BEFORE THE SOUTH DAKOTA PUBLIC UTILITIES COMMISSION

DOCKET NG07-013

IN THE MATTER OF THE APPLICATION BY NORTHWESTERN CORPORATION D/B/A NORTHWESTERN ENERGY FOR AUTHORITY TO INCREASE RATES FOR NATURAL GAS SERVICE

Testimony and Exhibits of

Basil L. Copeland, Jr.

On Behalf of

the Staff of the Public Utilities Commission of South Dakota

October 19, 2007

STATE OF SOUTH DAKOTA

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

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I. BACKGROUND AND QUALIFICATIONS

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

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

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

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

Q. PLEASE DESCRIBE YOUR EDUCATION AND PROFESSIONAL EXPERIENCE.

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

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

information system for monitoring energy supply and demand in Arkansas, including comprehensive forecasts of energy demand by fuel source and sector.

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

I have published numerous articles, set forth in Appendix A, on a variety of utility issues, including articles or comments in *Land Economics, American Economic Review, Public Utilities Fortnightly, Journal of Business Research, Yale Journal on Regulation, Journal of Portfolio Management, Energy Law Journal,* and the *Financial Analysts Journal.* My 1982 article in the Financial Analysts Journal on the equity risk premium received a Graham and Dodd award from the Financial Analysts Federation. I have also served as an academic referee for two academic journals where I reviewed articles on utility economics and finance. My article in the Spring 1991 issue of the *Energy Law Journal*[1] deals with the constitutional standards for due process as applied to utility ratemaking under the celebrated

Hope case. It offers a comparative analysis and critique of the 1989 Duquesne decision.[2] A list of publications is provided at the end of my testimony.

II. OVERVIEW OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to present evidence with respect to the cost of capital for Northwestern Corporation (d/b/a Northwestern Energy, hereafter "NorthWestern" or "Company" or "Applicant") and to recommend a fair and reasonable rate of return based upon that evidence. In connection with the presentation of evidence concerning the cost of capital, I will review and respond as necessary to NorthWestern's presentation of evidence on this matter.

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 and Exhibit____(BLC-1), I conclude that the cost of equity and fair rate of return on equity is in the range of 8.0 to 9.0 percent, and I recommend a rate of return on equity of 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 and reasonable rate of return is 7.83 percent. My recommendations are summarized in the following table, and in Exhibit __(BLC-1), Schedule 1.

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[1] "Procedural vs. Substantive Economic Due Process for Public Utilities," with Walter Nixon. ***Energy Law Journal*** 12 No. 1 (Spring 1991): 81-110.
[2] Federal Power Comm'n v. Hope Natural Gas, 320 U.S. 591 (1944); Duquesne Light Co. v. Barasch, 488 U.S. 591 (1989).

Source of Capital	Cost (a)	Weighting (b)	Weighted Cost (c = a x b)
Long Term Debt	6.60%	48.54%	3.20%
Common Stock	9.00%	51.46%	4.63%
Overall			7.83%

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 recent 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. In Section VII I respond to the Applicant'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. Traditionally, 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. Presently, NorthWestern does not

have any preferred stock. Therefore, its capital structure consists entirely of common stock and long-term debt.

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 as an ongoing concern 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.

Q. DID YOU PERFORM ANY OTHER ANALYSIS TO ASSURE THAT YOUR RECOMMENDED RATE OF RETURN WILL MAINTAIN NORTHWESTERN'S FINANCIAL INTEGRITY?

A. Yes. I calculated the pro-forma interest coverage ratio my rate of return will provide. Using Applicant's gross revenue conversion factor, I estimate that my rate of return will prove earnings equal to 3.23 times its interest requirements (Exhibit __(BLC-1) Schedule 1). This level of interest coverage is adequate to maintain NorthWestern's financial integrity.

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.

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

A. In the case of methodologies like CAPM (as well as the modified form of this model used by the Company's witness, discussed below), 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 rate of return 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 South Dakota Public Utilities Commission ("Commission") make a more informed decision about the appropriate rate of return for NorthWestern.

Q. WHAT HAS SPARKED THE RECENT INTEREST 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 – and a veritable cottage industry of academic research has grown up trying to solve the puzzle – is that through much of the 20th century returns to stock relative to risk free

[3] The DCF and CAPM methodologies are described in detail later in my testimony.
[4] Mehra, Rajnish, and Edward C. Prescott, "The. Equity Premium: A Puzzle," Journal of Monetary Economics, March 1985, 15, 145-62.

investments has been much higher than what can be explained by economic theory. 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 once believed. This has very important implications for determining the cost of equity.

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 stock 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 to modify social security to allow investments in the stock market, the question of the future performance of the stock market has become an important public policy issue. More specifically, the ERP is an explicit public policy variable in various proposals to modify social security. What are public policy planners assuming about the future of the stock market? Are those assumptions plausible? How do they compare with what rate of return witnesses are saying?

In short, 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 can help the Commission reach a more informed judgment about the fair rate of return for NorthWestern.

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

A. I will present survey 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 an historical perspective. The most common historical perspective is realized return data published by Ibbotson Associates (now Morningstar). Based on the most recent SBBI Yearbook, for 2007, the long run historical difference between returns to investments in common stocks, and income returns on long-term government bonds is 7.1 percent. It is important to note that this is based on an arithmetic mean, and that were we to use a geometric mean, the historical data yields a return premium of only 5.2 percent. I discuss the relative merits of the two ways of measuring historical returns in detail later in my testimony. In either case, these returns – 7.1 percent arithmetic, and 5.2 percent geometric – give us an historical "benchmark" from which to characterize current thinking about the ERP.[5]

In the first category are those who believe that the ERP remains relatively high. Few will any longer say 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 in this category tend to fall into the 4-6 percent range.

A second group, which is as close as we get to a consensus here, is 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 tend to fall into the 2-4 percent range.

[5] NorthWestern's witness, Michael J. Vilbert, uses the Morningstar data to derive a long-term market risk premium of 6.50 percent, and a short term market risk premium of 8.00 percent. I discuss this below in connection with my review of Mr. Vilbert's testimony.

A third group believes 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 estimates of 0-2 percent, and in some cases even less.

Q. WHY IS THERE SUCH DISPARITY OF OPINION ABOUT THE ERP?

A. With rare exception there is large 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 such as Mr. Vilbert (NorthWestern's rate of return witness in this case) simply extrapolating historical returns for an equity risk premium. But one can find little serious research these days to back up such an approach.

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

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

and

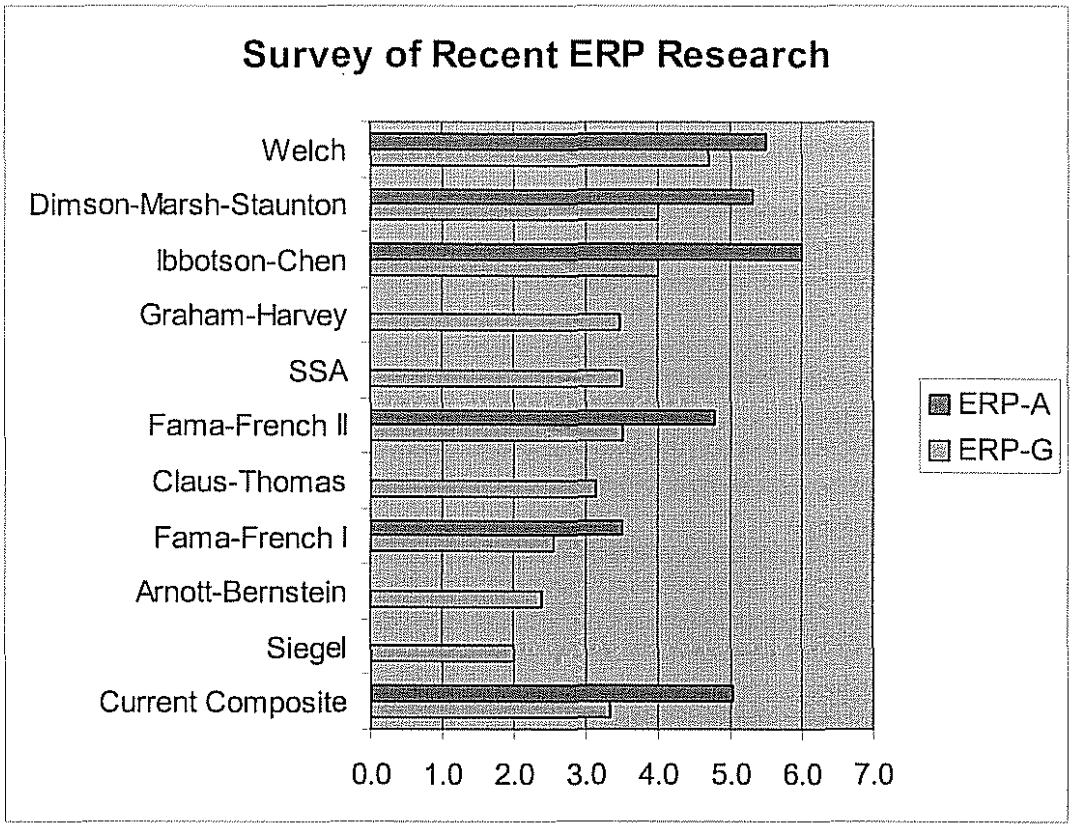
[6] In other words, lower than the 7.1 percent arithmetic and 5.2 percent geometric means realized historically. Keep this in mind when viewing the results presented below.
[7] (Arnott, Peter, "The Meaning of a Slender Risk Premium," Financial Analysts Journal, March/April 2004, pp. 6-8.)

- 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 risk free rate.

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

Q. PLEASE PROCEED WITH YOUR SURVEY OF RECENT ERP RESEARCH.

A. The following chart summarizes a number of recent studies on the ERP.



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

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

A. These are studies that fall toward the upper end of the range of recent estimates of the market risk premium. Ivo Welch, a Professor of Economics and Finance at Brown University, and a National Bureau of Economics Research Associate in the Corporate Finance group, published an updated survey in 2001 of the views of finance and economic professors on the ERP. With results from over 400 respondents, Welch reports 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 – which is what the 7.1 arithmetic and 5.2 geometric averages from Ibbotson Associates/Morningstar measure – would be even lower.

In my view, though, the exemplary study supporting a high ERP is by Roger Ibbotson and Peng Chen.[9] Using a variety of historical and supply-side (forward-looking) data, they conclude that the ERP is 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 estimating the current risk premium.[10] 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,

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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 (last accessed October 10, 2007).

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

[10] 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 (last accessed October 10, 2007).

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 IBBOTSON ASSOCIATES/MORNINGSTAR PUBLISHES IN THEIR YEARBOOK?

A. No. Ibbotson Associates/Morningstar have recently been presenting a "supply-side" estimate of the ERP in their Yearbook. In the 2007 Valuation Edition, this "supply-side" estimate is 6.35 percent arithmetically, and 4.33 percent geometrically. In other words, they are indeed publishing the lower "supply-side" estimate, even though this is not mentioned in Applicant's testimony.

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 1926-2006), investors actually received a return of 5.2 percent (geometric) or 7.1 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 P/E (Price/Earnings) 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 also varies 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.[11]

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.[12] Either result is considerably below the 6.5 percent or 8.0 percent ERPs used by Company witness Vilbert.

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

[12] 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."

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

A. Somewhat in the vein of the classic historical analysis of Ibbotson Associates, the Dimson-Marsh-Staunton research goes further by using a longer historical dataset – beginning in 1900 rather than 1926 – and extending the analysis to equity markets in countries other than just the US. But in what now is becoming conventional wisdom, they recognize that the historical series includes unanticipated capital gains, and subtract these to yield what is essentially a "supply-side" estimate of the historical equity risk premium. For the US, the 1900-2001 realized return premium was 5.6 percent (geometric); adjusted for unanticipated capital gains and a declining cost of equity capital, they derive a 4.0 percent (geometric) ERP for the US over the entire 1900-2001, and project a 5.3 percent (arithmetic) ERP going forward.[13] 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.[14] Still, it is yet another study with results that are substantially below the ERP's used by Company witness Vilbert.

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 ERP since this question was added to the survey was 2.88 percent in March 2002; the highest ERP was 4.65 percent in September 2000. The latest (January 2007) ERP is 3.21 percent, and the

[13] 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.

average for all quarters is 3.47 percent. The average for all quarters is depicted in the chart.[15]

Q. PLEASE DESCRIBE THE EQUITY RISK PREMIUM SHOWN FOR SSA.

A. This is the ERP – 3.5 percent – used by actuaries of the Social Security Administration to project expected stock returns in analyzing current proposals for reforming Social Security.[16] I think that this is a very important witness to what is a credible estimate of the ERP from a public policy perspective. The Commission, of course, is making "public policy" about the ERP when it sets an allowed rate of return on equity for the utility. But that only affects the utility and its customers. Social Security is a public policy issue that affects the nation, which means that ERP assumptions made by the SSA will be subjected to intense scrutiny. Now what would have been the result of proposals to modify Social Security that assumed an ERP of 6.5 to 8.0 percent (the risk premium estimates used in Applicant's testimony)? I can assure the Commission that such proposals would have been rejected out of hand.

Q. PLEASE DESCRIBE THE CLAUS-THOMAS, ARNOTT-BERNSTEIN, AND SIEGEL ESTIMATES OF THE ERP SHOWN IN THE CHART.

A. 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." They used what they call an "abnormal earnings" version of the discounted cash flow model of stock valuation. While it is a considerable over-simplification to describe it this way, it is similar in construct to a two-stage

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

[15] Graham, J.R., Campbell, R.H., "The Equity Premium in January 2007: Evidence from the Global CFO Outlook Survey," January 25, 2007, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=959703 (last accessed October 10, 2007).

[16] 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 (last accessed October 10, 2007). 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 (last accessed October 10, 2007).

or non-constant DCF model. In my view, the key intuition in their approach is recognizing that analysts' forecasts, such as the I/B/E/S forecasts often used in DCF analysis, are abnormally high and cannot be projected indefinitely or into perpetuity. When this is taken into account, they find that the implied ERP from analysts' forecasts averaged 3.36 percent from 1985 to 1998.[17]

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.[18] One aspect of 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," they find that the "normal" ERP is just 2.4 percent. Moreover, almost all of the "happy accidents" for stocks have accumulated since 1981, and when they take this into account they suggest that the current ERP could be zero, or even negative! But what I depict in the chart is their "normal" ERP of 2.4 percent.

The final ERP shown in the chart is a forecast by Jeremy Siegel. Siegel is the author of several well known studies and books analyzing historical returns. In a recent forum on the equity risk premium, he projects an ERP of 2 percent.[19]

Q. PLEASE DESCRIBE THE "CURRENT COMPOSITE" SHOWN IN THE CHART.

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

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[17] 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.

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

represent geometric or arithmetic means. For reasons described later when I discuss the issue of geometric versus arithmetic means in the estimation of the ERP, in deriving this "Current Composite" I associate geometric means with Treasury bond yields, and arithmetic means with Treasury bill returns. As indicated by the chart, the studies show an average geometric ERP of a little over 3.3 percent, and an average arithmetic ERP of about 5 percent.

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

A. I believe it provides the basis for at least one benchmark for judging the reasonableness of rate of return on equity recommendations. For example, a geometric mean ERP of 3.3 percent relative to a current long term government bond yield of 4.9 percent implies a total market return of 8.2 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, one could argue that this represents an upper bound to what is a fair and reasonable return on equity for NorthWestern 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 7 to 8 percent on the market as a whole at this point in time (and bear in mind that many informed analysts are projecting less), then the ROE that NorthWestern is asking for in this case, 11.25 percent, does not even come close to meeting a Hope test of what is a fair and reasonable rate of return on equity. While I will take into consideration other evidence in determining what is a reasonable ROE to recommend, I believe this evidence of a "low" or

[19] 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).

"slender" risk premium is important for putting into perspective how unreasonable is Applicant's requested ROE of 11.25 percent.

V. NORTHWESTERN'S COST OF EQUITY CAPITAL

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

A. I used two variations of the "Discounted Cash Flow" ("DCF") methodology. I also performed a supplemental "Capital Asset Pricing Model" ("CAPM") 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. Where possible, I prefer to utilize the same sample of companies that the applicant uses to determine its cost of capital. In this instance, I do not believe that it is proper to rely upon the sample of companies utilized by NorthWestern's witness to estimate the cost of capital to NorthWestern.

Q. PLEASE EXPLAIN WHY NOT.

A. NorthWestern's rate of return witness, Michael J. Vilbert, developed his recommendation using a sample based upon natural gas distribution companies. While this docket concerns a requested gas rate increase, the proper rate of return on equity is one which is fair to NorthWestern's shareholders, and not necessarily to a particular segment of the business. The applicable standard under Hope as to what is fair from the investor point of view is that the return be commensurate with what the investors could reasonably expect to earn on investments of comparable risk. NorthWestern's investors have not invested in just the gas distribution operations of the Company. They have invested in the Company as a whole. Thus the relevant standard of comparability is to operations comparable to NorthWestern as a whole. In my opinion, this requires that the sample of comparable companies be combination utilities with combined gas and electric operations similar to NorthWestern. For this reason, I have relied primarily upon a sample of 11 electric utilities with gas distribution operations. However, for the sake of comparison, I've also applied my methodologies to the 9 company gas distribution sample used by the Company's witness.

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

A. For my constant growth DCF study, I utilized the Zacks consensus estimate of projected growth in earnings per share ("EPS"), and Value Line estimates of growth in dividends per share ("DPS"), growth in book value per share ("BVPS"), and the Value Line estimate of "% Retained to Common Equity" (a measure of long term sustainable growth).[20] 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 are shown on Exhibit____(BLC-1), Schedule 3. As can be seen from Columns F and G, there is some disparity between the EPS growth rates projected by Zacks and the DPS growth rates projected by Value Line: the projected DPS growth rates are 1.5 to 2 percent lower than the projected EPS growth rate. 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

[20] 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.

expectations. Similarly, relying solely upon projected DPS growth rates will 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?

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 book value per share 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 book value per share.[21] For this reason, an average of these various growth rate measures is required to reasonably estimate investors' long-term growth expectations.

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

A. The results are shown on Exhibit __(BLC-1), Schedule 3, Column K. Column K is the sum of Column E and the average of Columns F, G, H and I (the average is shown in Column J). Column E is the dividend yield portion of the DCF cost of equity, and is computed using a 180-day moving average stock price.[22] 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 estimate of "k" is 8.71 percent, and the median estimate of "k" is 8.69 percent. The difference between the median and the mean reflects the impact of "outliers"

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[21] 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.

[22] 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.

or atypical observations in the calculation of the mean. For that reason the median is the more reliable measure of central tendency.

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 in 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 growth projections of the type published by Zacks, Value Line, or other investment services in a constant growth form of the DCF model can produce distorted and unreliable results. Multiple-period dividend discount models provide more reliable and accurate measures of the expected DCF return under such conditions.

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

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

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

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.

A. The basic data employed in my implementation of this methodology is presented in Exhibit____(BLC-1), Schedule 4. This is a summary sheet with input data and the resulting DDM estimates of the cost of equity. Detailed backup is provided in my workpapers.

The basic input data consists of the current dividend yield, an estimated EPS projection for 2007, the current Zacks consensus EPS growth projection, an estimate of long-term growth into perpetuity, and estimated retention ratios for 2007, 2011, and 2026. The DDM analysis assumes that earnings grow from 2007 to 2011 at the indicated Zacks consensus EPS growth rate, and at the long-term growth rate (4.00 percent, the median value of Value Line's "% Retained to Common Equity") thereafter. The period from 2011 to 2026 is a transition period during which the retention ratio changes from the value projected by Value Line in the year 2011 to a common value of 0.40 (the median Value Line estimate for 2011) for all companies in the sample in the year 2026. 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 4.00 percent, and a retention ratio of 0.40 percent — apply after the year 2026, allowing the determination of a terminal share price for the year 2026. These long-term conditions after 2026 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 4, were developed using the "solver" routine in an Excel spreadsheet.

Q. PLEASE SUMMARIZE THE RESULTS AND COMMENT ON THEIR SIGNIFICANCE.

A. The mean DDM return for the 11 company sample was 8.10 percent, and the median DDM return was 8.14 percent. These results are slightly lower than those obtained with the constant growth model, a finding consistent with the slightly lower DPS growth relative to EPS growth forecasted for the next 4-5 years, and a lower long run growth rate after 2011.

Q. EARLIER YOU MENTIONED APPLYING YOUR METHODOLOGIES TO APPLICANT'S NATURAL GAS DISTRIBUTION SAMPLE. WHAT WAS THE RESULT?

A. The results are shown on Exhibit____(BLC-1), Schedules 5 and 6. These were prepared as described above for Schedules 3 and 4. They show a cost of equity slightly lower than the results I obtained using a sample of combination utilities.

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:

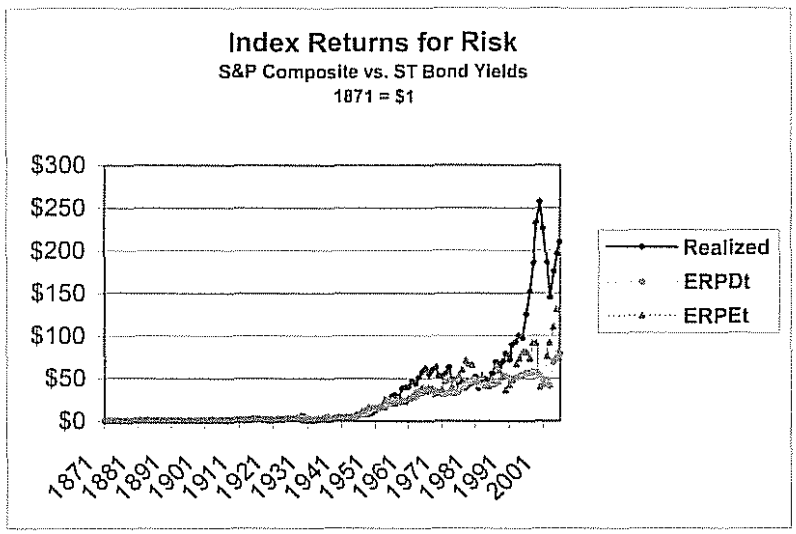
$$k = r_f + \beta r_p$$

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 2004. Using that data, I take the historical return on stocks relative to a short term 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 and dividend yields, designated ERPE and ERPD, respectively. 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 "Ex-D/P" and "Ex-E/P" series quantify these unanticipated capital gains and remove them from the realized returns to derive implied estimates of the expected ERP.

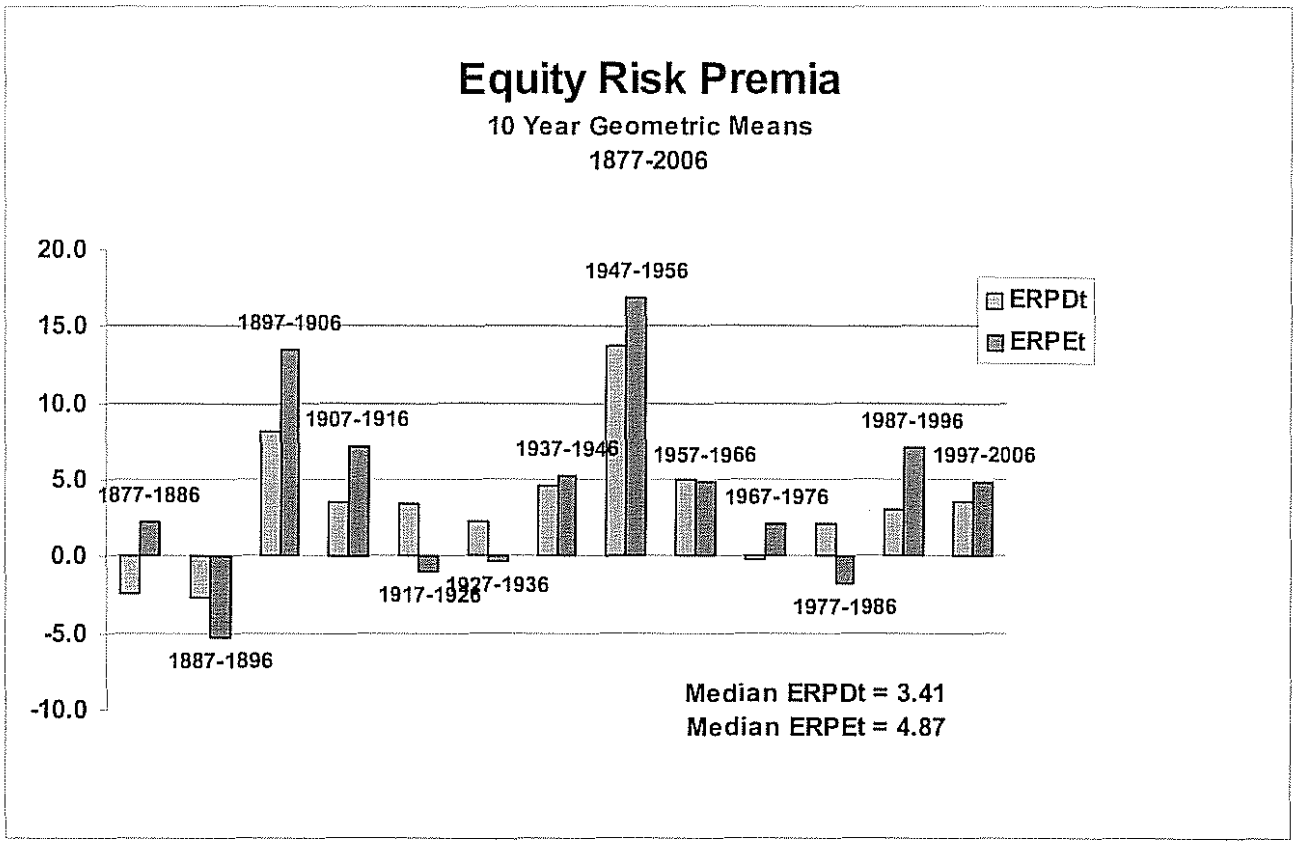
Geometric mean risk premiums for selected holding periods from the series depicted in the charts are shown in the following table:

Geometric Mean Risk Premia for Selected Holding Periods

Period	$ERPR_t$	$ERPD_t$	$ERPE_t$
1872-2006	4.20	3.42	3.83
1872-1950	2.85	3.40	3.58
1926-2006	5.37	4.16	4.68
1951-1981	4.89	4.09	5.05
1951-2006	5.30	3.15	4.03
1981-2006	5.58	1.96	2.82

For the period 1951-2006, the ERP based on dividends is just a little over 3 percent (3.15), while the ERP based on earnings has been 4.03 percent. But even within this period there is evidence of a downward trend, with the ERP higher in the period 1951-1981 than afterwards. Just casual inspection of these results suggests that the ERP is currently no more than 2-3 percent, based on the data for 1981-2006.

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 13 periods from 1877 to 2006 was 3.41 percent; using earnings, the median 10 year average geometric risk premium was 4.87 percent.

Q. WHICH IS THE MORE ACCURATE WAY OF DEVELOPING A SUPPLY-SIDE ERP, USING DIVIDENDS OR EARNINGS?

A. Based on statistical tests of the two, the supply-side ERP derived using dividends is clearly superior. The statistical tests, and a description of the tests, are supplied with my workpapers.

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 to 3.5 percent. For this case I will use an ERP of 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 about 8 to 10 basis points higher than the geometric mean. I conclude, conservatively, that both the geometric and arithmetic risk premium is 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 CURRENT 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 example of this are the 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.[23] 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

[23] 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.

> 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.
>
> 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.[24]

In estimating a market cost of equity for NorthWestern, we are not estimating a short-term, one-year rate of return. Were we 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 ERP's that incorporate unanticipated gains. The latter 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. The resulting CAPM estimate of the cost of equity, 8.05 percent, is shown in Exhibit____(BLC-1), Schedule 7.

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

A. The following table summarizes the evidence I've presented for applicant's cost of equity capital:

Source of Estimate	Estimate
Schedule 3, Constant DCF, Combination Utilities, Mean	8.71 percent
Schedule 3, Constant DCF, Combination Utilities, Median	8.69 percent
Schedule 4, Non-Constant DCF, Combination Utilities, Mean	8.10 percent
Schedule 4, Non-Constant DCF, Combination Utilities, Median	8.14 percent
Schedule 5, Constant DCF, Gas Distribution Utilities, Mean	7.93 percent
Schedule 5, Constant DCF, Gas Distribution Utilities, Median	8.01 percent
Schedule 6, Non-Constant DCF, Gas Distribution Utilities, Mean	8.28 percent
Schedule 6, Non-Constant DCF, Gas Distribution Utilities, Median	8.09 percent
Schedule 7, CAPM, Combination Utilities, Median	8.05 percent

Based on these results, I conclude that NorthWestern's cost of equity capital is in the range of 8 to 9 percent, and I recommend a rate of return on equity of 9 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. To calculate the overall rate of return, I have used the December 31, 2006 capital structure and debt capital costs presented in the Applicant's Statement G.

Q. WHAT OVERALL RATE OF RETURN DOES YOUR RECOMMENDATION PRODUCE?

A. It produces an overall rate of return of 7.83 percent, as shown on Exhibit____(BLC-1) Schedule 1.

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

VII. ANALYSIS OF COMPANY TESTIMONY.

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

A. Mr. Michael J. Vilbert presents NorthWestern's testimony on rate of return on equity. Mr. Vilbert presents estimates of the cost of equity based on a constant growth DCF analysis and a variation of the CAPM he calls the "risk positioning model." Each of these methods are implemented with biases that overstate NorthWestern's actual cost of equity capital.

Q. WHAT BIASES EXIST IN MR. VILBERT'S DCF ANALYSIS?

A. First, Mr. Vilbert has not given any consideration whatsoever to dividend growth in developing the growth rates for his DCF model. As shown on my Exhibit____(BLC-1), Schedule 5, the median projected dividend growth for Mr. Vilbert's sample of combination utilities is 2.82 percent, compared to a median Zack's EPS growth rate forecast of 5.00 percent. Bear in mind that the "C" in "DCF" stands for "cash," and the only cash that accrues to investors who hold stock is the dividend. Consequently, dividends must be taken into consideration somehow in the determination of a DCF growth rate. By ignoring the near term lower dividend growth rate for these utilities, Mr. Vilbert's results are inherently biased upwards. Mr. Vilbert also ignores growth estimates such as book value per share (BVPS), and % Retained to Common Equity, which incorporate the effect of slower dividend growth, and are in effect a weighted average of earnings and dividend growth. In terms of DCF theory, price growth, which is the ultimate expression of investor expectations, will track most closely to one of these latter two growth variables. As shown on my Exhibit____(BLC-1), Schedule 7, the median projected BVPS growth rate is 3.31 percent, and the median % Retained to Common Equity growth rate is 4.5 percent.

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

Q. HOW MUCH DOES THIS ACTUALLY BIAS MR. VILBERT'S ANALYSIS?

A. My Exhibit____(BLC-1), Schedule 7, gives some indication. A median growth rate based on all the growth rate data presented in my Schedule 7 would be 3.52 percent, compared to a median growth rate of 4.3 percent from the data shown on Mr. Vilbert's Table MJV-5. The total DCF rates of return determined by Mr. Vilbert are 8.2 and 8.7 percent, shown on MJV-7. The difference in growth rate between our two studies largely accounts for the difference in the total DCF rates of return we compute. Still, Mr. Vilbert's DCF results fall within the range of 8 to 9 percent that I find to be a reasonable rate of return on equity for NorthWestern. So a rate of return in this range is supported even by the Applicant's own witness.

Q. PLEASE DISCUSS THE BIASES IN MR. VILBERT'S CAPM RATE OF RETURN ANALYSIS.

A. Here there are two principle issues. The chief bias is his use of 6.50 percent as the long term market risk premium, and 8 percent as the short term market risk premium. I have already discussed this issue at length, and will not repeat myself in detail. A second issue with Mr. Vilbert's CAPM implementation is his use of the "Empirical Capital Asset Pricing Model" (ECAPM), presented on pages 18-20 of his Direct Testimony. The empirical evidence for the "flatter" security market line is an artifact associated the phenomenon of "regression toward the mean." Over time, low betas tend to regress upward, and high betas tend to regress downward. Betas published by investment services, such as the Value Line betas used by Mr. Vilbert and myself, are already adjusted to reflect this regression tendency. The use of the ECAPM is appropriate only with the use of raw or unadjusted betas, which for low beta stocks will tend to be lower than the adjusted betas published by Value Line. By using Value Line betas with an ECAPM model, Mr. Vilbert is double counting the empirical tendency of betas to underestimate returns on low beta stocks, and overestimate returns on high beta stocks.

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

A. Yes, it does, except for the list of publications that follows.

APPENDIX A

Publications of Basil L. Copeland, Jr.

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

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

"Estimates of the Cost of Equity for Public Utilities, 1971-1976." ***Journal of Business Research*** 7 No. 1 (1979): 9-17.

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

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

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

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

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

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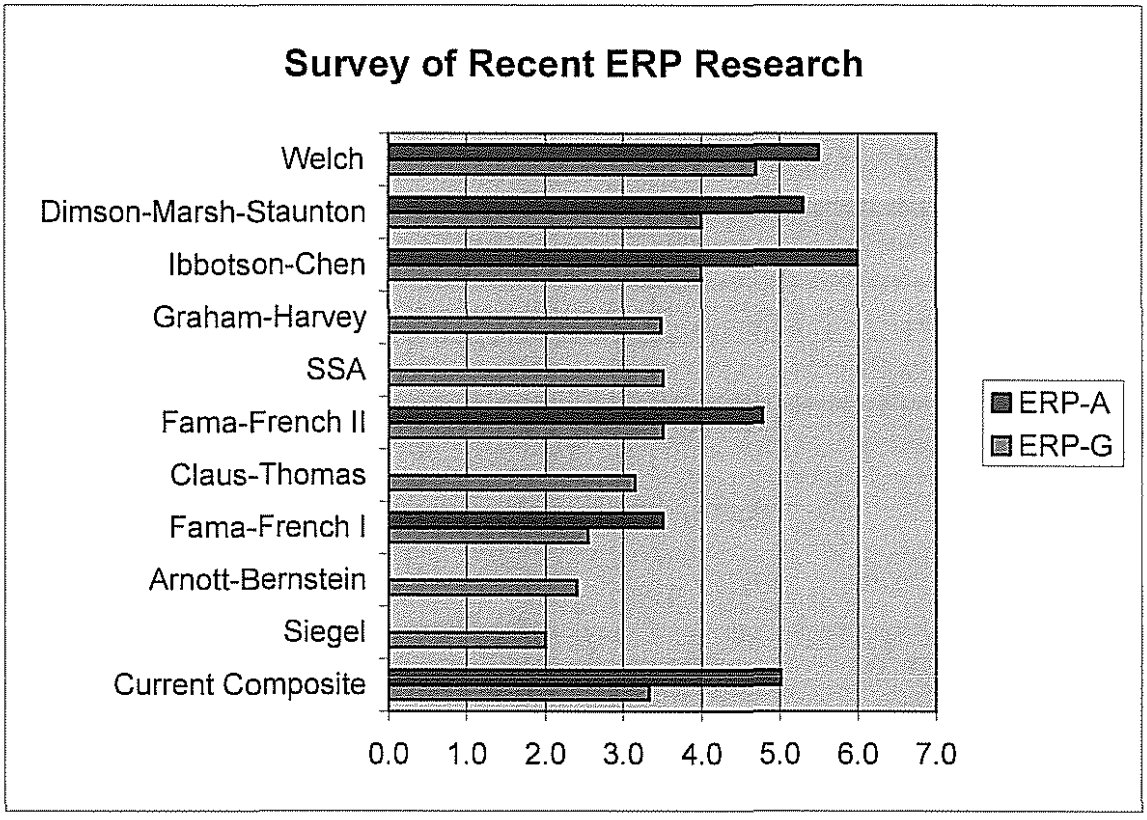
NORTHWESTERN ENERGY
Capital Structure and Overall Rate of Return

Source	Per Books	% of Total	Cost	Wtd Cost
A	B	C	D	E
Long-Term Debt	$700,604,448	48.54%	6.60%	3.20%
Common Stock Equity	742,771,580	51.46%	9.00%	4.63%
Total	$1,443,376,028	100.00%		7.83%

Implied Pro-Forma Interest Coverage: **3.23**

Sources:
Statement G, Page 1 of 4
Testimony and Exhibit of Staff Witness Copeland



Source Data For Chart:

Source	Equity Risk Premium ERP-G	ERP-A	Estimated Total Stock Return Long-Term	Annual
Current Composite	3.33	5.02	8.23	9.42
Siegel	2.00		6.90	
Arnott-Bernstein	2.40		7.30	
Fama-French I	2.55	3.50	7.45	7.90
Claus-Thomas	3.15		8.05	
Fama-French II	3.50	4.78	8.40	9.18
SSA	3.50		8.40	
Graham-Harvey	3.47		8.37	
Ibbotson-Chen	4.00	6.00	8.90	10.40
Dimson-Marsh-Staunton	4.00	5.30	8.90	9.70
Welch	4.70	5.50	9.60	9.90
Risk-free rates			4.9	4.4

NORTHWESTERN ENERGY

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

Combination Utilities

Company	Dividend 2007	Dividend 2008	Stock Price	Dividend Yield	Proj. EPS Growth (Zacks)	Proj. DPS Growth (VL)	Proj. BVPS Growth (VL)	% Ret. To Com. Eq. (VL)	Avg. Growth Rate	DCF Cost of Equity k
A	B	C	D	E	F	G	H	I	J	K
Alliant Energy	1.27	1.37	39.33	3.36%	6.00%	4.07%	5.26%	4.50%	4.96%	8.31%
Ameren Corp	2.54	2.54	50.32	5.05%	7.00%	0.00%	2.68%	2.00%	2.92%	7.97%
Avista Corp	0.60	0.65	20.04	3.12%	4.50%	16.36%	3.69%	3.00%	6.89%	10.01%
Black Hills Corp	1.36	1.40	40.37	3.42%	6.50%	2.82%	3.86%	4.50%	4.42%	7.84%
Integrys Energy	2.64	2.64	51.55	5.12%	6.30%	1.12%	4.30%	3.50%	3.80%	8.93%
MDU Resources	0.56	0.60	27.20	2.13%	7.70%	6.48%	8.62%	7.00%	7.45%	9.58%
NiSource Inc.	0.92	0.92	19.63	4.69%	3.50%	2.11%	2.57%	2.50%	2.67%	7.35%
PNM Resources	0.91	0.95	24.30	3.83%	8.80%	4.13%	4.25%	3.50%	5.17%	9.00%
Puget Energy	1.00	1.00	24.10	4.15%	5.50%	4.66%	3.94%	4.00%	4.53%	8.67%
Wisconsin Energy	1.00	1.08	45.60	2.28%	9.30%	6.78%	5.74%	7.00%	7.20%	9.48%
Xcel Energy	0.91	0.95	21.36	4.35%	4.80%	4.85%	3.70%	4.00%	4.34%	8.69%
			Mean:	**3.77%**	**6.35%**	**4.85%**	**4.42%**	**4.14%**	**4.94%**	**8.71%**
			Median:	**3.83%**	**6.30%**	**4.13%**	**3.94%**	**4.00%**	**4.53%**	**8.69%**
				Std Error:	**0.54%**	**1.31%**	**0.51%**	**0.49%**		**0.24%**

Sources

Columns B, C and I: Value Line
Column D: Stockcharts.Com
Column F: Zacks Investment Research
Column E: ((Column B + Column C) / 2) / Column D
Columns G, H, and I: Computed from Value Line data
Column J: Column E plus the average of Columns F through I

Exhibit____(BLC-1)
Schedule 3

NORTHWESTERN ENERGY
DCF Rate of Return Analysis Using Dividend Discount Model (DDM)
Combination Utilities

Company	Inputs:							Output:
	Dividend Yield	2007 EPS	Zacks Growth	Long-Term Growth	Retention Ratios 2007	2011	2026	DDM Return
Alliant Energy	3.36%	2.45	6.00%	4.00%	0.48	0.46	0.40	7.93%
Ameren Corp	5.05%	3.20	7.00%	4.00%	0.21	0.24	0.40	8.62%
Avista Corp	3.12%	1.00	4.50%	4.00%	0.40	0.37	0.40	7.14%
Black Hills Corp	3.42%	2.40	6.50%	4.00%	0.43	0.45	0.40	7.78%
Integrys Energy	5.12%	3.45	6.30%	4.00%	0.23	0.34	0.40	8.51%
MDU Resources	2.13%	1.70	7.70%	4.00%	0.67	0.64	0.40	7.73%
NiSource Inc.	4.69%	1.35	3.50%	4.00%	0.32	0.33	0.40	8.16%
PNM Resources	3.83%	1.90	8.80%	4.00%	0.52	0.48	0.40	9.20%
Puget Energy	4.15%	1.60	5.50%	4.00%	0.38	0.40	0.40	8.14%
Wisconsin Energy	2.28%	2.65	9.30%	4.00%	0.62	0.63	0.40	7.73%
Xcel Energy	4.35%	1.40	4.80%	4.00%	0.35	0.37	0.40	8.14%
Mean:			**6.35%**	**4.00%**	**0.42**	**0.43**		**8.10%**
Median:					**0.40**	**0.40**		**8.14%**
Std Error:								**0.13%**

NORTHWESTERN ENERGY
DCF Rate of Return Analysis Using Dividend Cash Flow Model (Constant Growth)
Gas Distribution Utilities

Company	Dividend 2007	Dividend 2008	Stock Price	Dividend Yield	Proj. EPS Growth (Zacks)	Proj. DPS Growth (VL)	Proj. BVPS Growth (VL)	% Ret. To Com. Eq. (VL)	Avg. Growth Rate	DCF Cost of Equity k
A	B	C	D	E	F	G	H	I	J	K
Atmos Energy	1.28	1.30	28.73	4.49%	5.30%	1.34%	2.93%	4.50%	3.52%	8.01%
Laclede Group	1.45	1.49	31.79	4.62%	3.00%	2.49%	4.30%	3.50%	3.32%	7.95%
Northwest Natural Gas	1.46	1.54	44.68	3.36%	5.30%	6.24%	4.20%	4.50%	5.06%	8.42%
Piedmont Natural Gas	0.99	1.03	25.89	3.90%	5.30%	3.82%	4.00%	3.50%	4.16%	8.06%
South Jersey Industries	0.98	1.04	35.00	2.89%	6.50%	5.19%	2.68%	10.00%	6.09%	8.98%
Southwest Gas	0.86	0.86	31.38	2.74%	5.00%	1.14%	2.75%	7.00%	3.97%	6.71%
WGL Holdings	1.36	1.40	32.17	4.29%	3.00%	2.82%	3.31%	3.50%	3.16%	7.45%
AGL Resources	1.64	1.64	39.12	4.19%	4.50%	2.35%	1.08%	6.00%	3.48%	7.68%
Vectren Corp	1.27	1.31	27.52	4.69%	4.30%	3.01%	3.54%	3.00%	3.46%	8.15%
			Mean:	3.91%	4.69%	3.16%	3.20%	5.06%	4.03%	7.93%
			Median:	4.19%	5.00%	2.82%	3.31%	4.50%	3.52%	8.01%
				Std Error:	0.34%	0.51%	0.30%	0.68%		0.19%

Sources
- Columns B, C and I: Value Line
- Column D: Stockcharts.Com
- Column F: Zacks Investment Research
- Column E: ((Column B + Column C) / 2) / Column D
- Columns G, H, and I: Computed from Value Line data
- Column J: Column E plus the average of Columns F through I

Exhibit___(BLC-1)
Schedule 5

NORTHWESTERN ENERGY
DCF Rate of Return Analysis Using Dividend Discount Model (DDM)
Gas Distribution Utilities

Company	Inputs:							Output:
	Dividend Yield	2006 EPS	Zacks Growth	Long-Term Growth	Retention Ratios 2006	2010	2025	DDM Return
Atmos Energy	4.49%	2.00	5.30%	4.50%	0.36	0.46	0.40	8.65%
Laclede Group	4.62%	1.90	3.00%	4.50%	0.24	0.32	0.40	8.06%
Northwest Natural Gas	3.36%	2.60	5.30%	4.50%	0.44	0.40	0.40	8.09%
Piedmont Natural Gas	3.90%	1.40	5.30%	4.50%	0.29	0.28	0.40	8.04%
South Jersey Industries	2.89%	2.30	6.50%	4.50%	0.57	0.60	0.40	8.29%
Southwest Gas	2.74%	2.15	5.00%	4.50%	0.60	0.67	0.40	8.03%
WGL Holdings	4.29%	1.98	3.00%	4.50%	0.31	0.37	0.40	8.07%
AGL Resources	4.19%	2.80	4.50%	4.50%	0.41	0.42	0.40	8.66%
Vectren Corp	4.69%	1.80	4.30%	4.50%	0.29	0.29	0.40	8.65%
Mean:			**4.69%**	**4.50%**	**0.39**	**0.42**		**8.28%**
Median:					**0.36**	**0.40**		**8.09%**
Std Error:								**0.07%**

NORTHWESTERN ENERGY
CAPM Rate of Return Analysis
Combination Utilities

Risk-free rate =	4.90
Equity Risk Premium =	3.50

Company	Beta	Required Return (k)
A	B	C
Alliant Energy	0.95	8.23
Ameren Corp	0.75	7.53
Avista Corp	0.90	8.05
Black Hills Corp	1.10	8.75
Integrys Energy	0.85	7.88
MDU Resources	1.00	8.40
NiSource Inc.	0.95	8.23
PNM Resources	0.95	8.23
Puget Energy	0.85	7.88
Wisconsin Energy	0.80	7.70
Xcel Energy	0.90	8.05
	Median =	**8.05**