But NOAA normals are not simply 30-year averages of raw station data, and a 30-year average of raw station data is unlikely to produce comparable results. NOAA normals undergo a detailed and stringent development process to correct them for inhomogeneities owing to issues such as missing observations, station moves, and equipment changes that are lacking in simply averaging raw station data. For this reason, there should always be a presumption in favor of using NOAA normals for weather normalization when available.

IX. CONCLUSIONS AND RECOMMENDATIONS

Q. PLEASE SUMMARIZE YOUR CONCLUSIONS AND RECOMMENDATIONS

A. Based on the evidence presented in this testimony, the cost of equity and fair rate of return on equity for MDU is in the range of 8.2 to 9.2 percent, and I recommend a rate of return of 8.7 percent, the midpoint of the range. A rate of return in the range I recommend is corroborated by the DCF analysis of MDU's witness, Mr. Gaske; Mr. Gaske's risk premium analysis is flawed and should be rejected. With respect to capital structure, MDU's target capital structure is 50 percent debt and 50 percent equity, and this is a reasonable capital structure. Using such a capital structure with the debt costs in MDU's updated Statement G, the overall rate of return is 7.23 percent as set forth in my Exhibit____(BLC-1), Schedule 1.

With respect to weather normalization, MDU's proposal to substitute a 60 degree base for computing HDD's is unsupported by the evidence and should be rejected; HDD's should be computed using the traditional base of 65 degrees. MDU's weather normalization adjustment is also flawed by the use of 30 degree "normals" that appear to be averages based on raw station data; these "normals" should be rejected, and the weather normalization adjustment should be based upon NOAA normals. Staff witness Mehlhaff is developing a weather normalization adjustment consistent with these recommendations.

Q. DOES THAT COMPLETE YOUR TESTIMONY AT THE PRESENT TIME?

A. Yes, it does.