BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA

In the Matter of the Application of Northern States Power Company dba Xcel Energy for Authority to Increase its Electric Rates	))))	Docket No. EL11-019

RATE OF RETURN AND COST OF CAPITAL

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

April 16, 2012

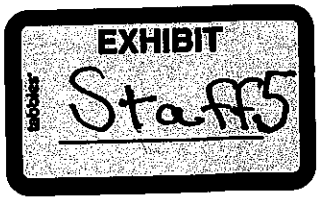

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TABLE OF CONTENTS

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

Hope case.[1] 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 Northern States Power ("NSP") and to recommend a fair and reasonable rate of return based upon that evidence. I will also review and respond as necessary to NSP's presentation of evidence on these matters.

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 NSP should be in the range of 8.5 to 9.5 percent, and I recommend a rate of return on equity at the midpoint of the range, 9.0 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 7.60 percent. My recommendations are summarized in the following table, and in Exhibit____(BLC-1), Schedule 1:

[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).

Northern States Power -- Minnesota
Capital Structure and Cost of Capital

Year Ending December 31, 2011

Line No.	Source	Ratio	Cost	Wtd Cost
	A	B	C	D
1	Long Term Debt	47.27%	6.02%	2.85%
2	Common Equity	52.73%	9.00%	4.75%
3	Total	100.00%		7.60%

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 that 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 NSP's testimony and evidence regarding cost of capital and rate of return.

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").[3] 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.

[3]The DCF and CAPM methodologies are described in more detail later in my testimony.

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 that familiarity with this research can help the Commission make a more informed decision about the appropriate rate of return for NSP.

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.[4] 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.

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

Somewhat related, 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.

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.

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 NSP.

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 2010, as the market rebounded somewhat, the historical equity return premium for common stocks averaged 6.7 percent.

It is important to note that this historical estimate is based on an arithmetic mean (or average), and that were we to use a geometric mean, the historical data through 2010 yielded a return premium of only 4.8 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 4.8 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-a-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.[5]

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-a-vis bonds.[6] 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.[7]

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:

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[5] 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.

[6] In other words, lower than the 6.7 percent arithmetic and 4.8 percent geometric means realized historically. Keep this in mind when viewing the results presented below.

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

- 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;

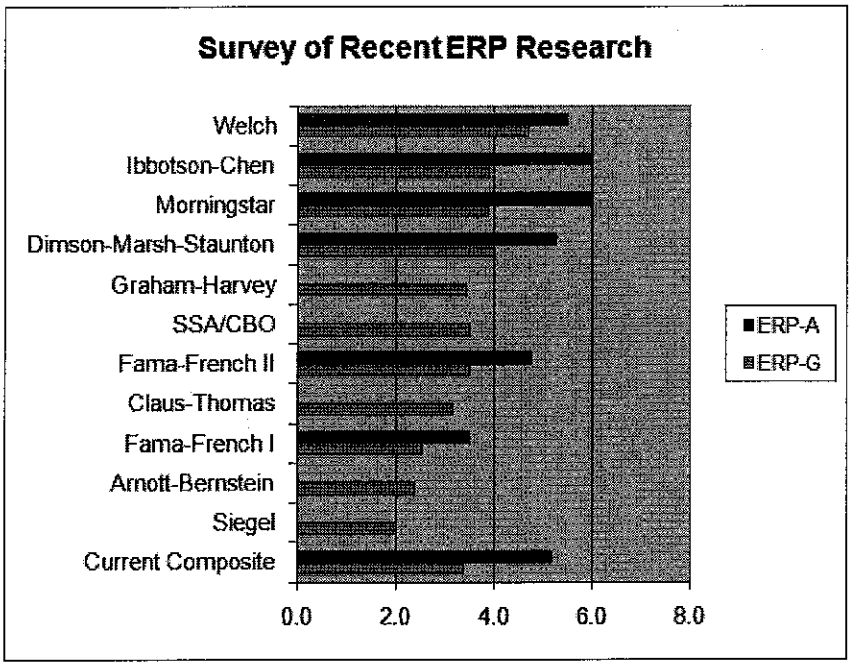
and

- 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 3. 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, therefore 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, 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).[8] 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 4.8 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."[9] 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

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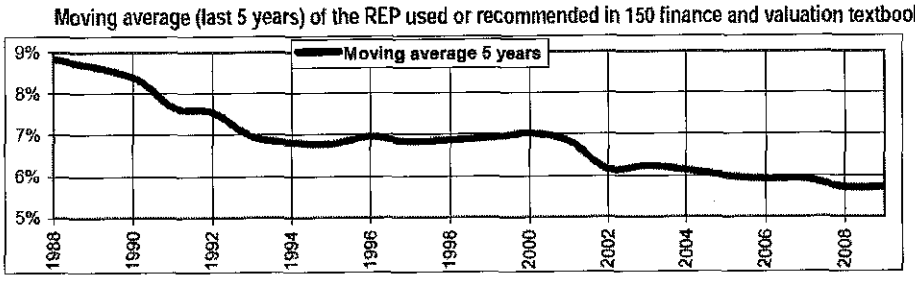
[8]Welch, Ivo, "The Equity Premium Consensus Forecast Revisited" (September 2001). Cowles Foundation Discussion Paper No. 1325. http://ssrn.com/abstract=285169.

[9]The updated results are posted online at http://welch.econ.brown.edu/academics/equpdate-results2009.html.

professors.[10] 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:

> 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.[11]

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):[12]



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

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[10]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.

[11]The quotation will be found on page 8 of the previously cited 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.

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

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.

In my view, though, the exemplary study supporting a high ERP is by Roger Ibbotson and Peng Chen.[13] 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.[14] 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 2010 edition, the "supply side" estimate of the ERP is 5.99 percent on an arithmetic mean basis, and 3.88 percent on a geometric return basis. So while Morningstar still publishes the historical returns, they now

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

[14]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

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 2010 Morningstar "supply side" ERP.

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

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 1926-2010), investors actually received a return of 4.8 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. Moreover, the "supply-side" ERP estimates also vary considerably over time. I present independently derived estimates of the "supply-side" ERP taking these considerations into account later in my testimony.

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.[15]

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.

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.[16] Either result is considerably below the 6.7 percent arithmetic return premium, or the 4.8 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 –

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

[16]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."

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 (arithmetic) ERP going forward.[17] 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.[18]

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 2.88 percent in March 2002; the highest ERP was 4.74 percent, in February 2009, and the latest ERP was 3.00 percent. The average for all quarters since the survey began is 3.46 percent, and this is what is depicted in the chart on Schedule 3 of my exhibit, and on Page 11 above.[19]

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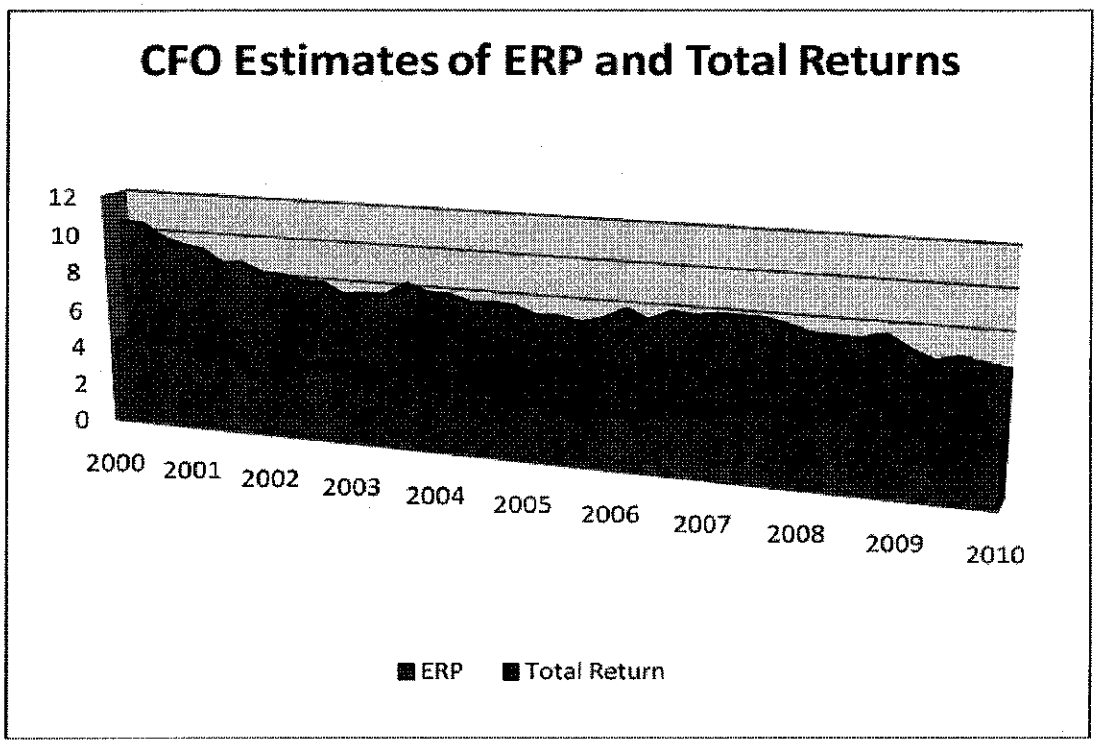
[17]Dimson, E., Marsh, P.R., and Staunton, M., "Global evidence on the equity risk premium," Journal of Applied Corporate Finance, Vol. 15, No. 4 (2003), 27-38.

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

[19]Graham, J.R., Campbell, R.H., "The Equity Risk Premium in 2010," August 9, 2010. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1654026

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 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 13,000 survey results now over the past decade, 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.[20] More recently, the same ERP -- 3.5 percent -- has been used by the Congressional Budget Office (CBO) in its analysis of budget projections.[21] I think that 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 2010)?

[20] 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 .

[21] 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.

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 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 NSP's rate of return witness, declines to use this as an estimate of the risk premium in one of his rate of return methodologies because he considers it too low. I will also note here that such high estimates of the ERP are incompatible with actuarial assumptions for typical pension plan forecasts, including NSP's. I cover this more specifically later in my response to the testimony of NSP's rate of return witness.

Q. PLEASE DESCRIBE THE CLAUS-THOMAS, ARNOTT-BERNSTEIN, AND SIEGEL ESTIMATES OF THE ERP SHOWN IN THE CHART ON SCHEDULE 3 OF YOUR EXHIBIT, AND ABOVE ON PAGE 13 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 Zack's 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.[22]

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.[23] 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"

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[22]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.

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

ERP of 2.4 percent.

The final ERP shown in the chart (Schedule 3 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.[24]

Q. PLEASE DESCRIBE THE CURRENT COMPOSITE SHOWN IN THE CHART ON SCHEDULE 3.

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. (I describe the reason for doing this later when I discuss the issue of geometric versus arithmetic means in the estimation of the ERP on page 33 below). As shown on the chart, the studies show an approximate average geometric ERP of 3.38 percent, and an approximate average arithmetic ERP of 5.18 percent.

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

A. Schedule 3 provides the basis for at least one benchmark in judging the reasonableness of rate of return on equity recommendations. For example, a geometric mean ERP of 3.5 percent relative to a current long term government bond yield of about 4.4 percent implies a total market return of 7.9 percent. Bear in mind, this is a projection of the return for "the market as a whole" or for a stock of "average risk." Since utilities are still of somewhat less risk than the market as a whole or the average stock in the S&P 500 index, one could argue

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[24]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).

that this represents an upper bound to what is a fair and reasonable return on equity for NSP under current market conditions. In other words, if there is wide-spread support and consensus for the idea that investors cannot reasonably expect a return of more than 8 percent on the market as a whole at this point in time (and this is certainly borne out by the CFO surveys), then the ROE (return on equity) that NSP is asking for in this case, 11.00 percent, is not within the realm of possibility of 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 a reasonable ROE to recommend is, I believe this evidence of a "low" or "slender" risk premium is important for putting into perspective how unreasonable NSP's requested ROE of 11.00 percent is.

V. NORTHERN STATES POWER'S COST OF EQUITY CAPITAL

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

A. I used two variations of the "Discounted Cash Flow" ("DCF") methodology. I also performed a supplemental analysis using the Capital Asset Pricing Model (CAPM).

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, 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, NSP's witness utilizes a sample of 10 electric utilities. It should be noted that the relevant entity for "comparability of risk" here is NSP's parent company, Xcel, because it is Xcel that goes to the marketplace and issues common stock. The sample proposed by NSP's witness is sufficiently comparable to Xcel that it provides a reasonable basis for determining the cost of equity and fair rate of return on equity for NSP.

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).[25] 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 22 combination utilities are shown on Exhibit __ (BLC-1), Schedule 4. 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, 5.70 percent, is substantially higher than the median DPS growth rate of 3.68 percent. The median % Return to Common Equity in Column I, 4.0 percent, is also well below the median Zacks forecast of 5.70 percent, implying that the projected earnings growth rate is

[25] 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.

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.

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. 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.[26] For this reason, an average of these various growth rate measurements is required to reasonably estimate investors' long-term growth expectations. Averaging them in the way I do in Schedule 4, the median expected growth rate (Column J) is 4.47 percent, and the mean is 4.74 percent. Lower than either the mean or median based on Zacks alone, this is a more reasonable estimate of the expected growth rate for a constant growth form of the DCF model.

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

A. The results are shown on Exhibit __(BLC-1), Schedule 4, 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).

[26] 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.

Column E is the dividend yield portion of the DCF cost of equity, and is computed using a 180-day moving average stock price.[27] 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 9.04 percent and 8.95 percent, 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. Here, though, the two are close enough to conclude that, using the constant growth form of the DCF model, the cost of equity appears to be about 9 percent.

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

[27] 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

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:

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

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.

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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.

A. The basic data employed in my implementation of this methodology is presented, for the 10 company sample of combination utilities, in Exhibit____(BLC-1), Schedule 5. 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 2011, the current Zacks consensus EPS growth projection, an estimate of long-term growth into perpetuity, and estimated retention ratios for 2011, 2015, and 2030. The DDM analysis assumes that earnings grow from 2011 to 2015 at the indicated Zacks consensus EPS growth rate (as noted for each company), and at the long-term growth rate (4.0 percent, the median value of Value Line's "% Retained to Common Equity") thereafter. The period from 2015 to 2030 is a transition period during which the retention ratio changes from the value projected by Value Line in the year 2015 to a common value of 0.39 (the median Value Line estimate for 2015) for all companies in the sample in the year 2029. 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 4.0 percent, and a retention ratio of 0.39 percent — apply after the year 2030, allowing the determination of a terminal share price for the year 2030. These long-term conditions after 2030 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 5, were developed using the "Goal

Seek" option in an Excel spreadsheet. I calculated the mean DDM return for the 10 company sample at 8.54 percent, and the median DDM return at 8.42 percent.

B. CAPM ANALYSIS

Q. *DID YOU UNDERTAKE A SUPPLEMENTAL ANALYSIS OF THE COST OF EQUITY FOR THE SAMPLE OF COMPARABLE COMPANIES TO VALIDATE YOUR DCF RESULTS?*

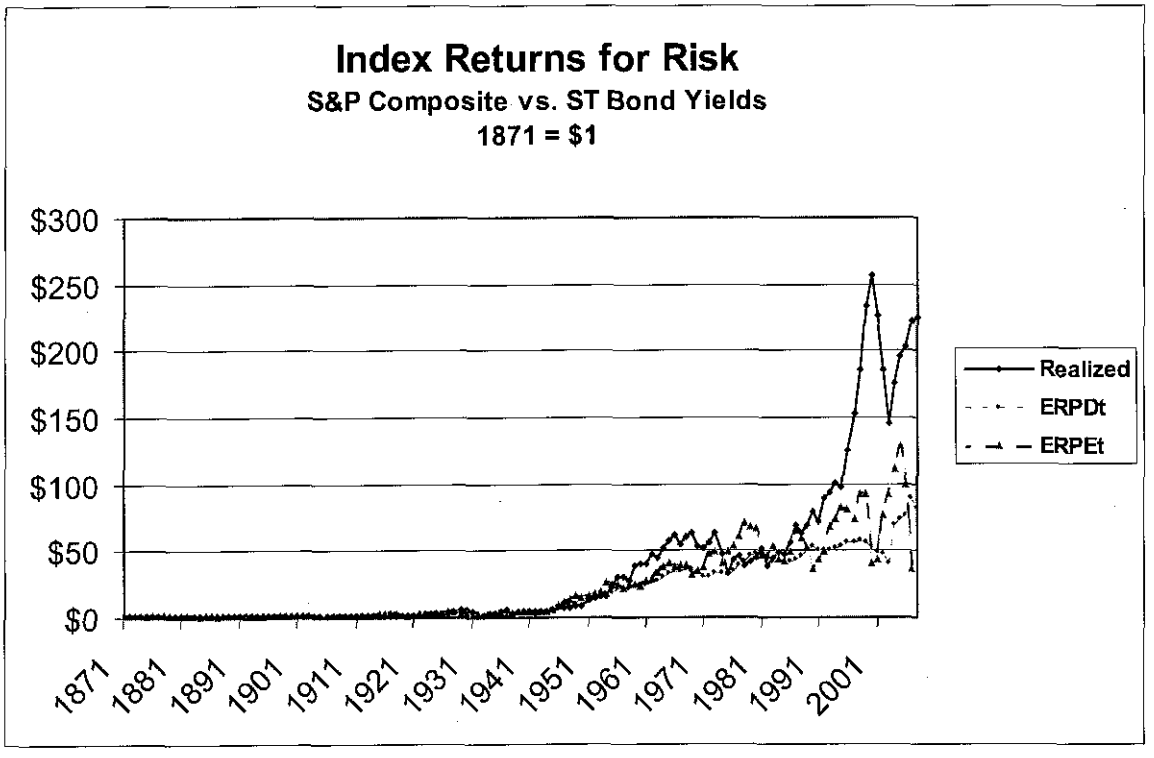
A. Yes, I did. I used the Capital Asset Pricing Model ("CAPM") to develop a third estimate of the cost of equity. CAPM is a risk premium methodology based on the principle that the cost of equity capital equals the cost of a risk-free investment, plus a "risk premium" to compensate investors for the risks associated with a specific equity investment. Under the CAPM methodology, the overall market risk premium for common stock is adjusted to reflect the risk of a specific stock or sample of stocks using the stock's beta coefficient. A beta coefficient is a financial market measure used in developing a risk-adjusted risk premium that reflects the market risk of an individual stock (sometimes referred to as its "systematic risk") relative to the risk of the market as a whole. This stock-specific risk premium is then added to an appropriate "risk-free" rate to yield a total required rate of return. Mathematically, the CAPM methodology can be stated as:

$$k = r_f + \beta r_p$$

where r_f is the risk-free rate, β is the stock's beta coefficient, and r_p is the market risk premium. For an estimate of the required return on stock, the yield on long-term government bonds is conventionally used to estimate the risk-free rate. More problematic is the estimate of the market risk premium.

Q. HOW DID YOU ESTIMATE THE MARKET RISK PREMIUM?

A. My estimate of the market risk premium, or ERP, is based on an analysis of historical data from 1872 to 2008. Using that data, I take the historical return on stocks relative to a yield on bonds and deconstruct the returns to remove the effect of changes in valuation or cost of capital. In effect, I am creating a "supply-side" estimate of the historical ERP. Unlike Ibbotson and Chen, who just adjust for changes in P/E ratios, I adjust for changes both in earnings ("ERP-Et") and dividend yields ("ERP-Dt"). I then construct index series which show what $1.00 invested in stock in 1871 has returned relative to bonds, i.e. what has been the compounded return for bearing risk. The following chart compares the two series with actual realized returns:



The three series do not begin to diverge until the early 1950's. In other words, until the early 1950's, there were no significant trends or changes in dividend yields or P/E ratios that would cause the historically realized risk premium to be significantly different than the expected risk

premium. Since the early 1950's, however, there have been significant secular (long term) changes in P/E ratios and dividend yields that indicate an overall downward trend in the cost of equity capital. This downward trend in the cost of equity capital has produced significant, and frequently large, unanticipated capital gains. The "ERP-Dt" and "ERP-Et" series quantify these unanticipated capital gains and remove them from the realized returns to derive implied estimates of the expected ERP.

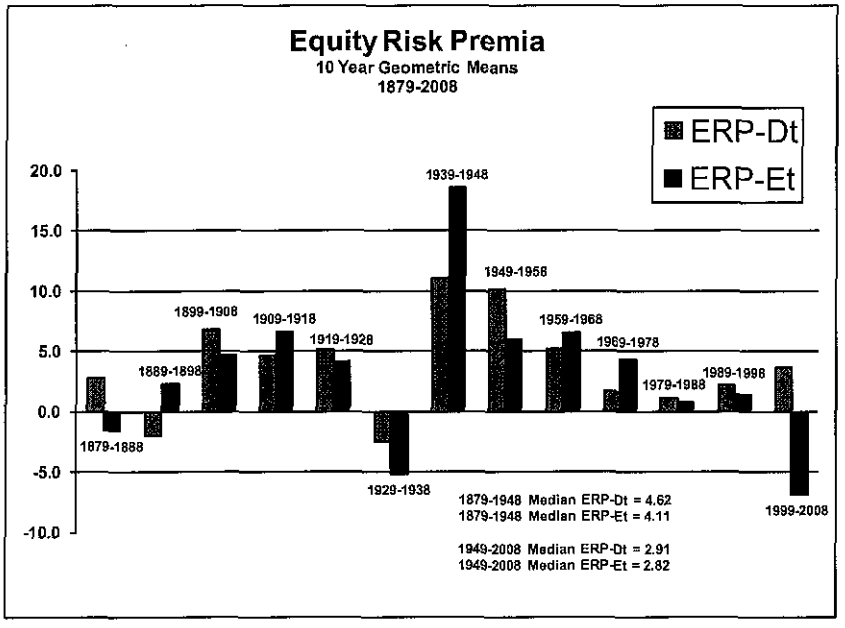
Geometric mean risk premiums for selected holding periods from the series depicted in the charts are shown in the following table:

Geometric Mean Risk Premia for Selected Holding Periods

Period	ERP-R_t	ERP-D_t	ERP-E_t
1872-2008	4.03	3.27	2.66
1872-1950	2.85	3.40	3.58
1926-2008	5.39	4.15	2.99
1951-1981	4.89	4.09	5.05
1951-2008	5.24	3.10	1.56
1981-2008	5.62	2.00	-2.17

For the period 1951-2008, the ERP based on dividends is 3.10 percent, while for the period 1981-2008, the ERP based on dividends was 2.00 percent.

The following figure presents another way of looking at the historical ERP, with non-overlapping 10 year geometric averages:



As shown in the figure, the median 10 year average geometric risk premium using dividends for 1879-1948 was 4.62 percent, while from 1949-2008 it was 2.91 percent. Using earnings, the median geometric risk premium for 1879-1948 was 4.11 percent, while for 1949-2008 the median was 2.82 percent.

Q. BASED ON THE EVIDENCE YOU HAVE PRESENTED, WHAT IS YOUR CONCLUSION ABOUT THE CURRENT ERP?

A. I believe that a reasonable estimate of the current ERP is on the order of 3.0 to 3.5 percent.

Q. YOU HAVE PRESENTED EVIDENCE BASED ON GEOMETRIC MEANS. WHAT WOULD A COMPARABLE ARITHMETIC ERP BE AT THE PRESENT TIME?

A. The relationship between the geometric and arithmetic means is based on the volatility (standard deviation) of annual returns. My analysis indicates an annual standard deviation in the ERP of about 4 to 5 percent, which would make the arithmetic mean only about 8 to 10 basis points higher than the geometric mean. I conclude, conservatively, that the geometric and arithmetic risk premiums are both currently in the range of 3.0 to 3.5 percent.

Q. THE DIFFERENCE BETWEEN GEOMETRIC AND ARITHMETIC MEANS CAN SOMETIMES MAKE A LARGE DIFFERENCE IN THE RESULTING ESTIMATE OF THE COST OF EQUITY. WHICH IS THE CORRECT ONE TO USE?

A. There is far more controversy over this issue than there should be. That is because many practitioners and even some "authorities" make broad and sweeping generalizations that ignore or gloss over relevant evidence and considerations. The best known examples of this are the Morningstar/Ibbotson Associate annual yearbooks. But there have been several challenges to their assertion that the arithmetic mean is the only relevant measure of the historic ERP, and it is notable that many of the authorities who have done recent work in this area present evidence of the geometric mean.[28] In any case, I think the best, relatively non-technical summary of the issue here is that of Professor Aswath Damodaran:

> *Geometric versus Arithmetic Risk Premiums: Which is better?*
>
> The conventional wisdom is that the arithmetic mean is the better estimate. This is true if
>
> (1) you consider each year to be a period (and the CAPM to be a one-period model)
>
> (2) annual returns in the stock and bond markets are serially uncorrelated
>
> As we move to longer time horizons, and as returns become more serially correlated (and empirical evidence suggests that they are), it is far better to use the geometric risk premium. In particular, when we use the risk premium to estimate the cost of equity to discount a cash flow in ten years, the single period in the CAPM is really ten years, and the appropriate returns are defined in geometric terms.
>
> *In summary, the arithmetic mean is more appropriate to use if you are using the Treasury bill rate as your riskfree rate, have a short time horizon and want to estimate expected returns over that horizon.*

[28] For challenges, see Russell J. Fuller and Kent A. Hickman, "A Note on Estimating the Historical Risk Premium," Financial Practice and Education, Fall/Winter 1991, pp. 45-48; George G. Cassiere, "Geometric Mean Return Premium Versus the Arithmetic Mean Return Premium – Expanding on the SBBI 1995 Yearbook Examples," Business Valuation Review, March 1996, Pp. 20-23; and most recently and notably, Eric Jacquier, Alex Kane, and Alan J. Marcus, "Geometric or Arithmetic Mean: A Reconsideration," Financial Analysts Journal, November/December 2003, pp. 46-52.

> The geometric mean is more appropriate if you are using the Treasury bond rate as your riskfree rate, have a long time horizon and want to estimate the expected return over that long time horizon.[29]

In estimating a market cost of equity for NSP, we are not estimating a short-term, one-year rate of return. If we were doing that, then a case could be made for using the arithmetic mean with a short term treasury bill rate.

So the case is easily made to support the use of a geometric mean ERP in estimating market cost of equity for a utility. However, the difference between the geometric and arithmetic mean is probably not as dramatic as often thought. The difference is a mathematical function of the volatility, or standard deviation, of the ERP. My research shows that a properly estimated ERP has much less volatility than ERPs that incorporate unanticipated gains. ERPs that incorporate unanticipated gains typically have a standard deviation of about 20 percent. My research shows that an ERP based only on anticipated capital gains is much less, on the order of about 4-5 percent. The usual formula for relating the arithmetic and geometric ERP's is:

$$ERP_A = ERP_B + \sigma^2/2$$

Where the standard deviation is 20 percent, the difference is 200 basis points. But where the standard deviation is only 4 percent, the difference is 8-10 basis points. This renders the controversy over which of the two to use to little more than "a tempest in a teapot."

Q. WHAT IS THE RESULTING CAPM ESTIMATE OF THE COST OF EQUITY?

A. As shown on Schedule 6 of Exhibit____(BLC-1), using CAPM with a risk premium of 3.50 percent, and a current long term treasury bond rate of 3.2 percent, the average cost of equity for the 10 company sample is 5.65 percent.

Q. THE CAPM RESULT IS CONSIDERABLY LOWER THAN THE DCF RESULTS. WHY IS THAT?

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[29] Aswath Damodaran, Applied Corporate Finance: A User's Manual, online version,

A. CAPM was not originally proposed as a model of long-term investor expectations. Strictly speaking, it was initially developed as a theory of relative rates of return using short-term investor expectations. In the purest application of it, the risk free rate is the 90 day return on Treasury bills, not long term Treasury bonds. But utility ratemaking envisions setting rates that will be in place for an indefinite period of time, and thus a longer investor return horizon is required. In my opinion, CAPM is not as accurate in estimating long term expectations as the DCF methodology. While it can be useful for comparison, primary reliance should be given to results obtained using the DCF methodology.

But even acknowledging that primary reliance should always be given to the DCF approach over the CAPM methodology, here the results seem particularly low. That owes, not to any deficiency in the risk premium estimate employed, but to abnormalities in the Treasury bill and bond market that probably makes the 30 year Treasury bond yield, here 3.20 percent, a poor estimate of the "risk free" rate in the current market environment. As I will note again later, in my review of the testimony of NSP's witness on cost of capital, the current yield on the one month Treasury bill is zero, and yields on the 5-year Inflation Indexed Treasury bond are actually negative. These low yields imply that currently investors are more worried about default risk than they are about inflation (and given the current economy, that is understandable). But this has the unusual (compared to a more normal economic environment) effect of driving up, or sustaining, higher prices on Treasury bills and bonds than would otherwise be the case. Now this "flight to safety" comes at the expense of other investment choices, such as common stock. So while the yield on the "risk free rate" as measured by the 30 year Treasury bond has been driven down, this doesn't mean that the real risk free rate for equities has fallen. Whatever decline in Treasury rates and yields as occurred with this flight to safety is probably offset by a corresponding rise, currently, in the

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http://pages.stern.nyu.edu/~adamodar/New_Home_Page/AppldCF/derivn/ch4deriv.html#ch4.1

premium for default risk reflected in equity returns. The bottom line, here, is that current Treasury rates and yields are probably a poor guide to the risk free rate for equities, implicating the negative utility of the CAPM methodology for determining a cost of equity at the present time.

One final thought here, on all of this, is to call attention to the fact that utility stocks have something of the same utility (value) as Treasuries as a safe haven in the kind of "flight to safety" that we are seeing with Treasury rates and yields. While not the same safe haven for "widows and orphans" they were once considered, they still attract investors who see their steady dividend streams, coupled with some prospects for growth, as an alternative between Treasuries and other equities with less attractive dividend prospects. This helps to explain why, even in the current market environment, where default risk has probably risen above historical norms, investors are content with equity returns on utility stock that are in the single digits.

C. SUMMARY

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

A. Based on the DCF results presented on Schedules 4 and 5, I believe that the best estimate of NSP's cost of equity at the present time is about 9 percent. Reflecting the uncertainty involved in estimating the cost of equity, I believe that a reasonable range for the rate of return on equity is 8.5 to 9.5 percent, but that absent other considerations, the fair rate of return on equity is at the midpoint of the range. Thus I recommend a rate of return on equity of 9.0 percent.

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. I have calculated the overall rate of return using the capital structure and cost of debt shown on Schedules 1 and 2 of my Exhibit____(BLC-1), with a capital structure consisting of 47.27 percent long term debt, 52.73 percent common equity, and cost rates of 6.02 percent for long term debt and 9.0 percent for common equity.

Q. IS THIS THE CAPITAL STRUCTURE PROPOSED BY NSP?

A. No, it is not, though when all is said and done the capital structure ratios are very similar. However, that is merely fortuitous, and there is a significant issue with respect to capital structure (and cost of debt) which precludes relying explicitly on the capital structure proposed by NSP. That issue is NSP's use of a 13 month average in developing the debt and equity balances used in the capital structure. Whatever merit a 13 month average has otherwise, it doesn't apply to capital stock balances, and can actually lead to significant distortions in the appropriate capital stock ratios and associated embedded debt costs. This can be illustrated by looking more closely at the capital structure and debt cost rates in NSP's initial filing.

Specifically, I call attention here to Footnote 3 of Exhibit____(DSD-1), Schedule 8, Page 1 of 1 accompanying the testimony of Mr. Dane, NSP's rate of return witness. As noted in the footnote, NSP issued two $250 million mortgage bond issues on August 11, 2010, at cost rates of 1.95 percent, and 4.95 percent, and under the 13 month average approach only included 5 of 13 months in determining both the balance amount included in the capital structure, and the associated impact on embedded cost of debt. But at year end 2010 -- NSP's capital structure purports to be "Actual Year 2010" -- it was known with

certainty (i.e., was "known and measurable") that on a forward going basis that the annual balances associated with these two issues would be $500 million, not the $192,308,000 (two times $96,154,000) included in Mr. Dane's calculation of the debt balances and associated embedded debt costs. Since the cost rates on these new issues were below the average embedded cost of debt, this approach, whether intended or not, would deprive ratepayers of the full effect -- a known and measurable effect, on a forward going basis -- of these new debt issues.

Now as it happens, NSP retired a $175 million bond issue (coupon rate = 4.75%) in 2010, and under the 13 month average methodology only included $107,692,000 in its capital structure balances and cost of debt. But this doesn't change anything. In fact, considering both what was retired and issued, the 13 month average approach results in $300 million at an average (weighted) cost of 3.88 percent, while using the known year end 2010 balances there was $500 million at an average (weighted) cost of 3.40 percent. So even factoring in what was retired, the 13 month average understates the appropriate amount ($300 million versus $500 million) and overstates the effective (weighted) coupon rate (3.88% versus 3.40%).

But regardless of the specific outcome, as a matter of general "principle" a 13 month average is inappropriate for capital balances. Here, the general "rule" is that the most accurate estimate of capital structure and embedded debt costs is based on capital balances and cost/coupon rates at the end of the test year with known and measurable changes. Moreover, this is the only approach that is truly "fair" and "balances" the competing interests of investors and ratepayers. If interest rates are rising, the 13 month average approach will fail to recover the full "known and measurable" effect of a new bond issue, and would prevent investors from a full recovery of the cost of (debt) capital. But if interest rates are falling -- as is the case here -- the 13 month average approach fails to pass through to

ratepayers the full benefit of the lower debt cost, and allows the utility to earn more than its cost of debt on a going forward basis. Using the year end balances to develop capital structure ratios and embedded debt costs is fair and reasonable to both investors and ratepayers.

Q. ARE THERE OTHER ISSUES WITH RESPECT TO THE DETERMINATION OF THE EMBEDDED COST OF DEBT?

A. Yes. Mr. Dane's development of the embedded cost treats the recovery of debt expense and premiums and discounts incorrectly, effectively "double counting" the effect of these items on the appropriate cost rate required to recover these costs. There are two different approaches to correctly recovering such costs. To explain, first note that a debt cost rate is effectively a ratio composed of a numerator ("N") over a denominator ("D"), or N/D. While the issues are the same with respect to premiums and discounts as they are with respect to debt expense, I will just consider debt expense in this initial explanation. When a company issues debt, and incurs debt expense, this has the "effect" of reducing the actual net proceeds to the company, and raising the "effective" cost of debt relative to the stated coupon rate. This higher "effective" cost of debt can be estimate in one of two ways, either by raising the numerator of the debt cost rate ratio, N/D, or by reducing the denominator. The second approach, I would point out, is reflected in NSP's original filing, Statement G, Page 3 of 8. The first approach would involve adding to N, the numerator, an amount equal to the annual amortization of debt expense (or the amortizations of debt premium and discount), and dividing now higher N by the original full amount of D, the face value of the amount of debt issued. In theory either approach -- raising N, or lowering D -- is defensible, and should yield similar results. In practice, they will not always yield the exact same result because of differences in amortization schedules and recovery periods associated with multiple debt issues. But they will be close.

What is most certainly not appropriate, and yet is what NSP and Mr. Dane propose, is to calculate the effective cost of debt by doing both, i.e. by raising "N" and by lowering "D." This effectively double counts the effect of debt expense and premiums and discounts on the annual cost rate. To demonstrate, consider the following example:

Coupon Rate	Amount	Premium Discount	Expense	Capital Employed	Interest Charge	Discount Amortization	Expense Amortization	Cost of Capital	Capital Cost %
A	B	C	D	E	F	G	H	I	J
5.00%	100,000	800	1,200	98,000	5,000	80	120	5,200	5.31%
								Actual Annual Rate, Column I Divided by Column B =	5.20%

The example assumes a $100,000 debt issue at a cost (coupon rate) of 5 percent. The discount is assumed to be $800, and the expense $1,200, so that the net proceeds are only $98,000. The "spreadsheet" illustrated above effectively mimics the way Mr. Dane has calculated the embedded debt cost in his Exhibit____(DSD-1), Schedule 8, Page 1 of 1. Mr. Dane adds the annual amortizations, $200 here in this example, Columns G and H, to the annual interest charge, here $5,000 in Column F, to derive an annual "cost of capital" of $5,200, and then divides, not by the full amount of the issue ($100,000 in Column B above), but by the net proceeds ("Capital Employed"), here $98,000 in Column E. The result, $5,200 divided by $98,000 produces a capital cost rate of 5.31 percent, which would then be applied in a capital structure, not to the balance used to determine it, $98,000, but to the full original amount of the issue, $100,000. In this example, which assumes a 10 year amortization, over a period of 10 years the total return, in dollars, would be $53,100. But this is excessive. An annual amortization of $200 for ten years would fully recover the expense and discount/premium of $2,000, and when the $50,000 for the annual interest costs are taken into consideration, the total required return for 10 years would be $52,000, not $53,100.

Do note that the correct annual cost rate can be determined directly by dividing the sum of interest and annual amortizations, $5,200, by the total face value of the bond

issuance, $100,000, yielding an effective cost rate of 5.20 percent. If one would object that this does not capture the time value of the $2,000 of "capital not available" associated with the initial expense and discount, that completely misses the point. The company is being allowed to include the full amount of the face value in its capital structure. Thus, company is receiving a return on the $2,000 of "capital not available," and that is sufficient.

This "capital not available" argument seems to underlie the misunderstanding implicit in NSP's reply to a data request asking about its treatment of unamortized losses on reacquired debt. In its response to Staff DR 2-14, NSP submitted the following:

Question:
Explain why it is appropriate on Schedule 8 to recognize Unamortized losses on reacquired debt *both* as a reduction in "Capital Employed" and by increasing the annual "Cost of Capital" by an amortization allowance.

Response:
Capital Employed is the net proceeds available to the Company after all premiums, losses, discounts and expenses have been removed, therefore it is appropriate to include the unamortized loss in question. The cost of capital includes all annual costs associated with the debt, i.e., annual interest expense and annual amortization expense of all of the discounts, issuance expenses, premiums, or losses. Loss on reacquired debt affects both capital employed and cost of capital; therefore needs to be included in the calculation of both items to get the true cost of debt.

The issue here involves the implicit "capital not employed." While this may not be available as actual capital for investment, in the capital structure that I am recommending on my Schedule 1 the full face value of the Company's debt ($3,346.9 million) is treated <u>as if it is available</u> and NSP is allowed a return on the "capital not employed." This does differ from NSP's approach, which is to include only the "capital employed" amount in the debt ratio. But that is inconsistent with the way we treat the equity portion of the capital structure. The equity balance is not net of issuance costs, and includes the full "face value" of equity issued, not just "capital employed." By reducing the debt in the capital structure to "capital employed," while <u>not</u> reducing the equity to "capital employed," there is a slight overstatement of the equity ratio relative to the debt ratio. The consistent approach is to

base the capital structure ratios on the face values of the debt and equity balances, and then reflect any implicit costs associated with issuances, discounts, reacquired debt, etc. as adjustments to the cost rate. That is the approach I have taken in developing the debt cost in Schedule 2 of my Exhibit____(BLC-1), and the capital structure ratios in Schedule 1.

Q. HOW MUCH OF AN ISSUE IS THIS?

A. *In responses to Staff DR's 2-12 and 2-14, NSP provided an update to their debt rate* calculations in which they reduced their calculation of the embedded cost of debt from 6.33 percent to 6.13 percent. This reduction is attributable to the effect of now having a full 13 months of the newer debt balances in the debt cost calculations, giving full effect to the lower debt costs associated with the two recent $250 million bond issues. By happenstance, then, the balances in their debt cost calculation are comparable to what I've used in mine. The remaining difference, then, between the debt cost that I propose of 6.02 percent, and the 6.13 percent reflected in NSP's updated cost of debt, is attributable to this issue of having double counted the effect of recovering debt expense, debt premium and discount, and the loss on reacquired debt.

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

Q. PLEASE DESCRIBE YOUR ANALYSIS OF NSP'S TESTIMONY ON RATE OF RETURN ON EQUITY.

A. NSP's testimony on rate of return on equity is presented by Daniel S. Dane. Mr. Dane estimates the cost of equity using a constant growth DCF analysis and a "Bond Yield Plus Risk Premium" approach. In addition, he considers the Capital Asset Pricing Model ("CAPM") analysis, but declines to make use of it. His DCF methodology is implemented with shortcomings that bias the result in favor of investors, and leads to an overstated

estimate of their required rate of return. His "Bond Yield Plus Risk Premium" approach is conceptually and structurally flawed, and is incapable of yielding any kind of meaningful inferences regarding the cost of equity.

Q. WHAT ARE THE SHORTCOMINGS THAT BIAS MR. DANE'S DCF ANALYSIS?

A. In implementing the constant growth DCF methodology, Mr. Dane relies exclusively upon projected earnings forecasts, and gives no consideration to dividends. As I explained earlier in my testimony, if dividends are expected to grow more slowly than earnings, then excluding dividends leads to an overestimation of the cost of equity. The issue here is not the use of analysts forecasts of earnings per share; the issue is the use of this as a metric of growth exclusively when there is evidence that the assumptions of the constant growth form of the DCF model are not consistent with actual market realities. Since the DCF approach to estimating the cost of equity is a present value methodology that explicitly enumerates the present value of dividends as a valuation methodology, it is always important to consider under what circumstances earnings projections will result in an accurate valuation when substituted for dividend growth. And it is incontrovertible that in the context of the constant growth form of the DCF model, substituting earnings for dividends yields an unbiased estimate of the DCF return only if payout ratios are constant, or subject to non-systematic (random, non-trending) variation.

Yet Mr. Dane presents no evidence, or gives no consideration, to whether the strict assumptions of the DCF model are currently satisfied. His growth projections, which consists entirely of earnings forecasts from three investment services, results in an average growth rate projection for his sample of just a little over 6 percent. (On his Exhibit____(DSD-1), Schedule 2, Page 1 of 3, the means for his three sources of earnings growth are 6.01 percent, 6.75 percent and 5.59 percent. The average of the three sources is 6.12 percent.) This is reasonably close to the 5.88 percent (mean) and 5.70 percent (median) I show for

projected EPS growth in my Schedule 5, Column K. But as shown on my Schedule 5, Column G, the average (mean) projected DPS growth rate for the comparable period (five years out) is 5.49 percent, and the median projected DPS growth rate is only 3.68 percent. Projected growth in book value per share for the comparable period, in Column H, is 3.72 percent, using the mean, and 3.72 percent using median. The longer term growth prospects for the sample, based on % Retained to Common Equity in Column I of my Schedule 5, are about 4.0 percent (median, with a mean of 3.85 percent). In a word, all of these other growth projections imply that the ~6.0 percent growth in earnings projected for the near future (five years) is not sustainable. In other words, the market conditions required to use earnings growth projections without considering other growth projections are not applicable at the present time, and a DCF estimate, such as Mr. Dane's, that relies exclusively on earnings, and ignores dividends, will overstate the DCF required return. The only choices here, to estimate the DCF cost of equity reliably, are to factor in the impact of other growth metrics, such as I've done in my Schedule 4, or explicitly relax the constant growth model assumptions like I've done with the DDM presented on my Schedule 5.

Q. CAN YOU QUANTIFY THE IMPACT THIS ISSUE CREATED BY MR. DANE'S EXCLUSIVE RELIANCE UPON EARNINGS PROJECTIONS HAS ON THE DIFFERENCE IN YOUR RATE OF RETURN RECOMMENDATIONS?

A. Yes. I am recommending a rate of return of 9.0 percent, while Mr. Dane is recommending a rate of return of 11 percent. With respect to the dividend yield component of the DCF approach, there is not a lot of difference between my results, and Mr. Dane's. Using the median results for yield (4.44 percent) and DCF cost of equity (8.95 percent) shown on my Schedule 4, the implied expected growth rate is approximately 4.50 percent, compared to the approximately 6 percent reflected in Mr. Dane's DCF analysis. Thus as much as 150 basis points of the 200 basis points separating our recommendations could be accounted for by

this issue. Were we to use the results shown on my Schedule 4, essentially all of the difference would be accounted for by this issue. Conservatively, we can account for at least 175 basis points because of this difference, and use this as a reasonable estimate of the overstatement or bias in Mr. Dane's DCF analysis.

Q. ARE THERE ANY OTHER ISSUES WITH RESPECT TO MR. DANE'S DCF ANALYSIS?

A. Yes, there is. Mr. Dane applies a "flotation cost adjustment" that adds 26 basis points, or a bit over a quarter of a percent, to his recommended rate of return. Generally, flotation cost is not a significant element of the required rate of return, at least not when computed correctly. I generally do not recommend an explicit allowance for flotation cost, because any cost incurred is so small that it will not seriously impact a utility's ability to earn a fair rate of return if it is ignored. In this case, I believe that the double leverage impact of Xcel preferred stock is, while small, sufficient to completely offset the possible impact of flotation costs.

Q. PLEASE EXPLAIN.

A. First, there is the issue of the correct way to compute flotation costs. The rate of return required to recover flotation costs can be expressed as

$$r = zf$$

where z is the rate of growth in new shares, and f is the percentage allowance for stock expense and underpricing. (The derivation of this equation is presented in Schedule 7 of Exbibit____(BLC-1), Page 2 of 2.) The method for calculating a flotation cost allowance by Mr. Dane uses the following variant of the DCF equation

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

where the divided yield, D/P, is adjusted upward by 1/(1 - f) where f is the same as in the preceding equation. Under certain, but highly unusual and unrealistic assumptions, the two

would produce the same general result. But under more plausible and realistic assumptions, the method used by Mr. Dane substantially overstates the adjustment required to recover flotation costs.

Q. PLEASE EXPLAIN WHY THE METHOD USED BY MR. DANE IS UNREALISTIC AND OVERSTATES THE ADJUSTMENT REQUIRED TO RECOVER FLOTATION COSTS.

A. When factored into the rate of return allowance and proposed by Mr. Dane, the allowance is allowed on all shares. But not all shares represent common stock raised through public market offerings, and Mr. Dane's approach allows the recovery of this expense on shares of stock where the expense was not incurred. 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. 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. The formula I derive (and apply) in my Schedule 7 takes both of these factors into account. Mr. Dane's method of adjustment does not.

Q. PLEASE ILLUSTRATE WHAT DIFFERENCE IT MAKES AND WHY IT MATTERS WHICH APPROACH IS USED TO ADJUST FOR FLOTATION COSTS.

A. First of all, it makes a difference, and matters, because only a fraction of the common equity of the company is actually raised through public stock offerings. Mr. Dane points out, for example, that in August of 2010, Xcel issued 21.85 million shares in conjunction with a public issue. (The transaction was not actually completed until the end of November, but that does not affect the point made here.) But the number of shares outstanding increased in 2010 from approximately 458 million shares as of December 31, 2009, to approximately 482 million shares as of December 31, 2010, an increase of 24 million shares. So not all the share growth in 2010 came from the new stock issue. In 2009, when there was no public

issuance of new common stock, shares outstanding increased from 454 million to 458 million. The additional shares come mostly from the dividend reinvestment program ("DRIP"), and secondarily from stock issued as a part of executive compensation plans. These are not insignificant sources of stock growth. In 2011, Xcel expected to raise $75 million from its dividend reinvestment program. Whatever merit Mr. Dane's methodology might have to recovering a cost associated with public stock issuance is inapplicable to stock raised through DRIP or executive compensation, and allowing a recovery of "flotation cost" on stock where the expense was not incurred is gratuitous and unwarranted.

On my Schedule 7, Page 1 of 2, I show that of an average annual (compound) growth in shares outstanding from 2000 to 2011 of 3.31 percent per year, only 1.19 percent per year was attributable to publicly issued shares. Now if we assumed that shares grew at 5 percent a year, and that all of this growth came from public issuances, then Mr. Dane's flotation cost allowance of 26 basis points would be about right:

5% (annual growth) x 5.28% (flotation cost percentage) = 26.4 basis points

But when we consider that for the past decade, the rate of growth in new shares attributable to public issuances is only 1.19 percent, then the appropriate adjustment falls to about 6 basis points:

1.19% (annual growth) x 5.28% (flotation cost percentage) = 6.3 basis points

So were an explicit allowance for flotation cost to be made, it would only be on the order of 6 basis points, not 26 basis points as in Mr. Dane's rate of return recommendation.

Q. WHY HAVE YOU NOT INCORPORATED AN ADJUSTMENT OF THIS MAGNITUDE INTO YOUR RATE OF RETURN RECOMMENDATION?

A. Given the relative imprecision with which we can estimate the cost of equity, which is why witnesses usually proffer their recommendation as a range on the order of 100 basis points, flotation cost is often so little that it is within the range of "rounding error" and may

reasonably be ignored. In this instance, however, there is an additional consideration that leads me to reject a specific allowance for flotation cost. NSP does not raise equity capital directly. When discussing equity capital raised in the marketplace, the relevant entity is Xcel. Xcel raises equity in the form of preferred stock as well as in the form of common stock. Under normal circumstances, the lower cost preferred stock would be explicitly reflected in the capital structure. Here, however, it is not. Nevertheless, the preferred stock exists, and provides Xcel with a degree of financial leverage in the equity that it supplies NSP. Since the leverage exists at a parent company level, and not at the subsidiary level, Xcel is able to exploit what is called "double leverage" in the equity it invests in NSP, and for which it is seeking an explicit return in this proceeding. The first layer of leverage is the leverage obtained using the preferred stock at the parent level; the second layer of leverage is the leverage obtained at the subsidiary from NSP's debt (first mortgage bonds). In my Schedule 7, Exhibit____(BLC-1), Page 1 of 2, I show that this double leverage effect is equivalent to about 6 basis points of return on equity. Were I to make an explicit 6 basis point adjustment to return on equity to compensate for Xcel's flotation cost, I would contend that it can be offset by the 6 basis points of return that Xcel receives from the double leverage effect of its preferred stock. At some point, adjustments like these imply a precision in estimating the cost of equity that is illusory, and here especially where they are offsetting, I believe they may be reasonably ignored in establishing a fair and reasonable rate of return on equity for NSP that is based on the cost of equity capital for Xcel.

Q. WHAT ARE THE ISSUES PRESENTED BY MR. DANE'S "BOND YIELD PLUS RISK PREMIUM" APPROACH.

A. The first, and most significant, problem is methodological. Mr. Dane's "bond yield plus risk premium" analysis is based on a regression of allowed rates of return on bond yields over time. This is not an estimate of the required rate of return. For many years now, utilities

have had very high market to book ratios, indicating that their allowed rates of return have generally been well above the required rate of return, or cost of equity. Mr. Dane's "bond yield plus risk premium" analysis would simply perpetuate the excess return that has sustained prices substantially above book value. A regulatory approach based upon adoption of this method of analysis would largely be an abdication of regulatory responsibility.

This type of analysis also presents a major "assumes facts not in evidence" problem for ratemaking. We have absolutely no idea of what went into the determinations of the allowed ROE's from the rate cases used in Mr. Dane's analysis. Were those cases all rightly decided? How many of them represent utilities comparable in risk to NSP? Were concessions made in the allowed ROE that compensate for the way different jurisdictions treat the broad variety of revenue requirement issues that arise in ratemaking? We do not have a clue. And that is the point. All we have here is a large amorphous group of allowed ROE's thrown into the witches' brew of a regression analysis. We do not know what went into those allowed ROE's. How are we supposed to make any sense of what comes out of the regression analysis? We cannot.

Additionally, there are fundamental statistical flaws in the analysis. In regression analysis, a "dependent" variable (left side of an equation) is regressed on one or more "independent" variables (right side of the equation). Functionally, Mr. Dane's regression is supposed to represent:

$$RP = f(BY)$$

where "RP" is the risk premium, and "BY" is the bond yield. But BY in Mr. Dane's regressions is not an independent variable. It is functionally related to RP via the allowed rate of return (where "AROE" is the allowed rate of return on equity):

$$BY = AROE - RP$$

Substituting the second equation into the first:

RP = f(AROE - RP)

Now when this is estimated statistically, RP is being regressed upon a variable derived from itself, setting up a form of the classic statistical problem of "spurious correlation." Note that

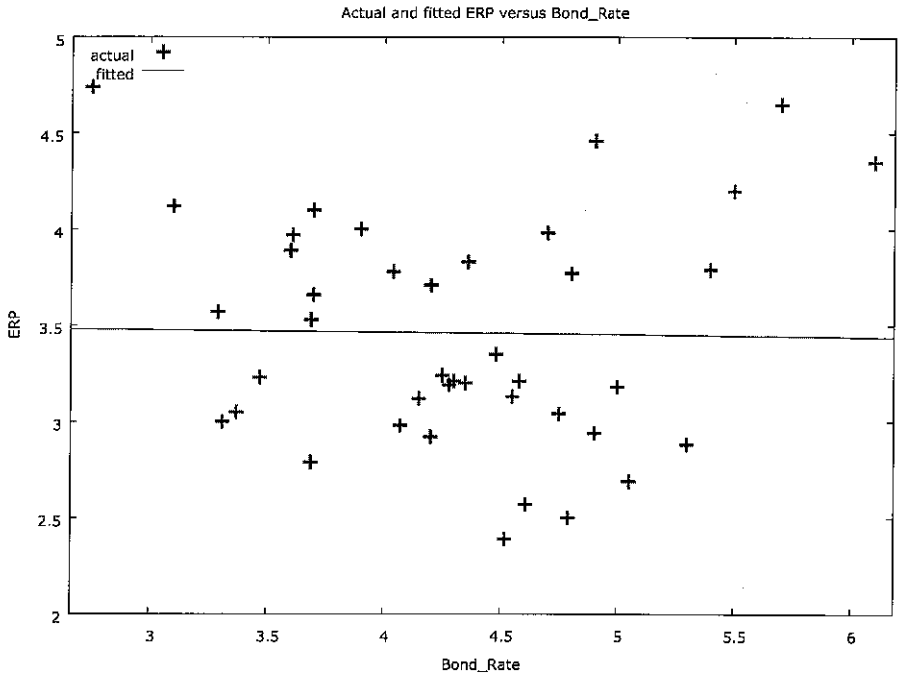
RP = AROE - BY

so that

(AROE - BY) = f(AROE - RP)

Implicitly, the allowed rate of return on equity is now on both sides of the equation. Modeling this relationship statistically is valid if, and only if, the allowed rate of return on equity and bond yield are statistically independent. Errors would then be random, and the relationship could be modeled with a statistical regression equation. But allowed rates of return and bond yields are hardly independent. When bond yields rise, allowed rates of return rise, and often the result is causal because regulators take rising interest rates to be evidence of a rising cost of equity, thus justifying a rising allowed rate of return. Whether the rise is 1 to 1, or some other relationship, the very dependence between the two means that the form of the regression used by Mr. Dane is statistically invalid.

To sum up, Mr. Dane's risk premium method implicitly assumes what it claims to prove (a relationship between allowed rates of return and bond rates in the form of a risk premium), and then claims to have proven what it assumed with a statistical analysis that is flawed and improper (a risk premium that varies with bond yield). Beyond this fundamental conceptual flaw, the posited relationship -- an inverse relationship between risk premium and bond yield -- can be demonstrated to be nonexistent. Earlier I referred to survey data of CFO expectations regarding risk premium. When this data is correlated with bond yields, it shows no discernable relationship of the kind posited by Mr. Dane:



The scatter diagram shown above looks like a random relationship, and statistically it is. The relationship posited by Mr. Dane is nonexistent.

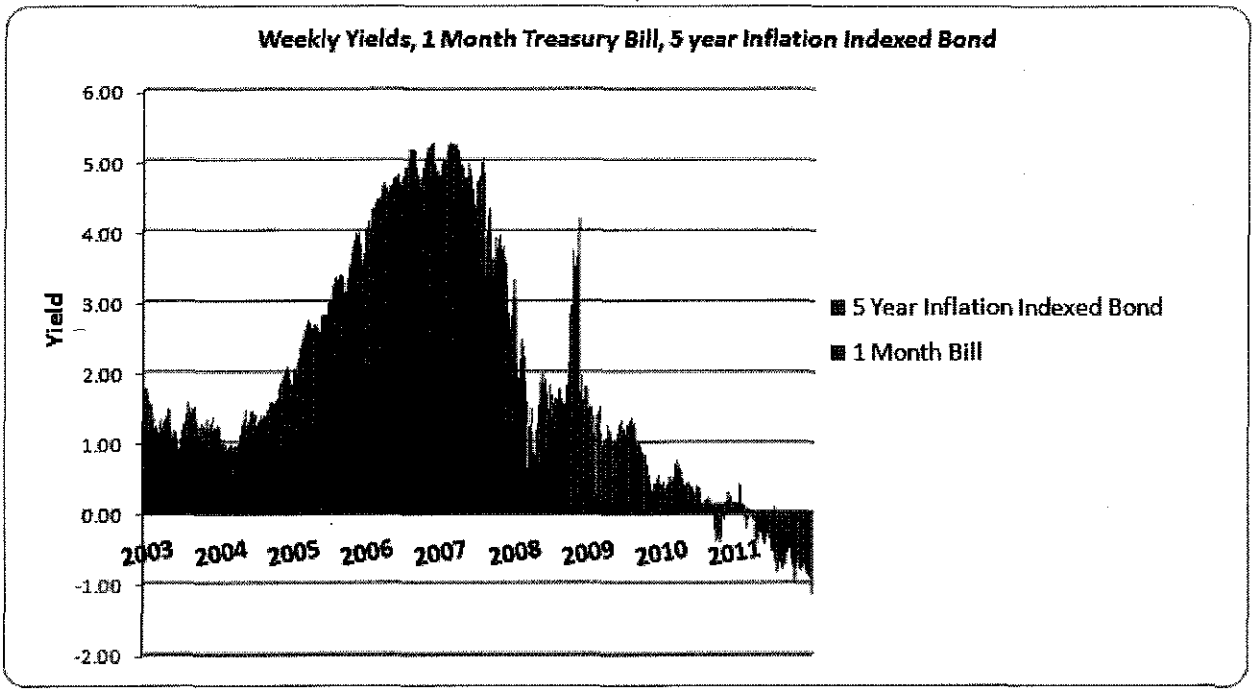
Q. MR. DANE CONSIDERS, BUT DECLINES TO USE, THE CAPITAL ASSET PRICING MODEL (CAPM) OF ESTIMATING THE COST OF EQUITY. DO YOU AGREE WITH HIS REASONING?

A. I agree only up to a point. I've already discussed what I think are the theoretical and practical limitations of the CAPM approach, and why it might be producing unusually low estimates at the present time. I do not agree that the problem, in part, is with the measurement of the "Market Risk Premium" (his "MRP" is equivalent to the "ERP" -- Equity Risk Premium -- that I discuss at length earlier in my testimony). Mr. Dane thinks that a historically based ERP (or MRP, such as the Ibbotson/Morningstar estimate of 6.7 percent is too low. While there are reasons not to use the CAPM at the present time, that is not one of them. Nor do I agree that current estimates of the "beta coefficient" are sufficiently unreliable to question the value of CAPM. But despite these differences in reasons why, I

agree that that at this time a fair rate of return on equity can and should be determined without consideration of the results of a CAPM analysis.

Q. MR. DANE CITES A FEDERAL RESERVE OPINION STATING THAT CURRENT ESTIMATES OF THE EQUITY RISK PREMIUM ARE "QUITE ELEVATED TO LONGER-TERM NORMS." HOW DOES THAT IMPACT YOUR CONCLUSIONS ABOUT THE EQUITY RISK PREMIUM?

A. Mr. Dane does not provide the correct context for understanding this comment (reported in minutes for the March 15, 2011 meeting of the Federal Reserve Open Market Committee.) The Federal Reserve is probably not looking at long term historical risk premium such as that being discussed by Mr. Dane, or reported by Ibbotson/Morningstar. The Federal Reserve is probably looking at expected returns as reflected by current Treasury bill and bond returns (yields), which are presently close to zero, and in some cases appear to even be negative, as shown in the following chart:



In recent months, the yield on the 1 month Treasury bill has been essentially zero, and the yield on the 5 year inflation indexed Treasury bond has been negative (a -2.15 percent as of February 3, 2012). Normally, these will be higher, implying a lower risk premium all other things being equal. So with a negative return on the 5 year inflation indexed Treasury bond, and essentially no return on the 1 month Treasury bill, from the Federal Reserve's perspective the equity risk premium would be "quite elevated" relative to longer term norms. But that really says nothing about what the Federal Reserve considers to be the "longer term norm." Based on the analysis presented earlier of the ERP, a reasonable estimate of the longer term norm of the ERP presently would be about 3.5 percent. "Quite elevated" relative to 3.5 percent might be 4 to 6 percent. But given the base from which this is being determined -- a zero or even negative "risk free rate" -- it still leaves the required equity return in single digits. In the end, Mr. Dane's citation does not constitute an argument from which to bootstrap anything close to the kind of double digit return on equity that he contends is justified.

Q. DO YOU HAVE ANY OTHER OBSERVATIONS WITH RESPECT TO MR. DANE'S RECOMMENDED RETURN ON EQUITY AND NSP'S REQUEST BASED UPON HIS RECOMMENDATION?

A. Yes, I do. Mr. Dane's recommendation, and NSP's request based on that recommendation, are out of touch with the assumptions built into Xcel's pension fund projections. In a sense, this is a matter that goes back to my previous discussion of current expectations regarding the ERP (equity risk premium). There I alluded to how such expectations factor into to macroeconomic policy considerations such as social security and health care reform. Here, they factor, at least implicitly, into corporate pension plan projections. These pension plan projections embody expectations of rates of return from various asset classes, such as stocks and bonds (with further classification between domestic and international markets).

In reviewing such plans, I've noticed two things, in particular, of interest. The first is that expected rates of return built into pension plan forecasts have been declining (and thus we should expect utility rate of return requests to be declining, also). The second is that expected equity returns, at least for "large cap" U.S. equities, are in the single digits. The latter is consistent with my ERP analysis, and in particular with the total equity return projections implied by the CFO surveys I reviewed earlier. Mr. Dane's testimony, and his recommended rate of return on equity of 11.0 percent, is completely out of touch with this financial reality, as if were prepared in a vacuum isolated from such inconvenient truths.

Q. ARE THE RETURN PROJECTIONS BUILT INTO XCEL'S PENSION PLAN FORECASTS COMPARABLE TO WHAT YOU'VE SEEN IN OTHER UTILITY PENSION PLAN FORECASTS?

A. Yes, they are. The overall rate of return expectation as reported in Xcel's 2010 SEC 10-K shows a steady decline year by year from 8.75 percent in 2008 to 7.50 percent for 2011. This is a weighted overall return. But embedded in the 7.50 percent expected return for 2011 is an expected return of 8.9 percent on "large cap" equities such as would dominate an overall market index such as the S&P 500. This single digit ROE is comparable to what I've seen in other utility pension plan projections. Thus Xcel's pension plan forecasts reflected an expected return on equity more in line with my recommended return of 9.0 percent, than Mr. Dane's recommended rate of return on equity of 11.0 percent.

VIII. CONCLUSION

Q. BASED ON YOUR REVIEW OF THE COMPANY'S TESTIMONY, AND YOUR INDEPENDENT ANALYSIS OF THE COST OF EQUITY FOR NSP, WHAT IS YOUR

CONCLUSION REGARDING A FAIR RATE OF RETURN ON EQUITY FOR THE COMPANY, AND A FAIR AND OVERALL RATE OF RETURN?

A. My independent analysis of the cost of equity for NSP shows that it is in the range of 8.5 to 9.5 percent. I have shown that when adjusted for obvious biases, Mr. Dane's DCF analysis supports a rate of return on equity within this range as well. I believe that the evidence is substantial and compelling that such a rate of return is a fair and reasonable rate of return on equity. Combining this with my proposed capital structure of 52.73 percent common equity and 47.27 percent long term debt, and an embedded cost of debt of 6.02 percent, the overall rate of return would be 7.60 percent. This is more than adequate to preserve NSP's financial integrity and its access to capital, and satisfies the requirement for a rate of return that adequately balances consumer and investor interests.

Q. DOES THAT COMPLETE YOUR ANALYSIS OF THE COMPANY'S TESTIMONY, AND OF YOUR TESTIMONY AS A WHOLE?

A. Yes, it does.